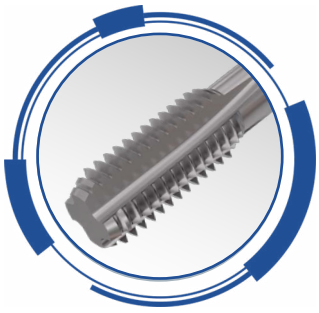
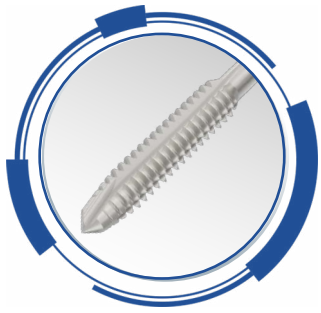
ISCAR **TAPPING** TOOLS

Metric · Imperial

MACHINING INTELLIGENTLY





Member IMC Group

ISCAR

www.iscar.com

CERTIFIED QMS AS 9100 THE STANDARDS INSTITUTION OF ISRAEL

CERTIFIED QMS SI ISO 9001: 2015 THE STANDARDS INSTITUTION OF ISRAEL

CERTIFIED EMS SI ISO 14001: 2015 THE STANDARDS INSTITUTION OF ISRAEL

CERTIFIED OHS SYSTEM SI ISO 45001:2018 THE STANDARDS INSTITUTION OF ISRAEL

CERTIFIED ENERGY MANAGEMENT SYSTEM SI ISO 50001 THE STANDARDS INSTITUTION OF ISRAEL

Quality Standard

ISCAR has been certified by the prestigious Standards Institution, as being in full compliance to ensure delivery of the finest quality goods. Quality control facilities include the metallurgical laboratory, raw metal testing, an online testing procedure and a machining center for tool performance testing and final product inspection. Only the finest products are packaged for entry into ISCAR's inventory.

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Tap

Tap

Tap Designation Code Key

TPGN	UNC	1/4-20	M	□	HE

Tap Style

TPH	-	hand tap
TPF	-	forming tap
TPG	-	gun point
TPS	-	spiral flute
TPST	-	straight flute

D	-	TPI
D	-	pitch

B - Bore for Coolant

(on request)

Coating Types*

HE	-	uncoated
HS	-	uncoated
HETI	-	TiN PVD coated
HENI	-	nitrated
HEST	-	steam tempered
PM	-	Uncoated
PMTC	-	TiCN PVD coated
PMTA	-	TiAlN PVD coated
PMST	-	Steam tempered
PMTI	-	TiN PVD coated
PMNI	-	Nitrated
HEDLC	-	DLC-coating
HETA	-	TiAlN PVD coated
HETC	-	TiCN PVD coated

Thread Standard

M	-	ISO metric coars thread DIN-13
MF	-	ISO metric fine thread DIN-13
UNF	-	unfied fine thread
UNC	-	unfied coarse thread

Tap Color Codes(1)

M	-	MULTI-MATERIAL application
W	-	steel with good machinability Rm<750 N/mm^2
S	-	stainless steel
H	-	hardened steel and high temp./ super alloys Rm>750 N/mm^2
G	-	grey cast iron
N	-	low alloy steel Rm<600 N/mm^2
A	-	aluminum and aluminum alloys
F	-	any material with at least 8~10% elongation
Y	-	nickel alloys

(1) The tools have a matching colored ring around the shank

Tap Materials

HS	-	H.S.S. (M2)
HE	-	H.S.S- E 5% Co. HSS (M35)
PM	-	compacted powder
HM	-	solid carbide

Chamfer Lead According to DIN2197 (Specified for Each Tool Family)

- **A** form a (chamfer lead 5-6 threads)
- **B** form b (with gun-nose and chamfer lead 4-5 threads)
- **C** form c (chamfer lead 2-3 threads)
- **D** form d (chamfer lead 4-5 threads)
- **E** form e (chamfer lead 1.5-2 threads)
- **F** form f (chamfer lead 1-1.5 threads)

Tap Surface Treatments and Coating Types

The high speed steels used by **ISCAR** grant high wear resistance and toughness. For machining certain materials, various surface treatments are an advantage.

Steam Tempered (ST)

The steam tempered is a Fe3O4 oxide coating which reduces the friction between the tool and workpiece and prevents cold welding.

Nitriding (NI)

Recommended surface treatment for machining hard wear/abrasive materials such as grey cast iron, aluminum alloys with high silicon percentage (more than 10%).

TiN Coating (TI)

The TiN coating has a hardness of approximately 2,300 HV and is temperature resistant up to approximately 600°C. This is an excellent golden colored coating for general applications.

TiCN-COATING – TiCN

TiCN takes place of TiN when the conditions require the coating to have a different hardness and toughness. The TiCN brings an advantage to machining very difficult steels or cutting interrupted bores. The TiCN-coating has a hardness of approx. 3,000 HV, but is temperature-resistant up to approx. 400° only. That means TiCN needs excellent cooling for long service life.
Color: Blue-grey coefficient of friction against steel : 0.4

DLC-Coating

With its high wear resistance and slight adhesion on nonferrous metals DLC (Diamond-Like Carbon) coating is perfectly recommended for cutting Aluminium and Aluminium alloys.

TiAIN-COATING – TiAIN

This is a special coating for machining abrasive materials such as: gray cast iron, alu-alloys with silicon, fiber reinforced plastics, etc., or machining under high temperatures, which means with insufficient cooling, or high speeds ≥ 600m/min. The TiAIN has a hardness of approx. 3,000 HV and is temperature resistant up to approx. 800°.
Color: Violet-grey coefficient of friction against steel : 0.4

Hardslick-COATING – Hardslick

Hardslick combines in a novel way the advantages of an extremely hard, thermally stable TiAIN-coating with the sliding and lubricating properties of an outer WC/C (Tungsten carbide/carbon) coating. The hardslick coating has a hardness of approx. 3,000 HV and is temperature-resistant up to approx. 800°.
Color: Violet-grey coefficient of friction against steel : 0.2

Tolerances According to DIN EN 22857

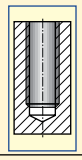
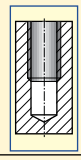
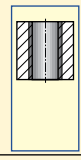
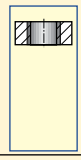
Intended for taps with ISO metric threads. The following chart gives a comparison between the new standard DIN EN 22857 and the withdrawn standard DIN 802 part 1. An important change is the re-classification from tap tolerance to tap application class.

Application Class for Taps to DIN EN 22857		Tolerance Class to Withdrawn Standard DIN 802 Part 1	Allotment of the Tolerance Zones of the Nut Thread to Be Cut				
class 1	ISO 1	4H	4H	5H	-	-	-
class 2	ISO 2	6H	5G	5G	6H	-	-
class 3	ISO 3	6G	-	-	6G	7H	8H
-	-	7G	-	-	-	7G	8G

A suitable transition period is to be expected.

Codes for tolerance classes 7G/8G and <X> tolerance zones have yet to be standardized within DIN EN 22857, and the values from DIN 802 part will remain valid.

Tap Selection Guide and Cutting Speed Recommendations

Material No.	Material		Condition	Tensile Strength [N/mm²]	Hardness HB	Chip	Coolant
	Hole Type[4]					tap color code[1]	
						tool material[1]	
						surface treatment/coating[2]	
						flute hand and angle	
						lead according to DIN 2197[3]	
	1	2	3	4	5	Hole Type[4]	
1	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	125	Ext. Long	T
2		≥0.25% C	annealed	650	190	Medium	T
3		<0.55% C	quenched and tempered	850	250	Long	T
4		≥0.55% C	annealed	750	220	Long	T
7	low alloy and cast steel (less than 5% of alloying elements)		quenched and tempered	930	275	Long	X
8				1000	300	Long	X
9				1200	350	Long	A
10	high alloyed steel, cast steel and tool steel		annealed	680	200	Long	X
11			quenched and tempered	1100	325	Long	X
12	stainless steel and cast steel		ferritic/martensitic	680	200	Medium	A
13			martensitic	820	240	Long	A
14	stainless steel and cast steel		austenitic, duplex	600	180	Long	A
15	gray cast iron (gg)		ferritic / pearlitic		180	Ext. Short	X
16			pearlitic / martensitic		260	Ext. Short	X
17	nodular cast iron (ggg)		ferritic		160	Short	X
18			pearlitic		250	Ext. Short	X
19	malleable cast iron		ferritic		130	Short	X
20			pearlitic		230	Short	X
21	aluminum-wrought alloys		not hardenable		60	Medium	T
22			hardenable		100	Medium	T
23	aluminum-cast alloys	≤12% Si	not hardenable		75	Short	T
24			hardenable		90	Short	T
25		>12% Si	high temperature		130	Short	T
26	copper alloys	>1% Pb	free cutting		110	Med/Short	T
27			brass		90	Long	T
28			electrolytic copper		100	Long	T
29	non metallic		duroplastics, fiber plastics		70 Shore D	Short	Z
31	high temperature alloys	Fe based	annealed		200	Long	A
32			hardened		280	Long	A
33		Ni or Co based	annealed		250	Long	A
34			hardened		350	Long	A
35			cast		320	Long	A
36	titanium alloys		pure	400	190	Med/Short	A
37			alpha+beta alloys, hardened	1050	310	Med/Short	A

[1] See page 4
[2] See page 4
[3] See page 10
[4] See page 6

coolant
A - cutting oil
T - oil emulsion
X - oil or emulsion
Z - dry or emulsion

W(1)	M	M	M	M	M	M	S	H	N	H	G	F
HSS	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
-	-	TI	ST	-	TI	ST	ST	-	ST	ST	NI	TI
-	-	-	-	R40°	R40°	R40°	-	-	R40°	R40°	-	-
1\2\3	B	B	B	C	C	C	B	B	C	C	C	C
1-2-3-4-5	4-5	4-5	4-5	1-2-3	1-2-3	1-2-3	4-5	4-5	1-2-3	1-2-3	1-2-3-4-5	1-2-3-4-5
M/min	M/min	M/min	M/min	M/min	M/min	M/min	M/min	M/min	M/min	M/min	M/min	M/min
•	10-25 ••	15-45 •	8-25 ••	20-25 ••	15-45 •	8-25 ••		20-25 ••	8-25 •	20-25 ••		20-60
•	10-20 ••	12-40 •	10-35 ••	15-20 ••	12-40 •	10-35 ••		15-20 ••	10-35 ••	15-20 ••		20-60
•	12-18 ••	15-25 •	6-12 ••	12-18 ••	15-25 •	6-12 ••		12-18 ••		12-18 ••		17-55
•	12-18 ••	15-40 •	6-20 ••	12-18 ••	15-40 •	6-20 ••		12-18 ••		12-18 ••		17-55
•	10-15 ••	5-25 •	4-10 ••	10-15 ••	5-25 •	4-10 ••		10-15 ••		10-15 ••		
•	6-10 ••	5-25 •	4-10 ••	6-10 ••	5-25 •	4-10 ••		6-10 ••		6-10 ••		
•	3-5 ••	5-20 •	3-5 ••	3-5 ••	5-20 •	3-5 ••		3-5 ••		3-5 ••		
•	10-15 ••	20-30 •	7-12 ••	10-15 ••	20-30 •	7-12 ••		10-15 ••		10-15 ••		10-30
•	7-13 ••	12-25 •	5-10 ••	7-13 ••	12-25 •	5-10 ••		7-13 ••		7-13 ••		
•	5-9 ••	8-18 •	1-5 •	5-9 ••	2-10 •	1-5 •	2-10 •			5-9 ••		7-15
•	4-6 ••	8-15 •	1-5 •	4-6 ••	2-10 •	1-5 •	2-10 •			4-6 ••		
•	5-9 ••	8-15 •	1-4 •	5-9 ••	2-10 •	1-4 •	2-10 •			5-9 ••		
•	10-15 ••	15-45 ••	13-20 •	10-15 ••	15-45 ••	13-20 •				10-15 ••	10-30 •	
•	8-12 ••	10-40 ••	21-31 •	8-12 ••	10-40 ••	21-31 •				8-12 ••	10-30 •	
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•	8-12 ••	10-20 ••	21-31 •	8-12 ••	10-20 ••	21-31 •				8-12 ••	10-35 •	
•	10-15 •	15-45 ••	13-20 •	10-15 ••	15-45 ••	13-20 •				10-15 ••	10-45 •	
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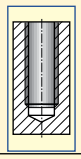
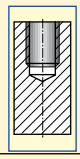
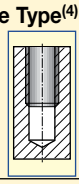
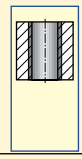
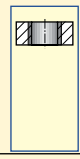
•	2-4 ••	4-8 •		2-4	3-7 ••			2-4		2-4 •		
•	2-4 ••	4-8 •		2-4	3-7 ••			2-4		2-4 •		
•	6-10 ••			6-10 ••				6-10		6-10 •		
•	6-10 •			6-10 ••				6-10		6-10 •		

• Recommended
•• Suitable
(1) Hand Tap

Material Group No.	Hole Type[4]					tap color code[1]	
						tool material[1]	
						surface treatment/coating[2]	
						flute hand and angle	
						lead according to DIN 2197[3]	
	1	2	3	4	5	Hole Type[4]	
	Material		Condition	Tensile Strength [ksi]	Hardness HB	Chip	Coolant
1	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	61	125	Ext. Long	T
2		≥0.25% C	annealed	94	190	Medium	T
3		<0.55% C	quenched and tempered	123	250	Long	T
4		≥0.55% C	annealed	109	220	Long	T
7	low alloy and cast steel (less than 5% of alloying elements)		quenched and tempered	135	275	Long	X
8				145	300	Long	X
9				174	350	Long	A
10	high alloyed steel, cast steel and tool steel		annealed	99	200	Long	X
11			quenched and tempered	160	325	Long	X
12	stainless steel and cast steel		ferritic/martensitic	99	200	Medium	A
13			martensitic	119	240	Long	A
14	stainless steel and cast steel		austenitic, duplex	87	180	Long	A
15	gray cast iron (GG)		ferritic / pearlitic		180	Ext. Short	X
16			pearlitic / martensitic		260	Ext. Short	X
17	nodular cast iron (GGG)		ferritic		160	Short	X
18			pearlitic		250	Ext. Short	X
19	malleable cast iron		ferritic		130	Short	X
20			pearlitic		230	Short	X
21	aluminum-wrought alloys		not hardenable		60	Medium	T
22			hardenable		100	Medium	T
23	aluminum-cast alloys	≤12% Si	not hardenable		75	Short	T
24			hardenable		90	Short	T
25		>12% Si	high temperature		130	Short	T
26	copper alloys	>1% Pb	free cutting		110	Med/Short	T
27			brass		90	Long	T
28			electrolytic copper		100	Long	T
29	non metallic		duroplastics, fiber plastics		70 Shore D	Short	Z
31	high temperature alloys	Fe based	annealed		200	Long	A
32			hardened		280	Long	A
33		Ni or Co based	annealed		250	Long	A
34			hardened		350	Long	A
35			cast		320	Long	A
36	titanium alloys		pure	58	190	Med/Short	A
37			alpha+beta alloys, hardened	152	310	Med/Short	A

• Recommended
•• Suitable
(1) See page 4
(2) See page 4
(3) See page 10
(4) See page 6

coolant
A - cutting oil
T - oil emulsion
X - oil or emulsion
Z - dry or emulsion

W(1)	M	M	M	M	M	M	S	H	N	H	G	F
HSS	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
-	-	TI	ST	-	TI	ST	ST	-	ST	ST	NI	TI
-	-	-	-	R40°	R40°	R40°	-	-	R40°	R40°	-	-
1\2\3	B	B	B	C	C	C	B	B	C	C	C	C
1-2-3-4-5	4-5	4-5	4-5	1-2-3	1-2-3	1-2-3	4-5	4-5	1-2-3	1-2-3	1-2-3-4-5	1-2-3-4-5
SFM	SFM	SFM	SFM	SFM	SFM	SFM	SFM	SFM	SFM	SFM	SFM	SFM
•	35-80	15-150	25-80	65-80	50-150	25-80		65-80	25-80	65-80		65-195
•	35-65	40-130	35-115	60-65	40-130	35-115		50-65	35-115	50-65		65-195
•	40-60	50-80	20-40	40-60	50-80	20-40		40-60		40-60		55-180
•	40-60	50-130	20-65	40-60	50-130	15-35		40-60		40-60		55-180
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•	15-20	25-50	5-15	15-20	5-35	5-16	5-35			15-20		
•	15-30	25-50	5-15	15-30	5-35	5-15	5-35			15-30		
•	35-50	50-150	45-65	35-50	50-150	45-65				35-50	35-100	
•	25-40	35-130	70-100	25-40	35-130	70-100				25-40	35-100	
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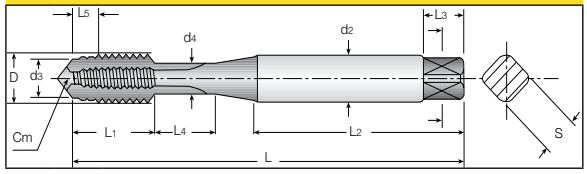
•	80-115	165-230	40-80	80-115	100-195	40-80			40-80	80-115		
•	35-50	35-130	35-80	35-50	50-130	35-80			35-80	35-50		
•	35-50	35-100	35-80	35-50	50-130	35-80			35-80	35-50		
•	35-50	35-100	35-65	35-50	50-100	35-65			35-65	35-50		
•	80-115	65-230	65-130	80-115	100-215	65-130			65-130	80-115		55-130
•	50-65	15-195	45-100	50-65	65-150	45-100			45-100	50-65		65-195
•	50-65	15-80	35-55	50-65	50-100	35-55			35-55	50-65		65-195
•	20-35	15-80	25-45	20-35	35-65	20-45			20-45	20-35		
•	5-15	15-25		5-15	10-25			5-15		5-15		
•	5-15	15-25		5-15	10-25			5-15		5-15		
•	5-15	15-25		5-15	10-25			5-15		5-15		
•	5-15	15-25		5-15	10-25			5-15		5-15		
•	5-15	15-25		5-15	10-25			5-15		5-15		
•	20-35			20-35				20-35		20-35		
•	20-35			20-35				20-35		20-35		

• Recommended
•• Suitable
(1) Hand Tap

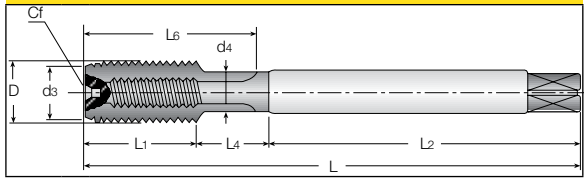
Tap Nomenclature and Standards

DIN 371



D - major diameter
d2 - shank diameter
d3 - chamfer diameter
d4 - neck diameter

DIN 376

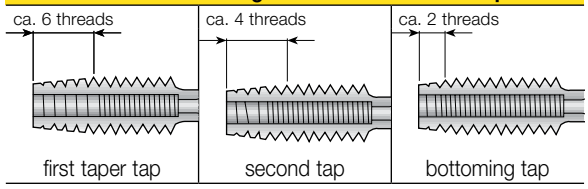


L - total length
L1 - thread length
L2 - shank length
L3 - square length
L4 - neck length
L5 - chamfer length
L6 - flute length
S - square size
Cm - center male
Cf - center female

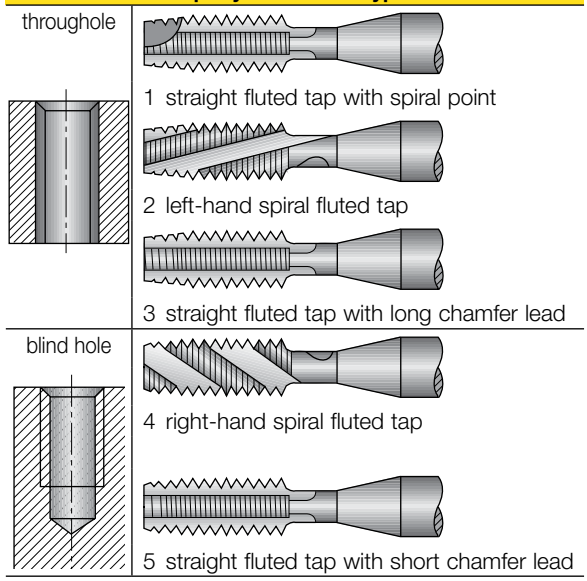
Chamfer Lead Forms According to DIN 2197

A	6-8 threads	**Form A** long, 6-8 threads for short through holes.
B	3.5-5 threads	**Form B** medium, 3.5-5 threads, with spiral point for all through holes and deep tapping holes.
C	2-3 threads	**Form C** long, 2-3 threads for blind holes and generally for aluminum grey cast iron and brass.
D	3.5-5 threads	**Form D** medium, 3.5-5 threads for through and blind holes with sufficient runout.
E	1.5-2 threads	**Form E** extremely short, 1.5-2 threads for blind holes with little runout depth. Avoid use if possible.
F	1-1.5 threads	**Form F** extremely short, 1-1.5 threads for blind holes with little runout depth. Avoid use if possible.

Chamfer Lead Length for Sets of 3 Hand Taps

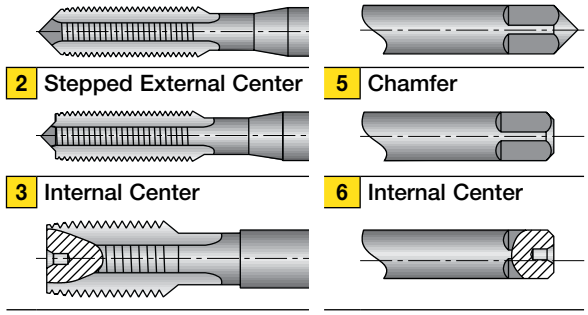


Tap Styles for Hole Types



Front and end configurations according to **DIN2197**

Front End	Shank End
1 External Center	4 External Center
2 Stepped External Center	5 Chamfer
3 Internal Center	6 Internal Center



Thread Dia. Range (mm)	Front End	Shank End	Tap Standard
≤Ø6	1	4 5	DIN352
Ø7	1 2	4 5 6	DIN371
≥Ø8	1 2 3	5 6	DIN376

Pre-Tapping Hole Sizes

ISO Metric Threads Coarse Pitch			
M	Pitch mm	Max Core Dia.mm	Drill Size mm
1	0.25	0.785	0.75
1.1	0.25	0.885	0.85
1.2	0.25	0.985	0.95
1.4	0.30	1.160	1.10
1.6	0.35	1.321	1.25
1.7	0.35	1.346	1.30
1.8	0.35	1.521	1.45
2	0.40	1.679	1.60
2.2	0.45	1.838	1.75
2.3	0.40	1.920	1.90
2.5	0.45	2.138	2.05
2.6	0.45	2.176	2.10
3	0.50	2.599	2.50
3.5	0.60	3.010	2.90
4	0.70	3.422	3.30
4.5	0.75	3.878	3.70
5	0.80	4.334	4.20
6	1.00	5.153	5.00
7	1.00	6.153	6.00
8	1.25	6.912	6.80
9	1.25	7.912	7.80
10	1.50	8.676	8.50
11	1.50	9.676	9.50
12	1.75	10.441	10.20
14	2.00	12.210	12.00
16	2.00	14.210	14.00
18	2.50	15.744	15.50
20	2.50	17.744	17.50
22	2.50	19.744	19.50
24	3.00	21.252	21.00
27	3.00	24.252	24.00
30	3.50	26.771	26.50
33	3.50	29.771	29.50
36	4.00	32.270	32.00
39	4.00	35.270	35.00
42	4.50	37.799	37.50
45	4.50	40.799	40.50
48	5.00	43.297	43.00
52	5.00	47.297	47.00
56	5.50	50.796	50.50
60	5.50	54.796	54.50
64	6.00	58.305	58.00
68	6.00	62.305	62.00

ISO Metric Threads Fine Pitch			
MF	Pitch mm	Max Core Dia.mm	Drill Size mm
2.5	0.35	2.221	2.15
3	0.35	2.271	2.65
3.5	0.35	3.221	3.15
4	0.50	3.599	3.50
4.5	0.50	4.099	4.00
5	0.50	4.599	4.50
5.5	0.50	5.099	5.00
6	0.75	5.378	5.20
7	0.75	6.378	6.20
8	0.75	7.378	7.20
8	1.00	7.153	7.00
9	0.75	8.378	8.20
9	1.00	8.153	8.00
10	0.75	9.378	9.20
10	1.00	9.153	9.00
10	1.25	8.912	8.80
11	0.75	10.378	10.20
11	1.00	10.153	10.00
12	1.00	11.153	11.00
12	1.25	10.912	10.80
12	1.50	10.676	10.50
14	1.00	13.153	13.00
14	1.25	12.912	12.80
14	1.50	12.676	12.50
15	1.00	14.153	14.00
15	1.50	13.676	13.50
16	1.00	15.153	15.00
16	1.50	14.676	14.50
17	1.00	16.153	16.00
17	1.50	15.676	15.50
18	1.00	17.153	17.00
18	1.50	16.676	16.50
18	2.00	16.210	16.00
20	1.00	19.153	19.00
20	1.50	18.676	18.50
20	2.00	18.210	18.00
22	1.00	21.153	21.00
22	1.50	20.676	20.50
22	2.00	20.210	20.00
24	1.00	23.153	23.00
24	1.50	22.676	22.50
24	2.00	22.210	22.00
25	1.00	24.153	24.00
25	1.50	23.676	23.50

ISO Metric Threads Fine Pitch			
MF	Pitch mm	Max Core Dia.mm	Drill Size mm
25	2.00	23.210	23.00
26	1.50	24.676	24.50
27	1.00	26.153	26.00
27	1.50	25.676	25.50
27	2.00	25.210	25.00
28	1.00	27.153	27.00
28	1.50	26.676	26.50
28	2.00	26.210	26.00
30	1.00	29.153	29.00
30	1.50	28.676	28.50
30	2.00	28.210	28.00
30	3.00	27.252	27.00
32	1.50	30.675	30.50
32	2.00	30.210	30.00
33	1.50	31.676	31.50
33	2.00	31.210	31.00
33	3.00	30.252	30.00
35	1.50	33.676	33.50
36	1.50	34.676	34.50
36	2.00	34.210	34.00
36	3.00	33.252	33.00
38	1.50	36.676	36.50
39	1.50	37.676	37.50
39	2.00	37.210	37.00
39	3.00	36.252	36.00
40	1.50	38.676	38.50
40	2.00	38.210	38.00
40	3.00	37.252	37.00
42	1.50	40.676	40.50
42	2.00	40.210	40.00
42	3.00	39.252	39.00
45	1.50	43.676	43.50
45	2.00	43.210	43.00
45	3.00	42.252	42.00
48	1.50	46.676	46.50
48	2.00	46.210	46.00
48	3.00	45.252	45.00
50	1.50	48.676	48.50
50	2.00	48.210	48.00
50	3.00	47.252	47.00
52	1.50	50.676	50.50
52	2.00	50.210	50.00
52	3.00	49.252	49.00

Recommended Tap Drill Size		
M	Pitch mm	Drill Size mm
1	0.25	0.9
1.1	0.25	1
1.2	0.25	1.1
1.4	0.3	1.28
1.6	0.35	1.47
1.7	0.35	1.57
1.8	0.35	1.67
2	0.4	1.85
2.2	0.45	2.03
2.3	0.4	2.15
2.5	0.45	2.33
2.6	0.45	2.43
3	0.5	2.8
3.5	0.6	3.25
4	0.7	3.7
4.5	0.75	4.2
5	0.8	4.65
6	1	5.55
7	1	6.55
8	1.25	6.6
9	1.25	7.45
10	1.5	8.45
11	1.5	9.35
12	1.75	11.25
14	2	13.1
16	2	15.1
18	2.5	16.85
20	2.5	18.85
22	2.5	20.85
24	3	22.65
27	3	25.65
30	3.5	28.4
33	3.5	31.4
36	4	34.15
39	4	37.15
42	4.5	39.9
45	4.5	42.9
48	5	45.65

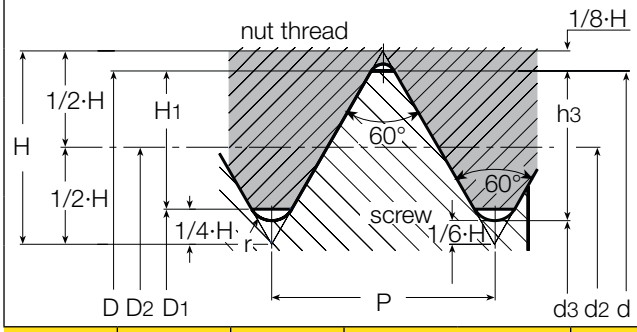
Recommended Tap Drill Size		
MF	Pitch mm	Drill Size mm
2.5	0.35	2.37
2.6	0.35	2.47
3	0.35	2.88
3.5	0.35	3.38
4	0.5	3.8
5	0.5	4.8
6	0.5	5.8
6	0.75	5.7
7	0.75	6.7
8	0.75	7.7
8	1	7.6
9	0.75	8.7
9	1	8.6
10	0.75	9.7
10	1	9.6
10	1.25	9.45
11	1	10.6
12	1	11.6
12	1.25	11.45
12	1.5	11.35
14	1	13.6
14	1.25	13.45
14	1.5	13.35
15	1	14.6
15	1.5	14.35
16	1	15.6
16	1.5	15.35
18	4	17.6
18	1.5	17.35
18	2	17.1
20	1	19.6
20	1.5	19.35
20	2	19.1
24	2	23.1
30	2	29.1
36	3	34.65
42	4	40.15
48	3	46.65

American Unified Coarse Threads			
UNC	T.P.I.	Max. Core Dia. Inch	Drill Size mm
#1	64	1.585	1.5
#2	56	1.872	1.8
#3	48	2.146	2.1
#4	40	2.385	2.3
#5	40	2.697	2.6
#6	32	2.896	2.85
#8	32	3.528	3.5
#10	24	3.95	3.9
#12	24	4.59	4.5
1/4"	20	5.25	5.2
5/16"	18	6.68	6.6
3/8"	16	8.082	8
7/16"	14	9.441	9.4
1/2"	13	10.881	10.75
9/16"	12	12.301	12.25
5/8"	11	13.693	13.5
3/4"	10	16.624	16.5
7/8"	9	19.52	19.5
1"	8	22.344	22.25
1 1/8"	7	25.082	25
1 1/4"	7	28.258	28.25
1 3/8"	6	30.851	30.75
1 1/2"	6	34.026	34
1 3/4"	5	39.56	39.5
2"	4.5	45.367	45.25

American Unified Fine Threads			
UNF	T.P.I	Max. Core Dia. Inch	Drill Size mm
#0	80	1.306	1.3
#1	72	1.613	1.6
#2	64	1.913	1.9
#3	56	2.197	2.1
#4	48	2.459	2.4
#5	44	2.741	2.7
#6	40	3.012	3
#8	36	3.597	3.5
#10	32	4.168	4.1
#12	28	4.717	4.7
1/4"	28	5.563	5.5
5/16"	24	6.995	6.9
3/8"	24	8.565	8.5
7/16"	20	9.947	9.9
1/2"	20	11.524	11.5
9/16"	18	12.969	12.9
5/8"	18	14.554	14.5
3/4"	16	17.546	17.5
7/8"	14	20.493	20.5
1"	12	23.363	23.25
1 1/8"	12	26.538	26.5
1 1/4"	12	29.713	29.5
1 3/8"	12	32.888	32.7
1 1/2"	12	36.063	36

ISO Metric Thread Nominal Dimensions According to UNI 4535-64

tap flank diameter production tolerances for ISO 6H Nut threads limit dimensions - nut threads ISO 6H



coarse pitch threads dimensions in mm

$H = 0.86603P$

$H_1 = \frac{5}{8} H = 0.54127P$

$h_3 = \frac{17}{24} H = 0.61343P$

$d_2 = D_2 = d - \frac{3}{4} H = d - 0.64952P$

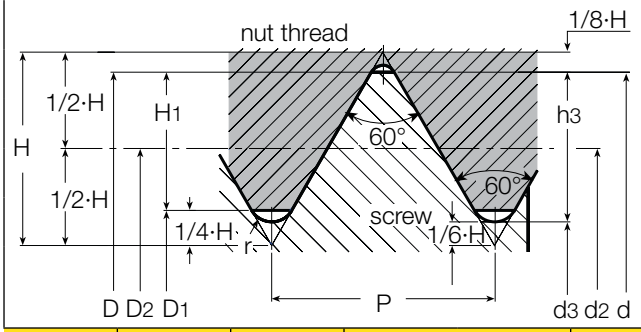
$d_3 = d - 2h_3 = d - 1.22687P$

$r = \frac{H}{6} = 0.14434P$

Nominal Dia. d=D	Pitch P	Flank Dia. D2=d2	Minor Diameter		Thread Depth		Radius r	Flank Dia. Tap Tolerance 6H D2		Flank Dia. Tap Tolerance 6H	
			Screw D3	Nut D1	Screw H3	Nut H1		Min.	Max.	Min.	Max.
M1.6	0.35	1.373	1.171	1.221	0.215	0.189	0.051	1.393	1.407	1.373	1.458
M1.8	0.35	1.573	1.371	1.421	0.215	0.189	0.051	1.593	1.607	1.573	1.658
M2	0.4	1.740	1.509	1.567	0.245	0.217	0.058	1.761	1.776	1.740	1.830
M2.2	0.45	1.908	1.648	1.713	0.276	0.244	0.065	1.931	1.946	1.908	2.003
M2.5	0.45	2.208	1.948	2.013	0.276	0.244	0.065	2.231	2.246	2.208	2.303
M3	0.5	2.675	2.387	2.459	0.307	0.271	0.072	2.699	2.715	2.675	2.775
M3.5	0.6	3.110	2.764	2.850	0.368	0.325	0.087	3.137	3.155	3.110	3.222
M4	0.7	3.545	3.141	3.242	0.429	0.379	0.101	3.574	3.593	3.545	3.663
M4.5	0.75	4.013	3.580	3.688	0.460	0.406	0.108	4.042	4.061	4.013	4.131
M5	0.8	4.480	4.019	4.134	0.491	0.433	0.115	4.510	4.530	4.480	4.605
M6	1	5.350	4.773	4.917	0.613	0.541	0.144	5.385	5.409	5.350	5.500
M7	1	6.350	5.773	5.917	0.613	0.541	0.144	6.385	6.409	6.350	6.500
M8	1.25	7.188	6.466	6.647	0.767	0.677	0.180	7.226	7.251	7.188	7.348
M9	1.25	8.188	7.466	7.647	0.767	0.677	0.180	8.226	8.251	8.188	8.348
M10	1.5	9.026	8.160	8.376	0.920	0.812	0.217	9.068	9.096	9.026	9.206
M11	1.5	10.026	9.160	9.376	0.920	0.812	0.217	10.068	10.096	10.026	10.206
M12	1.75	10.863	9.853	10.106	1.074	0.947	0.253	10.911	10.943	10.863	11.063
M14	2	12.701	11.546	11.835	1.227	1.083	0.289	12.752	12.786	12.701	12.913
M16	2	14.701	13.546	13.835	1.227	1.083	0.289	14.752	14.786	14.701	14.913
M18	2.5	16.376	14.933	15.294	1.534	1.353	0.361	16.430	16.466	16.376	16.600
M20	2.5	18.376	16.933	17.294	1.534	1.353	0.361	18.430	18.466	18.376	18.600
M22	2.5	20.376	18.933	19.294	1.534	1.353	0.361	20.430	20.466	20.376	20.600
M24	3	22.051	20.319	20.752	1.840	1.624	0.433	22.115	22.157	22.051	22.316
M27	3	25.051	23.319	23.752	1.840	1.624	0.433	25.115	25.157	25.051	25.316
M30	3.5	27.727	25.706	26.211	2.147	1.894	0.505	27.794	27.839	27.727	28.007
M33	3.5	30.727	28.706	29.211	2.147	1.894	0.505	30.794	30.839	30.727	31.007
M36	4	33.402	31.093	31.670	2.454	2.165	0.577	33.473	33.520	33.402	33.702
M39	4	36.402	34.093	34.670	2.454	2.165	0.577	36.473	36.520	36.402	36.702
M42	4.5	39.077	36.479	37.129	2.760	2.436	0.650	39.152	39.202	39.077	39.392
M45	4.5	42.077	39.479	40.129	2.760	2.436	0.650	42.152	42.202	42.077	42.392
M48	5	44.752	41.866	42.587	3.067	2.706	0.722	44.832	44.885	44.752	45.087
M52	5	48.752	45.866	46.587	3.067	2.706	0.722	48.832	48.885	48.752	49.087
M56	5.5	52.428	49.252	50.046	3.374	2.977	0.794	52.512	52.568	52.428	52.783
M60	5.5	56.428	53.252	54.046	3.374	2.977	0.794	56.512	56.568	56.428	56.783
M64	6	60.103	56.639	57.505	3.681	3.248	0.866	60.193	60.253	60.103	60.478
M68	6	64.103	60.639	61.505	3.681	3.248	0.866	64.193	64.253	64.103	64.478
Metric Thread MA (old UNI 159 Profile)								**Nut Tolerance SH8**			
M1.7	0.35	1.473	1.246	1.246	0.227	0.227	0.040	1.493	1,507	1.473	1.529
M2.3	0.4	2.040	1.780	1.780	0.260	0.260	0.040	2.061	2.076	2.040	2.120
M2.6	0.45	2.308	2.016	2.016	0.292	0.292	0.050	2.331	2.346	2.308	2.388

ISO Metric Fine Thread Nominal Dimensions According to UNI 4535-64

tap flank diameter production tolerances for ISO 6H Nut threads limit dimensions - nut threads ISO 6H



coarse pitch threads dimensions in mm

$H = 0.86603P$

$H_1 = \frac{5}{8} H = 0.54127P$

$h_3 = \frac{17}{24} H = 0.61343P$

$d_2 = D_2 = d - \frac{3}{4} H = d - 0.64952P$

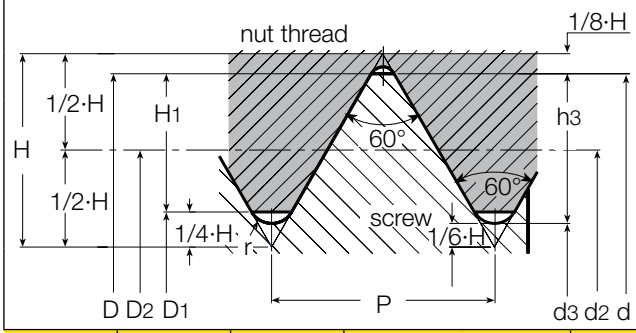
$d_3 = d - 2h_3 = d - 1.22687P$

$r = \frac{H}{6} = 0.14434P$

Nominal Dia. d=D	Pitch P	Flank Dia. D2=D2	Minor Diameter		Thread Depth		Radius r	Flank Dia. Tap Tolerance 6H D2		Flank Dia. Tap Tolerance 6H	
			Screw D3	Nut D1	Screw H3	Nut H1		Min.	Max.	Min.	Max.
M 2	0.25	1.838	1.693	1.729	0.153	0.135	0.036	1.844	1.856	1.838	1.886
M 2.5	0.35	2.273	2.701	2.121	0.215	0.189	0.051	2.293	2.307	2.273	2.358
M 3	0.35	2.773	2.571	2.621	0.215	0.189	0.051	2.794	2.809	2.773	2.863
M 3.5	0.35	3.273	3.071	3.121	0.215	0.189	0.051	3.294	3.309	3.273	3.363
M 4	0.5	3.675	3.387	3.459	0.307	0.271	0.072	3.699	3.715	3.675	3.775
M 4.5	0.5	4.175	3.887	3.959	0.307	0.271	0.072	4.199	4.215	4.175	4.275
M 5	0.5	4.675	4.387	4.459	0.307	0.271	0.072	4.699	4.715	4.675	4.775
M 5.5	0.5	5.175	4.887	4.959	0.307	0.271	0.072	5.199	5.215	5.175	5.275
M 6	0.5	5.675	5.387	5.459	0.307	0.271	0.072	5.702	5.72	5.675	5.787
M 6	0.75	5.513	5.08	5.188	0.46	0.406	0.108	5.545	5.566	5.513	5.645
M 7	0.75	6.513	6.08	6.188	0.46	0.406	0.108	6.545	6.566	6.513	6.645
M 8	0.5	7.675	7.387	7.459	0.307	0.271	0.072	7.702	7.72	7.675	7.787
M 8	0.75	7.513	7.08	7.188	0.46	0.406	0.108	7.545	7.566	7.513	7.645
M 8	1	7.35	6.773	6.917	0.613	0.541	0.144	7.835	7.409	7.35	7.5
M 9	0.75	8.513	8.08	8.188	0.46	0.406	0.108	8.545	8.566	8.513	8.645
M 9	1	8.35	7.773	7.917	0.613	0.541	0.144	8.385	8.409	8.35	8.5
M 10	0.5	9.675	9.387	9.459	0.307	0.271	0.072	9.702	9.72	9.675	9.787
M 10	0.75	9.513	9.08	9.188	0.46	0.406	0.108	9.545	9.566	9.513	9.645
M 10	1	9.35	8.773	8.917	0.613	0.541	0.144	9.385	9.409	9.35	9.5
M 10	1.25	9.188	8.466	8.647	0.767	0.677	0.18	9.226	9.251	9.188	9.348
M 11	0.75	10.513	10.08	10.188	0.46	0.406	0.108	10.545	10.566	10.513	10.645
M 11	1	10.35	9.773	9.917	0.613	0.541	0.144	10.385	10.409	10.35	10.5
M 12	0.75	11.513	11.08	11.188	0.46	0.406	0.108	11.547	11.569	11.513	11.653
M 12	1	11.35	10.773	10.917	0.613	0.541	0.144	11.388	11.413	11.35	11.51
M 12	1.25	11.188	10.466	10.647	0.767	0.677	0.18	11.23	11.258	11.188	11.368
M 12	1.5	11.026	10.16	10.376	0.92	0.812	0.217	11.071	11.101	11.026	11.216
M 13	1	12.35	11.773	11.917	0.613	0.541	0.144	12.388	12.413	12.35	12.51
M 14	1	13.35	12.773	12.917	0.613	0.541	0.144	13.388	13.413	13.35	13.51
M 14	1.25	13.188	12.466	12.647	0.767	0.677	0.18	13.23	13.258	13.188	13.368
M 14	1.5	13.026	12.16	12.376	0.92	0.812	0.217	13.071	13.101	13.026	13.216
M 15	1	14.35	13.773	13.917	0.613	0.541	0.144	14.388	14.413	14.35	14.51
M 15	1.5	14.026	13.16	13.376	0.92	0.812	0.217	14.071	14.101	14.026	14.216
M 16	1	15.35	14.773	14.917	0.613	0.541	0.144	15.388	15.413	15.35	15.51
M 16	1.25	15.188	14.466	14.647	0.767	0.677	0.18	15.23	15.258	15.188	15.368
M 16	1.5	15.026	14.16	14.376	0.92	0.812	0.217	15.071	15.101	15.026	15.216
M 17	1	16.35	15.773	15.917	0.613	0.541	0.144	16.388	16.413	16.35	16.51
M 17	1.5	16.026	15.16	15.376	0.92	0.812	0.217	16.071	16.101	16.026	16.216
M 18	1	17.350	16.773	16.917	0.613	0.541	0.144	17.388	17.413	17.35	17.51
M 18	1.5	17.026	16.16	16.376	0.92	0.812	0.217	17.071	17.101	17.026	17.216
M 18	2	16.701	15.546	15.835	1.227	1.083	0.289	16.752	16.786	16.701	16.913
M 20	1	19.35	18.773	18.917	0.613	0.541	0.144	19.388	19.413	19.35	19.51

ISO Metric Fine Thread
Nominal Dimensions According to UNI 4535-64

tap flank diameter production tolerances for ISO 6H Nut threads limit dimensions - nut threads ISO 6H



coarse pitch threads dimensions in mm

$H = 0.86603P$

$H_1 = \frac{5}{8} H = 0.54127P$

$h_3 = \frac{17}{24} H = 0.61343P$

$d_2 = D_2 = d - \frac{3}{4} H = d - 0.64952P$

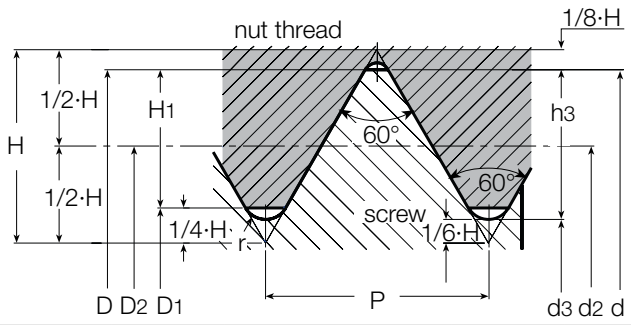
$d_3 = d - 2h_3 = d - 1.22687P$

$r = \frac{H}{6} = 0.14434P$

Nominal Dia. d=D	Pitch P	Flank Dia. D2=D2	Minor Diameter		Thread Depth		Radius r	Flank Dia. Tap Tolerance 6H D2		Flank Dia. Tap Tolerance 6H	
			Screw D3	Nut D1	Screw H3	Nut H1		Min.	Max.	Min.	Max.
M 20	1.5	19.026	18.16	18.376	0.92	0.812	0.217	19.071	19.101	19.026	19.216
M 20	2	18.701	17.546	17.835	1.227	1.083	0.289	18.752	18.786	18.701	18.913
M 22	1	21.35	20.773	20.917	0.613	0.541	0.144	21.388	21.413	21.35	21.51
M 22	1.5	21.026	20.16	20.376	0.92	0.812	0.217	21.071	21.101	21.026	21.216
M 22	2	20.701	19.546	19.835	1.227	1.083	0.289	20.752	20.786	20.701	20.913
M 24	1	23.350	22.773	22.917	0.613	0.541	0.144	23.390	23.416	23.350	23.520
M 24	1.5	23.026	22.160	22.376	0.920	0.812	0.217	23.074	23.106	23.026	23.226
M 24	2	22.701	21.546	21.835	1.227	1.083	0.289	22.754	22.791	22.701	22.925
M 25	1	24.350	23.773	23.917	0.613	0.541	0.144	24.390	24.416	24.350	24.520
M 25	1.5	24.026	23.160	23.376	0.920	0.812	0.217	24.074	24.106	24.026	24.226
M 25	2	23.701	22.546	22.835	1.227	1.083	0.289	23.754	23.791	23.701	23.925
M 26	1	25.350	24.773	24.917	0.613	0.541	0.144	25.390	25.416	25.350	25.520
M 26	1.5	25.026	24.160	24.376	0.920	0.812	0.217	25.074	25.106	25.026	25.226
M 26	2	24.701	23.546	23.835	1.227	1.083	0.289	24.754	24.791	24.701	24.925
M 27	1	26.350	25.773	25.917	0.613	0.541	0.144	26.390	26.416	26.350	26.520
M 27	1.5	26.026	25.160	25.376	0.920	0.812	0.217	26.074	26.106	26.026	26.226
M 27	2	25.701	24.546	24.835	1.227	1.083	0.289	25.754	25.791	25.701	25.925
M 28	1	27.350	26.773	26.917	0.613	0.541	0.144	27.390	27.416	27.350	27.520
M 28	1.5	27.026	26.160	26.376	0.920	0.812	0.217	27.074	27.106	27.026	27.226
M 28	2	26.701	25.546	25.835	1.227	1.083	0.289	26.754	26.791	26.701	26.925
M 30	1	29.350	28.773	28.917	0.613	0.541	0.144	29.390	29.416	29.350	29.520
M 30	1.5	29.026	28.160	28.376	0.920	0.812	0.217	29.074	29.106	29.026	29.226
M 30	2	28.701	27.546	27.835	1.227	1.083	0.289	28.754	28.791	28.701	28.925
M 30	3	28.051	26.319	26.752	1.840	1.624	0.433	28.115	28.157	28.051	28.316
M 32	1.5	31.026	30.160	30.376	0.920	0.812	0.217	31.074	31.106	31.026	31.226
M 32	2	30.701	29.546	29.835	1.227	1.083	0.289	30.754	30.791	30.701	30.925
M 33	1.5	32.026	31.160	31.376	0.920	0.812	0.217	32.074	32.106	32.026	32.226
M 33	2	31.701	30.546	30.835	1.227	1.083	0.289	31.754	31.791	31.701	31.925
M 33	3	31.051	29.319	29.752	1.840	1.624	0.433	31.115	31.157	31.051	31.316
M 35	1.5	34.026	33.160	33.376	0.920	0.812	0.217	34.074	34.106	34.026	34.226
M 35	2	33.701	32.546	32.835	1.227	1.083	0.289	33.754	33.791	33.701	33.925
M 36	1.5	35.026	34.160	34.376	0.920	0.812	0.217	35.074	35.106	35.026	35.226
M 36	2	34.701	33.546	33.835	1.227	1.083	0.289	34.754	34.791	34.701	34.925
M 36	3	34.051	32.319	32.752	1.840	1.624	0.433	34.115	34.157	34.051	34.316
M 38	1.5	37.026	36.160	36.376	0.920	0.812	0.217	37.074	37.106	37.026	37.226
M 39	1.5	38.026	37.160	37.376	0.920	0.812	0.217	38.074	38.106	38.026	38.226
M 39	2	37.701	36.546	36.835	1.227	1.083	0.289	37.754	37.791	37.701	37.925
M 39	3	37.051	35.319	35.752	1.840	1.624	0.433	37.115	37.157	37.051	37.316
M 40	1.5	39.026	38.160	38.376	0.920	0.812	0.217	39.074	39.106	39.026	39.226
M 40	2	38.701	37.546	37.835	1.227	1.083	0.289	38.754	38.791	38.701	38.925
M 40	3	38.051	36.319	36.752	1.840	1.624	0.433	38.115	38.157	38.051	38.316

ISO Metric Fine Thread
Nominal Dimensions According to UNI 4535-64

tap flank diameter production tolerances for ISO 6H Nut threads limit dimensions - nut threads ISO 6H



coarse pitch threads dimensions in mm

$H = 0.86603P$

$H_1 = \frac{5}{8} H = 0.54127P$

$h_3 = \frac{17}{24} H = 0.61343P$

$d_2 = D_2 = d - \frac{3}{4} H = d - 0.64952P$

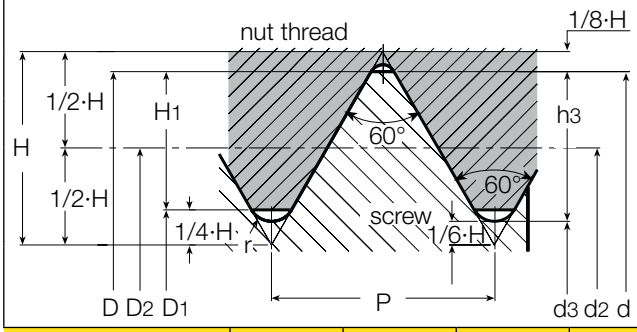
$d_3 = d - 2h_3 = d - 1.22687P$

$r = \frac{H}{6} = 0.14434P$

Nominal Dia. d=D	Pitch P	Flank Dia. D2=D2	Minor Diameter		Thread Depth		Radius r	Flank Dia. Tap Tolerance 6H D2		Flank Dia. Tap Tolerance 6H	
			Screw D3	Nut D1	Screw H3	Nut H1		Min.	Max.	Min.	Max.
M 42	1.5	41.026	40.160	40.376	0.920	0.812	0.217	41.074	41.106	41.026	41.226
M 42	2	40.701	39.546	39.835	1.227	1.083	0.289	40.754	40.791	40.701	40.925
M 42	3	40.051	38.319	38.752	1.840	1.624	0.433	40.115	40.157	40.051	40.316
M 45	1.5	44.026	43.160	43.376	0.920	0.812	0.217	44.074	44.106	44.026	44.226
M 45	2	43.701	42.546	42.835	1.227	1.083	0.289	43.754	43.791	43.701	43.925
M 45	3	43.051	41.319	41.752	1.840	1.624	0.433	43.115	43.157	43.051	43.316
M 48	1.5	47.026	46.160	46.376	0.920	0.812	0.217	47.077	47.111	47.026	47.238
M 48	2	46.701	45.546	45.835	1.227	1.083	0.289	46.758	46.796	46.701	46.937
M 48	3	46.051	44.319	44.752	1.840	1.624	0.433	46.118	46.163	46.051	46.331
M 50	1.5	49.026	48.160	48.376	0.920	0.812	0.217	49.077	49.111	49.026	49.238
M 50	2	48.701	47.546	47.835	1.227	1.083	0.289	48.758	48.796	48.701	48.937
M 50	3	48.051	46.319	46.752	1.840	1.624	0.433	48.118	48.163	48.051	48.331
M 52	1.5	51.026	50.160	50.376	0.920	0.812	0.217	51.077	51.111	51.026	51.238
M 52	2	50.701	49.546	49.835	1.227	1.083	0.289	50.758	50.796	50.701	50.937
M 52	3	50.051	48.319	48.752	1.840	1.624	0.433	50.118	50.163	50.051	50.331
M 55	1.5	54.026	53.160	53.376	0.920	0.812	0.217	54.077	54.111	54.026	54.238
M 55	2	53.701	52.546	52.835	1.227	1.083	0.289	53.758	53.796	53.701	53.937
M 55	3	53.051	51.319	51.752	1.840	1.624	0.433	53.118	53.163	53.051	53.331
M 56	1.5	55.026	54.160	54.376	0.920	0.812	0.217	55.077	55.111	55.026	55.238
M 56	2	54.701	53.546	53.835	1.227	1.083	0.289	54.758	54.796	54.701	54.937
M 56	3	54.051	52.319	52.752	1.840	1.624	0.433	54.118	54.163	54.051	54.331
M 58	1.5	57.026	56.160	56.376	0.920	0.812	0.217	57.077	57.111	57.026	57.238
M 58	2	56.701	55.546	55.835	1.227	1.083	0.289	56.758	56.796	56.701	56.937
M 58	3	56.051	54.319	54.752	1.840	1.624	0.433	56.118	56.163	56.051	56.331
M 60	1.5	59.026	58.160	58.376	0.920	0.812	0.217	59.077	59.111	59.026	59.238
M 60	2	58.701	57.546	57.835	1.227	1.083	0.289	58.758	58.796	58.701	58.937
M 60	3	58.051	56.319	56.752	1.840	1.624	0.433	58.118	58.163	58.051	58.331
Metric Thread MA (old UNI 160 Profile)										Nut Tolerance SH8	
M 2,3	0.25	2.138	1.976	1.976	0.162	0.162	0.03	2.144	2.156	2.138	2.194
M 2,6	0.35	2.373	2.146	2.146	0.227	0.227	0.04	2.393	2.407	2.373	2.429

UNIFIED Coarse Thread
Nominal Dimensions According to ANSI B1.1

Tap flank diameter production tolerances for ISO 2B
Nut threads limit dimensions - nut threads ANSI B1.1, 2B-3B



Coarse Pitch Threads Dimensions in mm

$H = 0.86603P$

$H_1 = \frac{5}{8} H = 0.54127P$

$h_3 = \frac{17}{24} H = 0.61343P$

$d_2 = D_2 = d - \frac{3}{4} H = d - 0.64952P$

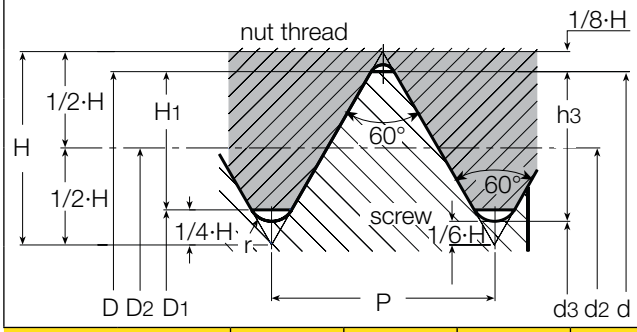
$d_3 = d - 2h_3 = d - 1.22687P$

$r = \frac{H}{6} = 0.14434P$

Nominal T.P.I Dia.		Pitch P	External Dia. d=D	Flank Dia. D2=D2	Minor Diameter		Pitch Diameter Tap Tolerance 2B		Pitch Diameter Nut Tolerance		
					Nut D1	Screw H3	Min.	Max.	Max. 2B/3B	Max. 2B	Max. 3B
UNC#1	- 64	0.397	1.854	1.598	1.425	1.367	1.610	1.623	1.598	1.664	1.646
UNC# 2	- 64	0.454	2.184	1.890	1.694	1.628	1.902	1.915	1.890	1.961	1.943
UNC#3	- 48	0.529	2.515	2.172	1.941	1.864	2.184	2.197	2.172	2.248	2.228
UNC# 4	- 40	0.635	2.845	2.433	2.156	2.065	2.446	2.459	2.433	2.517	2.494
UNC# 5	- 40	0.635	3.175	2.764	2.487	2.395	2.776	2.789	2.764	2.847	2.827
UNC# 6	- 32	0.794	3.505	2.990	2.647	2.532	3.105	3.028	2.990	3.084	3.058
UNC# 8	- 32	0.794	4.166	3.650	3.307	3.193	3.675	3.688	3.650	3.746	3.721
UNC# 10	- 24	1.058	4.826	4.138	3.680	3.528	4.163	4.176	4.138	4.247	4.219
UNC# 12	- 24	1.058	5.486	4.798	4.341	4.188	4.823	4.836	4.798	4.910	4.882
UNC 1/4"	- 20	1.270	6.350	5.524	4.976	4.793	5.575	5.588	5.524	5.646	5.616
UNC 5/16"	- 18	1.411	7.938	7.021	6.411	6.205	7.071	7.084	7.021	7.155	7.120
UNC 3/8"	- 16	1.588	9.525	8.494	7.805	7.577	8.545	8.557	8.494	8.639	8.603
UNC 7/16"	- 14	1.814	11.112	9.934	9.149	8.887	9.985	9.997	9.934	10.089	10.051
UNC 1/2"	- 13	1.954	12.700	11.430	10.584	10.302	11.481	11.494	11.430	11.595	11.552
UNC 9/16"	- 12	2.117	14.288	12.913	11.996	11.692	12.964	12.977	12.913	13.086	13.043
UNC 5/8"	- 11	2.309	15.875	14.376	13.376	13.043	14.427	14.440	14.376	14.559	14.514
UNC 3/4"	- 10	2.540	19.050	17.399	16.229	15.933	17.450	17.463	17.399	17.595	17.544
UNC 7/8"	- 9	2.822	22.225	20.391	19.169	18.763	20.455	20.467	20.391	20.599	20.546
UNC 1"	- 8	3.175	25.400	23.338	21.963	21.504	23.401	23.414	23.338	23.561	23.505
UNC 1 1/8"	- 7	3.629	28.575	26.218	24.648	24.122	26.294	26.319	26.218	26.457	26.398
UNC 1 1/4"	- 7	3.629	31.750	29.393	27.823	27.297	29.469	29.494	29.393	29.637	29.576
UNC 1 3/8"	- 6	4.233	34.925	32.174	30.343	29.731	32.250	32.276	32.174	32.438	32.372
UNC 1 1/2"	- 6	4.233	38.100	35.349	33.518	32.906	35.425	35.451	35.349	35.616	35.550
UNC 1 3/4"	- 5	5.080	44.450	41.151	38.951	38.217	41.241	41.266	41.151	41.445	41.372
UNC 2"	- 4 1/2	5.644	50.800	47.135	44.689	43.876	47.235	47.260	47.135	47.450	47.371
UNC 2 1/4"	- 4 1/2	5.644	57.150	53.485	51.039	50.226			53.485	53.805	53.726
UNC 2 1/2"	- 4	6.350	63.500	59.375	56.627	55.710			59.375	59.718	59.632
UNC 2 3/4"	- 4	6.350	69.850	65.725	62.977	62.060			65.725	66.073	65.987
UNC 3"	- 4	6.350	76.200	72.075	69.327	68.410			72.075	72.428	72.339
UNC 3 1/4"	- 4	6.350	82.550	78.425	75.677	74.760			78.425	78.783	78.694
UNC 3 1/2"	- 4	6.350	88.900	84.775	82.027	81.110			84.775	85.183	85.049
UNC 3 3/4"	- 4	6.350	95.250	91.125	88.377	87.460			91.125	91.493	91.402
UNC 4"	- 4	6.350	101.600	97.475	94.727	93.810			97.475	97.848	97.757

UNIFIED Fine Thread
Nominal Dimensions According to ANSI B1.1

Tap flank diameter production tolerances for ISO 2B Nut threads limit dimensions - nut threads ANSI B1.1, 2B-3B



Coarse Pitch Threads Dimensions in mm

$H = 0.86603P$

$H_1 = \frac{5}{8} H = 0.54127P$

$h_3 = \frac{17}{24} H = 0.61343P$

$d_2 = D_2 = d - \frac{3}{4} H = d - 0.64952P$

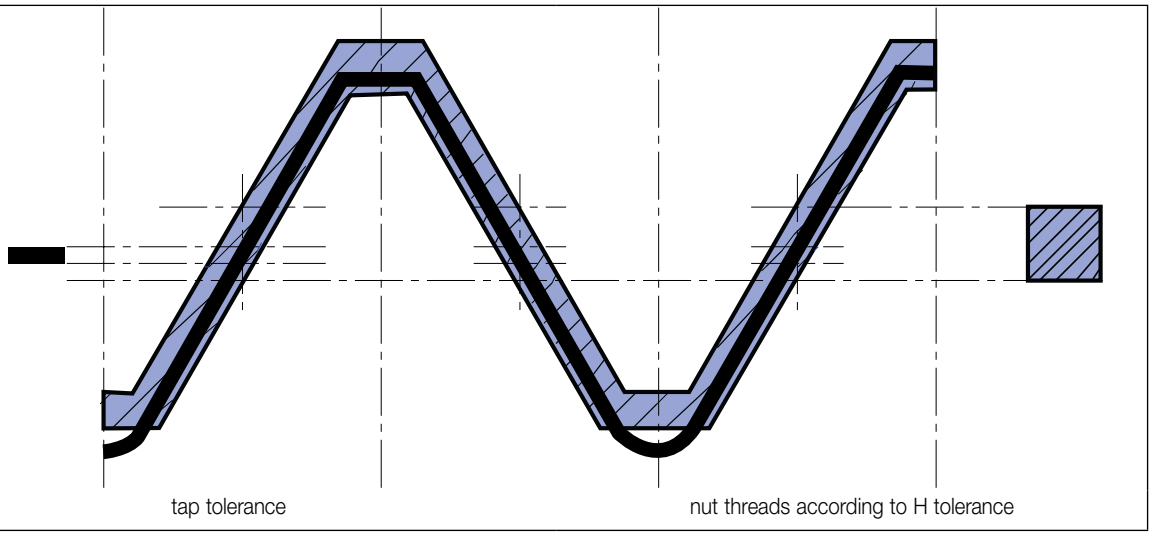
$d_3 = d - 2h_3 = d - 1.22687P$

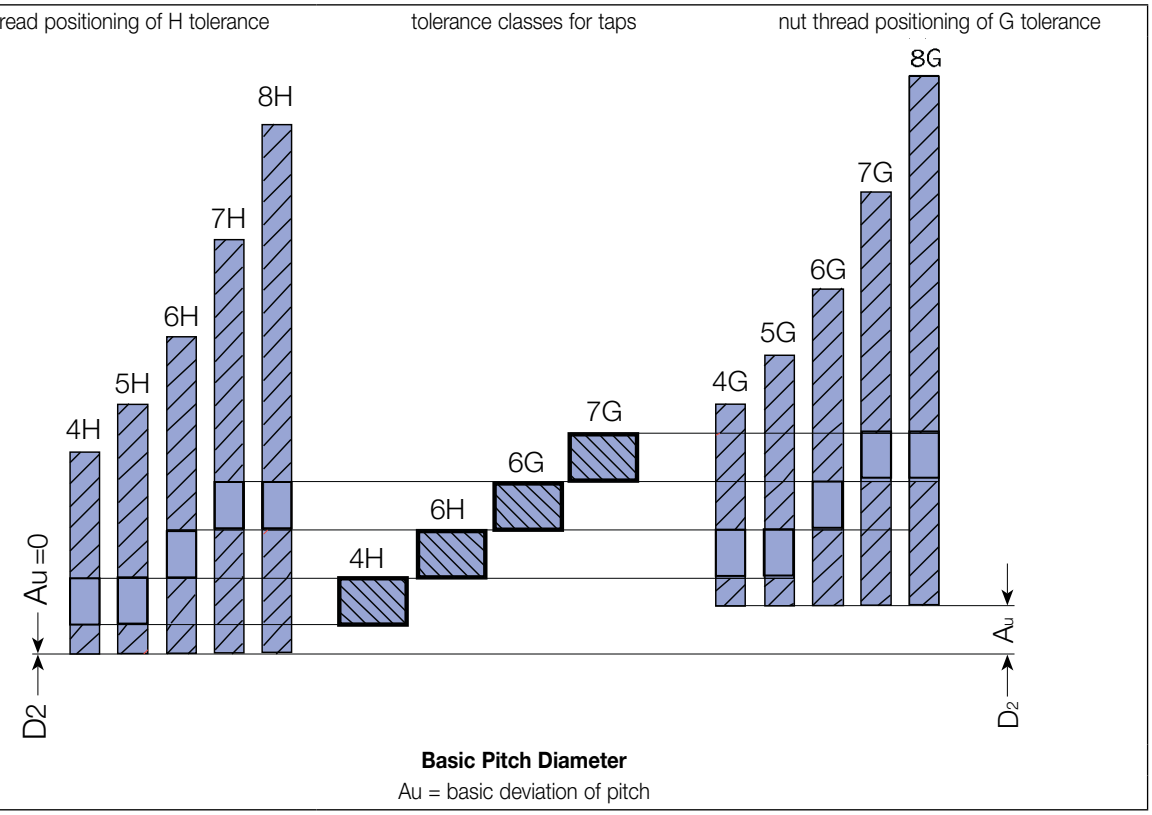
$r = \frac{H}{6} = 0.14434P$

Nominal T.P.I Dia.		Pitch P	External Dia. d=D	Flank Di a. D2=D2	Minor Diameter		Pitch Diameter Tap Tolerance 2B		Pitch Diameter Nut Tolerance		
					Nut D1	Screw H3	Min.	Max.	Max. 2B/3B	Max. 2B	Max. 3B
UNF#0	- 80	0.318	1.524	1.318	1.181	1.135	1.331	1.344	1.318	1.377	1.361
UNF#1	- 72	0.353	1.854	1.626	1.473	1.422	1.638	1.651	1.626	1.689	1.674
UNF#2	- 64	0.397	2.184	1.928	1.755	1.697	1.941	1.953	1.928	1.996	1.979
UNF#3	- 56	0.454	2.515	2.220	2.024	1.958	2.233	2.245	2.220	2.291	2.273
UNF#4	- 48	0.529	2.845	2.502	2.271	2.195	2.515	2.527	2.502	2.581	2.560
UNF#5	- 44	0.577	3.175	2.799	2.550	2.466	2.812	2.824	2.799	2.880	2.860
UNF#6	- 40	0.635	3.505	3.094	2.817	2.725	3.108	3.119	3.094	3.180	3.157
UNF#8	- 36	0.706	4.166	3.708	3.401	3.299	3.721	3.734	3.708	3.800	3.777
UNF#10	- 32	0.794	4.826	4.310	3.967	3.853	4.336	4.348	4.310	4.409	4.384
UNF#12	- 28	0.907	5.486	4.897	4.503	4.374	4.923	4.935	4.897	5.004	4.976
UNF 1/4"	- 28	0.907	6.350	5.761	5.367	5.237	5.799	5.812	5.761	5.870	5.842
UNF 5/16"	- 24	1.058	7.938	7.249	6.792	6.640	7.287	7.300	7.249	7.371	7.341
UNF 3/8"	- 24	1.058	9.525	8.837	8.379	8.227	8.875	8.887	8.837	8.961	8.931
UNF 7/16"	- 20	1.270	11.112	10.287	9.738	9.555	10.338	10.351	10.287	10.424	10.391
UNF 1/2"	- 20	1.270	12.700	11.874	11.326	11.143	11.925	11.938	11.874	12.017	11.981
UNF 9/16"	- 18	1.411	14.288	13.371	12.761	12.555	13.421	13.434	13.371	13.520	13.482
UNF 5/8"	- 18	1.411	15.875	14.958	14.348	14.143	15.009	15.022	14.958	15.110	15.072
UNF 3/4"	- 16	1.588	19.050	18.019	17.330	17.102	18.070	18.082	18.019	18.184	18.143
UNF 7/8"	- 14	1.814	22.225	21.046	20.262	20.000	21.110	21.123	21.046	21.224	21.181
UNF 1"	- 12	2.117	25.400	24.026	23.109	22.804	24.089	24.102	24.026	24.219	24.171
UNF 1*1/8"	- 12	2.117	28.575	27.201	26.284	25.979	27.252	27.277	27.201	27.339	27.351
UNF 1*1/4"	- 12	2.117	31.750	30.376	29.459	29.154	30.427	30.452	30.376	30.579	30.528
UNF 1*3/8"	- 12	2.117	34.925	33.551	32.634	32.329	33.602	33.627	33.551	33.759	33.706
UNF 1*1/2"	- 12	2.117	38.100	36.726	35.809	35.504	36.777	36.802	36.726	36.937	36.886

Tap Tolerances

Tolerance classes of taps and tolerance positions for screw threads as per ISO metric standard.





Basic Pitch Diameter

Au = basic deviation of pitch

For Optimum Tapping Conditions, Reduced Machining Times and Increased Tap Life

Selection of the Most Suitable Tap

As a general rule, materials with deformation capability of at least 10% can be cold-formed. To decide on the most suitable tap, please refer to the tap recommendation table on pages 4-5.

Pre-Tapping Holes

Check that the holes are within the prescribed size range depending on the application (see table on pages 11-13).
The holes should be clean and swarf-free.

Lubrication

Frequently the lubricant content of the coolant used for general machining is too low for tapping.

- If it is not possible to increase the lubricant content, following are some possible solutions:
- A separate lubricating unit can be connected to the machine control, to deliver the required quantity of concentrated emulsion into the core hole or onto the tap.Tapping in separate operations allows the use of the ideal tapping lubricant.

Tapping Speeds

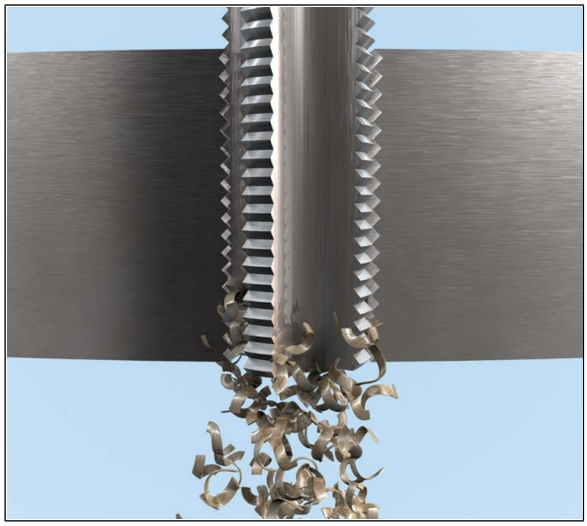
The tapping speed has a great influence on chip flow and the life of the tap. It is worthwhile to establish the ideal speed by tapping trials. For recommended initial values, see table on page 9. In addition, the following should be taken into consideration: characteristics of the material, machine and clamping method.

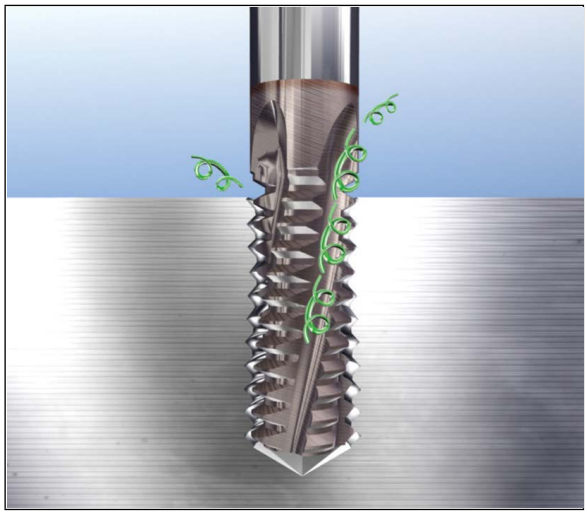
Effects of Unsuitable Tapping Speed

- Forced tapping.
- Tap lead chipping caused by overloaded cutting tooth.
- Torn threads.
- Unsatisfactory tap life.
- Rejected threads.

Chip Explusion

Tap selection is also influenced by the type of hole being threaded. Through hole tapping usually requires a tap that pushes the chips out in front of the cutting edge and through the other end of the hole. A bottom hole tap must pull chips up and out of the hole.





Tap Jamming

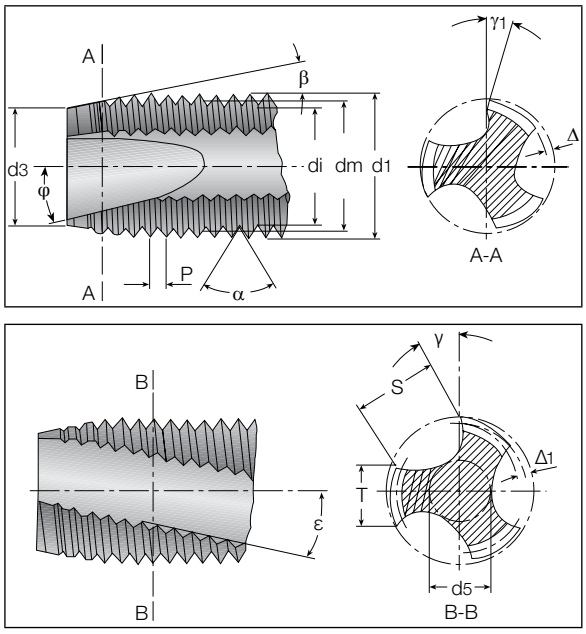
Some possible causes of tap jamming are:

- Unsuitable tap.
- Tap with incorrect cutting geometry.
- Unsuitable coolant for material.
- Insufficient coolant.
- Axial pressure (pull or push) on the tap.
- Core hole too small.
- Breaks in walls of core hole.
- Speed too high or too low.
- Swarf trapped in the hole.
- Incorrect alignment of tap and core hole.
- Tap eccentricity.

Troubleshooting

Problem	Cause	Solution
Tapped Hole Oversized	incorrect tap (cutting geometry unsuitable for application)	use tap selected from the relevant material group
	faulty alignment	ensure that the tap is correctly aligned with the core hole axis
	tap jamming	improve lubrication and direction of coolant adjust cutting speed
	incorrectly reground tap (lead tip is not concentric)	regrind tap
Stripped Threads	incorrect tap (cutting geometry incorrect for application)	use a tap from the relevant material group
	spindle speed and feed rate are not synchronized	check feed rate programming and/or pitch of leading spindle. use a tapping spindle with axial float (gti/gtin)
	insufficient starting pressure exerted on tap (causes peeling)	increase starting pressure
Bell Mouthed Tapped Hole	incorrect starting pressure	use a tapping spindle with axial float (gti/gtin)
Unsatisfactory Thread Surface Finish	incorrect tap (cutting geometry unsuitable for application)	select tap for the relevant material group
	the tap is blunt	replace or regrind tap
	tap badly re-ground	regrind tap, check that cutting geometry is suitable for material
	incorrect lubricant, concentration or quantity	ensure the use of a suitable coolant and an ample supply
Partial Chipping of Tap	swarf jamming	check cutting speed. use alternative tap
	tap has jammed against bottom of pre-hole	check hole and thread depths. drill a deeper pre-hole
	tap incorrectly reground (lead-in diameter too short, therefore too few cutting teeth)	ensure that correct dimensions are maintained when regrinding
	irregular workpiece material structure	adjust cutting speed. improve lubricant quality of coolant
Excessive Tap Wear	incorrect cutting speed	adjust cutting speed to suit workpiece material
	coolant lacking in lubricating qualities and/or quantity	ensure the use of a suitable coolant and an ample supply. check that the coolant is reaching the cutting zone
	surface of the pre-hole is compacted	check pre-hole drilling conditions (drill carefully to reduce risk of surface compacting). check drill cutting edges
Tap Breakage	incorrect tap in use (cutting geometry unsuitable for application)	use tap from the relevant material group
	centering error	ensure that axes of tap and pre-hole are aligned
	blunt tap	regrind tap
	tap has reached bottom of pre-hole	use tapping spindle with axial float and slipping clutch (**GTI**/**GTIN**)
	pre-hole too small	check for correct pre-hole size, see pages 11-13

Tap Nomenclature (Regrinding)



d1	major diameter	ϒ	gun nose front rake angle
dm	flank diameter	Δ	chamfer relief
di	minor diameter	Δ 1	pitch diameter relief on the land
d3	chamfer diameter	ϒ1	rake angle
P	pitch	T	width of land
α	flank angle	S	flute width
ß	chamfer angle	d5	web thickness
φ	gun nose angle	ε	angle of spiral flute

Regrinding

Tap regrinding is performed in two steps:

1 regrinding of relieved chamfer
2 regrinding of flutes (see picture 1)

Regrinding of Relieved Chamfer

It is recommended that the resharpening should be executed either on specific tap regrinding machines or on conventional resharpening machines equipped with an auxiliary device to generate the circular back relief.

Picture 2 shows the regrinding done with the cylindrical surface of a grinding wheel. Before regrinding, verify that the tap, fixed between points or on the pincer, runs concentrical. Also ensure that angle B is in the correct order to keep the same number of threads on chamfer.

Resharpening of Flutes

The rake angle g is obtained by moving the tap axis, in relation to the regrinding surface, of an amount X to be calculated with the formula: X = 1/2 d1 sin (ϒ) (see picture 3).(d1 =tap major diameter).

Example:
Tap 10 X 1,5 to Cut on Steel
Strength = 600 N/mm²

D1 = 10 Mm ; ϒ = 15° ; Sin (ϒ) = 0,25882;

$$X = \frac{0.25885}{2} \text{ x10 ; X=1.29 mm}$$

On all taps with spiral flutes, it is possible to find the pitch of the spiral in reference to the lead screw necessary for resharpening. In case of using taps equipped with a deburring tool, it is necessary to extend the flutes according to the supplier's recommendation. As the wear on a tap is mainly on the chamfer area, for taps with a gun nose, regrinding the flutes can be done on the front area only (see picture 4).

In cases where the thread flanks are worn (in addition to the active edges), regrinding as described above is impractical.

In this case restoration is done, by cutting the chamfer away (thus creating a shorter tap) and then reproducing the chamfer with same angle and relief. (see picture 5).

In the absence of special regrinding machines, such restoration is advisable for regrinding taps with spiral flutes. This is because regrinding the flutes becomes unnecessary.

General Recommendations (Regrinding)

Maintenance

It is important to periodically regrind the worn tap.
This is to avoid permanent damage or even tool breakage.

The Grinding Wheels

The structure and grain of grinding wheels must be appropriate for the tap to be resharpened.

Taps for Cast Iron

Taps used on cast iron can rarely be resharpened, as it is very abrasive and tends to wear the flank in such a manner that it becomes grossly out of tolerance.

Taps for Aluminun

After regrinding it is advisable to remove the steel burrs with a wire brush.

Tap Inspection

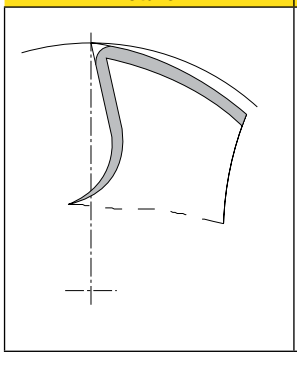
It is important to inspect the tap after regrinding to ensure that all of the dimensions and angles have remained according to the specifications.

Controls (Tests)

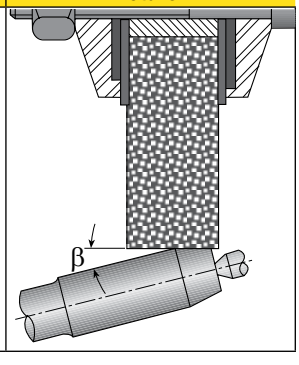
Once the tap is resharpened, it is always best to test it to correctly to obtain the same threads as when the tap was new.

- The chamfer must be perfectly on axis in order to avoid the effects of picture 6.
  The cutters must have correct divisions.
- The results of resharpening with an incorrect division is shown in picture 7.
- The length and number of threads in a chamfer must be precisely identical to those of the new tap.

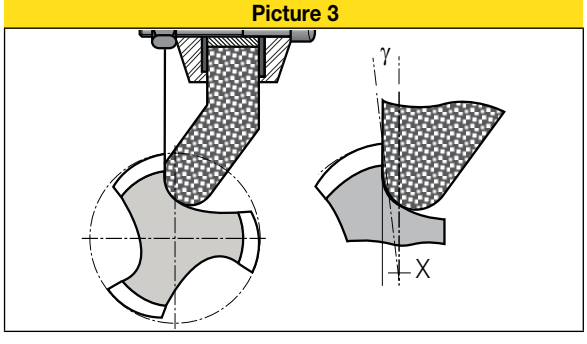
Picture 1



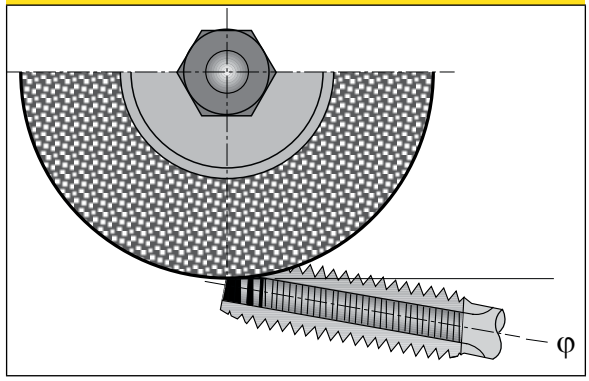
Picture 2



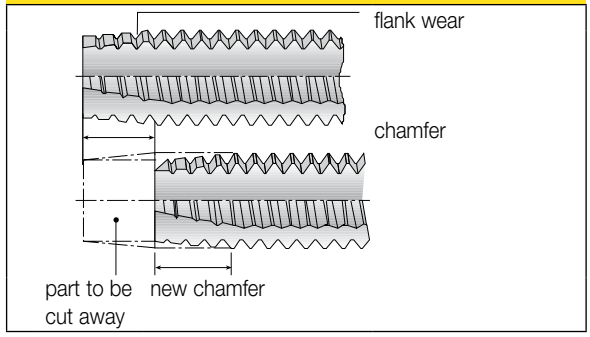
Picture 3



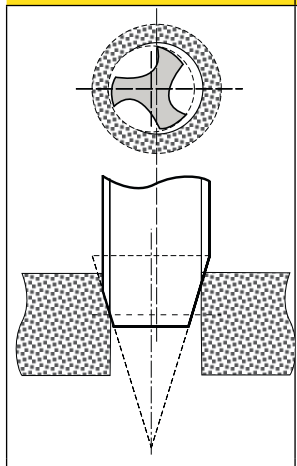
Picture 4



Picture 5

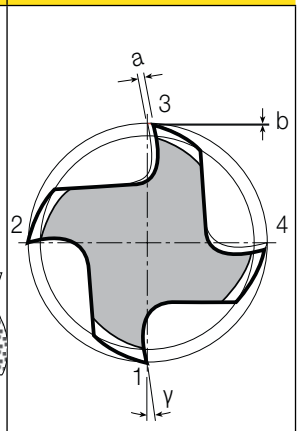


Picture 6



chamfer out of center

Picture 7



incorrect division-cutters not concentric

Test Report Form

Company _____ **Department** _____

Address _____ **Phone** _____

_____

Tool

description of the tap being used at present thread diameter and pitch _____ make _____ type _____

class of tolerance _____

☐ right-hand cutting ☐ left-hand cutting _____

☐ fluteless ☐ right-hand spiral flutes _____ degrees _____

☐ straight flutes ☐ left-hand spiral flutes _____ degrees _____

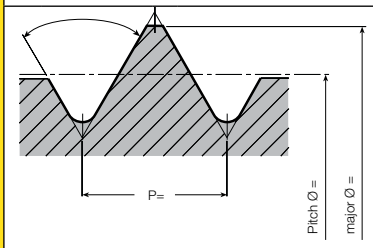
☐ spiral point ☐ length of chamfer _____ mm _____

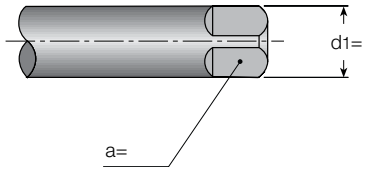
additional information for special pitches or thread forms

major diameter _____

pitch diameter _____ flank angle _____ degrees _____

minor diameter _____





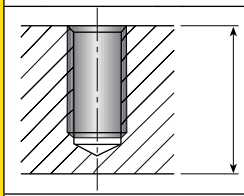
Hole

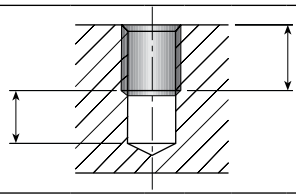
tap drill diameter _____ length of hole _____

☐ through hold depth of full thread _____

☐ blind hole

special requirements or unusual characteristics of the threaded product _____





unusual characteristics of the threaded product or of the tapping method. _____

ie. counterbore, tapping on an angle, etc. _____

Tapping Speed	_____ m/min _____ rPM
Lubricant	☐ none ☐ emulsion _____ % ☐ cutting oil ☐ other _____ ☐ under pressure ☐ vaporization _____
Machine	type _____ ☐ horizontal tapping ☐ vertical tapping
Driving	☐ tap revolvers number of spindles _____ ☐ workpiece revolvers
Feed	☐ without ☐ power ☐ CNC _____ %
Toolholder	☐ rigid ☐ floating ☐ safety clutch make _____ type _____
Material to Be Tapped	material no. or designation _____ composition, if known _____ tensile strength or hardness _____ N/mm^2 _____ HB _____ HRc chip form ☐ short ☐ long ☐ annealed steel ☐ hardened steel ☐ heat treated steel

more details: _____

_____

_____

_____

_____

_____

_____

contact person _____

date _____ signature _____

Thread Standards

Cylindrical Threads	
UNC	unified coarse thread series
UNF	unified fine thread series
UNEF	unified extra-fine thread series
UN	constant pitch series - threads with constant pitch of t.p.i. 4, 6, 8, 12, 16, 20, 28, 32
UNS	selected combinations - threads with special dia. - pitch combinations
UNJ	unified threads with constant pitch with radius on minor diameter from 0.15011 pitch to 0.18042 pitch
UNJC	unified coarse thread with radius on minor diameter from 0.15011 pitch to 0.18042 pitch
UNJEF	unified extra-fine thread with radius on minor diameter from 0.15011 pitch to 0.18042 pitch
UNJF	unified fine threads with radius on minor diameter from 0.15011 pitch to 0.18042 pitch

Pipe Cylindrical Threads	
NPS	cylindrical threads for pipe
NPSC	american standard for pipe coupling
NPSF	american standard for internal threads on pipe, dryseal
NPSH	american standard for cylindrical threads for pipes, joints and nipples
NPSI	american standard for internal cylindrical threads on pipe (dryseal)
NPSL	american standard for cylindrical threads on pipes for nuts
NPSM	american standard for cylindrical threads on pipes for mechanical joints
NGO	american national pipe threads for gas exhaust
NGS	american national pipe threads for gas

Taper Pipe Threads	
ANPT	taper pipe threads for army, navy and airforce
F-PTE	taper pipe fine threads (dryseal)

Trapezoidal and Saw Tooth Threads	
ACME-C ACME	self-centering threads
ACME-G ACME	generical application
STUB-ACME	acme flat threads with reduced thread depth
60° STUB-ACME	acme flat threads with 60° flank angle
N BUTT	american national saw tooth threads

British Standard	
BSW	whitworth british standard coarse pitch
BSF	whitworth british standard fine pitch
WHIT	whitworth standard special pitch
R	british standard external threading for taper pipe (dryseal) (already BSP-Tr)
Rc	british standard internal threading taper thread for pipe (BSP-Tr)
Rp	british standard cylindrical thread for pipe (already BSP.Pl)
BA	british standard association threads
BSC	british standard threads for bicycles
CEI	british standard for bicycles

GTI / GTIN - Tapping Attachment

Compact tapping collet with tension and compression floating mechanism for ER32 collet chucks.
A tapping collet for standard and rigid tapping operations. The **GTIN** ER32 collet makes tap removal and replacement easy, quick and reliable. Designed for stationary and rotating applications, the **GTIN** ER32 collets are economical and efficient due to the ability to use existing ER32 collet chucks (with various shank sizes and types).

Applications

The **GTIN** ER32 tapping collet is designed especially for CNC mill/turn centers, for regular and rigid tapping.

Advantages

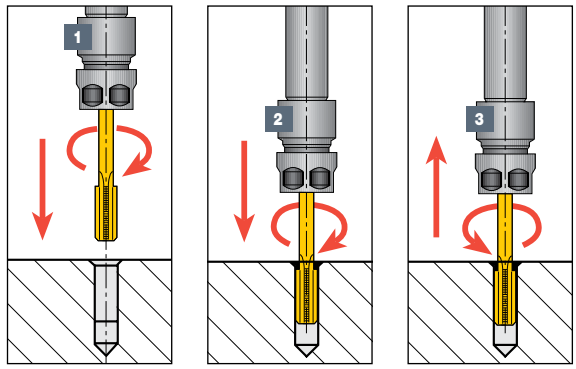
Quick tap change with a front clamping nut.

- Compact design for minimal clearance between the turret and chuck.
- Fits every type of stationary and rotating ER32 collet chuck.
- Positive tap drive with internal square driver.
- Compensates for machine feed and tap pitch variance, resulting in greater thread accuracy.
- Floating mechanism compensates for misalignment between tap and workpiece.
- High accuracy due to tension and compression mechanism.
- Available for all tap shank standards (DIN, ISO, ANSI, JIS).
- Tapping range M1-M16 (#0 to 5/8″).
- Saves setup time by quick tap changing without removing **GTIN** from the machine.
- Optimal for machines which have limited space between the turret and workpiece.

Operation

For through- and blind-hole tapping:

1. enter feed rate according to thread pitch (or 1-2 % lower). Set spindle to starting point with 0.08 mm clearance.
2. start spindle forward with right hand rotation until reaching desired depth.
3. stop feed and rotation and reverse to starting point.



Description

Short tap chucks for ER collets.

Application

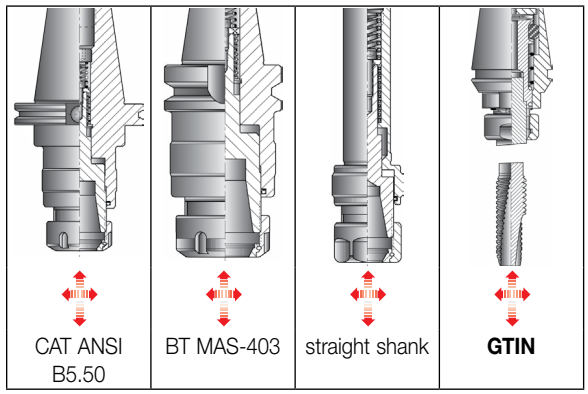
Axial float/tension/compression type for CNC milling machines and lathes with reversing motors and rigid tapping.

Features

- Compensates for machine feed and tap pitch variance.
- Floating mechanism compensates for misalignment between tap and workpiece.
- Right- and left-hand tapping.

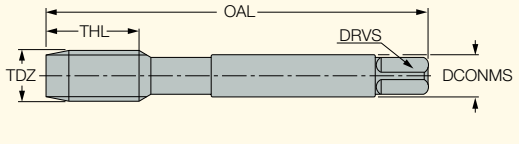
Advantages

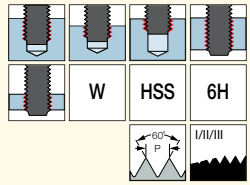
- Practical and efficient tap holding by the ER spring collet without using jaw drive.
- Compact design for minimal clearance applications.
- Heavy duty design for high torque drive ensures the same accuracy as the tap itself.



ISCARTAPS

TPHN M-W
DIN 13 HSS Hand Tap Set for
ISO Metric Coarse Threads





M E T R I C

Designation	Dimensions									HS
	TDZ	TP[1]	OAL	THL	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPHN M-2X0.4-W	M2	0.400	36.00	8.0	2.80	3	2.10	1.60	DIN 352	●
TPHN M-2.2X0.45-W	M2.2	0.450	36.00	9.0	2.80	3	2.10	1.75	DIN 352	●
TPHN M-2.5X0.45-W	M2.5	0.450	40.00	9.0	2.80	3	2.10	2.05	DIN 352	●
TPHN M-3X0.5-W	M3	0.500	42.00	12.0	3.50	3	2.70	2.50	DIN 352	●
TPHN M-3.5X0.6-W	M3.5	0.600	45.00	14.0	4.00	3	3.00	2.90	DIN 352	●
TPHN M-4X0.7-W	M4	0.700	46.00	14.0	4.50	3	3.40	3.30	DIN 352	●
TPHN M-5X0.8-W	M5	0.800	50.00	16.0	6.00	3	4.90	4.20	DIN 352	●
TPHN M-6X1.0-W	M6	1.000	52.00	18.0	6.00	3	4.90	5.00	DIN 352	●
TPHN M-8X1.25-W	M8	1.250	63.00	18.0	6.00	3	4.90	6.80	DIN 352	●
TPHN M-10X1.5-W	M10	1.500	70.00	23.0	7.00	3	5.50	8.50	DIN 352	●
TPHN M-12X1.75-W	M12	1.750	75.00	28.0	9.00	3	7.00	10.20	DIN 352	●
TPHN M-14X2.0-W	M14	2.000	80.00	30.0	11.00	4	9.00	12.00	DIN 352	●
TPHN M-16X2.0-W	M16	2.000	80.00	30.0	12.00	4	9.00	14.00	DIN 352	●
TPHN M-18X2.5-W	M18	2.500	95.00	35.0	14.00	4	11.00	15.50	DIN 352	●
TPHN M-20X2.5-W	M20	2.500	95.00	34.0	16.00	4	12.00	17.50	DIN 352	●

- NOTE: Each set contains 2 or 3 taps
- For user guide and cutting conditions, see pages 4-28

(1) Thread pitch
(2) Number of flutes
(3) Torque key size

I N C H

Designation	Dimensions									HS
	TDZ	TP mm[1]	OAL	THL	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPHN M-2X0.4-W	M2	.400	1.417	.315	.110	3	.083	.06	DIN 352	●
TPHN M-2.2X0.45-W	M2.2	.450	1.417	.354	.110	3	.083	.07	DIN 352	●
TPHN M-2.5X0.45-W	M2.5	.450	1.575	.354	.110	3	.083	.08	DIN 352	●
TPHN M-3X0.5-W	M3	.500	1.654	.472	.138	3	.106	.10	DIN 352	●
TPHN M-3.5X0.6-W	M3.5	.600	1.772	.551	.157	3	.118	.11	DIN 352	●
TPHN M-4X0.7-W	M4	.700	1.811	.551	.177	3	.134	.13	DIN 352	●
TPHN M-5X0.8-W	M5	.800	1.968	.630	.236	3	.193	.17	DIN 352	●
TPHN M-6X1.0-W	M6	1.000	2.047	.709	.236	3	.193	.20	DIN 352	●
TPHN M-8X1.25-W	M8	1.250	2.480	.709	.236	3	.193	.27	DIN 352	●
TPHN M-10X1.5-W	M10	1.500	2.756	.906	.276	3	.217	.33	DIN 352	●
TPHN M-12X1.75-W	M12	1.750	2.953	1.102	.354	3	.276	.40	DIN 352	●
TPHN M-14X2.0-W	M14	2.000	3.150	1.181	.433	4	.354	.47	DIN 352	●
TPHN M-16X2.0-W	M16	2.000	3.150	1.181	.472	4	.354	.55	DIN 352	●
TPHN M-18X2.5-W	M18	2.500	3.740	1.378	.551	4	.433	.61	DIN 352	●
TPHN M-20X2.5-W	M20	2.500	3.740	1.339	.630	4	.472	.69	DIN 352	●

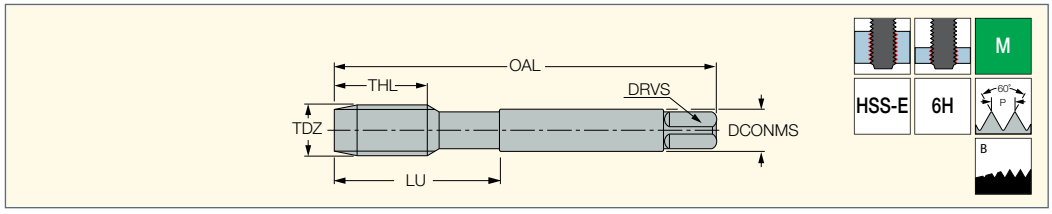
- NOTE: Each set contains 2 or 3 taps
- For user guide and cutting conditions, see pages 4-28

(1) Thread pitch
(2) Number of flutes
(3) Torque key size

ONETAP

TPGN M-M

DIN 13 HSSE 5% Co gun point machine taps - ISO metric coarse threads for a wide range of materials.



M E T R I C

Designation	Dimensions										Tough ↔ Hard	
	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	HE	HETI
TPGN M-2X0.4-M	M2	0.400	45.00	8.0	-	2.80	2	2.10	1.60	DIN 371	•	•
TPGN M-2.2X0.45-M	M2.2	0.450	45.00	9.0	-	2.80	2	2.10	1.75	DIN 371	•	•
TPGN M-2.5X0.45-M	M2.5	0.450	50.00	9.0	-	2.80	2	2.10	2.05	DIN 371	•	•
TPGN M-3X0.5-M	M3	0.500	56.00	10.0	18.0	3.50	3	2.70	2.50	DIN 371	•	•
TPGN M-3.5X0.6-M	M3.5	0.600	56.00	10.0	20.0	4.00	3	3.00	2.90	DIN 371	•	•
TPGN M-4X0.7-M	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.30	DIN 371	•	•
TPGN M-5X0.8-M	M5	0.800	70.00	14.0	25.0	6.00	3	4.90	4.20	DIN 371	•	•
TPGN M-6X1.0-M	M6	1.000	80.00	16.0	30.0	6.00	3	4.90	5.00	DIN 371	•	•
TPGN M-8X1.25-M	M8	1.250	90.00	18.0	35.0	8.00	3	6.20	6.80	DIN 371	•	•
TPGN M-10X1.5-M	M10	1.500	100.00	20.0	39.0	10.00	3	8.00	8.50	DIN 371	•	•
TPGN M-12X1.75-M	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	DIN 376	•	•
TPGN M-14X2.0-M	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	DIN 376	•	•
TPGN M-16X2.0-M	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	DIN 376	•	•
TPGN M-18X2.5-M	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	DIN 376	•	•
TPGN M-20X2.5-M	M20	2.500	140.00	30.0	-	16.00	4	12.00	17.50	DIN 376	•	•
TPGN M-22X2.5-M	M22	2.500	140.00	30.0	-	18.00	4	14.50	19.50	DIN 376	•	•
TPGN M-24X3.0-M	M24	3.000	160.00	36.0	-	18.00	4	14.50	21.00	DIN 376	•	•
TPGN M-27X3.0-M	M27	3.000	160.00	36.0	-	20.00	4	16.00	24.00	DIN 376	•	•
TPGN M-30X3.5-M	M30	3.500	180.00	40.0	-	22.00	4	18.00	26.50	DIN 376	•	•

• For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

(2) Number of flutes

(3) Torque key size

I N C H

Designation	Dimensions										Tough ↔ Hard	
	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	HE	HETI
TPGN M-2X0.4-M	M2	.400	1.772	.315	-	.110	2	.083	.06	DIN 371	•	•
TPGN M-2.2X0.45-M	M2.2	.450	1.772	.354	-	.110	2	.083	.07	DIN 371	•	•
TPGN M-2.5X0.45-M	M2.5	.450	1.968	.354	-	.110	2	.083	.08	DIN 371	•	•
TPGN M-3X0.5-M	M3	.500	2.205	.394	.71	.138	3	.106	.10	DIN 371	•	•
TPGN M-3.5X0.6-M	M3.5	.600	2.205	.394	.79	.157	3	.118	.11	DIN 371	•	•
TPGN M-4X0.7-M	M4	.700	2.480	.472	.83	.177	3	.134	.13	DIN 371	•	•
TPGN M-5X0.8-M	M5	.800	2.756	.551	.98	.236	3	.193	.17	DIN 371	•	•
TPGN M-6X1.0-M	M6	1.000	3.150	.630	1.18	.236	3	.193	.20	DIN 371	•	•
TPGN M-8X1.25-M	M8	1.250	3.543	.709	1.38	.315	3	.244	.27	DIN 371	•	•
TPGN M-10X1.5-M	M10	1.500	3.937	.787	1.54	.394	3	.315	.33	DIN 371	•	•
TPGN M-12X1.75-M	M12	1.750	4.331	.866	-	.354	4	.276	.40	DIN 376	•	•
TPGN M-14X2.0-M	M14	2.000	4.331	.945	-	.433	4	.354	.47	DIN 376	•	•
TPGN M-16X2.0-M	M16	2.000	4.331	1.024	-	.472	4	.354	.55	DIN 376	•	•
TPGN M-18X2.5-M	M18	2.500	4.921	1.181	-	.551	4	.433	.61	DIN 376	•	•
TPGN M-20X2.5-M	M20	2.500	5.512	1.181	-	.630	4	.472	.69	DIN 376	•	•
TPGN M-22X2.5-M	M22	2.500	5.512	1.181	-	.709	4	.571	.77	DIN 376	•	•
TPGN M-24X3.0-M	M24	3.000	6.299	1.417	-	.709	4	.571	.83	DIN 376	•	•
TPGN M-27X3.0-M	M27	3.000	6.299	1.417	-	.787	4	.630	.94	DIN 376	•	•
TPGN M-30X3.5-M	M30	3.500	7.087	1.575	-	.866	4	.709	1.04	DIN 376	•	•

• For user guide and cutting conditions, see pages 4-28

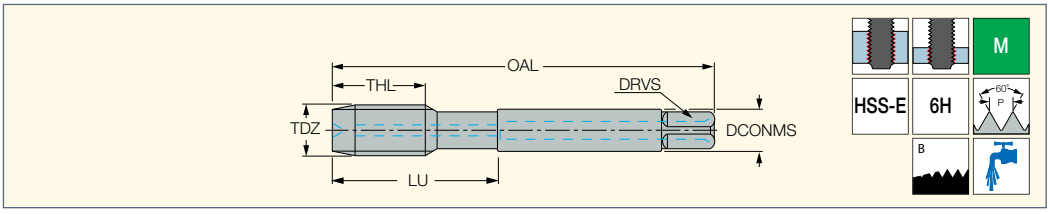
(1) Thread pitch

(2) Number of flutes

(3) Torque key size

ONETAP

TPGN M-M-B
DIN 13 HSS Gun Point Machine Taps - ISO Metric Coarse Threads for Hardened Steel and H.T.A.



M E T R I C

Designation	Dimensions											HETI
	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	CSP[4]	Standard	
TPGN M-8X1.25-M-B	M8	1.250	90.00	18.0	35.0	8.00	3	6.20	6.80	1	DIN 371	●
TPGN M-10X1.5-M-B	M10	1.500	100.00	20.0	39.0	10.00	3	8.00	8.50	1	DIN 371	●
TPGN M-12X1.75-M-B	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	1	DIN 376	●
TPGN M-14X2.0-M-B	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	1	DIN 376	●
TPGN M-16X2.0-M-B	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	1	DIN 376	●

• For user guide and cutting conditions, see pages 4-28
[1] Thread pitch
[2] Number of flutes
[3] Torque key size
[4] 0 - Without coolant supply, 1 - With coolant supply

I N C H

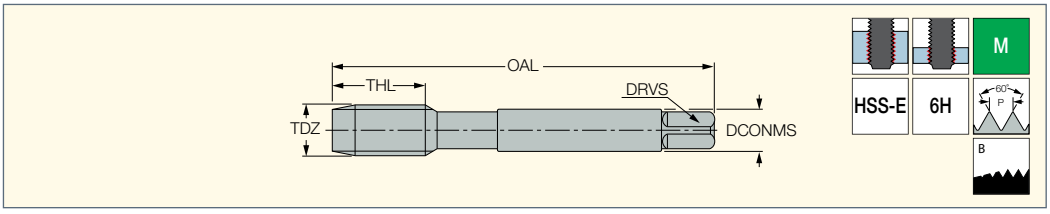
Designation	Dimensions											HETI
	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	CSP[4]	Standard	
TPGN M-8X1.25-M-B	M8	1.250	3.543	.709	1.38	.315	3	.244	.27	1	DIN 371	●
TPGN M-10X1.5-M-B	M10	1.500	3.937	.787	1.54	.394	3	.315	.33	1	DIN 371	●
TPGN M-12X1.75-M-B	M12	1.750	4.331	.866	-	.354	4	.276	.40	1	DIN 376	●
TPGN M-14X2.0-M-B	M14	2.000	4.331	.945	-	.433	4	.354	.47	1	DIN 376	●
TPGN M-16X2.0-M-B	M16	2.000	4.331	1.024	-	.472	4	.354	.55	1	DIN 376	●

• For user guide and cutting conditions, see pages 4-28
[1] Thread pitch
[2] Number of flutes
[3] Torque key size
[4] 0 - Without coolant supply, 1 - With coolant supply

ONETAP

TPGN MF-M

DIN 13 HSSE 5% Co gun point machine taps - ISO metric fine threads for a wide range of materials.



M E T R I C

Designation	Dimensions TDZ	TP(1)	OAL	THL	DCONMS	NOF(2)	DRVS(3)	Pre-hole	Standard	Tough ↔ Hard HE	HETI
TPGN MF-4X0.5-M	MF4	0.500	63.00	10.0	2.80	3	2.10	3.50	DIN 374	•	•
TPGN MF-5X0.5-M	MF5	0.500	70.00	12.0	3.50	3	2.70	4.50	DIN 374	•	•
TPGN MF-6X0.75-M	MF6	0.750	80.00	12.0	4.50	3	3.40	5.20	DIN 374	•	•
TPGN MF-8X1.0-M	MF8	1.000	90.00	15.0	6.00	3	4.90	7.00	DIN 374	•	•
TPGN MF-10X1.0-M	MF10	1.000	90.00	18.0	7.00	3	5.50	9.00	DIN 374	•	•
TPGN MF-10X1.25-M	MF10	1.250	100.00	18.0	7.00	3	5.50	8.80	DIN 374	•	•
TPGN MF-12X1.0-M	MF12	1.000	100.00	18.0	9.00	4	7.00	11.00	DIN 374	•	•
TPGN MF-12X1.25-M	MF12	1.250	100.00	18.0	9.00	4	7.00	10.80	DIN 374	•	•
TPGN MF-12X1.5-M	MF12	1.500	100.00	18.0	9.00	4	7.00	10.50	DIN 374	•	•
TPGN MF-14X1.0-M	MF14	1.000	100.00	18.0	11.00	4	9.00	13.00	DIN 374	•	•
TPGN MF-14X1.25-M	MF14	1.250	100.00	18.0	11.00	4	9.00	12.80	DIN 374	•	•
TPGN MF-14X1.5-M	MF14	1.500	100.00	18.0	11.00	4	9.00	12.50	DIN 374	•	•
TPGN MF-16X1.5-M	MF16	1.500	100.00	18.0	12.00	4	9.00	14.50	DIN 374	•	•
TPGN MF-18X1.5-M	MF18	1.500	110.00	20.0	14.00	4	11.00	16.50	DIN 374	•	•
TPGN MF-20X1.5-M	MF20	1.500	125.00	24.0	16.00	4	12.00	18.50	DIN 374	•	•
TPGN MF-22X1.5-M	MF22	1.500	125.00	24.0	18.00	4	14.50	20.50	DIN 374	•	•
TPGN MF-24X1.5-M	MF24	1.500	140.00	24.0	18.00	4	14.50	22.50	DIN 374	•	•

• For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

(2) Number of flutes

(3) Torque key size

I N C H

Designation	Dimensions TDZ	TP mm(1)	OAL	THL	DCONMS	NOF(2)	DRVS(3)	Pre-hole	Standard	Tough ↔ Hard HE	HETI
TPGN MF-4X0.5-M	MF4	.500	2.480	.394	.110	3	.083	.14	DIN 374	•	•
TPGN MF-5X0.5-M	MF5	.500	2.756	.472	.138	3	.106	.18	DIN 374	•	•
TPGN MF-6X0.75-M	MF6	.750	3.150	.472	.177	3	.134	.20	DIN 374	•	•
TPGN MF-8X1.0-M	MF8	1.000	3.543	.591	.236	3	.193	.28	DIN 374	•	•
TPGN MF-10X1.0-M	MF10	1.000	3.543	.709	.276	3	.217	.35	DIN 374	•	•
TPGN MF-10X1.25-M	MF10	1.250	3.937	.709	.276	3	.217	.35	DIN 374	•	•
TPGN MF-12X1.0-M	MF12	1.000	3.937	.709	.354	4	.276	.43	DIN 374	•	•
TPGN MF-12X1.25-M	MF12	1.250	3.937	.709	.354	4	.276	.43	DIN 374	•	•
TPGN MF-12X1.5-M	MF12	1.500	3.937	.709	.354	4	.276	.41	DIN 374	•	•
TPGN MF-14X1.0-M	MF14	1.000	3.937	.709	.433	4	.354	.51	DIN 374	•	•
TPGN MF-14X1.25-M	MF14	1.250	3.937	.709	.433	4	.354	.50	DIN 374	•	•
TPGN MF-14X1.5-M	MF14	1.500	3.937	.709	.433	4	.354	.49	DIN 374	•	•
TPGN MF-16X1.5-M	MF16	1.500	3.937	.709	.472	4	.354	.57	DIN 374	•	•
TPGN MF-18X1.5-M	MF18	1.500	4.331	.787	.551	4	.433	.65	DIN 374	•	•
TPGN MF-20X1.5-M	MF20	1.500	4.921	.945	.630	4	.472	.73	DIN 374	•	•
TPGN MF-22X1.5-M	MF22	1.500	4.921	.945	.709	4	.571	.81	DIN 374	•	•
TPGN MF-24X1.5-M	MF24	1.500	5.512	.945	.709	4	.571	.89	DIN 374	•	•

• For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

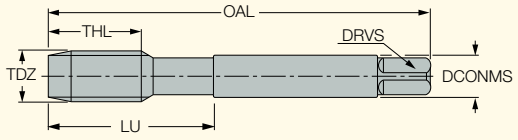
(2) Number of flutes

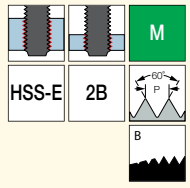
(3) Torque key size

ONETAP

TPGN UNC-M

HSSE 5% Co gun point machine taps - unified coarse threads for a wide range of materials.





M E T R I C

Designation	Dimensions										Tough ↔ Hard	
	TDZ	TPI(1)	OAL	THL	LU	DCONMS	NOF(2)	DRVS(3)	Pre-hole	Standard	HE	HETI
TPGN UNC #4 40-M	UNC No.4	40.0	56.00	10.0	18.0	3.50	2	2.70	2.35	DIN 371	•	
TPGN UNC #4-40-M	UNC No.4	40.0	56.00	10.0	18.0	3.50	2	2.70	2.35	DIN 371		•
TPGN UNC #5-40-M	UNC No.5	40.0	56.00	10.0	18.0	3.50	3	2.70	2.65	DIN 371	•	•
TPGN UNC #6-32-M	UNC No.6	32.0	56.00	10.0	20.0	4.00	3	3.00	2.85	DIN 371	•	•
TPGN UNC #8-32-M	UNC No.8	32.0	63.00	12.0	21.0	4.50	3	3.40	3.50	DIN 371	•	•
TPGN UNC #10-24-M	UNC No.10	24.0	7.00	14.0	25.0	6.00	3	4.90	3.90	DIN 371	•	•
TPGN UNC #12-24-M	UNC No.12	24.0	80.00	16.0	30.0	6.00	3	4.90	4.50	DIN 371	•	•
TPGN UNC 1/4-20-M	UNC 1/4	20.0	80.00	16.0	30.0	7.00	3	5.50	5.10	DIN 371	•	•
TPGN UNC 5/16-18-M	UNC 5/16	18.0	90.00	18.0	35.0	8.00	3	6.20	6.60	DIN 371	•	•
TPGN UNC 3/8-16-M	UNC 3/8	16.0	100.00	20.0	39.0	10.00	3	8.00	8.00	DIN 371	•	•
TPGN UNC 7/16-14-M	UNC 7/16	14.0	100.00	20.0	-	8.00	4	6.20	9.40	DIN 376	•	•
TPGN UNC 1/2-13-M	UNC 1/2	13.0	110.00	22.0	-	9.00	4	7.00	10.80	DIN 376	•	•
TPGN UNC 9/16-12-M	UNC 9/16	12.0	110.00	24.0	-	11.00	4	9.00	12.20	DIN 376	•	•
TPGN UNC 5/8-11-M	UNC 5/8	11.0	110.00	26.0	-	12.00	4	9.00	13.50	DIN 376	•	•
TPGN UNC 3/4-10-M	UNC 3/4	10.0	125.00	30.0	-	14.00	4	11.00	16.50	DIN 376	•	•
TPGN UNC 7/8-9-M	UNC 7/8	9.0	140.00	30.0	-	18.00	4	14.50	19.50	DIN 376	•	•
TPGN UNC 1"-8-M	UNC 1"	8.0	160.00	36.0	-	18.00	4	14.50	22.25	DIN 376	•	
TPGN UNC-1"- 8-M	UNC 1"	8.0	160.00	36.0	-	18.00	4	14.50	22.25	DIN 376		•

• For user guide and cutting conditions, see pages 4-28

(1) Threads per inch

(2) Number of flutes

(3) Torque key size

I N C H

Designation	Dimensions										Tough ↔ Hard	
	TDZ	TPI(1)	OAL	THL	LU	DCONMS	NOF(2)	DRVS(3)	Pre-hole	Standard	HE	HETI
TPGN UNC #4 40-M	UNC No.4	40.0	2.205	.394	.71	.138	2	.106	.09	DIN 371	•	
TPGN UNC #4-40-M	UNC No.4	40.0	2.205	.394	.71	.138	2	.106	.09	DIN 371		•
TPGN UNC #5-40-M	UNC No.5	40.0	2.205	.394	.71	.138	3	.106	.10	DIN 371	•	•
TPGN UNC #6-32-M	UNC No.6	32.0	2.205	.394	.79	.157	3	.118	.11	DIN 371	•	•
TPGN UNC #8-32-M	UNC No.8	32.0	2.480	.472	.83	.177	3	.134	.14	DIN 371	•	•
TPGN UNC #10-24-M	UNC No.10	24.0	.276	.551	.98	.236	3	.193	.15	DIN 371	•	•
TPGN UNC #12-24-M	UNC No.12	24.0	3.150	.630	1.18	.236	3	.193	.18	DIN 371	•	•
TPGN UNC 1/4-20-M	UNC 1/4	20.0	3.150	.630	1.18	.276	3	.217	.20	DIN 371	•	•
TPGN UNC 5/16-18-M	UNC 5/16	18.0	3.543	.709	1.38	.315	3	.244	.26	DIN 371	•	•
TPGN UNC 3/8-16-M	UNC 3/8	16.0	3.937	.787	1.54	.394	3	.315	.31	DIN 371	•	•
TPGN UNC 7/16-14-M	UNC 7/16	14.0	3.937	.787	-	.315	4	.244	.37	DIN 376	•	•
TPGN UNC 1/2-13-M	UNC 1/2	13.0	4.331	.866	-	.354	4	.276	.43	DIN 376	•	•
TPGN UNC 9/16-12-M	UNC 9/16	12.0	4.331	.945	-	.433	4	.354	.48	DIN 376	•	•
TPGN UNC 5/8-11-M	UNC 5/8	11.0	4.331	1.024	-	.472	4	.354	.53	DIN 376	•	•
TPGN UNC 3/4-10-M	UNC 3/4	10.0	4.921	1.181	-	.551	4	.433	.65	DIN 376	•	•
TPGN UNC 7/8-9-M	UNC 7/8	9.0	5.512	1.181	-	.709	4	.571	.77	DIN 376	•	•
TPGN UNC 1"-8-M	UNC 1"	8.0	6.299	1.417	-	.709	4	.571	.88	DIN 376	•	
TPGN UNC-1"- 8-M	UNC 1"	8.0	6.299	1.417	-	.709	4	.571	.88	DIN 376		•

• For user guide and cutting conditions, see pages 4-28

(1) Threads per inch

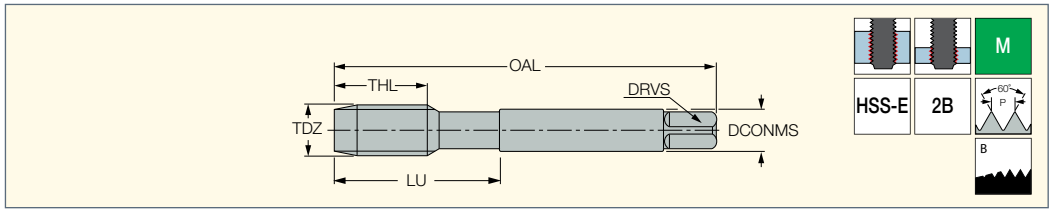
(2) Number of flutes

(3) Torque key size

ONETAP

TPGN UNF-M

HSSE 5% Co spiral flute machine taps - unified fine threads, for a wide range of materials.



M E T R I C

Designation	TDZ	TPI(1)	OAL	THL	LU	DCONMS	NOF(2)	DRVS(3)	Pre-hole	Standard	Tough ↔ Hard: HE	Tough ↔ Hard: HETI
	Dimensions											
TPGN UNF #4-48-M	UNF No.4	48.0	56.00	8.0	18.0	3.50	2	2.70	2.40	DIN 371	•	•
TPGN UNF #5-44-M	UNF No.5	44.0	56.00	9.0	18.0	3.50	3	2.70	2.70	DIN 371	•	•
TPGN UNF #6-40-M	UNF No.6	40.0	56.00	10.0	20.0	4.00	3	3.00	2.95	DIN 371	•	•
TPGN UNF #8-36-M	UNF No.8	36.0	63.00	12.0	21.0	4.50	3	3.40	3.50	DIN 371	•	•
TPGN UNF #10-32-M	UNF No.10	32.0	70.00	12.0	25.0	6.00	3	4.90	4.10	DIN 371	•	•
TPGN UNF #12-28-M	UNF No.12	28.0	80.00	12.0	30.0	6.00	3	4.90	4.60	DIN 371	•	•
TPGN UNF 1/4-28-M	UNF 1/4	28.0	80.00	12.0	30.0	7.00	3	5.50	5.50	DIN 371		•
TPGN UNF 1/4-8-M	UNF 1/4	28.0	80.00	12.0	30.0	7.00	3	5.50	5.50	DIN 371	•	
TPGN UNF 5/16-24-M	UNF 5/16	24.0	90.00	15.0	35.0	8.00	3	6.20	6.90	DIN 371	•	•
TPGN UNF 3/8-24-M	UNF 3/8	24.0	90.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	•	•
TPGN UNF 7/16-20-M	UNF 7/16	20.0	100.00	18.0	-	8.00	4	6.20	9.90	DIN 376	•	•
TPGN UNF 1/2-20-M	UNF 1/2	20.0	100.00	18.0	-	9.00	4	7.00	11.50	DIN 376	•	•
TPGN UNF 9/16-18-M	UNF 9/16	18.0	100.00	18.0	-	11.00	4	9.00	12.90	DIN 376	•	•
TPGN UNF 5/8-18-M	UNF 5/8	18.0	100.00	18.0	-	12.00	4	9.00	14.50	DIN 376	•	•
TPGN UNF 3/4-16- M	UNF 3/4	16.0	110.00	24.0	-	14.00	4	11.00	17.50	DIN 376	•	
TPGN UNF 3/4-16-M	UNF 3/4	16.0	110.00	24.0	-	14.00	4	11.00	17.50	DIN 376		•
TPGN UNF 7/8 -14-M	UNF 7/8	14.0	125.00	24.0	-	18.00	4	14.50	20.50	DIN 376		•
TPGN UNF 7/8-14-M	UNF 7/8	14.0	125.00	24.0	-	18.00	4	14.50	20.50	DIN 376	•	
TPGN UNF 1"-12-M	UNF 1"	12.0	140.00	28.0	-	18.00	4	14.50	23.25	DIN 376	•	•

• For user guide and cutting conditions, see pages 4-28

(1) Threads per inch

(2) Number of flutes

(3) Torque key size

I N C H

Designation	TDZ	TPI(1)	OAL	THL	LU	DCONMS	NOF(2)	DRVS(3)	Pre-hole	Standard	Tough ↔ Hard: HE	Tough ↔ Hard: HETI
	Dimensions											
TPGN UNF #4-48-M	UNF No.4	48.0	2.205	.315	.71	.138	2	.106	.09	DIN 371	•	•
TPGN UNF #5-44-M	UNF No.5	44.0	2.205	.354	.71	.138	3	.106	.11	DIN 371	•	•
TPGN UNF #6-40-M	UNF No.6	40.0	2.205	.394	.79	.157	3	.118	.12	DIN 371	•	•
TPGN UNF #8-36-M	UNF No.8	36.0	2.480	.472	.83	.177	3	.134	.14	DIN 371	•	•
TPGN UNF #10-32-M	UNF No.10	32.0	2.756	.472	.98	.236	3	.193	.16	DIN 371	•	•
TPGN UNF #12-28-M	UNF No.12	28.0	3.150	.472	1.18	.236	3	.193	.18	DIN 371	•	•
TPGN UNF 1/4-28-M	UNF 1/4	28.0	3.150	.472	1.18	.276	3	.217	.22	DIN 371		•
TPGN UNF 1/4-8-M	UNF 1/4	28.0	3.150	.472	1.18	.276	3	.217	.22	DIN 371	•	
TPGN UNF 5/16-24-M	UNF 5/16	24.0	3.543	.591	1.38	.315	3	.244	.27	DIN 371	•	•
TPGN UNF 3/8-24-M	UNF 3/8	24.0	3.543	.709	1.54	.394	3	.315	.33	DIN 371	•	•
TPGN UNF 7/16-20-M	UNF 7/16	20.0	3.937	.709	-	.315	4	.244	.39	DIN 376	•	•
TPGN UNF 1/2-20-M	UNF 1/2	20.0	3.937	.709	-	.354	4	.276	.45	DIN 376	•	•
TPGN UNF 9/16-18-M	UNF 9/16	18.0	3.937	.709	-	.433	4	.354	.51	DIN 376	•	•
TPGN UNF 5/8-18-M	UNF 5/8	18.0	3.937	.709	-	.472	4	.354	.57	DIN 376	•	•
TPGN UNF 3/4-16- M	UNF 3/4	16.0	4.331	.945	-	.551	4	.433	.69	DIN 376	•	
TPGN UNF 3/4-16-M	UNF 3/4	16.0	4.331	.945	-	.551	4	.433	.69	DIN 376		•
TPGN UNF 7/8 -14-M	UNF 7/8	14.0	4.921	.945	-	.709	4	.571	.81	DIN 376		•
TPGN UNF 7/8-14-M	UNF 7/8	14.0	4.921	.945	-	.709	4	.571	.81	DIN 376	•	
TPGN UNF 1"-12-M	UNF 1"	12.0	5.512	1.102	-	.709	4	.571	.92	DIN 376	•	•

• For user guide and cutting conditions, see pages 4-28

(1) Threads per inch

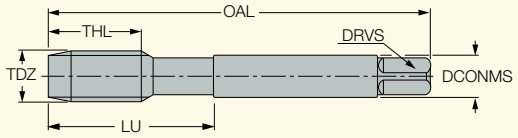
(2) Number of flutes

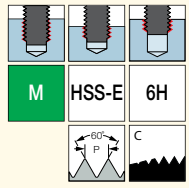
(3) Torque key size

ONETAP

TPSN M-M

DIN 13 HSSE 5% Co spiral flute machine taps ISO Metric coar se threads for a wide range of materials.





M E T R I C

Designation	Dimensions TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ↔ Hard HE	HETI
TPSN M-2X0.4-M	M2	0.400	45.00	6.0	10.0	2.80	3	2.10	1.60	DIN 371	•	•
TPSN M-2.2X0.45-M	M2.2	0.450	45.00	6.0	10.0	2.80	3	2.10	1.75	DIN 371	•	•
TPSN M-2.5X0.45-M	M2.5	0.450	50.00	6.0	12.0	2.80	3	2.10	2.05	DIN 371	•	•
TPSN M-3X0.5-M	M3	0.500	56.00	7.0	18.0	3.50	3	2.70	2.50	DIN 371	•	•
TPSN M-3.5X0.6-M	M3.5	0.600	56.00	7.0	20.0	4.00	3	3.00	2.90	DIN 371	•	•
TPSN M-4X0.7-M	M4	0.700	63.00	8.0	21.0	4.50	3	3.40	3.30	DIN 371	•	•
TPSN M-5X0.8-M	M5	0.800	70.00	10.0	25.0	6.00	3	4.90	4.20	DIN 371	•	•
TPSN M-6X1.0-M	M6	1.000	80.00	12.0	30.0	6.00	3	4.90	5.00	DIN 371	•	•
TPSN M-8X1.25-M	M8	1.250	90.00	15.0	35.0	8.00	3	6.20	6.80	DIN 371	•	•
TPSN M-10X1.5-M	M10	1.500	100.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	•	•
TPSN M-12X1.75-M	M12	1.750	110.00	18.0	-	9.00	3	7.00	10.20	DIN 376	•	•
TPSN M-14X2.0-M	M14	2.000	110.00	20.0	-	11.00	3	9.00	12.00	DIN 376	•	•
TPSN M-16X2.0-M	M16	2.000	110.00	20.0	-	12.00	4	9.00	14.00	DIN 376	•	•
TPSN M-18X2.5-M	M18	2.500	125.00	25.0	-	14.00	4	11.00	15.50	DIN 376	•	•
TPSN M-20X2.5-M	M20	2.500	140.00	25.0	-	16.00	4	12.00	17.50	DIN 376	•	•
TPSN M-22X2.5-M	M22	2.500	140.00	25.0	-	18.00	4	14.50	19.50	DIN 376	•	•
TPSN M-24X3.0-M	M24	3.000	160.00	30.0	-	18.00	4	14.50	21.00	DIN 376	•	•
TPSN M-27X3.0-M	M27	3.000	160.00	30.0	-	20.00	4	16.00	24.00	DIN 376	•	•
TPSN M-30X3.5-M	M30	3.500	180.00	35.0	-	22.00	4	18.00	26.50	DIN 376	•	•

• For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

(2) Number of flutes

(3) Torque key size

I N C H

Designation	Dimensions TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ↔ Hard HE	HETI
TPSN M-2X0.4-M	M2	.400	1.772	.236	.39	.110	3	.083	.06	DIN 371	•	•
TPSN M-2.2X0.45-M	M2.2	.450	1.772	.236	.39	.110	3	.083	.07	DIN 371	•	•
TPSN M-2.5X0.45-M	M2.5	.450	1.968	.236	.47	.110	3	.083	.08	DIN 371	•	•
TPSN M-3X0.5-M	M3	.500	2.205	.276	.71	.138	3	.106	.10	DIN 371	•	•
TPSN M-3.5X0.6-M	M3.5	.600	2.205	.276	.79	.157	3	.118	.11	DIN 371	•	•
TPSN M-4X0.7-M	M4	.700	2.480	.315	.83	.177	3	.134	.13	DIN 371	•	•
TPSN M-5X0.8-M	M5	.800	2.756	.394	.98	.236	3	.193	.17	DIN 371	•	•
TPSN M-6X1.0-M	M6	1.000	3.150	.472	1.18	.236	3	.193	.20	DIN 371	•	•
TPSN M-8X1.25-M	M8	1.250	3.543	.591	1.38	.315	3	.244	.27	DIN 371	•	•
TPSN M-10X1.5-M	M10	1.500	3.937	.709	1.54	.394	3	.315	.33	DIN 371	•	•
TPSN M-12X1.75-M	M12	1.750	4.331	.709	-	.354	3	.276	.40	DIN 376	•	•
TPSN M-14X2.0-M	M14	2.000	4.331	.787	-	.433	3	.354	.47	DIN 376	•	•
TPSN M-16X2.0-M	M16	2.000	4.331	.787	-	.472	4	.354	.55	DIN 376	•	•
TPSN M-18X2.5-M	M18	2.500	4.921	.984	-	.551	4	.433	.61	DIN 376	•	•
TPSN M-20X2.5-M	M20	2.500	5.512	.984	-	.630	4	.472	.69	DIN 376	•	•
TPSN M-22X2.5-M	M22	2.500	5.512	.984	-	.709	4	.571	.77	DIN 376	•	•
TPSN M-24X3.0-M	M24	3.000	6.299	1.181	-	.709	4	.571	.83	DIN 376	•	•
TPSN M-27X3.0-M	M27	3.000	6.299	1.181	-	.787	4	.630	.94	DIN 376	•	•
TPSN M-30X3.5-M	M30	3.500	7.087	1.378	-	.866	4	.709	1.04	DIN 376	•	•

• For user guide and cutting conditions, see pages 4-28

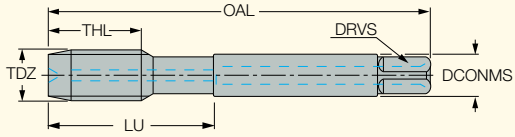
(1) Thread pitch

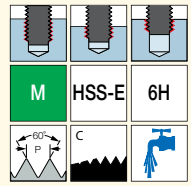
(2) Number of flutes

(3) Torque key size

ONETAP

TPSN M-M-B
DIN 13 HSS Spiral Flute Machine Taps - Metric Coarse Threads for a Wide Range of Materials





M E T R I C

Designation	Dimensions TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	CSP[4]	HETI
TPSN M-6X1.0-M-B	M6	1.000	80.00	12.0	30.0	6.00	3	4.90	5.00	DIN 371	1	●
TPSN M-8X1.25-M-B	M8	1.250	90.00	15.0	35.0	8.00	3	6.20	6.80	DIN 371	1	●
TPSN M-10X1.5-M-B	M10	1.500	100.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	1	●
TPSN M-12X1.75-M-B	M12	1.750	110.00	18.0	-	9.00	3	7.00	10.20	DIN 376	1	●
TPSN M-14X2.0-M-B	M14	2.000	110.00	20.0	-	11.00	3	9.00	12.00	DIN 376	1	●
TPSN M-16X2.0-M-B	M16	2.000	110.00	20.0	-	12.00	4	9.00	14.00	DIN 376	1	●

• For user guide and cutting conditions, see pages 4-28
(1) Thread pitch
(2) Number of flutes
(3) Torque key size
(4) 0 - Without coolant supply, 1 - With coolant supply

I N C H

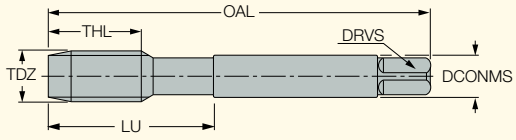
Designation	Dimensions TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	CSP[4]	HETI
TPSN M-6X1.0-M-B	M6	1.000	3.150	.472	1.18	.236	3	.193	.20	DIN 371	1	●
TPSN M-8X1.25-M-B	M8	1.250	3.543	.591	1.38	.315	3	.244	.27	DIN 371	1	●
TPSN M-10X1.5-M-B	M10	1.500	3.937	.709	1.54	.394	3	.315	.33	DIN 371	1	●
TPSN M-12X1.75-M-B	M12	1.750	4.331	.709	-	.354	3	.276	.40	DIN 376	1	●
TPSN M-14X2.0-M-B	M14	2.000	4.331	.787	-	.433	3	.354	.47	DIN 376	1	●
TPSN M-16X2.0-M-B	M16	2.000	4.331	.787	-	.472	4	.354	.55	DIN 376	1	●

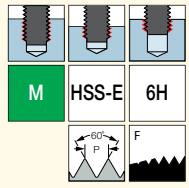
• For user guide and cutting conditions, see pages 4-28
(1) Thread pitch
(2) Number of flutes
(3) Torque key size
(4) 0 - Without coolant supply, 1 - With coolant supply

ONETAP

TPSN M-M-E

DIN 13 HSSE. 5% Co spiral flute machine taps ISO Metric coarse threads for a wide range of materials.





M E T R I C

Designation	Dimensions										HE
	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPSN M-4X0.7-M-F	M4	0.700	63.00	8.0	21.0	4.50	3	3.40	3.30	DIN 371	●
TPSN M-5X0.8-M-F	M5	0.800	70.00	10.0	25.0	6.00	3	4.90	4.20	DIN 371	●
TPSN M-6X1.0-M-F	M6	1.000	80.00	12.0	30.0	6.00	3	4.90	5.00	DIN 371	●
TPSN M-8X1.25-M-F	M8	1.250	90.00	15.0	35.0	8.00	3	6.20	6.80	DIN 371	●
TPSN M-10X1.5-M-F	M10	1.500	100.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	●
TPSN M-12X1.75-M-F	M12	1.750	110.00	18.0	-	9.00	3	7.00	10.20	DIN 376	●
TPSN M-14X2.0-M-F	M14	2.000	110.00	20.0	-	11.00	3	9.00	12.00	DIN 376	●
TPSN M-16X2.0-M-F	M16	2.000	110.00	20.0	-	12.00	4	9.00	14.00	DIN 376	●

• For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

(2) Number of flutes

(3) Torque key size

I N C H

Designation	Dimensions										HE
	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPSN M-4X0.7-M-F	M4	.700	2.480	.315	.83	.177	3	.134	.13	DIN 371	●
TPSN M-5X0.8-M-F	M5	.800	2.756	.394	.98	.236	3	.193	.17	DIN 371	●
TPSN M-6X1.0-M-F	M6	1.000	3.150	.472	1.18	.236	3	.193	.20	DIN 371	●
TPSN M-8X1.25-M-F	M8	1.250	3.543	.591	1.38	.315	3	.244	.27	DIN 371	●
TPSN M-10X1.5-M-F	M10	1.500	3.937	.709	1.54	.394	3	.315	.33	DIN 371	●
TPSN M-12X1.75-M-F	M12	1.750	4.331	.709	-	.354	3	.276	.40	DIN 376	●
TPSN M-14X2.0-M-F	M14	2.000	4.331	.787	-	.433	3	.354	.47	DIN 376	●
TPSN M-16X2.0-M-F	M16	2.000	4.331	.787	-	.472	4	.354	.55	DIN 376	●

• For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

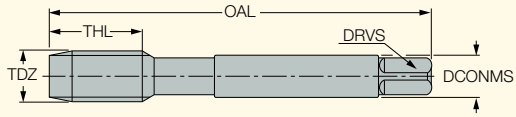
(2) Number of flutes

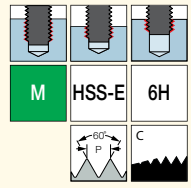
(3) Torque key size

ONETAP

TPSN MF-M

DIN 13 HSSE 5% Co spiral flute machine taps. ISO Metric fine threads for a wide range of materials.





M E T R I C

Designation	TDZ	TP[1]	OAL	THL	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ↔ Hard: HE	Tough ↔ Hard: HETI
		Dimensions									
TPSN MF-4X0.5-M	MF4	0.500	63.00	10.0	2.80	3	2.10	3.50	DIN 374	●	●
TPSN MF-5X0.5-M	MF5	0.500	70.00	12.0	3.50	3	2.70	4.50	DIN 374	●	●
TPSN MF-6X0.75-M	MF6	0.750	80.00	12.0	4.50	3	3.40	5.20	DIN 374	●	●
TPSN MF-8X1.0-M	MF8	1.000	90.00	15.0	6.00	3	4.90	7.00	DIN 374	●	●
TPSN MF-10X1.25-M	MF10	1.250	100.00	18.0	7.00	3	5.50	8.80	DIN 374		●
TPSN MF-10X1.25-M	MF10	1.250	100.00	18.0	7.00	3	5.50	8.80	DIN 374	●	
TPSN MF-10X1.0-M	MF10	1.000	90.00	18.0	7.00	3	5.50	9.00	DIN 374		●
TPSN MF-10X1.0-M	MF10	1.000	90.00	18.0	7.00	3	5.50	9.00	DIN 374	●	
TPSN MF-12X1.5-M	MF12	1.500	100.00	18.0	9.00	4	7.00	10.50	DIN 374		●
TPSN MF-12X1.5-M	MF12	1.500	100.00	18.0	9.00	4	7.00	10.50	DIN 374	●	
TPSN MF-12X1.25-M	MF12	1.250	100.00	18.0	9.00	4	7.00	10.80	DIN 374	●	●
TPSN MF-12X1.0-M	MF12	1.000	100.00	18.0	9.00	4	7.00	11.00	DIN 374		●
TPSN MF-12X1.0-M	MF12	1.000	100.00	18.0	9.00	4	7.00	11.00	DIN 374	●	
TPSN MF-14X1.5-M	MF14	1.500	100.00	18.0	11.00	4	9.00	12.50	DIN 374		●
TPSN MF-14X1.5-M	MF14	1.500	100.00	18.0	11.00	4	9.00	12.50	DIN 374	●	
TPSN MF-14X1.25-M	MF14	1.250	100.00	18.0	11.00	4	9.00	12.80	DIN 374	●	●
TPSN MF-14X1.0-M	MF14	1.000	100.00	18.0	11.00	4	9.00	13.00	DIN 374		●
TPSN MF-14X1.0-M	MF14	1.000	100.00	18.0	11.00	4	9.00	13.00	DIN 374	●	
TPSN MF-16X1.5-M	MF16	1.500	100.00	18.0	12.00	4	9.00	14.50	DIN 374	●	●
TPSN MF-18X1.5-M	MF18	1.500	110.00	20.0	14.00	4	11.00	16.50	DIN 374	●	●
TPSN MF-20X1.5-M	MF20	1.500	125.00	24.0	16.00	4	12.00	18.50	DIN 374	●	●
TPSN MF-22X1.5-M	MF22	1.500	125.00	24.0	18.00	4	14.50	20.50	DIN 374	●	●
TPSN MF-24X1.5-M	MF24	1.500	140.00	24.0	18.00	4	14.50	22.50	DIN 374	●	●

I N C H

Designation	TDZ	TP mm[1]	OAL	THL	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ↔ Hard: HE	Tough ↔ Hard: HETI
		Dimensions									
TPSN MF-4X0.5-M	MF4	.500	2.480	.394	.110	3	.083	.14	DIN 374	●	●
TPSN MF-5X0.5-M	MF5	.500	2.756	.472	.138	3	.106	.18	DIN 374	●	●
TPSN MF-6X0.75-M	MF6	.750	3.150	.472	.177	3	.134	.20	DIN 374	●	●
TPSN MF-8X1.0-M	MF8	1.000	3.543	.591	.236	3	.193	.28	DIN 374	●	●
TPSN MF-10X1.25-M	MF10	1.250	3.937	.709	.276	3	.217	.35	DIN 374		●
TPSN MF-10X1.25-M	MF10	1.250	3.937	.709	.276	3	.217	.35	DIN 374	●	
TPSN MF-10X1.0-M	MF10	1.000	3.543	.709	.276	3	.217	.35	DIN 374		●
TPSN MF-10X1.0-M	MF10	1.000	3.543	.709	.276	3	.217	.35	DIN 374	●	
TPSN MF-12X1.5-M	MF12	1.500	3.937	.709	.354	4	.276	.41	DIN 374		●
TPSN MF-12X1.5-M	MF12	1.500	3.937	.709	.354	4	.276	.41	DIN 374	●	
TPSN MF-12X1.25-M	MF12	1.250	3.937	.709	.354	4	.276	.43	DIN 374	●	●
TPSN MF-12X1.0-M	MF12	1.000	3.937	.709	.354	4	.276	.43	DIN 374		●
TPSN MF-12X1.0-M	MF12	1.000	3.937	.709	.354	4	.276	.43	DIN 374	●	
TPSN MF-14X1.5-M	MF14	1.500	3.937	.709	.433	4	.354	.49	DIN 374		●
TPSN MF-14X1.5-M	MF14	1.500	3.937	.709	.433	4	.354	.49	DIN 374	●	
TPSN MF-14X1.25-M	MF14	1.250	3.937	.709	.433	4	.354	.50	DIN 374	●	●
TPSN MF-14X1.0-M	MF14	1.000	3.937	.709	.433	4	.354	.51	DIN 374		●
TPSN MF-14X1.0-M	MF14	1.000	3.937	.709	.433	4	.354	.51	DIN 374	●	
TPSN MF-16X1.5-M	MF16	1.500	3.937	.709	.472	4	.354	.57	DIN 374	●	●
TPSN MF-18X1.5-M	MF18	1.500	4.331	.787	.551	4	.433	.65	DIN 374	●	●
TPSN MF-20X1.5-M	MF20	1.500	4.921	.945	.630	4	.472	.73	DIN 374	●	●
TPSN MF-22X1.5-M	MF22	1.500	4.921	.945	.709	4	.571	.81	DIN 374	●	●
TPSN MF-24X1.5-M	MF24	1.500	5.512	.945	.709	4	.571	.89	DIN 374	●	●

• For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

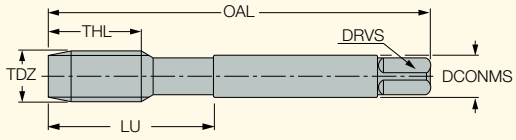
(2) Number of flutes

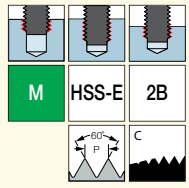
(3) Torque key size

ONETAP

TPSN UNC-M

HSSE 5% Co spiral flute machine taps unified coarse threads, for a wide range of materials.





M E T R I C

Designation	TDZ	TPI[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ↔ Hard HE	HETI
TPSN UNC #4-40-M	UNC No.4	40.0	56.00	10.0	18.0	3.50	3	2.70	2.35	DIN 371	●	●
TPSN UNC #5-40-M	UNC No.5	40.0	56.00	10.0	18.0	3.50	3	2.70	2.65	DIN 371	●	●
TPSN UNC #6-32-M	UNC No.6	32.0	56.00	10.0	20.0	4.00	3	3.00	2.85	DIN 371	●	●
TPSN UNC #8-32-M	UNC No.8	32.0	63.00	12.0	21.0	4.50	3	3.40	3.50	DIN 371	●	●
TPSN UNC #10-24-M	UNC No.10	24.0	7.00	14.0	25.0	6.00	3	4.90	3.90	DIN 371	●	●
TPSN UNC #12-24-M	UNC No.12	24.0	80.00	16.0	30.0	6.00	3	4.90	4.50	DIN 371	●	●
TPSN UNC 1/4-20-M	UNC 1/4	20.0	80.00	16.0	30.0	7.00	3	5.50	5.10	DIN 371	●	●
TPSN UNC 5/16-18-M	UNC 5/16	18.0	90.00	18.0	35.0	8.00	3	6.20	6.60	DIN 371	●	●
TPSN UNC 3/8-16-M	UNC 3/8	16.0	100.00	20.0	39.0	10.00	3	8.00	8.00	DIN 371	●	●
TPSN UNC 7/16-14-M	UNC 7/16	14.0	100.00	20.0	-	8.00	3	6.20	9.40	DIN 376	●	●
TPSN UNC 1/2-13-M	UNC 1/2	13.0	110.00	22.0	-	9.00	3	7.00	10.80	DIN 376	●	●
TPSN UNC 9/16-12-M	UNC 9/16	12.0	110.00	24.0	-	11.00	4	9.00	12.20	DIN 376	●	●
TPSN UNC 5/8-11-M	UNC 5/8	11.0	110.00	26.0	-	12.00	4	9.00	13.50	DIN 376	●	●
TPSN UNC 3/4-10-M	UNC 3/4	10.0	125.00	30.0	-	14.00	4	11.00	16.50	DIN 376	●	●
TPSN UNC 7/8-9-M	UNC 7/8	9.0	140.00	30.0	-	18.00	4	14.50	19.50	DIN 376	●	●
TPSN UNC 1"-8-M	UNC 1"	8.0	160.00	35.0	-	18.00	4	14.50	22.25	DIN 376	●	●

• For user guide and cutting conditions, see pages 4-28

(1) Threads per inch

(2) Number of flutes

(3) Torque key size

I N C H

Designation	TDZ	TPI[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ↔ Hard HE	HETI
TPSN UNC #4-40-M	UNC No.4	40.0	2.205	.394	.71	.138	3	.106	.09	DIN 371	●	●
TPSN UNC #5-40-M	UNC No.5	40.0	2.205	.394	.71	.138	3	.106	.10	DIN 371	●	●
TPSN UNC #6-32-M	UNC No.6	32.0	2.205	.394	.79	.157	3	.118	.11	DIN 371	●	●
TPSN UNC #8-32-M	UNC No.8	32.0	2.480	.472	.83	.177	3	.134	.14	DIN 371	●	●
TPSN UNC #10-24-M	UNC No.10	24.0	.276	.551	.98	.236	3	.193	.15	DIN 371	●	●
TPSN UNC #12-24-M	UNC No.12	24.0	3.150	.630	1.18	.236	3	.193	.18	DIN 371	●	●
TPSN UNC 1/4-20-M	UNC 1/4	20.0	3.150	.630	1.18	.276	3	.217	.20	DIN 371	●	●
TPSN UNC 5/16-18-M	UNC 5/16	18.0	3.543	.709	1.38	.315	3	.244	.26	DIN 371	●	●
TPSN UNC 3/8-16-M	UNC 3/8	16.0	3.937	.787	1.54	.394	3	.315	.31	DIN 371	●	●
TPSN UNC 7/16-14-M	UNC 7/16	14.0	3.937	.787	-	.315	3	.244	.37	DIN 376	●	●
TPSN UNC 1/2-13-M	UNC 1/2	13.0	4.331	.866	-	.354	3	.276	.43	DIN 376	●	●
TPSN UNC 9/16-12-M	UNC 9/16	12.0	4.331	.945	-	.433	4	.354	.48	DIN 376	●	●
TPSN UNC 5/8-11-M	UNC 5/8	11.0	4.331	1.024	-	.472	4	.354	.53	DIN 376	●	●
TPSN UNC 3/4-10-M	UNC 3/4	10.0	4.921	1.181	-	.551	4	.433	.65	DIN 376	●	●
TPSN UNC 7/8-9-M	UNC 7/8	9.0	5.512	1.181	-	.709	4	.571	.77	DIN 376	●	●
TPSN UNC 1"-8-M	UNC 1"	8.0	6.299	1.378	-	.709	4	.571	.88	DIN 376	●	●

• For user guide and cutting conditions, see pages 4-28

(1) Threads per inch

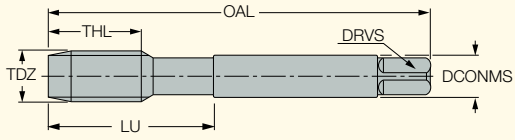
(2) Number of flutes

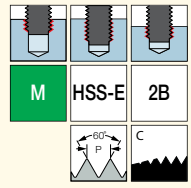
(3) Torque key size

ONETAP

TPSN UNF-M

HSSE 5% Co spiral flute machine taps unified fine threads, for a wide range of materials.





M E T R I C

Designation	TDZ	TPI[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ↔ Hard: HE	HETI
	Dimensions											
TPSN UNF #4-48-M	UNF No.4	48.0	56.00	8.0	18.0	3.50	3	2.70	2.40	DIN 371	•	•
TPSN UNF #5-44-M	UNF No.5	44.0	56.00	9.0	18.0	3.50	3	2.70	2.70	DIN 371	•	•
TPSN UNF #6-40-M	UNF No.6	40.0	56.00	10.0	20.0	4.00	3	3.00	2.95	DIN 371	•	•
TPSN UNF #8-36-M	UNF No.8	36.0	63.00	12.0	21.0	4.50	3	3.40	3.50	DIN 371	•	•
TPSN UNF #10-32-M	UNF No.10	32.0	70.00	12.0	25.0	6.00	3	4.90	4.10	DIN 371	•	•
TPSN UNF #12-28-M	UNF No.12	28.0	80.00	12.0	30.0	6.00	3	4.90	4.60	DIN 371	•	•
TPSN UNF 1/4-28-M	UNF 1/4	28.0	80.00	12.0	30.0	7.00	3	5.50	5.50	DIN 371	•	•
TPSN UNF 5/16-24-M	UNF 5/16	24.0	90.00	15.0	35.0	8.00	3	6.20	6.90	DIN 371	•	•
TPSN UNF 3/8-24-M	UNF 3/8	24.0	90.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	•	•
TPSN UNF 7/16-20-M	UNF 7/16	20.0	100.00	18.0	-	8.00	4	6.20	9.90	DIN 376	•	•
TPSN UNF 1/2-20-M	UNF 1/2	20.0	100.00	18.0	-	9.00	4	7.00	11.50	DIN 376	•	•
TPSN UNF 9/16-18-M	UNF 9/16	18.0	100.00	18.0	-	11.00	4	9.00	12.90	DIN 376	•	•
TPSN UNF 5/8-18-M	UNF 5/8	18.0	100.00	18.0	-	12.00	4	9.00	14.50	DIN 376	•	•
TPSN UNF 3/4-16-M	UNF 3/4	16.0	110.00	24.0	-	14.00	4	11.00	17.50	DIN 376	•	•
TPSN UNF 7/8-14-M	UNF 7/8	14.0	125.00	24.0	-	18.00	4	14.50	20.50	DIN 376	•	•
TPSN UNF 1"-12-M	UNF 1"	12.0	140.00	28.0	-	18.00	4	14.50	23.25	DIN 376	•	•

• For user guide and cutting conditions, see pages 4-28

(1) Threads per inch

(2) Number of flutes

(3) Torque key size

I N C H

Designation	TDZ	TPI[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ↔ Hard: HE	HETI
	Dimensions											
TPSN UNF #4-48-M	UNF No.4	48.0	2.205	.315	.71	.138	3	.106	.09	DIN 371	•	•
TPSN UNF #5-44-M	UNF No.5	44.0	2.205	.354	.71	.138	3	.106	.11	DIN 371	•	•
TPSN UNF #6-40-M	UNF No.6	40.0	2.205	.394	.79	.157	3	.118	.12	DIN 371	•	•
TPSN UNF #8-36-M	UNF No.8	36.0	2.480	.472	.83	.177	3	.134	.14	DIN 371	•	•
TPSN UNF #10-32-M	UNF No.10	32.0	2.756	.472	.98	.236	3	.193	.16	DIN 371	•	•
TPSN UNF #12-28-M	UNF No.12	28.0	3.150	.472	1.18	.236	3	.193	.18	DIN 371	•	•
TPSN UNF 1/4-28-M	UNF 1/4	28.0	3.150	.472	1.18	.276	3	.217	.22	DIN 371	•	•
TPSN UNF 5/16-24-M	UNF 5/16	24.0	3.543	.591	1.38	.315	3	.244	.27	DIN 371	•	•
TPSN UNF 3/8-24-M	UNF 3/8	24.0	3.543	.709	1.54	.394	3	.315	.33	DIN 371	•	•
TPSN UNF 7/16-20-M	UNF 7/16	20.0	3.937	.709	-	.315	4	.244	.39	DIN 376	•	•
TPSN UNF 1/2-20-M	UNF 1/2	20.0	3.937	.709	-	.354	4	.276	.45	DIN 376	•	•
TPSN UNF 9/16-18-M	UNF 9/16	18.0	3.937	.709	-	.433	4	.354	.51	DIN 376	•	•
TPSN UNF 5/8-18-M	UNF 5/8	18.0	3.937	.709	-	.472	4	.354	.57	DIN 376	•	•
TPSN UNF 3/4-16-M	UNF 3/4	16.0	4.331	.945	-	.551	4	.433	.69	DIN 376	•	•
TPSN UNF 7/8-14-M	UNF 7/8	14.0	4.921	.945	-	.709	4	.571	.81	DIN 376	•	•
TPSN UNF 1"-12-M	UNF 1"	12.0	5.512	1.102	-	.709	4	.571	.92	DIN 376	•	•

• For user guide and cutting conditions, see pages 4-28

(1) Threads per inch

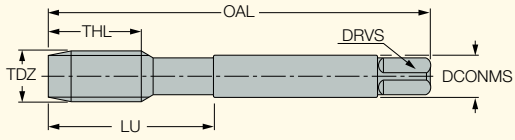
(2) Number of flutes

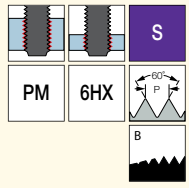
(3) Torque key size

ISCARTAPS

TPGN M-S

PM gun point machine taps according to DIN 13 - ISO Metric coarse threads on steel with good machinability.





M E T R I C

Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ↔ Hard PMST	PMTC
TPGN M-2X0.4-S	M2	0.400	45.00	8.0	39.0	2.80	2	2.10	1.60	DIN 371	●	●
TPGN M-2.5X0.45-S	M2.5	0.450	50.00	9.0	30.0	2.80	2	2.10	2.05	DIN 371	●	●
TPGN M-3X0.5-S	M3	0.500	56.00	10.0	18.0	3.50	3	2.70	2.50	DIN 371	●	●
TPGN M-4X0.7-S	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.30	DIN 371	●	●
TPGN M-5X0.8-S	M5	0.800	70.00	14.0	25.0	6.00	3	4.90	4.20	DIN 371	●	●
TPGN M-6X1.0-S	M6	1.000	80.00	16.0	30.0	6.00	3	4.90	5.00	DIN 371	●	●
TPGN M-8X1.25-S	M8	1.250	90.00	18.0	35.0	8.00	3	6.20	6.80	DIN 371	●	●
TPGN M-10X1.5-S	M10	1.500	100.00	20.0	39.0	10.00	3	8.00	8.50	DIN 371	●	●
TPGN M-12X1.75-S	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	DIN 376	●	●
TPGN M-14X2.0-S	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	DIN 376	●	●
TPGN M-16X2.0-S	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	DIN 376	●	●
TPGN M-18X2.5-S	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	DIN 376	●	●
TPGN M-20X2.5-S	M20	2.500	140.00	30.0	21.0	16.00	4	12.00	17.50	DIN 376	●	●

• For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

(2) Number of flutes

(3) Torque key size

I N C H

Designation	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ↔ Hard PMST	PMTC
TPGN M-2X0.4-S	M2	.400	1.772	.315	1.54	.110	2	.083	.06	DIN 371	●	●
TPGN M-2.5X0.45-S	M2.5	.450	1.968	.354	1.18	.110	2	.083	.08	DIN 371	●	●
TPGN M-3X0.5-S	M3	.500	2.205	.394	.71	.138	3	.106	.10	DIN 371	●	●
TPGN M-4X0.7-S	M4	.700	2.480	.472	.83	.177	3	.134	.13	DIN 371	●	●
TPGN M-5X0.8-S	M5	.800	2.756	.551	.98	.236	3	.193	.17	DIN 371	●	●
TPGN M-6X1.0-S	M6	1.000	3.150	.630	1.18	.236	3	.193	.20	DIN 371	●	●
TPGN M-8X1.25-S	M8	1.250	3.543	.709	1.38	.315	3	.244	.27	DIN 371	●	●
TPGN M-10X1.5-S	M10	1.500	3.937	.787	1.54	.394	3	.315	.33	DIN 371	●	●
TPGN M-12X1.75-S	M12	1.750	4.331	.866	-	.354	4	.276	.40	DIN 376	●	●
TPGN M-14X2.0-S	M14	2.000	4.331	.945	-	.433	4	.354	.47	DIN 376	●	●
TPGN M-16X2.0-S	M16	2.000	4.331	1.024	-	.472	4	.354	.55	DIN 376	●	●
TPGN M-18X2.5-S	M18	2.500	4.921	1.181	-	.551	4	.433	.61	DIN 376	●	●
TPGN M-20X2.5-S	M20	2.500	5.512	1.181	.83	.630	4	.472	.69	DIN 376	●	●

• For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

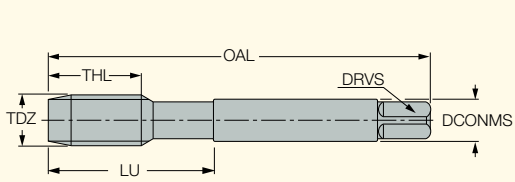
(2) Number of flutes

(3) Torque key size

ISCARTAPS

TPGN M-A

DIN 13 HSSE 5% Co gun point machine taps - ISO metric coarse threads for machining aluminum.



M E T R I C

Designation	Dimensions										HEDLC
	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPGN M-2X0.4-A	M2	0.400	45.00	8.0	-	2.80	2	2.10	1.60	DIN 371	●
TPGN M-3X0.5-A	M3	0.500	56.00	10.0	18.0	3.50	3	2.70	2.50	DIN 371	●
TPGN M-4X0.7-A	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.30	DIN 371	●
TPGN M-5X0.8-A	M5	0.800	70.00	14.0	25.0	6.00	3	4.90	4.20	DIN 371	●
TPGN M-6X1.0-A	M6	1.000	80.00	16.0	30.0	6.00	3	4.90	5.00	DIN 371	●
TPGN M-8X1.25-A	M8	1.250	90.00	18.0	35.0	8.00	3	6.20	6.80	DIN 371	●
TPGN M-10X1.5-A	M10	1.500	100.00	20.0	39.0	10.00	3	8.00	8.50	DIN 371	●
TPGN M-12X1.75-A	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	DIN 376	●
TPGN M-14X2.0-A	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	DIN 376	●
TPGN M-16X2.0-A	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	DIN 376	●
TPGN M-18X2.5-A	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	DIN 376	●
TPGN M-20X2.5-A	M20	2.500	140.00	30.0	-	16.00	4	12.00	17.50	DIN 376	●

• For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

(2) Number of flutes

(3) Torque key size

I N C H

Designation	Dimensions										HEDLC
	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPGN M-2X0.4-A	M2	.400	1.772	.315	-	.110	2	.083	.06	DIN 371	●
TPGN M-3X0.5-A	M3	.500	2.205	.394	.71	.138	3	.106	.10	DIN 371	●
TPGN M-4X0.7-A	M4	.700	2.480	.472	.83	.177	3	.134	.13	DIN 371	●
TPGN M-5X0.8-A	M5	.800	2.756	.551	.98	.236	3	.193	.17	DIN 371	●
TPGN M-6X1.0-A	M6	1.000	3.150	.630	1.18	.236	3	.193	.20	DIN 371	●
TPGN M-8X1.25-A	M8	1.250	3.543	.709	1.38	.315	3	.244	.27	DIN 371	●
TPGN M-10X1.5-A	M10	1.500	3.937	.787	1.54	.394	3	.315	.33	DIN 371	●
TPGN M-12X1.75-A	M12	1.750	4.331	.866	-	.354	4	.276	.40	DIN 376	●
TPGN M-14X2.0-A	M14	2.000	4.331	.945	-	.433	4	.354	.47	DIN 376	●
TPGN M-16X2.0-A	M16	2.000	4.331	1.024	-	.472	4	.354	.55	DIN 376	●
TPGN M-18X2.5-A	M18	2.500	4.921	1.181	-	.551	4	.433	.61	DIN 376	●
TPGN M-20X2.5-A	M20	2.500	5.512	1.181	-	.630	4	.472	.69	DIN 376	●

• For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

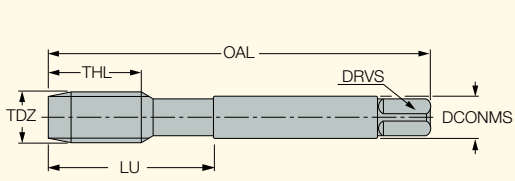
(2) Number of flutes

(3) Torque key size

ISCARTAPS

TPGN M-G

DIN 13 HSSE 5% Co gun point machine taps - ISO metric coarse threads for machining cast iron.



M E T R I C

Designation	Dimensions										HETA
	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPGN M-3X0.5-G	M3	0.500	56.00	10.0	18.0	3.50	3	2.70	2.50	DIN 371	●
TPGN M-4X0.7-G	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.30	DIN 371	●
TPGN M-5X0.8-G	M5	0.800	70.00	14.0	25.0	6.00	3	4.90	4.20	DIN 371	●
TPGN M-6X1.0-G	M6	1.000	80.00	16.0	30.0	6.00	3	4.90	5.00	DIN 371	●
TPGN M-8X1.25-G	M8	1.250	90.00	18.0	35.0	8.00	3	6.20	6.80	DIN 371	●
TPGN M-10X1.5-G	M10	1.500	100.00	20.0	39.0	10.00	3	8.00	8.50	DIN 371	●
TPGN M-12X1.75-G	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	DIN 376	●
TPGN M-14X2.0-G	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	DIN 376	●
TPGN M-16X2.0-G	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	DIN 376	●
TPGN M-18X2.5-G	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	DIN 376	●
TPGN M-20X2.5-G	M20	2.500	140.00	30.0	-	16.00	4	12.00	17.50	DIN 376	●

• For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

(2) Number of flutes

(3) Torque key size

I N C H

Designation	Dimensions										HETA
	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPGN M-3X0.5-G	M3	.500	2.205	.394	.71	.138	3	.106	.10	DIN 371	●
TPGN M-4X0.7-G	M4	.700	2.480	.472	.83	.177	3	.134	.13	DIN 371	●
TPGN M-5X0.8-G	M5	.800	2.756	.551	.98	.236	3	.193	.17	DIN 371	●
TPGN M-6X1.0-G	M6	1.000	3.150	.630	1.18	.236	3	.193	.20	DIN 371	●
TPGN M-8X1.25-G	M8	1.250	3.543	.709	1.38	.315	3	.244	.27	DIN 371	●
TPGN M-10X1.5-G	M10	1.500	3.937	.787	1.54	.394	3	.315	.33	DIN 371	●
TPGN M-12X1.75-G	M12	1.750	4.331	.866	-	.354	4	.276	.40	DIN 376	●
TPGN M-14X2.0-G	M14	2.000	4.331	.945	-	.433	4	.354	.47	DIN 376	●
TPGN M-16X2.0-G	M16	2.000	4.331	1.024	-	.472	4	.354	.55	DIN 376	●
TPGN M-18X2.5-G	M18	2.500	4.921	1.181	-	.551	4	.433	.61	DIN 376	●
TPGN M-20X2.5-G	M20	2.500	5.512	1.181	-	.630	4	.472	.69	DIN 376	●

• For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

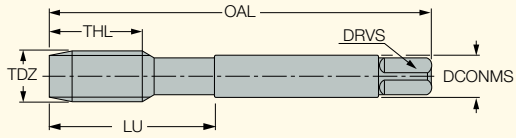
(2) Number of flutes

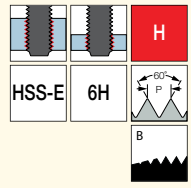
(3) Torque key size

ISCARTAPS

TPGN M-H

DIN 13 HSSE 5% Co gun point machine taps - ISO metric coarse threads, for hardened steel and high temperature alloys.





M E T R I C

Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ↔ Hard HENI	HETC
TPGN M-2X0.4-H	M2	0.400	45.00	8.0	-	2.80	2	2.10	1.60	DIN 371	•	•
TPGN M-2.2X0.45-H	M2.2	0.450	45.00	9.0	-	2.80	2	2.10	1.75	DIN 371	•	•
TPGN M-2.5X0.45-H	M2.5	0.450	50.00	9.0	-	2.80	2	2.10	2.05	DIN 371	•	•
TPGN M-3X0.5-H	M3	0.500	56.00	10.0	18.0	3.50	3	2.70	2.50	DIN 371	•	•
TPGN M-3.5X0.6-H	M3.5	0.600	56.00	10.0	20.0	4.00	3	3.00	2.90	DIN 371	•	•
TPGN M-4X0.7-H	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.30	DIN 371	•	•
TPGN M-5X0.8-H	M5	0.800	70.00	14.0	25.0	6.00	3	4.90	4.20	DIN 371	•	•
TPGN M-6X1.0-H	M6	1.000	80.00	16.0	30.0	6.00	3	4.90	5.00	DIN 371	•	•
TPGN M-8X1.25-H	M8	1.250	90.00	18.0	35.0	8.00	3	6.20	6.80	DIN 371	•	•
TPGN M-10X1.5-H	M10	1.500	100.00	20.0	39.0	10.00	3	8.00	8.50	DIN 371	•	•
TPGN M-12X1.75-H	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	DIN 376	•	•
TPGN M-14X2.0-H	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	DIN 376	•	•
TPGN M-16X2.0-H	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	DIN 376	•	•
TPGN M-18X2.5-H	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	DIN 376	•	•
TPGN M-20X2.5-H	M20	2.500	140.00	30.0	-	16.00	4	12.00	17.50	DIN 376	•	•

• For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

(2) Number of flutes

(3) Torque key size

I N C H

Designation	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ↔ Hard HENI	HETC
TPGN M-2X0.4-H	M2	.400	1.772	.315	-	.110	2	.083	.06	DIN 371	•	•
TPGN M-2.2X0.45-H	M2.2	.450	1.772	.354	-	.110	2	.083	.07	DIN 371	•	•
TPGN M-2.5X0.45-H	M2.5	.450	1.968	.354	-	.110	2	.083	.08	DIN 371	•	•
TPGN M-3X0.5-H	M3	.500	2.205	.394	.71	.138	3	.106	.10	DIN 371	•	•
TPGN M-3.5X0.6-H	M3.5	.600	2.205	.394	.79	.157	3	.118	.11	DIN 371	•	•
TPGN M-4X0.7-H	M4	.700	2.480	.472	.83	.177	3	.134	.13	DIN 371	•	•
TPGN M-5X0.8-H	M5	.800	2.756	.551	.98	.236	3	.193	.17	DIN 371	•	•
TPGN M-6X1.0-H	M6	1.000	3.150	.630	1.18	.236	3	.193	.20	DIN 371	•	•
TPGN M-8X1.25-H	M8	1.250	3.543	.709	1.38	.315	3	.244	.27	DIN 371	•	•
TPGN M-10X1.5-H	M10	1.500	3.937	.787	1.54	.394	3	.315	.33	DIN 371	•	•
TPGN M-12X1.75-H	M12	1.750	4.331	.866	-	.354	4	.276	.40	DIN 376	•	•
TPGN M-14X2.0-H	M14	2.000	4.331	.945	-	.433	4	.354	.47	DIN 376	•	•
TPGN M-16X2.0-H	M16	2.000	4.331	1.024	-	.472	4	.354	.55	DIN 376	•	•
TPGN M-18X2.5-H	M18	2.500	4.921	1.181	-	.551	4	.433	.61	DIN 376	•	•
TPGN M-20X2.5-H	M20	2.500	5.512	1.181	-	.630	4	.472	.69	DIN 376	•	•

• For user guide and cutting conditions, see pages 4-28

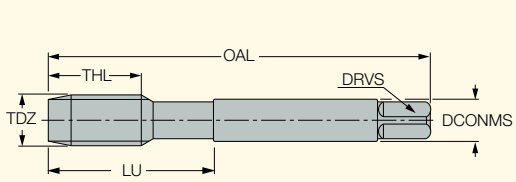
(1) Thread pitch

(2) Number of flutes

(3) Torque key size

ISCARTAPS

TPGN M-Y
DIN 13 HSS Gun Point Machine Taps - ISO Metric Coarse Threads for Hardened Steel and H.T.A.



M E T R I C

Designation	Dimensions										PMTC
	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPGN M-2X0.4-Y	M2	0.400	45.00	8.0	-	2.80	2	2.10	1.60	DIN 371	●
TPGN M-2.2X0.45-Y	M2.2	0.450	45.00	9.0	-	2.80	2	2.10	1.75	DIN 371	●
TPGN M-2.5X0.45-Y	M2.5	0.450	50.00	9.0	-	2.80	2	2.10	2.05	DIN 371	●
TPGN M-3X0.5-Y	M3	0.500	56.00	10.0	18.0	3.50	3	2.70	2.50	DIN 371	●
TPGN M-3.5X0.6-Y	M3.5	0.600	56.00	10.0	20.0	4.00	3	3.00	2.90	DIN 371	●
TPGN M-4X0.7-Y	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.30	DIN 371	●
TPGN M-5X0.8-Y	M5	0.800	70.00	14.0	25.0	6.00	3	4.90	4.20	DIN 371	●
TPGN M-6X1.0-Y	M6	1.000	80.00	16.0	30.0	6.00	3	4.90	5.00	DIN 371	●
TPGN M-8X1.25-Y	M8	1.250	90.00	18.0	35.0	8.00	3	6.20	6.80	DIN 371	●
TPGN M-10X1.5-Y	M10	1.500	100.00	20.0	39.0	10.00	3	8.00	8.50	DIN 371	●
TPGN M-12X1.75-Y	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	DIN 376	●
TPGN M-14X2.0-Y	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	DIN 376	●
TPGN M-16X2.0-Y	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	DIN 376	●
TPGN M-18X2.5-Y	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	DIN 376	●
TPGN M-20X2.5-Y	M20	2.500	140.00	30.0	-	16.00	4	12.00	17.50	DIN 376	●

• For user guide and cutting conditions, see pages 4-28
(1) Thread pitch
(2) Number of flutes
(3) Torque key size

I N C H

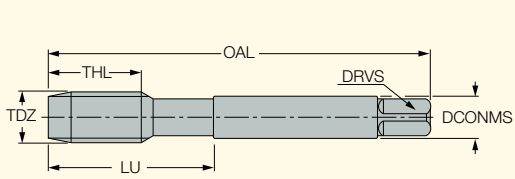
Designation	Dimensions										PMTC
	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPGN M-2X0.4-Y	M2	.400	1.772	.315	-	.110	2	.083	.06	DIN 371	●
TPGN M-2.2X0.45-Y	M2.2	.450	1.772	.354	-	.110	2	.083	.07	DIN 371	●
TPGN M-2.5X0.45-Y	M2.5	.450	1.968	.354	-	.110	2	.083	.08	DIN 371	●
TPGN M-3X0.5-Y	M3	.500	2.205	.394	.71	.138	3	.106	.10	DIN 371	●
TPGN M-3.5X0.6-Y	M3.5	.600	2.205	.394	.79	.157	3	.118	.11	DIN 371	●
TPGN M-4X0.7-Y	M4	.700	2.480	.472	.83	.177	3	.134	.13	DIN 371	●
TPGN M-5X0.8-Y	M5	.800	2.756	.551	.98	.236	3	.193	.17	DIN 371	●
TPGN M-6X1.0-Y	M6	1.000	3.150	.630	1.18	.236	3	.193	.20	DIN 371	●
TPGN M-8X1.25-Y	M8	1.250	3.543	.709	1.38	.315	3	.244	.27	DIN 371	●
TPGN M-10X1.5-Y	M10	1.500	3.937	.787	1.54	.394	3	.315	.33	DIN 371	●
TPGN M-12X1.75-Y	M12	1.750	4.331	.866	-	.354	4	.276	.40	DIN 376	●
TPGN M-14X2.0-Y	M14	2.000	4.331	.945	-	.433	4	.354	.47	DIN 376	●
TPGN M-16X2.0-Y	M16	2.000	4.331	1.024	-	.472	4	.354	.55	DIN 376	●
TPGN M-18X2.5-Y	M18	2.500	4.921	1.181	-	.551	4	.433	.61	DIN 376	●
TPGN M-20X2.5-Y	M20	2.500	5.512	1.181	-	.630	4	.472	.69	DIN 376	●

• For user guide and cutting conditions, see pages 4-28
(1) Thread pitch
(2) Number of flutes
(3) Torque key size

ISCARTAPS

TPSN M-S

PM Right-hand 40° spiral flute machine taps - ISO metric coarse threads, according to DIN 13, for stainless steel.



M E T R I C

Designation	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ↔ Hard PMST	PMTC
TPSN M-2X0.4-S	M2	0.400	45.00	6.0	10.0	2.80	3	2.10	1.60	DIN 371	●	●
TPSN M-2.5X0.45-S	M2.5	0.450	50.00	6.0	12.0	2.80	3	2.10	2.05	DIN 371	●	●
TPSN M-3X0.5-S	M3	0.500	56.00	7.0	18.0	3.50	3	2.70	2.50	DIN 371	●	●
TPSN M-4X0.7-S	M4	0.700	63.00	8.0	21.0	4.50	3	3.40	3.30	DIN 371	●	●
TPSN M-5X0.8-S	M5	0.800	70.00	10.0	25.0	6.00	3	4.90	4.20	DIN 371	●	●
TPSN M-6X1.0-S	M6	1.000	80.00	12.0	30.0	6.00	3	4.90	5.00	DIN 371	●	●
TPSN M-8X1.25-S	M8	1.250	90.00	15.0	35.0	8.00	3	6.20	6.80	DIN 371	●	●
TPSN M-10X1.5-S	M10	1.500	100.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	●	●
TPSN M-12X1.75-S	M12	1.750	110.00	18.0	-	9.00	3	7.00	10.20	DIN 376	●	●
TPSN M-14X2.0-S	M14	2.000	110.00	20.0	-	11.00	3	9.00	12.00	DIN 376	●	●
TPSN M-16X2.0-S	M16	2.000	110.00	20.0	-	12.00	4	9.00	14.00	DIN 376	●	●
TPSN M-18X2.5-S	M18	2.500	125.00	25.0	-	14.00	4	11.00	15.50	DIN 371	●	●
TPSN M-20X2.5-S	M20	2.500	140.00	25.0	-	16.00	4	12.00	17.50	DIN 376	●	●

• For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

(2) Number of flutes

(3) Torque key size

I N C H

Designation	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ↔ Hard PMST	PMTC
TPSN M-2X0.4-S	M2	.400	1.772	.236	.39	.110	3	.083	.06	DIN 371	●	●
TPSN M-2.5X0.45-S	M2.5	.450	1.968	.236	.47	.110	3	.083	.08	DIN 371	●	●
TPSN M-3X0.5-S	M3	.500	2.205	.276	.71	.138	3	.106	.10	DIN 371	●	●
TPSN M-4X0.7-S	M4	.700	2.480	.315	.83	.177	3	.134	.13	DIN 371	●	●
TPSN M-5X0.8-S	M5	.800	2.756	.394	.98	.236	3	.193	.17	DIN 371	●	●
TPSN M-6X1.0-S	M6	1.000	3.150	.472	1.18	.236	3	.193	.20	DIN 371	●	●
TPSN M-8X1.25-S	M8	1.250	3.543	.591	1.38	.315	3	.244	.27	DIN 371	●	●
TPSN M-10X1.5-S	M10	1.500	3.937	.709	1.54	.394	3	.315	.33	DIN 371	●	●
TPSN M-12X1.75-S	M12	1.750	4.331	.709	-	.354	3	.276	.40	DIN 376	●	●
TPSN M-14X2.0-S	M14	2.000	4.331	.787	-	.433	3	.354	.47	DIN 376	●	●
TPSN M-16X2.0-S	M16	2.000	4.331	.787	-	.472	4	.354	.55	DIN 376	●	●
TPSN M-18X2.5-S	M18	2.500	4.921	.984	-	.551	4	.433	.61	DIN 371	●	●
TPSN M-20X2.5-S	M20	2.500	5.512	.984	-	.630	4	.472	.69	DIN 376	●	●

• For user guide and cutting conditions, see pages 4-28

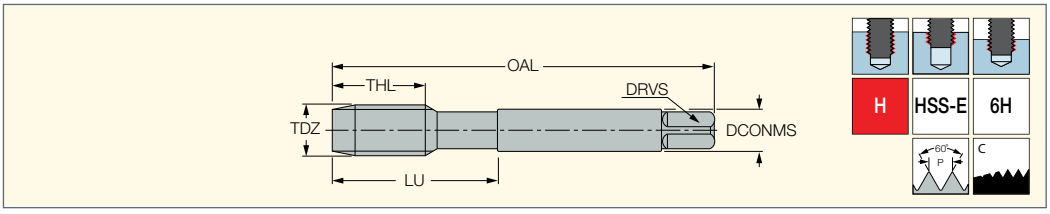
(1) Thread pitch

(2) Number of flutes

(3) Torque key size

ISCARTAPS

TPSN M-H
DIN 13 HSS Right-Hand 40° Spiral Flute Machine Taps - ISO Metric Coarse Threads for H.T.A.



M E T R I C

Designation	Dimensions										Tough ↔ Hard	
	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	HE	HETC
TPSN M-2X0.4-H	M2	0.400	45.00	6.0	10.0	2.80	3	2.10	1.60	DIN 371	●	●
TPSN M-2.2X0.45-H	M2.2	0.450	45.00	6.0	10.0	2.80	3	2.10	1.75	DIN 371	●	●
TPSN M-2.5X0.45-H	M2.5	0.450	50.00	6.0	12.0	2.80	3	2.10	2.05	DIN 371	●	●
TPSN M-3X0.5-H	M3	0.500	56.00	7.0	18.0	3.50	3	2.70	2.50	DIN 371	●	●
TPSN M-3.5X0.6-H	M3.5	0.600	56.00	7.0	20.0	4.00	3	3.00	2.90	DIN 371	●	●
TPSN M-4X0.7-H	M4	0.700	63.00	8.0	21.0	4.50	3	3.40	3.30	DIN 371	●	●
TPSN M-5X0.8-H	M5	0.800	70.00	10.0	25.0	6.00	3	4.90	4.20	DIN 371	●	●
TPSN M-6X1.0-H	M6	1.000	80.00	12.0	30.0	6.00	3	4.90	5.00	DIN 371	●	●
TPSN M-8X1.25-H	M8	1.250	90.00	15.0	35.0	8.00	3	6.20	6.80	DIN 371	●	●
TPSN M-10X1.5-H	M10	1.500	100.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	●	●
TPSN M-12X1.75-H	M12	1.750	110.00	18.0	-	9.00	3	7.00	10.20	DIN 376	●	●
TPSN M-14X2.0-H	M14	2.000	110.00	20.0	-	11.00	3	9.00	12.00	DIN 376	●	●
TPSN M-16X2.0-H	M16	2.000	110.00	20.0	-	12.00	4	9.00	14.00	DIN 376	●	●
TPSN M-18X2.5-H	M18	2.500	125.00	25.0	-	14.00	4	11.00	15.50	DIN 376	●	●
TPSN M-20X2.5-H	M20	2.500	140.00	25.0	-	16.00	4	12.00	17.50	DIN 376	●	●

• For user guide and cutting conditions, see pages 4-28
(1) Thread pitch
(2) Number of flutes
(3) Torque key size

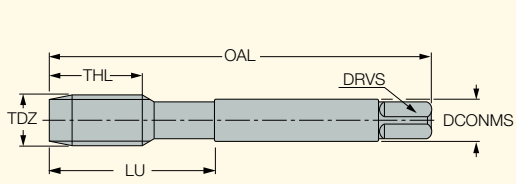
I N C H

Designation	Dimensions										Tough ↔ Hard	
	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	HE	HETC
TPSN M-2X0.4-H	M2	.400	1.772	.236	.39	.110	3	.083	.06	DIN 371	●	●
TPSN M-2.2X0.45-H	M2.2	.450	1.772	.236	.39	.110	3	.083	.07	DIN 371	●	●
TPSN M-2.5X0.45-H	M2.5	.450	1.968	.236	.47	.110	3	.083	.08	DIN 371	●	●
TPSN M-3X0.5-H	M3	.500	2.205	.276	.71	.138	3	.106	.10	DIN 371	●	●
TPSN M-3.5X0.6-H	M3.5	.600	2.205	.276	.79	.157	3	.118	.11	DIN 371	●	●
TPSN M-4X0.7-H	M4	.700	2.480	.315	.83	.177	3	.134	.13	DIN 371	●	●
TPSN M-5X0.8-H	M5	.800	2.756	.394	.98	.236	3	.193	.17	DIN 371	●	●
TPSN M-6X1.0-H	M6	1.000	3.150	.472	1.18	.236	3	.193	.20	DIN 371	●	●
TPSN M-8X1.25-H	M8	1.250	3.543	.591	1.38	.315	3	.244	.27	DIN 371	●	●
TPSN M-10X1.5-H	M10	1.500	3.937	.709	1.54	.394	3	.315	.33	DIN 371	●	●
TPSN M-12X1.75-H	M12	1.750	4.331	.709	-	.354	3	.276	.40	DIN 376	●	●
TPSN M-14X2.0-H	M14	2.000	4.331	.787	-	.433	3	.354	.47	DIN 376	●	●
TPSN M-16X2.0-H	M16	2.000	4.331	.787	-	.472	4	.354	.55	DIN 376	●	●
TPSN M-18X2.5-H	M18	2.500	4.921	.984	-	.551	4	.433	.61	DIN 376	●	●
TPSN M-20X2.5-H	M20	2.500	5.512	.984	-	.630	4	.472	.69	DIN 376	●	●

• For user guide and cutting conditions, see pages 4-28
(1) Thread pitch
(2) Number of flutes
(3) Torque key size

ISCARTAPS

TPSN M-G
HSS straight flute machine taps
- ISO metric coarse threads,
according to DIN 13,
for grey cast iron.



M E T R I C

Designation	Dimensions										HETA
	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPSN M-3X0.5-G	M3	0.500	56.00	7.0	18.0	3.50	3	2.70	2.50	DIN 371	●
TPSN M-4X0.7-G	M4	0.700	63.00	8.0	21.0	4.50	3	3.40	3.30	DIN 371	●
TPSN M-5X0.8-G	M5	0.800	70.00	10.0	25.0	6.00	3	4.90	4.20	DIN 371	●
TPSN M-6X1.0-G	M6	1.000	80.00	12.0	30.0	6.00	3	4.90	5.00	DIN 371	●
TPSN M-8X1.25-G	M8	1.250	90.00	15.0	35.0	8.00	3	6.20	6.80	DIN 371	●
TPSN M-10X1.5-G	M10	1.500	100.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	●
TPSN M-12X1.75-G	M12	1.750	110.00	18.0	-	9.00	3	7.00	10.20	DIN 376	●
TPSN M-14X2.0-G	M14	2.000	110.00	20.0	-	11.00	3	9.00	12.00	DIN 376	●
TPSN M-16X2.0-G	M16	2.000	110.00	20.0	-	12.00	4	9.00	14.00	DIN 376	●
TPSN M-18X2.5-G	M18	2.500	125.00	25.0	-	14.00	4	11.00	15.50	DIN 376	●
TPSN M-20X2.5-G	M20	2.500	140.00	25.0	-	16.00	4	12.00	17.50	DIN 376	●

- For user guide and cutting conditions, see pages 4-28

(1) Thread pitch
(2) Number of flutes
(3) Torque key size

I N C H

Designation	Dimensions										HETA
	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPSN M-3X0.5-G	M3	.500	2.205	.276	.71	.138	3	.106	.10	DIN 371	●
TPSN M-4X0.7-G	M4	.700	2.480	.315	.83	.177	3	.134	.13	DIN 371	●
TPSN M-5X0.8-G	M5	.800	2.756	.394	.98	.236	3	.193	.17	DIN 371	●
TPSN M-6X1.0-G	M6	1.000	3.150	.472	1.18	.236	3	.193	.20	DIN 371	●
TPSN M-8X1.25-G	M8	1.250	3.543	.591	1.38	.315	3	.244	.27	DIN 371	●
TPSN M-10X1.5-G	M10	1.500	3.937	.709	1.54	.394	3	.315	.33	DIN 371	●
TPSN M-12X1.75-G	M12	1.750	4.331	.709	-	.354	3	.276	.40	DIN 376	●
TPSN M-14X2.0-G	M14	2.000	4.331	.787	-	.433	3	.354	.47	DIN 376	●
TPSN M-16X2.0-G	M16	2.000	4.331	.787	-	.472	4	.354	.55	DIN 376	●
TPSN M-18X2.5-G	M18	2.500	4.921	.984	-	.551	4	.433	.61	DIN 376	●
TPSN M-20X2.5-G	M20	2.500	5.512	.984	-	.630	4	.472	.69	DIN 376	●

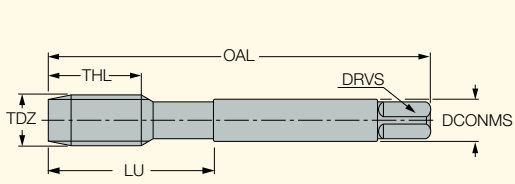
- For user guide and cutting conditions, see pages 4-28

(1) Thread pitch
(2) Number of flutes
(3) Torque key size

ISCARTAPS

TPSN M-N

HSS straight flute machine taps - ISO metric coarse threads, according to DIN 13, for low Carbone Steel



M E T R I C

Designation	Dimensions										HEST
	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPSN M-4X0.7-N	M4	0.700	63.00	8.0	21.0	4.50	3	3.40	3.30	DIN 371	●
TPSN M-5X0.8-N	M5	0.800	70.00	10.0	25.0	6.00	3	4.90	4.20	DIN 371	●
TPSN M-6X1.0-N	M6	1.000	80.00	12.0	30.0	6.00	3	4.90	5.00	DIN 371	●
TPSN M-7X1.0-N	M7	1.000	80.00	12.0	30.0	7.00	3	5.50	6.00	DIN 371	●
TPSN M-8X1.25-N	M8	1.250	90.00	15.0	35.0	8.00	3	6.20	6.80	DIN 371	●
TPSN M-10X1.5-N	M10	1.500	100.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	●
TPSN M-11X1.5-N	M11	1.500	100.00	18.0	-	8.00	3	6.20	9.50	DIN 376	●
TPSN M-12X1.75-N	M12	1.750	110.00	18.0	-	9.00	3	7.00	10.20	DIN 376	●
TPSN M-14X2.0-N	M14	2.000	110.00	20.0	-	11.00	3	9.00	12.00	DIN 376	●
TPSN M-16X2.0-N	M16	2.000	110.00	20.0	-	12.00	4	9.00	14.00	DIN 376	●
TPSN M-18X2.5-N	M18	2.500	125.00	25.0	-	14.00	4	11.00	15.50	DIN 376	●
TPSN M-20X2.5-N	M20	2.500	140.00	25.0	-	16.00	4	12.00	17.50	DIN 376	●

• For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

(2) Number of flutes

(3) Torque key size

I N C H

Designation	Dimensions										HEST
	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPSN M-4X0.7-N	M4	.700	2.480	.315	.83	.177	3	.134	.13	DIN 371	●
TPSN M-5X0.8-N	M5	.800	2.756	.394	.98	.236	3	.193	.17	DIN 371	●
TPSN M-6X1.0-N	M6	1.000	3.150	.472	1.18	.236	3	.193	.20	DIN 371	●
TPSN M-7X1.0-N	M7	1.000	3.150	.472	1.18	.276	3	.217	.24	DIN 371	●
TPSN M-8X1.25-N	M8	1.250	3.543	.591	1.38	.315	3	.244	.27	DIN 371	●
TPSN M-10X1.5-N	M10	1.500	3.937	.709	1.54	.394	3	.315	.33	DIN 371	●
TPSN M-11X1.5-N	M11	1.500	3.937	.709	-	.315	3	.244	.37	DIN 376	●
TPSN M-12X1.75-N	M12	1.750	4.331	.709	-	.354	3	.276	.40	DIN 376	●
TPSN M-14X2.0-N	M14	2.000	4.331	.787	-	.433	3	.354	.47	DIN 376	●
TPSN M-16X2.0-N	M16	2.000	4.331	.787	-	.472	4	.354	.55	DIN 376	●
TPSN M-18X2.5-N	M18	2.500	4.921	.984	-	.551	4	.433	.61	DIN 376	●
TPSN M-20X2.5-N	M20	2.500	5.512	.984	-	.630	4	.472	.69	DIN 376	●

• For user guide and cutting conditions, see pages 4-28

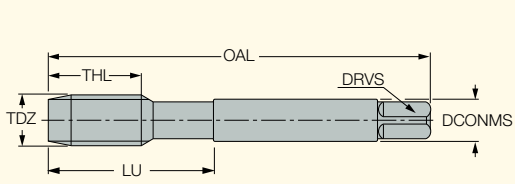
(1) Thread pitch

(2) Number of flutes

(3) Torque key size

ISCARTAPS

TPSN M-A
DIN 13 HSS Right-Hand 40° Spiral Flute Machine Taps for ISO Metric Coarse Threads on Aluminum and Aluminum Alloys



M E T R I C

Designation	Dimensions										HEDLC
	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPSN M-2X0.4-A	M2	0.400	45.00	6.0	10.0	2.80	3	2.10	1.60	DIN 371	●
TPSN M-3X0.5-A	M3	0.500	56.00	7.0	18.0	3.50	3	2.70	2.50	DIN 371	●
TPSN M-4X0.7-A	M4	0.700	63.00	8.0	21.0	4.50	3	3.40	3.30	DIN 371	●
TPSN M-5X0.8-A	M5	0.800	70.00	10.0	25.0	6.00	3	4.90	4.20	DIN 371	●
TPSN M-6X1.0-A	M6	1.000	80.00	12.0	30.0	6.00	3	4.90	5.00	DIN 371	●
TPSN M-8X1.25-A	M8	1.250	90.00	15.0	35.0	8.00	3	6.20	6.80	DIN 371	●
TPSN M-10X1.5-A	M10	1.500	100.00	18.0	39.0	10.00	3	8.00	8.50	DIN 371	●
TPSN M-12X1.75-A	M12	1.750	110.00	18.0	-	9.00	3	7.00	10.20	DIN 376	●
TPSN M-14X2.0-A	M14	2.000	110.00	20.0	-	11.00	3	9.00	12.00	DIN 376	●
TPSN M-16X2.0-A	M16	2.000	110.00	20.0	-	12.00	4	9.00	14.00	DIN 376	●
TPSN M-18X2.5-A	M18	2.500	125.00	25.0	-	14.00	4	11.00	15.50	DIN 376	●
TPSN M-20X2.5-A	M20	2.500	140.00	25.0	-	16.00	4	12.00	17.50	DIN 376	●

• For user guide and cutting conditions, see pages 4-28
(1) Thread pitch
(2) Number of flutes
(3) Torque key size

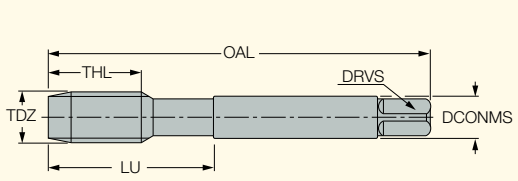
I N C H

Designation	Dimensions										HEDLC
	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPSN M-2X0.4-A	M2	.400	1.772	.236	.39	.110	3	.083	.06	DIN 371	●
TPSN M-3X0.5-A	M3	.500	2.205	.276	.71	.138	3	.106	.10	DIN 371	●
TPSN M-4X0.7-A	M4	.700	2.480	.315	.83	.177	3	.134	.13	DIN 371	●
TPSN M-5X0.8-A	M5	.800	2.756	.394	.98	.236	3	.193	.17	DIN 371	●
TPSN M-6X1.0-A	M6	1.000	3.150	.472	1.18	.236	3	.193	.20	DIN 371	●
TPSN M-8X1.25-A	M8	1.250	3.543	.591	1.38	.315	3	.244	.27	DIN 371	●
TPSN M-10X1.5-A	M10	1.500	3.937	.709	1.54	.394	3	.315	.33	DIN 371	●
TPSN M-12X1.75-A	M12	1.750	4.331	.709	-	.354	3	.276	.40	DIN 376	●
TPSN M-14X2.0-A	M14	2.000	4.331	.787	-	.433	3	.354	.47	DIN 376	●
TPSN M-16X2.0-A	M16	2.000	4.331	.787	-	.472	4	.354	.55	DIN 376	●
TPSN M-18X2.5-A	M18	2.500	4.921	.984	-	.551	4	.433	.61	DIN 376	●
TPSN M-20X2.5-A	M20	2.500	5.512	.984	-	.630	4	.472	.69	DIN 376	●

• For user guide and cutting conditions, see pages 4-28
(1) Thread pitch
(2) Number of flutes
(3) Torque key size

ISCARTAPS

TPSN M-Y
DIN 13 HSS Spiral Flute Machine Taps - Metric Coarse Threads for a Wide Range of Materials



M E T R I C

Designation	Dimensions										PMTI
	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPSN M-2X0.4-Y	M2	0.400	45.00	8.0	-	2.80	3	2.10	1.60	DIN 371	●
TPSN M-2.2X0.45-Y	M2.2	0.450	45.00	9.0	-	2.80	3	2.10	1.75	DIN 376	●
TPSN M-2.5X0.45-Y	M2.5	0.450	50.00	9.0	-	2.80	3	2.10	2.05	DIN 371	●
TPSN M-3 0.5-Y	M3	0.500	56.00	10.0	18.0	3.50	3	2.70	2.50	DIN 371	●
TPSN M-3.5X0.6-Y	M3.5	0.600	56.00	10.0	20.0	4.00	3	3.00	2.90	DIN 371	●
TPSN M-4X0.7-Y	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.30	DIN 371	●
TPSN M-5X0.8-Y	M5	0.800	70.00	14.0	25.0	6.00	3	4.90	4.20	DIN 371	●
TPSN M-6X1.0-Y	M6	1.000	80.00	16.0	30.0	6.00	3	4.90	5.00	DIN 371	●
TPSN M-8X1.25-Y	M8	1.250	90.00	18.0	35.0	8.00	3	6.20	6.80	DIN 371	●
TPSN M-10X1.5-Y	M10	1.500	100.00	20.0	39.0	10.00	3	8.00	8.50	DIN 371	●
TPSN M-12X1.75-Y	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	DIN 376	●
TPSN M-14X2.0-Y	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	DIN 376	●
TPSN M-16X2.0-Y	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	DIN 376	●
TPSN M-18X2.5-Y	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	DIN 376	●
TPSN M-20X2.5-Y	M20	2.500	140.00	30.0	-	16.00	4	12.00	17.50	DIN 376	●

• For user guide and cutting conditions, see pages 4-28

(1) Thread pitch
(2) Number of flutes
(3) Torque key size

I N C H

Designation	Dimensions										PMTI
	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPSN M-2X0.4-Y	M2	.400	1.772	.315	-	.110	3	.083	.06	DIN 371	●
TPSN M-2.2X0.45-Y	M2.2	.450	1.772	.354	-	.110	3	.083	.07	DIN 376	●
TPSN M-2.5X0.45-Y	M2.5	.450	1.968	.354	-	.110	3	.083	.08	DIN 371	●
TPSN M-3 0.5-Y	M3	.500	2.205	.394	.71	.138	3	.106	.10	DIN 371	●
TPSN M-3.5X0.6-Y	M3.5	.600	2.205	.394	.79	.157	3	.118	.11	DIN 371	●
TPSN M-4X0.7-Y	M4	.700	2.480	.472	.83	.177	3	.134	.13	DIN 371	●
TPSN M-5X0.8-Y	M5	.800	2.756	.551	.98	.236	3	.193	.17	DIN 371	●
TPSN M-6X1.0-Y	M6	1.000	3.150	.630	1.18	.236	3	.193	.20	DIN 371	●
TPSN M-8X1.25-Y	M8	1.250	3.543	.709	1.38	.315	3	.244	.27	DIN 371	●
TPSN M-10X1.5-Y	M10	1.500	3.937	.787	1.54	.394	3	.315	.33	DIN 371	●
TPSN M-12X1.75-Y	M12	1.750	4.331	.866	-	.354	4	.276	.40	DIN 376	●
TPSN M-14X2.0-Y	M14	2.000	4.331	.945	-	.433	4	.354	.47	DIN 376	●
TPSN M-16X2.0-Y	M16	2.000	4.331	1.024	-	.472	4	.354	.55	DIN 376	●
TPSN M-18X2.5-Y	M18	2.500	4.921	1.181	-	.551	4	.433	.61	DIN 376	●
TPSN M-20X2.5-Y	M20	2.500	5.512	1.181	-	.630	4	.472	.69	DIN 376	●

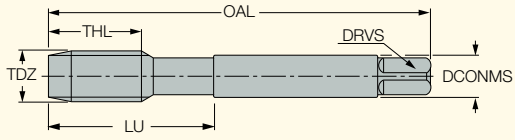
• For user guide and cutting conditions, see pages 4-28

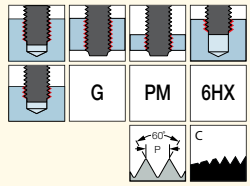
(1) Thread pitch
(2) Number of flutes
(3) Torque key size

ISCARTAPS

TPSTN M-G

PM straight flute machine taps - ISO metric coarse threads, according to DIN 13, for gray cast iron.





M E T R I C

Designation	Dimensions TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ↔ Hard PMNI	PMTA
TPSTN M-2X0.4-G	M2	0.400	45.00	8.0	-	2.80	3	2.10	1.60	DIN 371	●	●
TPSTN M-3X0.5-G	M3	0.500	56.00	10.0	18.0	3.50	3	2.70	2.50	DIN 371	●	●
TPSTN M-4X0.7-G	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.30	DIN 371	●	●
TPSTN M-5X0.8-G	M5	0.800	70.00	14.0	25.0	6.00	4	4.90	4.20	DIN 371	●	●
TPSTN M-6X1.0-G	M6	1.000	80.00	16.0	30.0	6.00	4	4.90	5.00	DIN 371	●	●
TPSTN M-8X1.25-G	M8	1.250	90.00	18.0	35.0	8.00	4	6.20	6.80	DIN 371	●	●
TPSTN M-10X1.5-G	M10	1.500	100.00	20.0	39.0	10.00	4	8.00	8.50	DIN 371	●	●
TPSTN M-12X1.75-G	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	DIN 376	●	●
TPSTN M-14X2.0-G	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	DIN 376	●	●
TPSTN M-16X2.0-G	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	DIN 376	●	●
TPSTN M-18X2.5-G	M18	2.500	125.00	30.0	-	14.00	4	11.00	15.50	DIN 376	●	●
TPSTN M-20X2.5-G	M20	2.500	140.00	30.0	-	16.00	4	12.00	17.50	DIN 376	●	●

• For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

(2) Number of flutes

(3) Torque key size

I N C H

Designation	Dimensions TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	Tough ↔ Hard PMNI	PMTA
TPSTN M-2X0.4-G	M2	.400	1.772	.315	-	.110	3	.083	.06	DIN 371	●	●
TPSTN M-3X0.5-G	M3	.500	2.205	.394	.71	.138	3	.106	.10	DIN 371	●	●
TPSTN M-4X0.7-G	M4	.700	2.480	.472	.83	.177	3	.134	.13	DIN 371	●	●
TPSTN M-5X0.8-G	M5	.800	2.756	.551	.98	.236	4	.193	.17	DIN 371	●	●
TPSTN M-6X1.0-G	M6	1.000	3.150	.630	1.18	.236	4	.193	.20	DIN 371	●	●
TPSTN M-8X1.25-G	M8	1.250	3.543	.709	1.38	.315	4	.244	.27	DIN 371	●	●
TPSTN M-10X1.5-G	M10	1.500	3.937	.787	1.54	.394	4	.315	.33	DIN 371	●	●
TPSTN M-12X1.75-G	M12	1.750	4.331	.866	-	.354	4	.276	.40	DIN 376	●	●
TPSTN M-14X2.0-G	M14	2.000	4.331	.945	-	.433	4	.354	.47	DIN 376	●	●
TPSTN M-16X2.0-G	M16	2.000	4.331	1.024	-	.472	4	.354	.55	DIN 376	●	●
TPSTN M-18X2.5-G	M18	2.500	4.921	1.181	-	.551	4	.433	.61	DIN 376	●	●
TPSTN M-20X2.5-G	M20	2.500	5.512	1.181	-	.630	4	.472	.69	DIN 376	●	●

• For user guide and cutting conditions, see pages 4-28

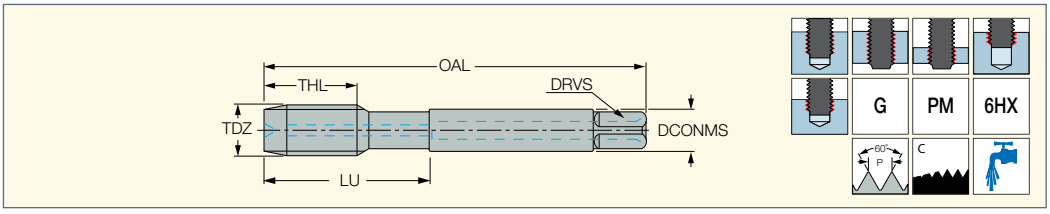
(1) Thread pitch

(2) Number of flutes

(3) Torque key size

ISCARTAPS

TPSTN M-G-B
DIN 13 HSS Straight Flute
Machine Taps - ISO Metric
Coarse Threads for
Grey Cast Iron



M E T R I C

Designation	Dimensions											PMTA
	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	CSP[4]	Standard	
TPSTN M-6X1.0-G-B	M6	1.000	80.00	16.0	30.0	6.00	4	4.90	5.00	1	DIN 371	●
TPSTN M-8X1.25-G-B	M8	1.250	90.00	18.0	35.0	8.00	4	6.20	6.80	1	DIN 371	●
TPSTN M-10X1.5-G-B	M10	1.500	100.00	20.0	39.0	10.00	4	8.00	8.50	1	DIN 371	●
TPSTN M-12X1.75-G-B	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	1	DIN 376	●
TPSTN M-14X2.0-G-B	M14	2.000	110.00	26.0	-	12.00	4	9.00	14.11	1	DIN 376	●
TPSTN M-16X2.0-G-B	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	1	DIN 376	●

• For user guide and cutting conditions, see pages 4-28
[1] Thread pitch
[2] Number of flutes
[3] Torque key size
[4] 0 - Without coolant supply, 1 - With coolant supply

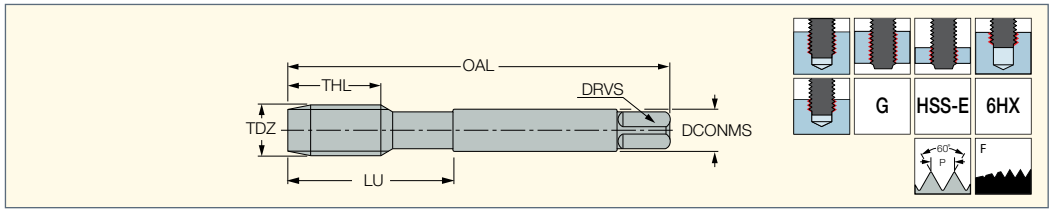
I N C H

Designation	Dimensions											PMTA
	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	CSP[4]	Standard	
TPSTN M-6X1.0-G-B	M6	1.000	3.150	.630	1.18	.236	4	.193	.20	1	DIN 371	●
TPSTN M-8X1.25-G-B	M8	1.250	3.543	.709	1.38	.315	4	.244	.27	1	DIN 371	●
TPSTN M-10X1.5-G-B	M10	1.500	3.937	.787	1.54	.394	4	.315	.33	1	DIN 371	●
TPSTN M-12X1.75-G-B	M12	1.750	4.331	.866	-	.354	4	.276	.40	1	DIN 376	●
TPSTN M-14X2.0-G-B	M14	2.000	4.331	1.024	-	.472	4	.354	.56	1	DIN 376	●
TPSTN M-16X2.0-G-B	M16	2.000	4.331	1.024	-	.472	4	.354	.55	1	DIN 376	●

• For user guide and cutting conditions, see pages 4-28
[1] Thread pitch
[2] Number of flutes
[3] Torque key size
[4] 0 - Without coolant supply, 1 - With coolant supply

ISCARTAPS

TPSTN M-G-F
PM straight flute machine taps
- ISO metric coarse threads,
according to DIN 13,
for gray cast iron.



M E T R I C

Designation	Dimensions										PMTA
	TDZ	TP[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPSTN M-4X0.7-G-F	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.30	DIN 371	●
TPSTN M-5X0.8-G-F	M5	0.800	70.00	14.0	25.0	6.00	4	4.90	4.20	DIN 371	●
TPSTN M-6X1.0-G-F	M6	1.000	80.00	16.0	30.0	6.00	4	4.90	5.00	DIN 371	●
TPSTN M-8X1.25-G-F	M8	1.250	90.00	18.0	35.0	8.00	4	6.20	6.80	DIN 371	●
TPSTN M-10X1.5-G-F	M10	1.500	100.00	20.0	39.0	10.00	4	8.00	8.50	DIN 371	●
TPSTN M-12X1.75-G-F	M12	1.750	110.00	22.0	-	9.00	4	7.00	10.20	DIN 376	●
TPSTN M-14X2.0-G-F	M14	2.000	110.00	24.0	-	11.00	4	9.00	12.00	DIN 376	●
TPSTN M-16X2.0-G-F	M16	2.000	110.00	26.0	-	12.00	4	9.00	14.00	DIN 376	●

• For user guide and cutting conditions, see pages 4-28
[1] Thread pitch
[2] Number of flutes
[3] Torque key size

I N C H

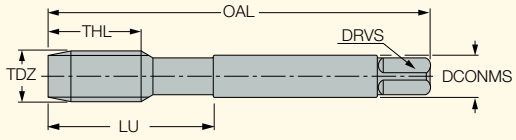
Designation	Dimensions										PMTA
	TDZ	TP mm[1]	OAL	THL	LU	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPSTN M-4X0.7-G-F	M4	.700	2.480	.472	.83	.177	3	.134	.13	DIN 371	●
TPSTN M-5X0.8-G-F	M5	.800	2.756	.551	.98	.236	4	.193	.17	DIN 371	●
TPSTN M-6X1.0-G-F	M6	1.000	3.150	.630	1.18	.236	4	.193	.20	DIN 371	●
TPSTN M-8X1.25-G-F	M8	1.250	3.543	.709	1.38	.315	4	.244	.27	DIN 371	●
TPSTN M-10X1.5-G-F	M10	1.500	3.937	.787	1.54	.394	4	.315	.33	DIN 371	●
TPSTN M-12X1.75-G-F	M12	1.750	4.331	.866	-	.354	4	.276	.40	DIN 376	●
TPSTN M-14X2.0-G-F	M14	2.000	4.331	.945	-	.433	4	.354	.47	DIN 376	●
TPSTN M-16X2.0-G-F	M16	2.000	4.331	1.024	-	.472	4	.354	.55	DIN 376	●

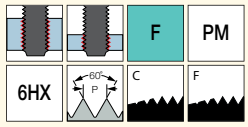
• For user guide and cutting conditions, see pages 4-28
[1] Thread pitch
[2] Number of flutes
[3] Torque key size

ONETAP

TPFN M-F (PM)

PM Cold Forming Machine
Taps - ISO Metric Coarse
Threads, According to DIN 13





M E T R I C

Designation	TDZ	TP[2]	OAL	THL	LU[3]	DCONMS	NOF[4]	DRVS[5]	Pre-hole	Standard	Tough ↔ Hard PMTI	PMTC
TPFN M-3X0.5-F	M3	0.500	56.00	10.0	18.0	3.50	3	2.70	2.80	DIN 371	●	●
TPFN M-4X0.7-F	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.70	DIN 371	●	●
TPFN M-5X0.8 F	M5	0.800	70.00	14.0	25.0	6.00	5	4.90	4.65	DIN 371	●	
TPFN M-5X0.8-F [1]	M5	0.800	70.00	14.0	25.0	6.00	5	4.90	4.65	DIN 371		●
TPFN M-6X1.0-F	M6	1.000	80.00	16.0	30.0	6.00	5	4.90	5.60	DIN 371	●	●
TPFN M-8X1.25-F	M8	1.250	90.00	18.0	35.0	8.00	5	6.20	7.40	DIN 371	●	●
TPFN M-10X1.5-F	M10	1.500	100.00	20.0	39.0	10.00	5	8.00	9.35	DIN 371	●	●
TPFN M-12X1.75-F	M12	1.750	110.00	22.0	-	9.00	6	7.00	11.25	DIN 376	●	●
TPFN M-14X2.0-F	M14	2.000	110.00	24.0	-	11.00	6	9.00	13.10	DIN 376	●	●
TPFN M-16X2.0-F	M16	2.000	110.00	26.0	-	12.00	6	9.00	15.10	DIN 376	●	●
TPFN M-18X2.5-F [1]	M18	2.500	125.00	30.0	-	14.00	6	11.00	16.85	DIN 376		●
TPFN M-20X2.5-F [1]	M20	2.500	140.00	30.0	-	16.00	6	12.00	18.85	DIN 376		●

- For user guide and cutting conditions, see pages 4-28

[1] Form C champfer lead
[2] Thread pitch
[3] DIN376 (M12+) and DIN374 (all MF) taps do not have a neck, meaning the shank diameter is smaller than the core hole. Therefore, the usable length isn't restricted by a neck.
[4] Number of flutes
[5] Torque key size

I N C H

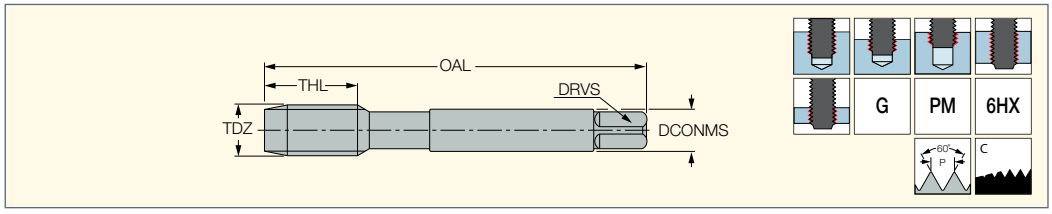
Designation	TDZ	TP mm[2]	OAL	THL	LU[3]	DCONMS	NOF[4]	DRVS[5]	Pre-hole	Standard	Tough ↔ Hard PMTI	PMTC
TPFN M-3X0.5-F	M3	.500	2.205	.394	.71	.138	3	.106	.11	DIN 371	●	●
TPFN M-4X0.7-F	M4	.700	2.480	.472	.83	.177	3	.134	.15	DIN 371	●	●
TPFN M-5X0.8 F	M5	.800	2.756	.551	.98	.236	5	.193	.18	DIN 371	●	
TPFN M-5X0.8-F [1]	M5	.800	2.756	.551	.98	.236	5	.193	.18	DIN 371		●
TPFN M-6X1.0-F	M6	1.000	3.150	.630	1.18	.236	5	.193	.22	DIN 371	●	●
TPFN M-8X1.25-F	M8	1.250	3.543	.709	1.38	.315	5	.244	.29	DIN 371	●	●
TPFN M-10X1.5-F	M10	1.500	3.937	.787	1.54	.394	5	.315	.37	DIN 371	●	●
TPFN M-12X1.75-F	M12	1.750	4.331	.866	-	.354	6	.276	.44	DIN 376	●	●
TPFN M-14X2.0-F	M14	2.000	4.331	.945	-	.433	6	.354	.52	DIN 376	●	●
TPFN M-16X2.0-F	M16	2.000	4.331	1.024	-	.472	6	.354	.59	DIN 376	●	●
TPFN M-18X2.5-F [1]	M18	2.500	4.921	1.181	-	.551	6	.433	.66	DIN 376		●
TPFN M-20X2.5-F [1]	M20	2.500	5.512	1.181	-	.630	6	.472	.74	DIN 376		●

- For user guide and cutting conditions, see pages 4-28

[1] Form C champfer lead
[2] Thread pitch
[3] DIN376 (M12+) and DIN374 (all MF) taps do not have a neck, meaning the shank diameter is smaller than the core hole. Therefore, the usable length isn't restricted by a neck.
[4] Number of flutes
[5] Torque key size

ISCARTAPS

TPSTN MF-G
PM straight flute machine taps - ISO metric fine threads, according to DIN 13, for for gray cast iron.



M E T R I C

Designation	Dimensions									PMTA
	TDZ	TP[1]	OAL	THL	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPSTN MF-8X1.0-G	MF8	1.000	90.00	15.0	6.00	4	4.90	7.00	DIN 374	●
TPSTNMF-10X1.25-G	MF10	1.250	100.00	18.0	7.00	4	5.50	8.80	DIN 374	●
TPSTN MF-10X1.0-G	MF10	1.000	90.00	18.0	7.00	4	5.50	9.00	DIN 374	●
TPSTNMF-12X1.5-G	MF12	1.500	100.00	18.0	9.00	4	7.00	10.50	DIN 374	●
TPSTN MF-12X1.25-G	MF12	1.250	100.00	18.0	9.00	4	7.00	10.80	DIN 374	●
TPSTNMF-12X1.0-G	MF12	1.000	100.00	18.0	9.00	4	7.00	11.00	DIN 374	●
TPSTNMF-14X1.5-G	MF14	1.500	100.00	18.0	11.00	4	9.00	12.50	DIN 374	●
TPSTN MF-14X1.25-G	MF14	1.250	100.00	18.0	11.00	4	9.00	12.80	DIN 374	●
TPSTNMF-14X1.0-G	MF14	1.000	100.00	18.0	11.00	4	9.00	13.00	DIN 374	●
TPSTN MF-16X1.5-G	MF16	1.500	100.00	18.0	12.00	4	9.00	14.50	DIN 374	●

• For user guide and cutting conditions, see pages 4-28
[1] Thread pitch
[2] Number of flutes
[3] Torque key size

I N C H

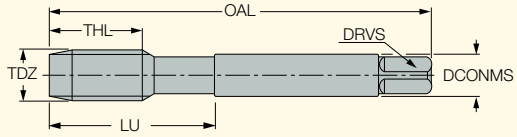
Designation	Dimensions									PMTA
	TDZ	TP mm[1]	OAL	THL	DCONMS	NOF[2]	DRVS[3]	Pre-hole	Standard	
TPSTN MF-8X1.0-G	MF8	1.000	3.543	.591	.236	4	.193	.28	DIN 374	●
TPSTNMF-10X1.25-G	MF10	1.250	3.937	.709	.276	4	.217	.35	DIN 374	●
TPSTN MF-10X1.0-G	MF10	1.000	3.543	.709	.276	4	.217	.35	DIN 374	●
TPSTNMF-12X1.5-G	MF12	1.500	3.937	.709	.354	4	.276	.41	DIN 374	●
TPSTN MF-12X1.25-G	MF12	1.250	3.937	.709	.354	4	.276	.43	DIN 374	●
TPSTNMF-12X1.0-G	MF12	1.000	3.937	.709	.354	4	.276	.43	DIN 374	●
TPSTNMF-14X1.5-G	MF14	1.500	3.937	.709	.433	4	.354	.49	DIN 374	●
TPSTN MF-14X1.25-G	MF14	1.250	3.937	.709	.433	4	.354	.50	DIN 374	●
TPSTNMF-14X1.0-G	MF14	1.000	3.937	.709	.433	4	.354	.51	DIN 374	●
TPSTN MF-16X1.5-G	MF16	1.500	3.937	.709	.472	4	.354	.57	DIN 374	●

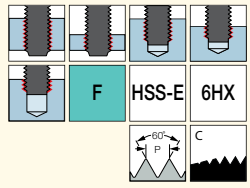
• For user guide and cutting conditions, see pages 4-28
[1] Thread pitch
[2] Number of flutes
[3] Torque key size

ISCARTAPS

TPFN M-F

HSSE 5% Co Cold Forming Machine Taps - ISO Metric Coarse Threads, According to DIN 13





M E T R I C

Designation	Dimensions										HETI
	TDZ	TP[1]	OAL	THL	LU[2]	DCONMS	NOF[3]	DRVS[4]	Pre-hole	Standard	
TPFN M-3X0.5-F	M3	0.500	56.00	10.0	18.0	3.50	3	2.70	2.80	DIN 371	●
TPFN M-4X0.7-F	M4	0.700	63.00	12.0	21.0	4.50	3	3.40	3.70	DIN 371	●
TPFN M-5X0.8-F	M5	0.800	70.00	14.0	25.0	6.00	5	4.90	4.65	DIN 371	●
TPFN M-6X1.0-F	M6	1.000	80.00	16.0	30.0	6.00	5	4.90	5.60	DIN 371	●
TPFN M-8X1.25-F	M8	1.250	90.00	18.0	35.0	8.00	5	6.20	7.45	DIN 371	●
TPFN M-10X1.5-F	M10	1.500	100.00	20.0	39.0	10.00	5	8.00	9.35	DIN 371	●
TPFN M-12X1.75-F	M12	1.750	110.00	22.0	-	9.00	6	7.00	11.25	DIN 376	●
TPFN M-14X2.0-F	M14	2.000	110.00	24.0	-	11.00	6	9.00	13.10	DIN 376	●
TPFN M-16X2.0-F	M16	2.000	110.00	26.0	-	12.00	6	9.00	15.10	DIN 376	●
TPFN M-18X2.5-F	M18	2.500	125.00	30.0	-	14.00	6	11.00	16.85	DIN 376	●
TPFN M-20X2.5-F	M20	2.500	140.00	30.0	-	16.00	6	12.00	18.85	DIN 376	●

- For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

(2) DIN376 (M12+) and DIN374 (all MF) taps do not have a neck, meaning the shank diameter is smaller than the core hole. Therefore, the usable length isn't restricted by a neck.

(3) Number of flutes

(4) Torque key size

I N C H

Designation	Dimensions										HETI
	TDZ	TP mm[1]	OAL	THL	LU[2]	DCONMS	NOF[3]	DRVS[4]	Pre-hole	Standard	
TPFN M-3X0.5-F	M3	.500	2.205	.394	.71	.138	3	.106	.11	DIN 371	●
TPFN M-4X0.7-F	M4	.700	2.480	.472	.83	.177	3	.134	.15	DIN 371	●
TPFN M-5X0.8-F	M5	.800	2.756	.551	.98	.236	5	.193	.18	DIN 371	●
TPFN M-6X1.0-F	M6	1.000	3.150	.630	1.18	.236	5	.193	.22	DIN 371	●
TPFN M-8X1.25-F	M8	1.250	3.543	.709	1.38	.315	5	.244	.29	DIN 371	●
TPFN M-10X1.5-F	M10	1.500	3.937	.787	1.54	.394	5	.315	.37	DIN 371	●
TPFN M-12X1.75-F	M12	1.750	4.331	.866	-	.354	6	.276	.44	DIN 376	●
TPFN M-14X2.0-F	M14	2.000	4.331	.945	-	.433	6	.354	.52	DIN 376	●
TPFN M-16X2.0-F	M16	2.000	4.331	1.024	-	.472	6	.354	.59	DIN 376	●
TPFN M-18X2.5-F	M18	2.500	4.921	1.181	-	.551	6	.433	.66	DIN 376	●
TPFN M-20X2.5-F	M20	2.500	5.512	1.181	-	.630	6	.472	.74	DIN 376	●

- For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

(2) DIN376 (M12+) and DIN374 (all MF) taps do not have a neck, meaning the shank diameter is smaller than the core hole. Therefore, the usable length isn't restricted by a neck.

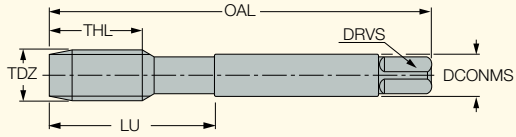
(3) Number of flutes

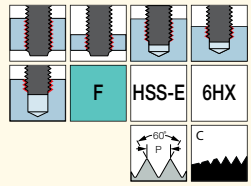
(4) Torque key size

ISCARTAPS

TPFN MF-F

HSSE 5% Co Cold Forming Machine Taps - ISO Metric Fine Threads, According to DIN 13





M E T R I C

Designation	Dimensions										HETI
	TDZ	TP[1]	OAL	THL	LU[2]	DCONMS	NOF[3]	DRVS[4]	Pre-hole	Standard	
TPFN MF-8X1.0-F	MF8	1.000	90.00	15.0	-	6.00	5	4.90	7.60	DIN 374	●
TPFN MF-10X1.0-F	MF10	1.000	90.00	18.0	-	7.00	5	5.50	9.60	DIN 374	●
TPFN MF-10X1.25-F	MF10	1.250	100.00	18.0	-	7.00	5	5.50	9.45	DIN 374	●
TPFN MF-12X1.0-F	MF12	1.000	100.00	18.0	-	9.00	6	7.00	11.60	DIN 374	●
TPFN MF-12X1.25-F	MF12	1.250	100.00	18.0	-	9.00	6	7.00	11.45	DIN 374	●
TPFN MF-12X1.5-F	MF12	1.500	100.00	18.0	-	9.00	6	7.00	11.35	DIN 374	●
TPFN MF-14X1.0-F	MF14	1.000	100.00	18.0	-	11.00	6	9.00	13.60	DIN 374	●
TPFN MF-14X1.25-F	MF14	1.250	100.00	18.0	-	11.00	6	9.00	13.45	DIN 374	●
TPFN MF-14X1.5-F	MF14	1.500	100.00	18.0	-	11.00	6	9.00	13.35	DIN 374	●
TPFN MF-16X1.5-F	MF16	1.500	100.00	18.0	-	12.00	6	9.00	15.35	DIN 374	●
TPFN MF-18X1.5-F	MF18	1.500	110.00	18.0	-	14.00	6	11.00	17.35	DIN 374	●
TPFN MF-20X1.5-F	MF20	1.500	125.00	18.0	-	16.00	6	12.00	19.35	DIN 374	●

- For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

(2) DIN376 (M12+) and DIN374 (all MF) taps do not have a neck, meaning the shank diameter is smaller than the core hole. Therefore, the usable length isn't restricted by a neck.

(3) Number of flutes

(4) Torque key size

I N C H

Designation	Dimensions										HETI
	TDZ	TP mm[1]	OAL	THL	LU[2]	DCONMS	NOF[3]	DRVS[4]	Pre-hole	Standard	
TPFN MF-8X1.0-F	MF8	1.000	3.543	.591	-	.236	5	.193	.30	DIN 374	●
TPFN MF-10X1.0-F	MF10	1.000	3.543	.709	-	.276	5	.217	.38	DIN 374	●
TPFN MF-10X1.25-F	MF10	1.250	3.937	.709	-	.276	5	.217	.37	DIN 374	●
TPFN MF-12X1.0-F	MF12	1.000	3.937	.709	-	.354	6	.276	.46	DIN 374	●
TPFN MF-12X1.25-F	MF12	1.250	3.937	.709	-	.354	6	.276	.45	DIN 374	●
TPFN MF-12X1.5-F	MF12	1.500	3.937	.709	-	.354	6	.276	.45	DIN 374	●
TPFN MF-14X1.0-F	MF14	1.000	3.937	.709	-	.433	6	.354	.54	DIN 374	●
TPFN MF-14X1.25-F	MF14	1.250	3.937	.709	-	.433	6	.354	.53	DIN 374	●
TPFN MF-14X1.5-F	MF14	1.500	3.937	.709	-	.433	6	.354	.53	DIN 374	●
TPFN MF-16X1.5-F	MF16	1.500	3.937	.709	-	.472	6	.354	.60	DIN 374	●
TPFN MF-18X1.5-F	MF18	1.500	4.331	.709	-	.551	6	.433	.68	DIN 374	●
TPFN MF-20X1.5-F	MF20	1.500	4.921	.709	-	.630	6	.472	.76	DIN 374	●

- For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

(2) DIN376 (M12+) and DIN374 (all MF) taps do not have a neck, meaning the shank diameter is smaller than the core hole. Therefore, the usable length isn't restricted by a neck.

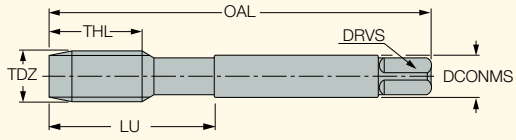
(3) Number of flutes

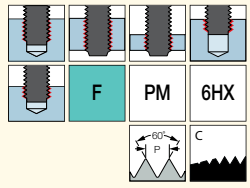
(4) Torque key size

ONETAP

TPFN MF-F (PM)

PM Cold Forming Machine Taps - ISO Metric Fine Threads, According to DIN 13





M E T R I C

Designation	Dimensions										PMTC
	TDZ	TP[1]	OAL	THL	LU[2]	DCONMS	NOF[3]	DRVS[4]	Pre-hole	Standard	
TPFN MF-8X1.0-F	MF8	1.000	90.00	15.0	-	6.00	5	4.90	7.60	DIN 374	●
TPFN MF-10X1.25-F	MF10	1.250	100.00	18.0	-	7.00	5	5.50	9.45	DIN 374	●
TPFN MF-10X1.0-F	MF10	1.000	90.00	18.0	-	7.00	5	5.50	9.60	DIN 374	●
TPFN MF-12X1.5-F	MF12	1.500	100.00	18.0	-	9.00	6	7.00	11.35	DIN 374	●
TPFN MF-12X1.25-F	MF12	1.250	100.00	18.0	-	9.00	6	7.00	11.45	DIN 374	●
TPFN MF-12X1.0-F	MF12	1.000	100.00	18.0	-	9.00	6	7.00	11.60	DIN 374	●
TPFN MF-14X1.5-F	MF14	1.500	100.00	18.0	-	11.00	6	9.00	13.35	DIN 374	●
TPFN MF-14X1.25-F	MF14	1.250	100.00	18.0	-	11.00	6	9.00	13.45	DIN 374	●
TPFN MF-14X1.0-F	MF14	1.000	100.00	18.0	-	11.00	6	9.00	13.60	DIN 374	●
TPFN MF-16X1.5-F	MF16	1.500	100.00	18.0	-	12.00	6	9.00	15.35	DIN 374	●
TPFN MF-18X1.5-F	MF18	1.500	110.00	18.0	-	14.00	6	11.00	17.35	DIN 374	●
TPFN MF-20X1.5-F	MF20	1.500	125.00	18.0	-	16.00	6	12.00	19.35	DIN 374	●

- For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

(2) DIN376 (M12+) and DIN374 (all MF) taps do not have a neck, meaning the shank diameter is smaller than the core hole. Therefore, the usable length isn't restricted by a neck.

(3) Number of flutes

(4) Torque key size

I N C H

Designation	Dimensions										PMTC
	TDZ	TP mm[1]	OAL	THL	LU[2]	DCONMS	NOF[3]	DRVS[4]	Pre-hole	Standard	
TPFN MF-8X1.0-F	MF8	1.000	3.543	.591	-	.236	5	.193	.30	DIN 374	●
TPFN MF-10X1.25-F	MF10	1.250	3.937	.709	-	.276	5	.217	.37	DIN 374	●
TPFN MF-10X1.0-F	MF10	1.000	3.543	.709	-	.276	5	.217	.38	DIN 374	●
TPFN MF-12X1.5-F	MF12	1.500	3.937	.709	-	.354	6	.276	.45	DIN 374	●
TPFN MF-12X1.25-F	MF12	1.250	3.937	.709	-	.354	6	.276	.45	DIN 374	●
TPFN MF-12X1.0-F	MF12	1.000	3.937	.709	-	.354	6	.276	.46	DIN 374	●
TPFN MF-14X1.5-F	MF14	1.500	3.937	.709	-	.433	6	.354	.53	DIN 374	●
TPFN MF-14X1.25-F	MF14	1.250	3.937	.709	-	.433	6	.354	.53	DIN 374	●
TPFN MF-14X1.0-F	MF14	1.000	3.937	.709	-	.433	6	.354	.54	DIN 374	●
TPFN MF-16X1.5-F	MF16	1.500	3.937	.709	-	.472	6	.354	.60	DIN 374	●
TPFN MF-18X1.5-F	MF18	1.500	4.331	.709	-	.551	6	.433	.68	DIN 374	●
TPFN MF-20X1.5-F	MF20	1.500	4.921	.709	-	.630	6	.472	.76	DIN 374	●

- For user guide and cutting conditions, see pages 4-28

(1) Thread pitch

(2) DIN376 (M12+) and DIN374 (all MF) taps do not have a neck, meaning the shank diameter is smaller than the core hole. Therefore, the usable length isn't restricted by a neck.

(3) Number of flutes

(4) Torque key size

Pre-Thread Drilling

Drilling

Pre-Tapping Hole Sizes

ISO Metric Threads Coarse Pitch			
M	Pitch mm	Max Core Dia.mm	Drill Size mm
1	0.25	0.785	0.75
1.1	0.25	0.885	0.85
1.2	0.25	0.985	0.95
1.4	0.30	1.160	1.10
1.6	0.35	1.321	1.25
1.7	0.35	1.346	1.30
1.8	0.35	1.521	1.45
2	0.40	1.679	1.60
2.2	0.45	1.838	1.75
2.3	0.40	1.920	1.90
2.5	0.45	2.138	2.05
2.6	0.45	2.176	2.10
3	0.50	2.599	2.50
3.5	0.60	3.010	2.90
4	0.70	3.422	3.30
4.5	0.75	3.878	3.70
5	0.80	4.334	4.20
6	1.00	5.153	5.00
7	1.00	6.153	6.00
8	1.25	6.912	6.80
9	1.25	7.912	7.80
10	1.50	8.676	8.50
11	1.50	9.676	9.50
12	1.75	10.441	10.20
14	2.00	12.210	12.00
16	2.00	14.210	14.00
18	2.50	15.744	15.50
20	2.50	17.744	17.50
22	2.50	19.744	19.50
24	3.00	21.252	21.00
27	3.00	24.252	24.00
30	3.50	26.771	26.50
33	3.50	29.771	29.50
36	4.00	32.270	32.00
39	4.00	35.270	35.00
42	4.50	37.799	37.50
45	4.50	40.799	40.50
48	5.00	43.297	43.00
52	5.00	47.297	47.00
56	5.50	50.796	50.50
60	5.50	54.796	54.50
64	6.00	58.305	58.00
68	6.00	62.305	62.00

ISO Metric Threads Fine Pitch			
MF	Pitch mm	Max Core Dia.mm	Drill Size mm
2.5	0.35	2.221	2.15
3	0.35	2.271	2.65
3.5	0.35	3.221	3.15
4	0.50	3.599	3.50
4.5	0.50	4.099	4.00
5	0.50	4.599	4.50
5.5	0.50	5.099	5.00
6	0.75	5.378	5.20
7	0.75	6.378	6.20
8	0.75	7.378	7.20
8	1.00	7.153	7.00
9	0.75	8.378	8.20
9	1.00	8.153	8.00
10	0.75	9.378	9.20
10	1.00	9.153	9.00
10	1.25	8.912	8.80
11	0.75	10.378	10.20
11	1.00	10.153	10.00
12	1.00	11.153	11.00
12	1.25	10.912	10.80
12	1.50	10.676	10.50
14	1.00	13.153	13.00
14	1.25	12.912	12.80
14	1.50	12.676	12.50
15	1.00	14.153	14.00
15	1.50	13.676	13.50
16	1.00	15.153	15.00
16	1.50	14.676	14.50
17	1.00	16.153	16.00
17	1.50	15.676	15.50
18	1.00	17.153	17.00
18	1.50	16.676	16.50
18	2.00	16.210	16.00
20	1.00	19.153	19.00
20	1.50	18.676	18.50
20	2.00	18.210	18.00
22	1.00	21.153	21.00
22	1.50	20.676	20.50
22	2.00	20.210	20.00
24	1.00	23.153	23.00
24	1.50	22.676	22.50
24	2.00	22.210	22.00
25	1.00	24.153	24.00
25	1.50	23.676	23.50

ISO Metric Threads Fine Pitch			
MF	Pitch mm	Max Core Dia.mm	Drill Size mm
25	2.00	23.210	23.00
26	1.50	24.676	24.50
27	1.00	26.153	26.00
27	1.50	25.676	25.50
27	2.00	25.210	25.00
28	1.00	27.153	27.00
28	1.50	26.676	26.50
28	2.00	26.210	26.00
30	1.00	29.153	29.00
30	1.50	28.676	28.50
30	2.00	28.210	28.00
30	3.00	27.252	27.00
32	1.50	30.675	30.50
32	2.00	30.210	30.00
33	1.50	31.676	31.50
33	2.00	31.210	31.00
33	3.00	30.252	30.00
35	1.50	33.676	33.50
36	1.50	34.676	34.50
36	2.00	34.210	34.00
36	3.00	33.252	33.00
38	1.50	36.676	36.50
39	1.50	37.676	37.50
39	2.00	37.210	37.00
39	3.00	36.252	36.00
40	1.50	38.676	38.50
40	2.00	38.210	38.00
40	3.00	37.252	37.00
42	1.50	40.676	40.50
42	2.00	40.210	40.00
42	3.00	39.252	39.00
45	1.50	43.676	43.50
45	2.00	43.210	43.00
45	3.00	42.252	42.00
48	1.50	46.676	46.50
48	2.00	46.210	46.00
48	3.00	45.252	45.00
50	1.50	48.676	48.50
50	2.00	48.210	48.00
50	3.00	47.252	47.00
52	1.50	50.676	50.50
52	2.00	50.210	50.00
52	3.00	49.252	49.00

Forming TAPS

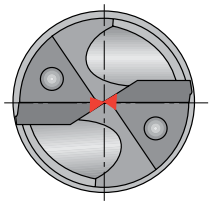
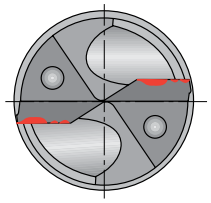
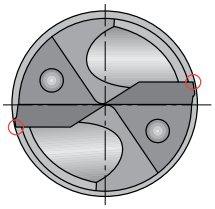
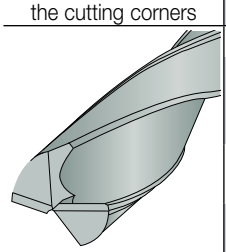
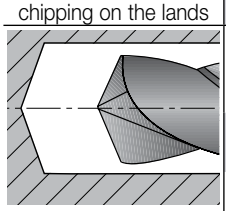
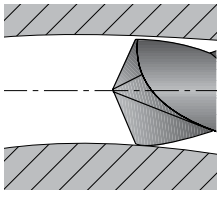
Recommended Tap Drill Size		
M	Pitch mm	Drill Size mm
1	0.25	0.9
1.1	0.25	1
1.2	0.25	1.1
1.4	0.3	1.28
1.6	0.35	1.47
1.7	0.35	1.57
1.8	0.35	1.67
2	0.4	1.85
2.2	0.45	2.03
2.3	0.4	2.15
2.5	0.45	2.33
2.6	0.45	2.43
3	0.5	2.8
3.5	0.6	3.25
4	0.7	3.7
4.5	0.75	4.2
5	0.8	4.65
6	1	5.55
7	1	6.55
8	1.25	6.6
9	1.25	7.45
10	1.5	8.45
11	1.5	9.35
12	1.75	11.25
14	2	13.1
16	2	15.1
18	2.5	16.85
20	2.5	18.85
22	2.5	20.85
24	3	22.65
27	3	25.65
30	3.5	28.4
33	3.5	31.4
36	4	34.15
39	4	37.15
42	4.5	39.9
45	4.5	42.9
48	5	45.65

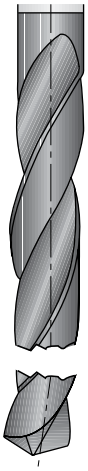
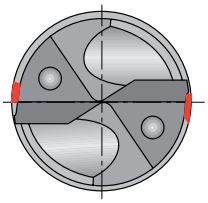
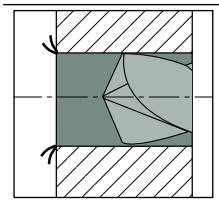
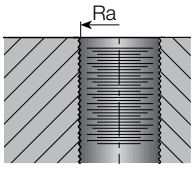
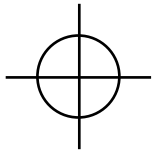
Recommended Tap Drill Size		
MF	Pitch mm	Drill Size mm
2.5	0.35	2.37
2.6	0.35	2.47
3	0.35	2.88
3.5	0.35	3.38
4	0.5	3.8
5	0.5	4.8
6	0.5	5.8
6	0.75	5.7
7	0.75	6.7
8	0.75	7.7
8	1	7.6
9	0.75	8.7
9	1	8.6
10	0.75	9.7
10	1	9.6
10	1.25	9.45
11	1	10.6
12	1	11.6
12	1.25	11.45
12	1.5	11.35
14	1	13.6
14	1.25	13.45
14	1.5	13.35
15	1	14.6
15	1.5	14.35
16	1	15.6
16	1.5	15.35
18	4	17.6
18	1.5	17.35
18	2	17.1
20	1	19.6
20	1.5	19.35
20	2	19.1
24	2	23.1
30	2	29.1
36	3	34.65
42	4	40.15
48	3	46.65

American Unified Coarse Threads			
UNC	T.P.I	Max. Core Dia. Inch	Drill Size mm
#1	64	1.585	1.5
#2	56	1.872	1.8
#3	48	2.146	2.1
#4	40	2.385	2.3
#5	40	2.697	2.6
#6	32	2.896	2.85
#8	32	3.528	3.5
#10	24	3.95	3.9
#12	24	4.59	4.5
1/4"	20	5.25	5.2
5/16"	18	6.68	6.6
3/8"	16	8.082	8
7/16"	14	9.441	9.4
1/2"	13	10.881	10.75
9/16"	12	12.301	12.25
5/8"	11	13.693	13.5
3/4"	10	16.624	16.5
7/8"	9	19.52	19.5
1"	8	22.344	22.25
1 1/8"	7	25.082	25
1 1/4"	7	28.258	28.25
1 3/8"	6	30.851	30.75
1 1/2"	6	34.026	34
1 3/4"	5	39.56	39.5
2"	4.5	45.367	45.25

American Unified Fine Threads			
UNF	T.P.I	Max. Core Dia. Inch	Drill Size mm
#0	80	1.306	1.3
#1	72	1.613	1.6
#2	64	1.913	1.9
#3	56	2.197	2.1
#4	48	2.459	2.4
#5	44	2.741	2.7
#6	40	3.012	3
#8	36	3.597	3.5
#10	32	4.168	4.1
#12	28	4.717	4.7
1/4"	28	5.563	5.5
5/16"	24	6.995	6.9
3/8"	24	8.565	8.5
7/16"	20	9.947	9.9
1/2"	20	11.524	11.5
9/16"	18	12.969	12.9
5/8"	18	14.554	14.5
3/4"	16	17.546	17.5
7/8"	14	20.493	20.5
1"	12	23.363	23.25
1 1/8"	12	26.538	26.5
1 1/4"	12	29.713	29.5
1 3/8"	12	32.888	32.7
1 1/2"	12	36.063	36

Troubleshooting

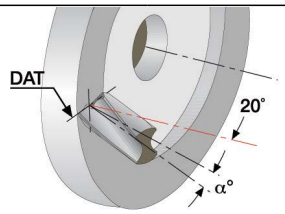
Problem	Cause	Solution
 chipping on the chisel edge	• poor clamping of the chuck	• check the clamping. use hydraulic clamping chuck, maxin power chuck or a shrink system.
	• unsuitable cutting conditions	• decrease feed, increase coolant pressure.
	• chisel runout	• check or replace the clamping adaptation.
	• workpiece movement	• increase workpiece chucking force.
 chipping on the cutting edges / built-up edge	• poor clamping of the chuck	• check the clamping. use hydraulic clamping chuck, maxin power chuck or a shrink system.
	• unsuitable cutting conditions	• increase cutting speed, reduce feed rate.
	• insufficient coolant	• check cooling lubricant. increase coolant pressure. in the case of external coolant supply, improve jet direction and add cooling jets.
	• rough application	• reduce feed rate by 30-50% during entry and exiting.
 excessive wear on the cutting corners	• insufficient coolant	• check cooling lubricant. increase coolant pressure. in the case of external coolant supply, improve jet direction and add coolant jets.
	• large runout	• check if the runout is within 0.02 mm t.i.r. (radial & axial)
	• unsuitable cutting conditions	• reduce cutting speed, increase feed.
	• rough application	• reduce feed rate by 30-50% during entry and exit.
	• poor clamping of the chuck	• check the clamping. use hydraulic clamping chuck, maxin power chuck or a shrink system.
 chipping on the lands	• workpiece movement	• increase workpiece chucking force.
	• insufficient coolant	• check cooling lubricant. increase coolant pressure. in the case of external coolant supply, improve jet direction and add coolant jets.
	• wrong drill	• check drill type, drilling depth, cooling system and workpiece material.
	• unsuitable cutting conditions	• increase feed. when spot drilling, reduce feed.
 hole diameter out of tolerance	• unsuitable cutting conditions	• if hole size is too large, increase cutting speed or reduce feed. if hole size is too small, reduce cutting speed or increase feed.
	• poor clamping of the chuck	• check the clamping. use hydraulic clamping chuck, maxin power chuck or a shrink system.
	• large runout	• make sure that the drill's runout is within 0.02 mm (radial & axial).
	• worn out center point (chisel)	• regrind cutting edge or replace the drill.
 hole not straight	• insufficient chip evacuation	• use pecking cycle.
	• poor clamping of the chuck	• check the clamping. use hydraulic clamping chuck, maxin power chuck or a shrink system.
	• workpiece rigidity	• increase workpiece chucking force.
	• worn out drill center point (chisel)	• regrind cutting edge.
	• unsuitable cutting conditions	• increase feed. when spot drilling, reduce feed.

Problem	Cause	Solution
 drill breakage	• poor clamping of the chuck.	• check the clamping. use hydraulic clamping chuck, maxin power chuck or a shrink system.
	• workpiece movement.	• increase workpiece chucking force.
	• wrong drill.	• check drill type and drilling depth, cooling system and workpiece material.
	• insufficient coolant.	• check cooling lubricant. increase coolant pressure. in the case of external coolant supply, improve jet direction and add cooling jets.
	• unsuitable cutting conditions.	• reduce feed.
	• worn out drill center point (chisel).	• regrind cutting edge.
	• insufficient chip evacuation.	• use pecking cycle.
 chipping on the cutting corners	• poor clamping of the chuck.	• check the clamping and adaptation. use hydraulic clamping chuck, maxin power chuck or a shrink system.
	• workpiece movement.	• increase workpiece chucking force.
	• wrong drill.	• check drill type and drilling depth, cooling system and workpiece material. possibly use longer drill.
	• insufficient coolant.	• check cooling lubricant. increase coolant pressure. in the case of external coolant supply, improve jet direction and add cooling jets.
	• unsuitable cutting conditions.	• check cutting parameters, and possibly reduce feed.
	• worn out or broken cutting corner.	• replace drill or regrind cutting edge.
 burrs on exit	• unsuitable cutting conditions.	• reduce feed by 30-50% during exit.
	• worn out drill.	• replace drill.
 rough surface finish	• unsuitable cutting conditions.	• adjust feed to improve chip flow.
	• large runout.	• make sure that the drill's runout is within 0.02 mm (radial & axial).
	• chip jamming.	• reduce cutting speed.
		• increase coolant pressure.
		• apply pecking procedure.
 deviation of hole position	• large runout.	• make sure that the drill runout is within 0.02 mm (radial & axial).
	• poor stability.	• check and improve drill and workpiece clamping rigidity.
	• rough application.	• when drilling hard materials or sloped surfaces, reduce feed by 30-50% during entrance.
		• use a short pilot drill with 140° point angle.

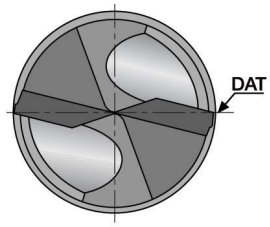
Regrinding Instructions for AP and ACP Geometries

For each grinding operation, rotate the drill 180° and repeat the grinding procedure.

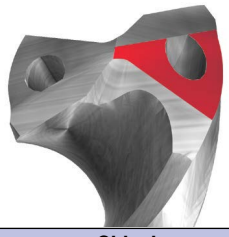
1 Primary Clearance

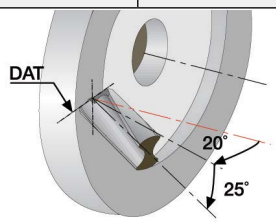


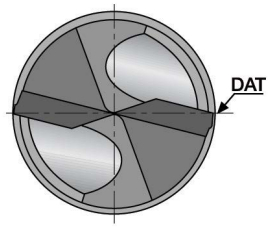
A°	D Range
7	0.8-6.0
10	>6.1



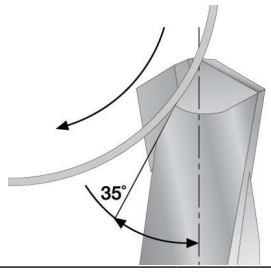
2 Secondary Clearance

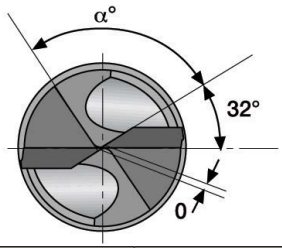






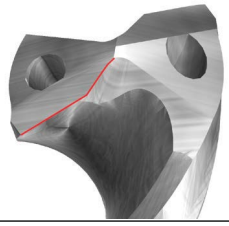
3 Chisel

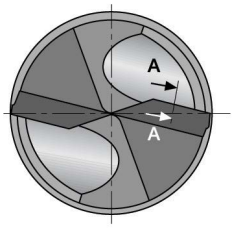




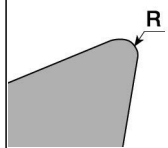
A°	D Range
100	3.0-4.8
105	4.9-10
95	10.1-20

4 Edge Preparation





A-A



R	D Range
0.02	0.8-6.0
0.03	6.1-18.0
0.04	18.1>UP

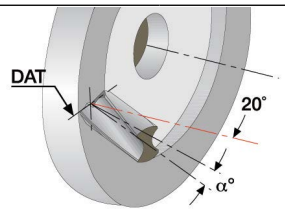
Grinding Wheel Recommended Specifications:

1 Diameter grinding wheel: GA2.
2 Grinding wheel bond: synthetic resin.
3 Grit size: 325/400 mesh (45/38µ).
4 Diamond concentration: C-75 (3.3 carat/cm^3).
5 Cutting fluid emulsion 3%.

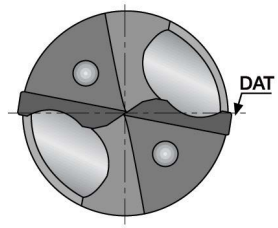
Regrinding Instructions for AG and ACG Geometries

For each Grinding operation, rotate the drill 180° and repeat the grinding procedure.

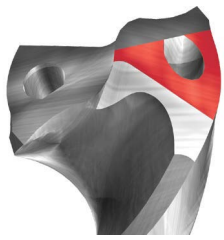
1 Primary Clearance

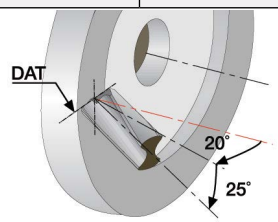


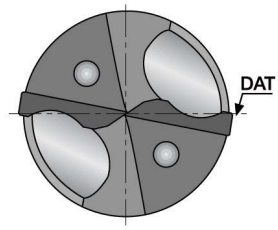
A°	D Range
7	0.8-6.0
10	>6.1



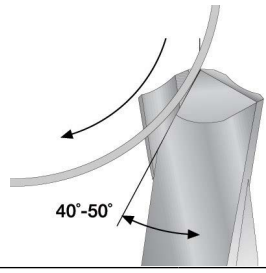
2 Secondary Clearance

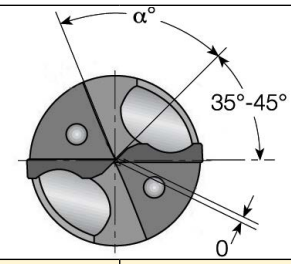






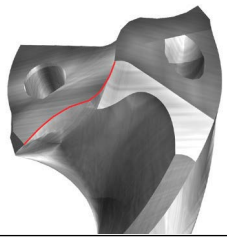
3 Chisel

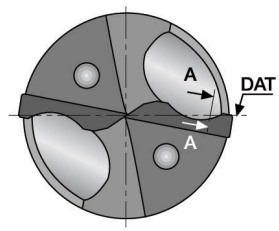




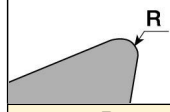
A°	D Range
100	3.0-4.8
105	4.9-10
95	10.1-20

4 Edge Preparation





A-A



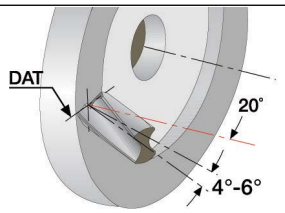
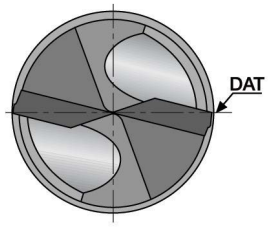
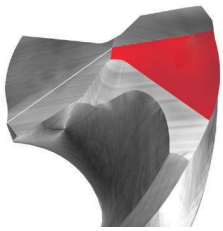
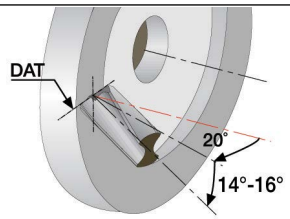
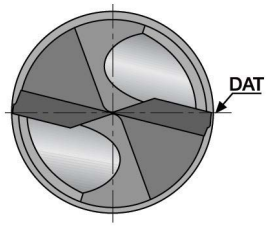
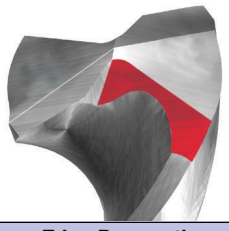
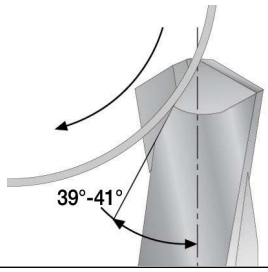
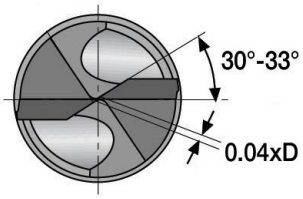
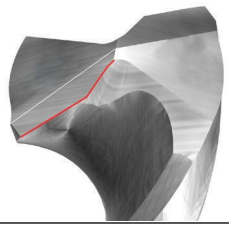
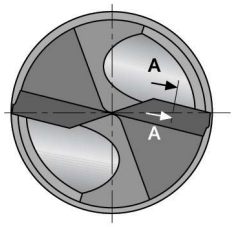
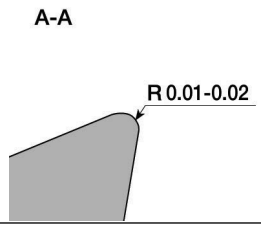
R	D Range
0.02	0.8-6.0
0.03	6.1-18.0
0.04	18.1>UP

Grinding Wheel Recommended Specifications:

1 Diameter grinding wheel: GA2.
2 Grinding wheel bond: synthetic resin.
3 Grit size: 325/400 mesh (45/38μ).
4 Diamond concentration: C-75 (3.3 carat/cm^3).
5 Cutting fluid emulsion 3%.

Regrinding Instructions for AH Geometry

For each grinding operation, rotate the drill 180° and repeat the grinding procedure.

1	**Primary Clearance**			
2	**Secondary Clearance**			
3	**Chisel**			
4	**Edge Preparation**			

Grinding Wheel Recommended Specifications:

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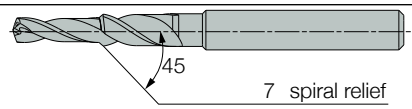
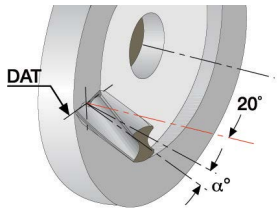
2 Grinding wheel bond: synthetic resin.
3 Grit size: 325/400 mesh (45/38µ).
4 Diamond concentration: C-75 (3.3 carat/cm^3).
5 Cutting fluid emulsion 3%.

Regrinding Instructions for SCDT Pre-Thread SOLIDDRILL

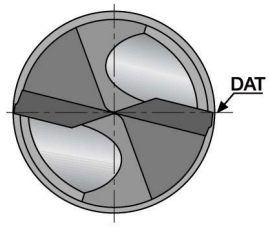
for each grinding operation, rotate the drill 180° and repeat the grinding procedure



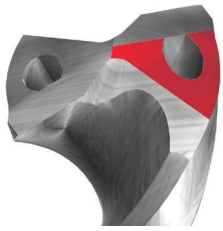
1 Primary Clearance

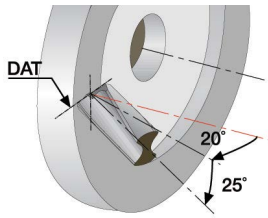


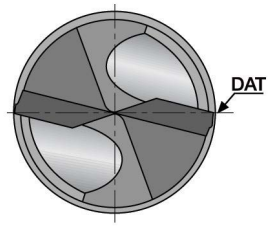
A°	D Range
7	0.8-6.0
10	>6.1



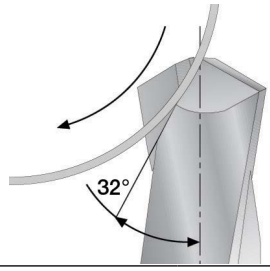
2 Secondary Clearance

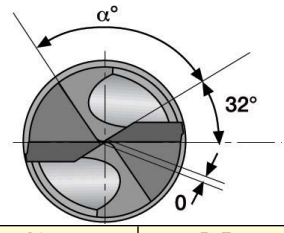






3 Chisel





A°	D Range
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105	4.9-10
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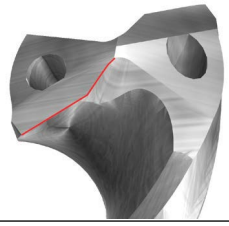
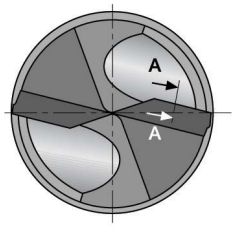
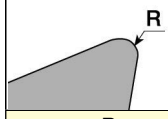
4 Edge Preparation





A-A



R	D Range
0.02	0.8-6.0
0.03	6.1-18.0
0.04	18.1>UP

Grinding Wheel Recommended Specifications

1 Diameter grinding wheel: GA2.
2 Grinding wheel bond: synthetic resin.
3 Grit size: 325/400 mesh (45/38µ).
4 Diamond concentration: C-75 (3.3 carat/cm^3).
5 Cutting fluid emulsion 3%.

General - Calculations - Metric

Spindle Speed (min^{-1})

$$n = \frac{v_c \cdot 1000}{\pi \cdot D}$$

Cutting Speed (m/min)

$$v_c = \frac{\pi \cdot D \cdot n}{1000}$$

Table Feed (mm/min)

$$v_f = f \cdot n$$

Material Removal Rate (cm^3/min)

$$Q = \frac{v_f \cdot \pi \cdot D_2}{4000}$$

Power Requirement (KW)

$$Pc = \frac{Q}{60.000 \cdot \eta} \cdot kc$$

Torque (Nm)

$$M_c = \frac{f \cdot k_c}{1000} \cdot \frac{D_2}{8}$$

Feed Force (Approx.) (N)

$$F_f = 0.7 \cdot \frac{D}{2} \cdot f \cdot kc \cdot \sin k$$

Machining Time (min/piece)

$$T_c = \frac{L+h}{vf}$$

Machining Cost ($/piece)

$$C_c = \frac{C_{Mh}}{60} \cdot Tc$$

F	=	feed/rev		mm/rev
K_c	=	material specific cutting force		N/mm^2
H	=	point to workpiece before feeding		mm
D	=	diameter of hole		mm
L	=	depth of hole		mm
C_{Mh}	=	cost/machine hour		$/h
H	=	machine efficiency		%
K	=	90°	180° bottom drills	
Sin k	=	1	DR...	
K	=	70°	140° point angle drills	
Sin k	=	0.94	SCD.., DCM.., DCN..	

General - Calculations - Inch

Spindle Speed (min^{-1})

$$n = \frac{v_c \cdot 12}{\pi \cdot D}$$

Cutting Sfm

$$v_c = \frac{\pi \cdot D \cdot n}{12}$$

Table Feed (in/min)

$$v_f = f \cdot n$$

Material Removal Rate (in^3/min)

$$Q = \frac{v_f \cdot \pi \cdot D_2}{4}$$

Power Consumption (hp)

$$Pc = \frac{Q}{396 \cdot \eta} \cdot kc$$

Torque

$$Mc = f \cdot kc \cdot 1000 \cdot \frac{D_2}{8} \cdot \sin k$$

Feed Force (Approx.) (lbf)

$$F_f = 700 \cdot \frac{D}{2} \cdot f \cdot kc \cdot \sin k$$

Machining Time (min/piece)

$$T_c = \frac{L+h}{vf}$$

Machining Cost ($/piece)

$$C_c = \frac{I_{nh}}{60} \cdot Tc$$

F	=	feed/rev		ipr
K_c	=	material specific cutting force		kpsi
H	=	point to workpiece before feeding		in
D	=	diameter of hole		in
L	=	depth of hole		in
Inh	=	cost/machine hour		$/h
H	=	machine efficiency		%
K	=	90°	180° bottom drills	
Sin k	=	1	DR...	
K	=	70°	140° point angle drills	
Sin k	=	0.94	SCD.., DIn.., DCN..	

K_c Values

ISCAR Material Group	K_c Value N/mm²	K_c Value Kpsi
1	1350	196
2	1500	218
3	1675	243
4	1700	247
5	1900	276
6	1775	257
7	1675	243
8	1725	250
9	1800	261
10	2450	355
11	2500	363
12	1875	272
13	1875	272
14	2150	312
15	1150	167
16	1350	196
17	1225	178
18	1350	196
19	1225	178
20	1450	206
21	700	102
22	800	116
23	700	102
26	700	102
27	750	109
28	700	102
31	2600	377
32	3100	450
33	3300	479
34	3300	479
35	3300	479
36	1700	247
37	2110	306
38	4600	667
39	4700	682
40	4600	667
41	4500	653

Tool Family	Dia. (mm)	Dia. (in)	L/D Ratio	Hole Accuracy*
DR	12-80	.469-3.15	2XD-5XD	IT 12-13
SUMOCHAM	4-32.9	.157-1.26	1.5XD-12XD	IT 8-9
CHAM-IQ-DRILL	33-40	1.299-1.575	1.5XD-8XD	IT 8-9
COMBICHAM	26-50	1.125-2.00	5XD	IT 9-10
LOGIQ	12-25	.472-.984	1.5XD-8XD	IT 8-9
MODUDRILL	33-40	1.299-1.575	3XD-12XD	IT 9-10

* ISO tolerance grade, provided in average cutting conditions

Machining Data for Solid Carbide Drills D=0.8-2.9 Mm

ISO	Material		Condition	Tensile Strength [N/mm²]	Hardness HB	Material No.(1)	Cutting Speed V_c (m/min)	Feed (mm/rev) Vs. Drill Diameter			
								Ø0.8-1.4	Ø1.5-1.9	Ø2-2.4	Ø2.5-2.9
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	125	1	50-100	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
		≥0.25% C	annealed	650	190	2	40-100	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
		<0.55% C	quenched and tempered	850	250	3	40-85	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
		≥0.55% C	annealed	750	220	4	40-85	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
			quenched and tempered	1000	300	5	40-85	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
	low alloy and cast steel (less than 5% of alloying elements)		annealed	600	200	6	40-75	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
			quenched and tempered	930	275	7	40-60	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
				1000	300	8	40-60	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
				1200	350	9	40-60	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
	high alloyed steel, cast steel and tool steel		annealed	680	200	10	30-50	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
			quenched and tempered	1100	325	11	30-50	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
	stainless steel and cast steel		ferritic / martensitic	680	200	12	20-35	0.03-0.06	0.04-0.08	0.05-0.10	0.06-0.10
			martensitic	820	240	13	20-35	0.03-0.06	0.04-0.08	0.05-0.10	0.06-0.10
M	stainless steel and cast steel		austenitic, duplex	600	180	14	20-35	0.03-0.06	0.04-0.08	0.05-0.10	0.06-0.10
K	gray cast iron (GG)		ferritic / pearlitic		180	15	40-80	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
			pearlitic / martensitic		260	16	40-70	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
	nodular cast iron (GGG)		ferritic		160	17	40-95	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
			pearlitic		250	18	50-95	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
	malleable cast iron		ferritic		130	19	40-80	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
			pearlitic		230	20	40-80	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
N	aluminum-wrought alloys		not hardenable		60	21	80-150	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
			hardenable		100	22	80-150	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
	aluminum-cast alloys	≤12% Si	not hardenable		75	23	80-150	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
			hardenable		90	24	80-150	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
		>12% Si	high temperature		130	25	80-150	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
	copper alloys	>1% Pb	free cutting		110	26	80-150	0.03-0.10	0.05-0.15	0.07-0.17	0.08-0.20
			brass		90	27	50-150	0.05-0.12	0.07-0.15	0.08-0.18	0.09-0.18
			electrolytic copper		100	28	60-160	0.05-0.15	0.07-0.18	0.08-0.20	0.09-0.22
	non metallic		duroplastics, fiber plastics		70 Shore D	29					
			hard rubber		55 Shore D	30					
S	high temperature alloys	Fe based	annealed		200	31	10-20	0.02-0.04	0.03-0.06	0.04-0.07	0.04-0.08
			hardened		280	32	10-20	0.02-0.04	0.03-0.06	0.04-0.07	0.04-0.08
		Ni or Co based	annealed		250	33	10-20	0.02-0.04	0.03-0.06	0.04-0.07	0.04-0.08
			hardened		350	34	10-20	0.02-0.04	0.03-0.06	0.04-0.07	0.04-0.08
			cast		320	35	10-20	0.02-0.04	0.03-0.06	0.04-0.07	0.04-0.08
	titanium alloys		pure	400	190	36	10-20	0.02-0.03	0.02-0.03	0.03-0.04	0.03-0.04
			alpha+beta alloys, hardened	1050	310	37	10-20	0.02-0.03	0.02-0.03	0.03-0.04	0.03-0.04
H	hardened steel		hardened		55 HRC	38	10-20	0.01-0.02	0.01-0.02	0.02-0.03	0.02-0.03
			hardened		60 HRC	39	10-20	0.01-0.02	0.01-0.02	0.02-0.03	0.02-0.03
	chilled cast iron		cast		400	40	10-20	0.01-0.02	0.01-0.02	0.02-0.03	0.02-0.03
	cast iron		hardened		55 HRC	41	10-20	0.01-0.02	0.01-0.02	0.02-0.03	0.02-0.03

- For drill with lengh to diameter ratio larger than 6xD, reduce feed by 20%
- If the RPM exceeds 10,000, a dynamic balance should be done to the system
- Maximal radial and axial runout should not exceed 0.01 mm

(1) For workpiece materials list, see pages 101-128

As a starting value, the middle of the recommended machining range should be used.
Then, (according to wear results), conditions can be changed in order to optimize performance.

Machining Data for Solid Carbide Drills - IC908 D=3.0-20.0 Mm

ISO	Material		Condition	Tensile Strength [N/mm²]	Hardness HB	Material No.(1)	Cutting Speed V_c (m/min)	Feed (mm/rev) Vs. Drill Diameter				
								Ø3-5	Ø5.1-8	Ø8.1-12	Ø12.1-16	Ø16.1-20
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	125	1	80-120	0.10-0.18	0.15-0.25	0.2-0.30	0.20-0.35	0.25-0.40
		≥0.25% C	annealed	650	190	2	80-110	0.10-0.18	0.15-0.25	0.2-0.30	0.20-0.35	0.25-0.40
		<0.55% C	quenched and tempered	850	250	3	70-100	0.10-0.20	0.15-0.28	0.2-0.35	0.20-0.38	0.25-0.42
		≥0.55% C	annealed	750	220	4						
			quenched and tempered	1000	300	5						
	low alloy and cast steel (less than 5% of alloying elements)		annealed	600	200	6	70-90	0.10-0.18	0.15-0.25	0.2-0.30	0.20-0.35	0.25-0.40
			quenched and tempered	930	275	7						
				1000	300	8	60-80	0.10-0.18	0.15-0.25	0.2-0.30	0.20-0.35	0.25-0.40
				1200	350	9	50-70	0.10-0.20	0.15-0.28	0.2-0.35	0.20-0.38	0.25-0.42
	high alloyed steel, cast steel and tool steel		annealed	680	200	10	60-80	0.10-0.20	0.15-0.28	0.18-0.35	0.20-0.38	0.25-0.42
			quenched and tempered	1100	325	11	50-70	0.10-0.15	0.12-0.20	0.14-0.25	0.16-0.30	0.18-0.32
	stainless steel and cast steel		ferritic / martensitic	680	200	12	25-75	0.04-0.10	0.05-0.15	0.05-0.18	0.08-0.20	0.10-0.20
			martensitic	820	240	13	25-75	0.04-0.10	0.05-0.15	0.05-0.18	0.08-0.20	0.10-0.20
M	stainless steel and cast steel		austenitic, duplex	600	180	14	25-75	0.04-0.10	0.05-0.15	0.05-0.18	0.08-0.20	0.10-0.20
K	gray cast iron (GG)		ferritic / pearlitic		180	15	85-105	0.15-0.25	0.20-0.35	0.25-0.45	0.30-0.50	0.35-0.55
			pearlitic / martensitic		260	16	75-90	0.15-0.25	0.20-0.35	0.25-0.45	0.30-0.50	0.35-0.55
	nodular cast iron (GGG)		ferritic		160	17	65-80	0.12-0.20	0.15-0.25	0.20-0.35	0.25-0.40	0.30-0.45
			pearlitic		250	18						
	malleable cast iron		ferritic		130	19						
			pearlitic		230	20						
N	aluminum-wrought alloys		not hardenable		60	21	70-300	0.10-0.25	0.15-0.35	0.25-0.45	0.30-0.50	0.35-0.55
			hardenable		100	22	70-200					
	aluminum-cast alloys	≤12% Si	not hardenable		75	23	70-300	0.07-0.18	0.12-0.25	0.20-0.35	0.25-0.45	0.30-0.50
			hardenable		90	24						
		>12% Si	high temperature		130	25						
	copper alloys	>1% Pb	free cutting		110	26						
			brass		90	27						
			electrolytic copper		100	28						
	non metallic		duroplastics, fiber plastics		70 Shore D	29						
			hard rubber		55 Shore D	30						
S	high temperature alloys	Fe based	annealed		200	31						
			hardened		280	32						
		Ni or Co based	annealed		250	33						
			hardened		350	34						
			cast		320	35						
	titanium alloys		pure	400	190	36						
			alpha+beta alloys, hardened	1050	310	37	15-35	0.02-0.07	0.04-0.10	0.06-0.12	0.08-0.15	0.08-0.18
H	hardened steel		hardened		55 HRC	38	40-70	0.06-0.10	0.08-0.12	0.10-0.14	0.12-0.16	0.14-0.18
			hardened		60 HRC	39						
	chilled cast iron		cast		400	40						
	cast iron		hardened		55 HRC	41						

As a starting value, the middle of the recommended machining range should be used, then (according to wear results), Conditions can be changed in order to optimize performance.

- When using external coolant supply only, reduce cutting speed by 10%
- Use internal coolant supply when machining austenitic stainless steel

(1) For workpiece materials list, see pages 101-128

Cutting Recommendations for 3 Flute Solid Carbide Drills

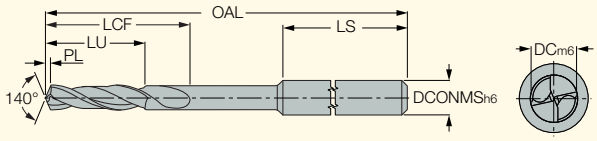
ISO	Material No (1)	Material		Material Condition	Cutting Speed V_c (m/min)	Cutting Diameter Feed f (mm/rev)				
						Ø4-Ø5	Ø5.1-Ø6	Ø6.1-Ø8	Ø8.1-Ø10	Ø10.1-Ø12
P	1	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	80-140	0.15-0.25	0.20-0.35	0.25-0.45	0.30-0.55	0.35-0.60
P	2	non-alloy steel and cast steel, free cutting steel	≥0.25% C	annealed	80-130					
P	3	non-alloy steel and cast steel, free cutting steel	<0.55% C	quenched and tempered	80-120					
P	4	non-alloy steel and cast steel, free cutting steel	≥0.55% C	annealed	70-110					
P	5	non-alloy steel and cast steel, free cutting steel	≥0.55% C	quenched and tempered	50-90					
P	6	low alloy and cast steel (less than 5% of alloying elements)		annealed	80-120			0.25-0.40	0.30-0.50	0.35-0.55
P	7	low alloy and cast steel (less than 5% of alloying elements)		quenched and tempered	70-110					
P	8	low alloy and cast steel (less than 5% of alloying elements)		quenched and tempered	50-90					
P	9	low alloy and cast steel (less than 5% of alloying elements)		quenched and tempered	40-70					
P	10	high alloyed steel, cast steel and tool steel		annealed	50-90	0.15-0.20	0.20-0.30	0.25-0.35	0.30-0.45	0.35-0.50
P	11	high alloyed steel, cast steel and tool steel		quenched and tempered	40-80					
K	15	gray cast iron (GG)		ferritic / pearlitic	80-140	0.20-0.30	0.25-0.45	0.35-0.55	0.40-0.60	0.45-0.65
K	16	gray cast iron (GG)		pearlitic / martensitic	70-120					
K	17	nodular cast iron (GGG)		ferritic	80-120		0.20-0.40	0.30-0.50	0.35-0.55	0.40-0.60
K	18	nodular cast iron (GGG)		pearlitic	70-110					
K	19	malleable cast iron		ferritic	80-120					
K	20	malleable cast iron		pearlitic	70-110					

(1) For workpiece materials list, see pages 101-128

SOLIDDRILL

SCD-AP4 (4xD)
DIN 6537 Solid Carbide
Drills without Coolant Holes,
Drilling Depth 4xD

DC	Tolerance m6
0.8-2.9	0.002-0.008



M E T R I C

Designation	Dimensions								IC908
	DC	DCONMS	LU	LCF	LS	OAL	FTDZ(1)	PL	
SCD 008-003-030 AP4	0.80	3.00	3.2	4.8	37.2	46.00	-	0.150	●
SCD 009-003-030 AP4	0.90	3.00	3.6	5.4	36.6	46.00	-	0.160	●
SCD 010-004-030 AP4	1.00	3.00	4.0	6.0	36.0	46.00	-	0.180	●
SCD 011-004-030 AP4	1.10	3.00	4.4	6.6	35.4	46.00	M1.4	0.200	●
SCD 012-004-030 AP4	1.20	3.00	4.8	7.2	34.8	46.00	-	0.220	●
SCD 013-005-030 AP4	1.30	3.00	5.2	7.8	34.2	46.00	-	0.240	●
SCD 014-005-030 AP4	1.40	3.00	5.6	8.4	33.6	46.00	-	0.250	●
SCD 015-006-030 AP4	1.50	3.00	6.0	9.0	33.0	46.00	-	0.270	●
SCD 016-006-030 AP4	1.60	3.00	6.4	9.6	32.4	46.00	M2	0.290	●
SCD 017-006-030 AP4	1.70	3.00	6.8	10.2	31.8	46.00	-	0.310	●
SCD 018-007-030 AP4	1.80	3.00	7.2	10.8	31.2	46.00	-	0.330	●
SCD 019-007-030 AP4	1.90	3.00	7.6	11.4	30.6	46.00	-	0.350	●
SCD 020-008-030 AP4	2.00	3.00	8.0	12.0	44.0	60.00	-	0.360	●
SCD 021-008-030 AP4	2.10	3.00	8.4	12.6	43.4	60.00	-	0.380	●
SCD 022-008-030 AP4	2.20	3.00	8.8	13.2	42.8	60.00	-	0.400	●
SCD 023-009-030 AP4	2.30	3.00	9.2	13.8	42.2	60.00	-	0.420	●
SCD 024-009-030 AP4	2.40	3.00	9.6	14.4	41.6	60.00	-	0.440	●
SCD 025-010-030 AP4	2.50	3.00	10.0	15.0	41.0	60.00	M3	0.450	●
SCD 026-010-030 AP4	2.60	3.00	10.4	15.6	40.4	60.00	-	0.470	●
SCD 027-010-030 AP4	2.70	3.00	10.8	16.2	39.8	60.00	-	0.490	●
SCD 028-011-030 AP4	2.80	3.00	11.2	16.8	39.2	60.00	-	0.510	●
SCD 029-011-030 AP4	2.90	3.00	11.6	17.4	38.6	60.00	M3.5	0.530	●

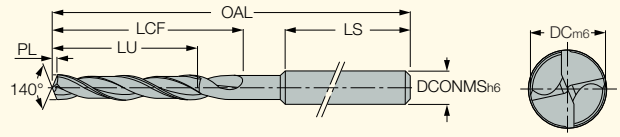
- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

(1) Used for standard thread size

SOLIDDRILL

SCD-AP6 (6xD)
DIN 6537 Solid Carbide
Drills without Coolant Holes,
Drilling Depth 6xD

DC	Tolerance m6
0.8-2.9	0.002-0.008



M E T R I C

Designation	Dimensions								IC908
	DC	DCONMS	LU	LCF	LS	OAL	FTDZ(1)	PL	
SCD 008-004-030 AP6	0.80	3.00	4.8	6.4	35.5	46.00	-	0.150	●
SCD 009-005-030 AP6	0.90	3.00	5.4	7.2	34.5	46.00	-	0.160	●
SCD 010-006-030 AP6	1.00	3.00	6.0	8.0	33.8	46.00	-	0.180	●
SCD 011-006-030 AP6	1.10	3.00	6.6	8.8	33.0	46.00	M1.4	0.200	●
SCD 012-007-030 AP6	1.20	3.00	7.2	9.6	32.3	46.00	-	0.220	●
SCD 013-007-030 AP6	1.30	3.00	7.8	10.4	31.5	46.00	-	0.240	●
SCD 014-008-030 AP6	1.40	3.00	8.4	11.2	30.8	46.00	-	0.250	●
SCD 015-009-030 AP6	1.50	3.00	9.0	12.0	30.0	46.00	-	0.270	●
SCD 016-009-030 AP6	1.60	3.00	9.6	12.8	29.3	46.00	M2	0.290	●
SCD 017-010-030 AP6	1.70	3.00	10.2	13.6	42.5	60.00	-	0.310	●
SCD 018-010-030 AP6	1.80	3.00	10.8	14.4	41.8	60.00	-	0.330	●
SCD 019-011-030 AP6	1.90	3.00	11.4	15.2	41.1	60.00	-	0.350	●
SCD 020-012-030 AP6	2.00	3.00	12.0	16.0	40.3	60.00	-	0.360	●
SCD 021-012-030 AP6	2.10	3.00	12.6	16.8	39.6	60.00	-	0.380	●
SCD 022-013-030 AP6	2.20	3.00	13.2	17.6	38.9	60.00	-	0.400	●
SCD 023-013-030 AP6	2.30	3.00	13.8	18.4	38.2	60.00	-	0.420	●
SCD 024-014-030 AP6	2.40	3.00	14.4	19.2	37.5	60.00	-	0.440	●
SCD 025-015-030 AP6	2.50	3.00	15.0	20.0	36.8	60.00	M3	0.450	●
SCD 026-015-030 AP6	2.60	3.00	15.6	20.8	36.1	60.00	-	0.470	●
SCD 027-016-030 AP6	2.70	3.00	16.2	21.6	35.5	60.00	-	0.490	●
SCD 028-016-030 AP6	2.80	3.00	16.8	22.4	34.8	60.00	-	0.510	●
SCD 029-017-030 AP6	2.90	3.00	17.4	23.2	34.4	60.00	M3.5	0.530	●

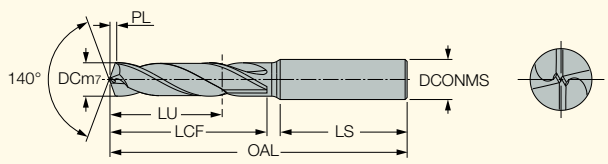
- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

(1) Used for standard thread size

SOLIDDRILL

SCD-AP3N (3xD)
DIN 6537 Solid Carbide
Drills without Coolant Holes,
Drilling Depth 3xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



M E T R I C

Designation	Dimensions DC	DCONMS	OAL	LU	LCF	PL	LS	FTDZ(1)	IC908
SCD 030-014-060 AP3N	3.00	6.00	62.00	14.00	21.0	0.500	34.0	-	●
SCD 031-014-060 AP3N	3.10	6.00	62.00	14.00	21.0	0.500	34.0	-	●
SCD 032-014-060 AP3N	3.20	6.00	62.00	14.00	21.0	0.500	34.0	-	●
SCD 033-014-060 AP3N	3.30	6.00	62.00	14.00	21.0	0.500	34.0	M4	●
SCD 034-014-060 AP3N	3.40	6.00	62.00	14.00	21.0	0.500	34.0	-	●
SCD 035-014-060 AP3N	3.50	6.00	62.00	14.00	21.0	0.600	34.0	-	●
SCD 036-014-060 AP3N	3.60	6.00	62.00	14.00	21.0	0.600	34.0	-	●
SCD 037-014-060 AP3N	3.70	6.00	62.00	14.00	21.0	0.600	34.0	-	●
SCD 038-017-060 AP3N	3.80	6.00	66.00	17.00	25.0	0.600	35.0	-	●
SCD 039-017-060 AP3N	3.90	6.00	66.00	17.00	25.0	0.600	35.0	-	●
SCD 040-017-060 AP3N	4.00	6.00	66.00	17.00	25.0	0.600	35.0	-	●
SCD 041-017-060 AP3N	4.10	6.00	66.00	17.00	25.0	0.700	35.0	-	●
SCD 042-017-060 AP3N	4.20	6.00	66.00	17.00	25.0	0.700	35.0	M5	●
SCD 043-017-060 AP3N	4.30	6.00	66.00	17.00	25.0	0.700	35.0	-	●
SCD 044-017-060 AP3N	4.40	6.00	66.00	17.00	25.0	0.700	35.0	-	●
SCD 045-017-060 AP3N	4.50	6.00	66.00	17.00	25.0	0.700	35.0	-	●
SCD 046-017-060 AP3N	4.60	6.00	66.00	17.00	25.0	0.700	35.0	-	●
SCD 047-017-060 AP3N	4.70	6.00	66.00	17.00	25.0	0.800	35.0	-	●
SCD 048-020-060 AP3N	4.80	6.00	66.00	20.00	29.0	0.800	36.0	-	●
SCD 049-020-060 AP3N	4.90	6.00	66.00	20.00	29.0	0.800	36.0	-	●
SCD 050-020-060 AP3N	5.00	6.00	66.00	20.00	29.0	0.800	36.0	M6	●
SCD 051-020-060 AP3N	5.10	6.00	66.00	20.00	29.0	0.800	36.0	-	●
SCD 052-020-060 AP3N	5.20	6.00	66.00	20.00	29.0	0.800	36.0	-	●
SCD 053-020-060 AP3N	5.30	6.00	66.00	20.00	29.0	0.800	36.0	-	●
SCD 054-020-060 AP3N	5.40	6.00	66.00	20.00	29.0	0.800	36.0	-	●
SCD 055-020-060 AP3N	5.50	6.00	66.00	20.00	29.0	0.900	36.0	-	●
SCD 056-020-060 AP3N	5.60	6.00	66.00	20.00	29.0	0.900	36.0	-	●
SCD 057-020-060 AP3N	5.70	6.00	66.00	20.00	29.0	0.900	36.0	-	●
SCD 058-020-060 AP3N	5.80	6.00	66.00	20.00	29.0	0.900	36.0	-	●
SCD 059-020-060 AP3N	5.90	6.00	66.00	20.00	29.0	0.900	36.0	-	●
SCD 060-020-060 AP3N	6.00	6.00	66.00	20.00	29.0	0.900	36.0	M7	●
SCD 061-024-080 AP3N	6.10	8.00	79.00	24.00	35.0	1.000	36.0	-	●
SCD 062-024-080 AP3N	6.20	8.00	79.00	24.00	35.0	1.000	36.0	-	●
SCD 063-024-080 AP3N	6.30	8.00	79.00	24.00	35.0	1.000	36.0	-	●
SCD 064-024-080 AP3N	6.40	8.00	79.00	24.00	35.0	1.000	36.0	-	●
SCD 065-024-080 AP3N	6.50	8.00	79.00	24.00	35.0	1.000	36.0	-	●
SCD 066-024-080 AP3N	6.60	8.00	79.00	24.00	35.0	1.000	36.0	-	●
SCD 067-024-080 AP3N	6.70	8.00	79.00	24.00	35.0	1.100	36.0	-	●
SCD 068-024-080 AP3N	6.80	8.00	79.00	24.00	35.0	1.100	36.0	M8	●
SCD 069-024-080 AP3N	6.90	8.00	79.00	24.00	35.0	1.100	36.0	-	●
SCD 070-024-080 AP3N	7.00	8.00	79.00	24.00	35.0	1.100	36.0	-	●
SCD 071-029-080 AP3N	7.10	8.00	79.00	29.00	42.0	1.100	36.0	-	●
SCD 072-029-080 AP3N	7.20	8.00	79.00	29.00	42.0	1.100	36.0	-	●
SCD 073-029-080 AP3N	7.30	8.00	79.00	29.00	42.0	1.100	36.0	-	●
SCD 074-029-080 AP3N	7.40	8.00	79.00	29.00	42.0	1.200	36.0	-	●
SCD 075-029-080 AP3N	7.50	8.00	79.00	29.00	42.0	1.200	36.0	-	●
SCD 076-029-080 AP3N	7.60	8.00	79.00	29.00	42.0	1.200	36.0	-	●
SCD 077-029-080 AP3N	7.70	8.00	79.00	29.00	42.0	1.200	36.0	-	●
SCD 078-029-080 AP3N	7.80	8.00	79.00	29.00	42.0	1.200	36.0	M9	●
SCD 079-029-080 AP3N	7.90	8.00	79.00	29.00	42.0	1.300	36.0	-	●
SCD 080-029-080 AP3N	8.00	8.00	79.00	29.00	42.0	1.300	36.0	-	●
SCD 081-035-100 AP3N	8.10	10.00	89.00	35.00	48.0	1.300	40.0	-	●
SCD 082-035-100 AP3N	8.20	10.00	89.00	35.00	48.0	1.300	40.0	-	●
SCD 083-035-100 AP3N	8.30	10.00	89.00	35.00	48.0	1.300	40.0	-	●

- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

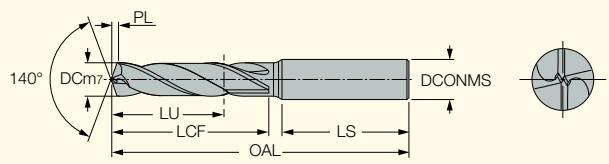
(1) Used for standard thread size

Continued

SOLIDDRILL

SCD-AP3N (3xD)
DIN 6537 Solid Carbide Drills without Coolant Holes, Drilling Depth 3xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



M E T R I C

Designation	Dimensions								IC908
	DC	DCONMS	OAL	LU	LCF	PL	LS	FTDZ[1]	
SCD 084-035-100 AP3N	8.40	10.00	89.00	35.00	48.0	1.300	40.0	-	●
SCD 085-035-100 AP3N	8.50	10.00	89.00	35.00	48.0	1.300	40.0	M10	●
SCD 086-035-100 AP3N	8.60	10.00	89.00	35.00	48.0	1.400	40.0	-	●
SCD 087-035-100 AP3N	8.70	10.00	89.00	35.00	48.0	1.400	40.0	-	●
SCD 088-035-100 AP3N	8.80	10.00	89.00	35.00	48.0	1.400	40.0	-	●
SCD 089-035-100 AP3N	8.90	10.00	89.00	35.00	48.0	1.400	40.0	-	●
SCD 090-035-100 AP3N	9.00	10.00	89.00	35.00	48.0	1.400	40.0	-	●
SCD 091-035-100 AP3N	9.10	10.00	89.00	35.00	48.0	1.400	40.0	-	●
SCD 092-035-100 AP3N	9.20	10.00	89.00	35.00	48.0	1.400	40.0	-	●
SCD 093-035-100 AP3N	9.30	10.00	89.00	35.00	48.0	1.500	40.0	-	●
SCD 094-035-100 AP3N	9.40	10.00	89.00	35.00	48.0	1.500	40.0	-	●
SCD 095-035-100 AP3N	9.50	10.00	89.00	35.00	48.0	1.500	40.0	M11	●
SCD 096-035-100 AP3N	9.60	10.00	89.00	35.00	48.0	1.500	40.0	-	●
SCD 097-035-100 AP3N	9.70	10.00	89.00	35.00	48.0	1.500	40.0	-	●
SCD 098-035-100 AP3N	9.80	10.00	89.00	35.00	48.0	1.600	40.0	-	●
SCD 099-035-100 AP3N	9.90	10.00	89.00	35.00	48.0	1.600	40.0	-	●
SCD 100-035-100 AP3N	10.00	10.00	89.00	35.00	48.0	1.600	40.0	-	●
SCD 101-040-120 AP3N	10.10	12.00	101.00	40.00	54.0	1.600	45.0	-	●
SCD 102-040-120 AP3N	10.20	12.00	101.00	40.00	54.0	1.600	45.0	M12	●
SCD 103-040-120 AP3N	10.30	12.00	101.00	40.00	54.0	1.600	45.0	-	●
SCD 104-040-120 AP3N	10.40	12.00	101.00	40.00	54.0	1.600	45.0	-	●
SCD 105-040-120 AP3N	10.50	12.00	101.00	40.00	54.0	1.600	45.0	-	●
SCD 106-040-120 AP3N	10.60	12.00	101.00	40.00	54.0	1.700	45.0	-	●
SCD 107-040-120 AP3N	10.70	12.00	101.00	40.00	54.0	1.700	45.0	-	●
SCD 108-040-120 AP3N	10.80	12.00	101.00	40.00	54.0	1.700	45.0	-	●
SCD 109-040-120 AP3N	10.90	12.00	101.00	40.00	54.0	1.700	45.0	-	●
SCD 110-040-120 AP3N	11.00	12.00	101.00	40.00	54.0	1.700	45.0	-	●
SCD 111-040-120 AP3N	11.10	12.00	101.00	40.00	55.0	1.700	45.0	-	●
SCD 112-040-120 AP3N	11.20	12.00	101.00	40.00	55.0	1.800	45.0	-	●
SCD 113-040-120 AP3N	11.30	12.00	101.00	40.00	55.0	1.800	45.0	-	●
SCD 114-040-120 AP3N	11.40	12.00	101.00	40.00	55.0	1.800	45.0	-	●
SCD 115-040-120 AP3N	11.50	12.00	101.00	40.00	55.0	1.800	45.0	-	●
SCD 116-040-120 AP3N	11.60	12.00	101.00	40.00	55.0	1.800	45.0	-	●
SCD 117-040-120 AP3N	11.70	12.00	101.00	40.00	55.0	1.900	45.0	-	●
SCD 118-040-120 AP3N	11.80	12.00	101.00	40.00	55.0	1.900	45.0	-	●
SCD 119-040-120 AP3N	11.90	12.00	101.00	40.00	55.0	1.900	45.0	-	●
SCD 120-040-120 AP3N	12.00	12.00	101.00	40.00	55.0	1.900	45.0	M14	●

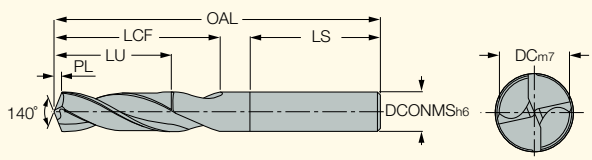
- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

(1) Used for standard thread size

SOLIDDRILL

SCD-AP3 (3xD)
DIN 6537 Solid Carbide
Drills without Coolant Holes,
Drilling Depth 3xD

DC	Tolerance m7
3.00- 6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



M E T R I C

Designation	Dimensions								IC908
	DC	DCONMS	LU	LCF	OAL	LS	FTDZ[1]	PL	
SCD 121-043-140 AP3	12.10	14.00	43.0	60.0	107.00	45.0	-	2.200	●
SCD 122-043-140 AP3	12.20	14.00	43.0	60.0	107.00	45.0	-	2.220	●
SCD 123-043-140 AP3	12.30	14.00	43.0	60.0	107.00	45.0	-	2.240	●
SCD 124-043-140 AP3	12.40	14.00	43.0	60.0	107.00	45.0	-	2.260	●
SCD 125-043-140 AP3	12.50	14.00	43.0	60.0	107.00	45.0	-	2.270	●
SCD 126-043-140 AP3	12.60	14.00	43.0	60.0	107.00	45.0	-	2.290	●
SCD 127-043-140 AP3	12.70	14.00	43.0	60.0	107.00	45.0	-	2.310	●
SCD 128-043-140 AP3	12.80	14.00	43.0	60.0	107.00	45.0	-	2.330	●
SCD 129-043-140 AP3	12.90	14.00	43.0	60.0	107.00	45.0	-	2.350	●
SCD 130-043-140 AP3	13.00	14.00	43.0	60.0	107.00	45.0	-	2.370	●
SCD 131-043-140 AP3	13.10	14.00	43.0	60.0	107.00	45.0	-	2.380	●
SCD 132-043-140 AP3	13.20	14.00	43.0	60.0	107.00	45.0	-	2.400	●
SCD 133-043-140 AP3	13.30	14.00	43.0	60.0	107.00	45.0	-	2.420	●
SCD 135-043-140 AP3	13.50	14.00	43.0	60.0	107.00	45.0	-	2.460	●
SCD 136-043-140 AP3	13.60	14.00	43.0	60.0	107.00	45.0	-	2.470	●
SCD 137-043-140 AP3	13.70	14.00	43.0	60.0	107.00	45.0	-	2.490	●
SCD 138-043-140 AP3	13.80	14.00	43.0	60.0	107.00	45.0	-	2.510	●
SCD 139-043-140 AP3	13.90	14.00	43.0	60.0	107.00	45.0	-	2.530	●
SCD 140-043-140 AP3	14.00	14.00	43.0	60.0	107.00	45.0	M16	2.550	●
SCD 141-045-160 AP3	14.10	16.00	45.0	65.0	115.00	45.0	-	2.570	●
SCD 142-045-160 AP3	14.20	16.00	45.0	65.0	115.00	45.0	-	2.580	●
SCD 143-045-160 AP3	14.30	16.00	45.0	65.0	115.00	45.0	-	2.600	●
SCD 144-045-160 AP3	14.40	16.00	45.0	65.0	115.00	45.0	-	2.620	●
SCD 145-045-160 AP3	14.50	16.00	45.0	65.0	115.00	45.0	-	2.640	●
SCD 146-045-160 AP3	14.60	16.00	45.0	65.0	115.00	45.0	-	2.660	●
SCD 147-045-160 AP3	14.70	16.00	45.0	65.0	115.00	45.0	-	2.680	●
SCD 148-045-160 AP3	14.80	16.00	45.0	65.0	115.00	45.0	-	2.690	●
SCD 149-045-160 AP3	14.90	16.00	45.0	65.0	115.00	45.0	-	2.710	●
SCD 150-045-160 AP3	15.00	16.00	45.0	65.0	115.00	45.0	-	2.730	●
SCD 151-045-160 AP3	15.10	16.00	45.0	65.0	115.00	45.0	-	2.750	●
SCD 152-045-160 AP3	15.20	16.00	45.0	65.0	115.00	45.0	-	2.770	●
SCD 153-045-160 AP3	15.30	16.00	45.0	65.0	115.00	45.0	-	2.780	●
SCD 154-045-160 AP3	15.40	16.00	45.0	65.0	115.00	45.0	-	2.800	●
SCD 155-045-160 AP3	15.50	16.00	45.0	65.0	115.00	45.0	M18	2.820	●
SCD 156-045-160 AP3	15.60	16.00	45.0	65.0	115.00	45.0	-	2.840	●
SCD 157-045-160 AP3	15.70	16.00	45.0	65.0	115.00	45.0	-	2.860	●
SCD 158-045-160 AP3	15.80	16.00	45.0	65.0	115.00	45.0	-	2.880	●
SCD 159-045-160 AP3	15.90	16.00	45.0	65.0	115.00	45.0	-	2.890	●
SCD 160-045-160 AP3	16.00	16.00	45.0	65.0	115.00	45.0	-	2.910	●
SCD 161-051-180 AP3	16.10	18.00	51.0	73.0	123.00	48.0	-	2.930	●
SCD 162-051-180 AP3	16.20	18.00	51.0	73.0	123.00	48.0	-	2.950	●
SCD 163-051-180 AP3	16.30	18.00	51.0	73.0	123.00	48.0	-	2.970	●
SCD 164-051-180 AP3	16.40	18.00	51.0	73.0	123.00	48.0	-	2.980	●
SCD 165-051-180 AP3	16.50	18.00	51.0	73.0	123.00	48.0	-	3.000	●
SCD 166-051-180 AP3	16.60	18.00	51.0	73.0	123.00	48.0	-	3.020	●
SCD 167-051-180 AP3	16.70	18.00	51.0	73.0	123.00	48.0	-	3.040	●
SCD 168-051-180 AP3	16.80	18.00	51.0	73.0	123.00	48.0	-	3.060	●
SCD 169-051-180 AP3	16.90	18.00	51.0	73.0	123.00	48.0	-	3.080	●
SCD 170-051-180 AP3	17.00	18.00	51.0	73.0	123.00	48.0	-	3.090	●
SCD 171-051-180 AP3	17.10	18.00	51.0	73.0	123.00	48.0	-	3.110	●
SCD 172-051-180 AP3	17.20	18.00	51.0	73.0	123.00	48.0	-	3.130	●
SCD 173-051-180 AP3	17.30	18.00	51.0	73.0	123.00	48.0	-	3.150	●
SCD 174-051-180 AP3	17.40	18.00	51.0	73.0	123.00	48.0	-	3.170	●

- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

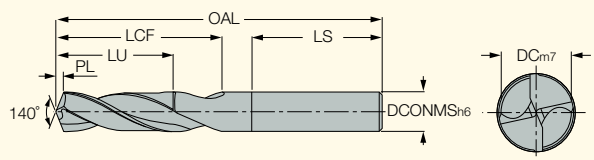
(1) Used for standard thread size

Continued

SOLIDDRILL

SCD-AP3 (3xD)
DIN 6537 Solid Carbide Drills without Coolant Holes, Drilling Depth 3xD

DC	Tolerance m7
3.00- 6	0.004-0.016
6.01-10	0.006-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



M E T R I C

Designation	Dimensions DC	DCONMS	LU	LCF	OAL	LS	FTDZ(1)	PL	IC908
SCD 175-051-180 AP3	17.50	18.00	51.0	73.0	123.00	48.0	M20	3.180	•
SCD 176-051-180 AP3	17.60	18.00	51.0	73.0	123.00	48.0	-	3.200	•
SCD 177-051-180 AP3	17.70	18.00	51.0	73.0	123.00	48.0	-	3.220	•
SCD 178-051-180 AP3	17.80	18.00	51.0	73.0	123.00	48.0	-	3.240	•
SCD 179-051-180 AP3	17.90	18.00	51.0	73.0	123.00	48.0	-	3.260	•
SCD 180-051-180 AP3	18.00	18.00	51.0	73.0	123.00	48.0	-	3.280	•
SCD 181-055-200 AP3	18.10	20.00	55.0	79.0	131.00	48.0	-	3.290	•
SCD 182-055-200 AP3	18.20	20.00	55.0	79.0	131.00	48.0	-	3.310	•
SCD 183-055-200 AP3	18.30	20.00	55.0	79.0	131.00	48.0	-	3.330	•
SCD 184-055-200 AP3	18.40	20.00	55.0	79.0	131.00	48.0	-	3.350	•
SCD 185-055-200 AP3	18.50	20.00	55.0	79.0	131.00	48.0	-	3.370	•
SCD 186-055-200 AP3	18.60	20.00	55.0	79.0	131.00	48.0	-	3.380	•
SCD 187-055-200 AP3	18.70	20.00	55.0	79.0	131.00	48.0	-	3.400	•
SCD 189-055-200 AP3	18.90	20.00	55.0	79.0	131.00	48.0	-	3.440	•
SCD 190-055-200 AP3	19.00	20.00	55.0	79.0	131.00	48.0	-	3.460	•
SCD 191-055-200 AP3	19.10	20.00	55.0	79.0	131.00	48.0	-	3.480	•
SCD 192-055-200 AP3	19.20	20.00	55.0	79.0	131.00	48.0	-	3.490	•
SCD 193-055-200 AP3	19.30	20.00	55.0	79.0	131.00	48.0	-	3.510	•
SCD 194-055-200 AP3	19.40	20.00	55.0	79.0	131.00	48.0	-	3.530	•
SCD 195-055-200 AP3	19.50	20.00	55.0	79.0	131.00	48.0	M22	3.550	•
SCD 197-055-200 AP3	19.70	20.00	55.0	79.0	131.00	48.0	-	3.590	•
SCD 198-055-200 AP3	19.80	20.00	55.0	79.0	131.00	48.0	-	3.600	•
SCD 199-055-200 AP3	19.90	20.00	55.0	79.0	131.00	48.0	-	3.620	•
SCD 200-055-200 AP3	20.00	20.00	55.0	79.0	131.00	48.0	-	3.640	•

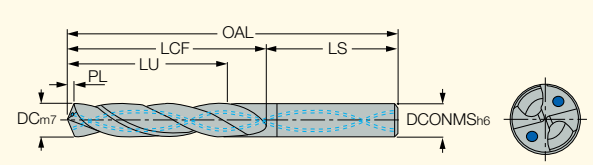
- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

(1) Used for standard thread size

SOLIDDRILL

SCD-ACP3 (3xD)
Solid Carbide Drills with Coolant Holes, Drilling Depth 3xD

D	Tolerance m7
.118-.236	.00016-.00063
.236-.394	.00024-.00083
.394-.709	.00028-.00099
.709- .827	.00031-.00114



I N C H

Designation	Dimensions DC	DCONMS	LU	LCF	OAL	LS	FTDZ(1)	PL	IC908
SCD 0185-105-0187ACP3	.185	.187	.800	1.05	2.580	1.440	12-28 UNF	.03400	•
SCD 0468-185-0500ACP3	.468	.500	1.340	1.85	3.740	1.790	-	.08500	•
SCD 0500-185-0500ACP3	.500	.500	1.340	1.85	3.740	1.790	-	.09100	•
SCD 0508-197-0562ACP3	.508	.562	1.350	1.97	3.860	1.790	-	.09200	•
SCD 0531-197-0562ACP3	.531	.562	1.350	1.97	3.860	1.790	-	.09700	•
SCD 0577-208-0625ACP3	.577	.625	1.380	2.08	4.090	1.910	5/8-18 UNF	.10500	•
SCD 0609-208-0625ACP3	.609	.625	1.380	2.08	4.090	1.910	-	.11100	•
SCD 0625-208-0625ACP3	.625	.625	1.380	2.08	4.090	1.910	-	.11400	•
SCD 0633-235-0687ACP3	.633	.687	1.610	2.35	4.360	1.910	-	.11500	•
SCD 0687-235-0687ACP3	.687	.687	1.610	2.35	4.360	1.910	-	.12500	•
SCD 0765-242-0812ACP3	.765	.812	1.610	2.42	4.500	1.990	-	.13900	•

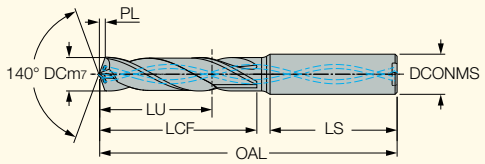
- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

(1) Used for standard thread size

SOLIDDRILL

SCD-ACP3N (3XD)
DIN 6537 Solid Carbide Drills with Coolant Holes, Drilling Depth 3xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



M E T R I C

Designation	Dimensions								IC908
	DC	DCONMS	OAL	LU	LCF	PL	LS	FTDZ(1)	
SCD 030-014-060 ACP3N	3.00	6.00	62.00	14.00	21.0	0.500	34.0	-	●
SCD 031-014-060 ACP3N	3.10	6.00	62.00	14.00	21.0	0.500	34.0	-	●
SCD 032-014-060 ACP3N	3.20	6.00	62.00	14.00	21.0	0.500	34.0	-	●
SCD 033-014-060 ACP3N	3.30	6.00	62.00	14.00	21.0	0.500	34.0	M4	●
SCD 034-014-060 ACP3N	3.40	6.00	62.00	14.00	21.0	0.500	34.0	-	●
SCD 035-014-060 ACP3N	3.50	6.00	62.00	14.00	21.0	0.600	34.0	-	●
SCD 036-014-060 ACP3N	3.60	6.00	62.00	14.00	21.0	0.600	34.0	-	●
SCD 037-014-060 ACP3N	3.70	6.00	62.00	14.00	21.0	0.600	34.0	-	●
SCD 038-017-060 ACP3N	3.80	6.00	66.00	17.00	25.0	0.600	35.0	-	●
SCD 039-017-060 ACP3N	3.90	6.00	66.00	17.00	25.0	0.600	35.0	-	●
SCD 040-017-060 ACP3N	4.00	6.00	66.00	17.00	25.0	0.600	35.0	-	●
SCD 041-017-060 ACP3N	4.10	6.00	66.00	17.00	25.0	0.700	35.0	-	●
SCD 042-017-060 ACP3N	4.20	6.00	66.00	17.00	25.0	0.700	35.0	M5	●
SCD 043-017-060 ACP3N	4.30	6.00	66.00	17.00	25.0	0.700	35.0	-	●
SCD 044-017-060 ACP3N	4.40	6.00	66.00	17.00	25.0	0.700	35.0	-	●
SCD 045-017-060 ACP3N	4.50	6.00	66.00	17.00	25.0	0.700	35.0	-	●
SCD 046-017-060 ACP3N	4.60	6.00	66.00	17.00	25.0	0.700	35.0	-	●
SCD 047-017-060 ACP3N	4.70	6.00	66.00	17.00	25.0	0.800	35.0	-	●
SCD 048-020-060 ACP3N	4.80	6.00	66.00	20.00	29.0	0.800	36.0	-	●
SCD 049-020-060 ACP3N	4.90	6.00	66.00	20.00	29.0	0.800	36.0	-	●
SCD 050-020-060 ACP3N	5.00	6.00	66.00	20.00	29.0	0.800	36.0	M6	●
SCD 051-020-060 ACP3N	5.10	6.00	66.00	20.00	29.0	0.800	36.0	-	●
SCD 052-020-060 ACP3N	5.20	6.00	66.00	20.00	29.0	0.800	36.0	-	●
SCD 053-020-060 ACP3N	5.30	6.00	66.00	20.00	29.0	0.800	36.0	-	●
SCD 054-020-060 ACP3N	5.40	6.00	66.00	20.00	29.0	0.800	36.0	-	●
SCD 055-020-060 ACP3N	5.50	6.00	66.00	20.00	29.0	0.900	36.0	-	●
SCD 056-020-060 ACP3N	5.60	6.00	66.00	20.00	29.0	0.900	36.0	-	●
SCD 057-020-060 ACP3N	5.70	6.00	66.00	20.00	29.0	0.900	36.0	-	●
SCD 058-020-060 ACP3N	5.80	6.00	66.00	20.00	29.0	0.900	36.0	-	●
SCD 059-020-060 ACP3N	5.90	6.00	66.00	20.00	29.0	0.900	36.0	-	●
SCD 060-020-060 ACP3N	6.00	6.00	66.00	20.00	29.0	0.900	36.0	M7	●
SCD 061-024-080 ACP3N	6.10	8.00	79.00	24.00	35.0	1.000	36.0	-	●
SCD 062-024-080 ACP3N	6.20	8.00	79.00	24.00	35.0	1.000	36.0	-	●
SCD 063-024-080 ACP3N	6.30	8.00	79.00	24.00	35.0	1.000	36.0	-	●
SCD 064-024-080 ACP3N	6.40	8.00	79.00	24.00	35.0	1.000	36.0	-	●
SCD 065-024-080 ACP3N	6.50	8.00	79.00	24.00	35.0	1.000	36.0	-	●
SCD 066-024-080 ACP3N	6.60	8.00	79.00	24.00	35.0	1.000	36.0	-	●
SCD 067-024-080 ACP3N	6.70	8.00	79.00	24.00	35.0	1.100	36.0	-	●
SCD 068-024-080 ACP3N	6.80	8.00	79.00	24.00	35.0	1.100	36.0	M8	●
SCD 069-024-080 ACP3N	6.90	8.00	79.00	24.00	35.0	1.100	36.0	-	●
SCD 070-024-080 ACP3N	7.00	8.00	79.00	24.00	35.0	1.100	36.0	-	●
SCD 071-029-080 ACP3N	7.10	8.00	79.00	29.00	42.0	1.100	36.0	-	●
SCD 072-029-080 ACP3N	7.20	8.00	79.00	29.00	42.0	1.100	36.0	-	●
SCD 073-029-080 ACP3N	7.30	8.00	79.00	29.00	42.0	1.100	36.0	-	●
SCD 074-029-080 ACP3N	7.40	8.00	79.00	29.00	42.0	1.200	36.0	-	●
SCD 075-029-080 ACP3N	7.50	8.00	79.00	29.00	42.0	1.200	36.0	-	●
SCD 076-029-080 ACP3N	7.60	8.00	79.00	29.00	42.0	1.200	36.0	-	●
SCD 077-029-080 ACP3N	7.70	8.00	79.00	29.00	42.0	1.200	36.0	-	●
SCD 078-029-080 ACP3N	7.80	8.00	79.00	29.00	42.0	1.200	36.0	M9	●
SCD 079-029-080 ACP3N	7.90	8.00	79.00	29.00	42.0	1.300	36.0	-	●
SCD 080-029-080 ACP3N	8.00	8.00	79.00	29.00	42.0	1.300	36.0	-	●
SCD 081-035-100 ACP3N	8.10	10.00	89.00	35.00	48.0	1.300	40.0	-	●
SCD 082-035-100 ACP3N	8.20	10.00	89.00	35.00	48.0	1.300	40.0	-	●
SCD 083-035-100 ACP3N	8.30	10.00	89.00	35.00	48.0	1.300	40.0	-	●

- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

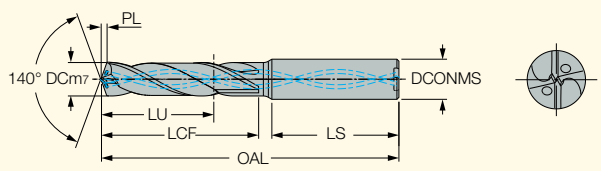
(1) Used for standard thread size

Continued

SOLIDDRILL

SCD-ACP3N (3XD)
DIN 6537 Solid Carbide Drills with Coolant Holes, Drilling Depth 3xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



M E T R I C

Designation	Dimensions								IC908
	DC	DCONMS	OAL	LU	LCF	PL	LS	FTDZ[1]	
SCD 084-035-100 ACP3N	8.40	10.00	89.00	35.00	48.0	1.300	40.0	-	●
SCD 085-035-100 ACP3N	8.50	10.00	89.00	35.00	48.0	1.300	40.0	M10	●
SCD 086-035-100 ACP3N	8.60	10.00	89.00	35.00	48.0	1.400	40.0	-	●
SCD 087-035-100 ACP3N	8.70	10.00	89.00	35.00	48.0	1.400	40.0	-	●
SCD 088-035-100 ACP3N	8.80	10.00	89.00	35.00	48.0	1.400	40.0	-	●
SCD 089-035-100 ACP3N	8.90	10.00	89.00	35.00	48.0	1.400	40.0	-	●
SCD 090-035-100 ACP3N	9.00	10.00	89.00	35.00	48.0	1.400	40.0	-	●
SCD 091-035-100 ACP3N	9.10	10.00	89.00	35.00	48.0	1.400	40.0	-	●
SCD 092-035-100 ACP3N	9.20	10.00	89.00	35.00	48.0	1.400	40.0	-	●
SCD 093-035-100 ACP3N	9.30	10.00	89.00	35.00	48.0	1.500	40.0	-	●
SCD 094-035-100 ACP3N	9.40	10.00	89.00	35.00	48.0	1.500	40.0	-	●
SCD 095-035-100 ACP3N	9.50	10.00	89.00	35.00	48.0	1.500	40.0	M11	●
SCD 096-035-100 ACP3N	9.60	10.00	89.00	35.00	48.0	1.500	40.0	-	●
SCD 097-035-100 ACP3N	9.70	10.00	89.00	35.00	48.0	1.500	40.0	-	●
SCD 098-035-100 ACP3N	9.80	10.00	89.00	35.00	48.0	1.600	40.0	-	●
SCD 099-035-100 ACP3N	9.90	10.00	89.00	35.00	48.0	1.600	40.0	-	●
SCD 100-035-100 ACP3N	10.00	10.00	89.00	35.00	48.0	1.600	40.0	-	●
SCD 101-040-120 ACP3N	10.10	12.00	102.00	40.00	55.0	1.600	45.0	-	●
SCD 102-040-120 ACP3N	10.20	12.00	102.00	40.00	55.0	1.600	45.0	M12	●
SCD 103-040-120 ACP3N	10.30	12.00	102.00	40.00	55.0	1.600	45.0	-	●
SCD 104-040-120 ACP3N	10.40	12.00	102.00	40.00	55.0	1.600	45.0	-	●
SCD 105-040-120 ACP3N	10.50	12.00	102.00	40.00	55.0	1.600	45.0	-	●
SCD 106-040-120 ACP3N	10.60	12.00	102.00	40.00	55.0	1.700	45.0	-	●
SCD 107-040-120 ACP3N	10.70	12.00	102.00	40.00	55.0	1.700	45.0		●
SCD 108-040-120 ACP3N	10.80	12.00	102.00	40.00	55.0	1.700	45.0	-	●
SCD 109-040-120 ACP3N	10.90	12.00	102.00	40.00	55.0	1.700	45.0	-	●
SCD 110-040-120 ACP3N	11.00	12.00	102.00	40.00	55.0	1.700	45.0	-	●
SCD 111-040-120 ACP3N	11.10	12.00	102.00	40.00	56.0	1.700	45.0	-	●
SCD 112-040-120 ACP3N	11.20	12.00	102.00	40.00	56.0	1.800	45.0	-	●
SCD 113-040-120 ACP3N	11.30	12.00	102.00	40.00	56.0	1.800	45.0	-	●
SCD 114-040-120 ACP3N	11.40	12.00	102.00	40.00	56.0	1.800	45.0	-	●
SCD 115-040-120 ACP3N	11.50	12.00	102.00	40.00	56.0	1.800	45.0	-	●
SCD 116-040-120 ACP3N	11.60	12.00	102.00	40.00	56.0	1.800	45.0	-	●
SCD 117-040-120 ACP3N	11.70	12.00	102.00	40.00	56.0	1.900	45.0	-	●
SCD 118-040-120 ACP3N	11.80	12.00	102.00	40.00	56.0	1.900	45.0	-	●
SCD 119-040-120 ACP3N	11.90	12.00	102.00	40.00	56.0	1.900	45.0	-	●
SCD 120-040-120 ACP3N	12.00	12.00	102.00	40.00	56.0	1.900	45.0	M14	●

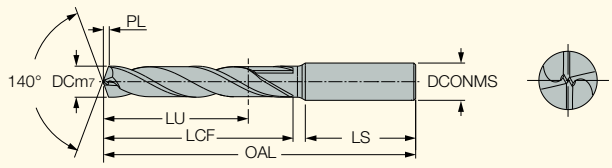
- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

(1) Used for standard thread size

SOLIDDRILL

SCD-AP5N (5xD)
DIN 6537 Solid Carbide
Drills without Coolant Holes,
Drilling Depth 5xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



M E T R I C

Designation	Dimensions								IC908
	DC	DCONMS	OAL	LU	PL	LS	LCF	FTDZ(1)	
SCD 030-023-060 AP5N	3.00	6.00	66.00	23.00	0.500	34.0	29.0	-	●
SCD 031-023-060 AP5N	3.10	6.00	66.00	23.00	0.500	34.0	29.0	-	●
SCD 032-023-060 AP5N	3.20	6.00	66.00	23.00	0.500	34.0	29.0	-	●
SCD 033-023-060 AP5N	3.30	6.00	66.00	23.00	0.500	34.0	29.0	M4	●
SCD 034-023-060 AP5N	3.40	6.00	66.00	23.00	0.500	34.0	29.0	-	●
SCD 035-023-060 AP5N	3.50	6.00	66.00	23.00	0.600	34.0	29.0	-	●
SCD 036-023-060 AP5N	3.60	6.00	66.00	23.00	0.600	34.0	29.0	-	●
SCD 037-023-060 AP5N	3.70	6.00	66.00	23.00	0.600	34.0	29.0	-	●
SCD 038-029-060 AP5N	3.80	6.00	74.00	29.00	0.600	35.0	37.0	-	●
SCD 039-029-060 AP5N	3.90	6.00	74.00	29.00	0.600	35.0	37.0	-	●
SCD 040-029-060 AP5N	4.00	6.00	74.00	29.00	0.600	35.0	37.0	-	●
SCD 041-029-060 AP5N	4.10	6.00	74.00	29.00	0.700	35.0	37.0	-	●
SCD 042-029-060 AP5N	4.20	6.00	74.00	29.00	0.700	35.0	37.0	M5	●
SCD 043-029-060 AP5N	4.30	6.00	74.00	29.00	0.700	35.0	37.0	-	●
SCD 044-029-060 AP5N	4.40	6.00	74.00	29.00	0.700	35.0	37.0	-	●
SCD 045-029-060 AP5N	4.50	6.00	74.00	29.00	0.700	35.0	37.0	-	●
SCD 046-029-060 AP5N	4.60	6.00	74.00	29.00	0.700	35.0	37.0	-	●
SCD 047-029-060 AP5N	4.70	6.00	74.00	29.00	0.800	35.0	37.0	-	●
SCD 048-035-060 AP5N	4.80	6.00	74.00	35.00	0.800	36.0	45.0	-	●
SCD 049-035-060 AP5N	4.90	6.00	82.00	35.00	0.800	36.0	45.0	-	●
SCD 050-035-060 AP5N	5.00	6.00	82.00	35.00	0.800	36.0	45.0	M6	●
SCD 051-035-060 AP5N	5.10	6.00	82.00	35.00	0.800	36.0	45.0	-	●
SCD 052-035-060 AP5N	5.20	6.00	82.00	35.00	0.800	36.0	45.0	-	●
SCD 053-035-060 AP5N	5.30	6.00	82.00	35.00	0.800	36.0	45.0	-	●
SCD 054-035-060 AP5N	5.40	6.00	82.00	35.00	0.800	36.0	45.0	-	●
SCD 055-035-060 AP5N	5.50	6.00	82.00	35.00	0.900	36.0	45.0	-	●
SCD 056-035-060 AP5N	5.60	6.00	82.00	35.00	0.900	36.0	45.0	-	●
SCD 057-035-060 AP5N	5.70	6.00	82.00	35.00	0.900	36.0	45.0	-	●
SCD 058-035-060 AP5N	5.80	6.00	82.00	35.00	0.900	36.0	45.0	-	●
SCD 059-035-060 AP5N	5.90	6.00	82.00	35.00	0.900	36.0	45.0	-	●
SCD 060-035-060 AP5N	6.00	6.00	82.00	35.00	0.900	36.0	45.0	M7	●
SCD 061-043-080 AP5N	6.10	8.00	91.00	43.00	1.000	36.0	54.0	-	●
SCD 062-043-080 AP5N	6.20	8.00	91.00	43.00	1.000	36.0	54.0	-	●
SCD 063-043-080 AP5N	6.30	8.00	91.00	43.00	1.000	36.0	54.0	-	●
SCD 064-043-080 AP5N	6.40	8.00	91.00	43.00	1.000	36.0	54.0	-	●
SCD 065-043-080 AP5N	6.50	8.00	91.00	43.00	1.000	36.0	54.0	-	●
SCD 066-043-080 AP5N	6.60	8.00	91.00	43.00	1.000	36.0	54.0	-	●
SCD 067-043-080 AP5N	6.70	8.00	91.00	43.00	1.100	36.0	54.0	-	●
SCD 068-043-080 AP5N	6.80	8.00	91.00	43.00	1.100	36.0	54.0	M8	●
SCD 069-043-080 AP5N	6.90	8.00	91.00	43.00	1.100	36.0	54.0	-	●
SCD 070-043-080 AP5N	7.00	8.00	91.00	43.00	1.100	36.0	54.0	-	●
SCD 071-043-080 AP5N	7.10	8.00	91.00	43.00	1.100	36.0	54.0	-	●
SCD 072-043-080 AP5N	7.20	8.00	91.00	43.00	1.100	36.0	54.0	-	●
SCD 073-043-080 AP5N	7.30	8.00	91.00	43.00	1.100	36.0	54.0	-	●
SCD 074-043-080 AP5N	7.40	8.00	91.00	43.00	1.200	36.0	54.0	-	●
SCD 075-043-080 AP5N	7.50	8.00	91.00	43.00	1.200	36.0	54.0	-	●
SCD 076-043-080 AP5N	7.60	8.00	91.00	43.00	1.200	36.0	54.0	-	●
SCD 077-043-080 AP5N	7.70	8.00	91.00	43.00	1.200	36.0	54.0	-	●
SCD 078-043-080 AP5N	7.80	8.00	91.00	43.00	1.200	36.0	54.0	M9	●
SCD 079-043-080 AP5N	7.90	8.00	91.00	43.00	1.300	36.0	54.0	-	●
SCD 080-043-080 AP5N	8.00	8.00	91.00	43.00	1.300	36.0	54.0	-	●
SCD 081-049-100 AP5N	8.10	10.00	103.00	49.00	1.300	40.0	62.0	-	●
SCD 082-049-100 AP5N	8.20	10.00	103.00	49.00	1.300	40.0	62.0	-	●
SCD 083-049-100 AP5N	8.30	10.00	103.00	49.00	1.300	40.0	62.0	-	●
SCD 084-049-100 AP5N	8.40	10.00	103.00	49.00	1.300	40.0	62.0	-	●

- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

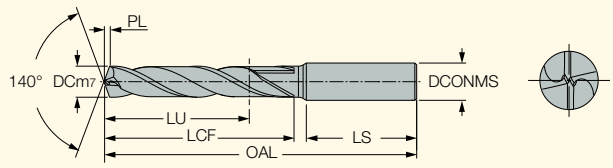
(1) Used for standard thread size

Continued

SOLIDDRILL

SCD-AP5N (5xD)
DIN 6537 Solid Carbide
Drills without Coolant Holes,
Drilling Depth 5xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



M E T R I C

Designation	Dimensions								IC908
	DC	DCONMS	OAL	LU	PL	LS	LCF	FTDZ(1)	
SCD 085-049-100 AP5N	8.50	10.00	103.00	49.00	1.300	40.0	62.0	M10	●
SCD 086-049-100 AP5N	8.60	10.00	103.00	49.00	1.400	40.0	62.0	-	●
SCD 087-049-100 AP5N	8.70	10.00	103.00	49.00	1.400	40.0	62.0	-	●
SCD 088-049-100 AP5N	8.80	10.00	103.00	49.00	1.400	40.0	62.0	-	●
SCD 089-049-100 AP5N	8.90	10.00	103.00	49.00	1.400	40.0	62.0	-	●
SCD 090-049-100 AP5N	9.00	10.00	103.00	49.00	1.400	40.0	62.0	-	●
SCD 091-049-100 AP5N	9.10	10.00	103.00	49.00	1.400	40.0	62.0	-	●
SCD 092-049-100 AP5N	9.20	10.00	103.00	49.00	1.400	40.0	62.0	-	●
SCD 093-049-100 AP5N	9.30	10.00	103.00	49.00	1.500	40.0	62.0	-	●
SCD 094-049-100 AP5N	9.40	10.00	103.00	49.00	1.500	40.0	62.0	-	●
SCD 095-049-100 AP5N	9.50	10.00	103.00	49.00	1.500	40.0	62.0	M11	●
SCD 096-049-100 AP5N	9.60	10.00	103.00	49.00	1.500	40.0	62.0	-	●
SCD 097-049-100 AP5N	9.70	10.00	103.00	49.00	1.500	40.0	62.0	-	●
SCD 098-049-100 AP5N	9.80	10.00	103.00	49.00	1.600	40.0	62.0	-	●
SCD 099-049-100 AP5N	9.90	10.00	103.00	49.00	1.600	40.0	62.0	-	●
SCD 100-049-100 AP5N	10.00	10.00	103.00	49.00	1.600	40.0	62.0	-	●
SCD 101-056-120 AP5N	10.10	12.00	118.00	56.00	1.600	45.0	71.0	-	●
SCD 102-056-120 AP5N	10.20	12.00	118.00	56.00	1.600	45.0	71.0	M12	●
SCD 103-056-120 AP5N	10.30	12.00	118.00	56.00	1.600	45.0	71.0	-	●
SCD 104-056-120 AP5N	10.40	12.00	118.00	56.00	1.600	45.0	71.0	-	●
SCD 105-056-120 AP5N	10.50	12.00	118.00	56.00	1.600	45.0	71.0	-	●
SCD 106-056-120 AP5N	10.60	12.00	118.00	56.00	1.700	45.0	71.0	-	●
SCD 107-056-120 AP5N	10.70	12.00	118.00	56.00	1.700	45.0	71.0	-	●
SCD 108-056-120 AP5N	10.80	12.00	118.00	56.00	1.700	45.0	71.0	-	●
SCD 109-056-120 AP5N	10.90	12.00	118.00	56.00	1.700	45.0	71.0	-	●
SCD 110-056-120 AP5N	11.00	12.00	118.00	56.00	1.700	45.0	71.0	-	●
SCD 111-056-120 AP5N	11.10	12.00	118.00	56.00	1.700	45.0	72.0	-	●
SCD 112-056-120 AP5N	11.20	12.00	118.00	56.00	1.800	45.0	72.0	-	●
SCD 113-056-120 AP5N	11.30	12.00	118.00	56.00	1.800	45.0	72.0	-	●
SCD 114-056-120 AP5N	11.40	12.00	118.00	56.00	1.800	45.0	72.0	-	●
SCD 115-056-120 AP5N	11.50	12.00	118.00	56.00	1.800	45.0	72.0	-	●
SCD 116-056-120 AP5N	11.60	12.00	118.00	56.00	1.800	45.0	72.0	-	●
SCD 117-056-120 AP5N	11.70	12.00	118.00	56.00	1.900	45.0	72.0	-	●
SCD 118-056-120 AP5N	11.80	12.00	118.00	56.00	1.900	45.0	72.0	-	●
SCD 119-056-120 AP5N	11.90	12.00	118.00	56.00	1.900	45.0	72.0	-	●
SCD 120-056-120 AP5N	12.00	12.00	118.00	56.00	1.900	45.0	72.0	M14	●

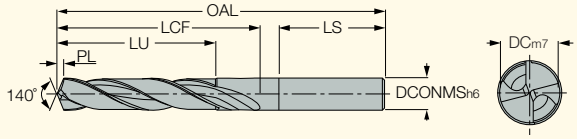
- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

(1) Used for standard thread size

SOLIDDRILL

SCD-AP5 (5xD)
Solid Carbide Drills without
Coolant Holes, Drilling Depth 5xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



M E T R I C

Designation	Dimensions								IC908
	DC	DCONMS	LU	LCF	OAL	LS	FTDZ(1)	PL	
SCD 121-060-140 AP5	12.10	14.00	60.0	77.0	124.00	45.0	-	2.200	●
SCD 122-060-140 AP5	12.20	14.00	60.0	77.0	124.00	45.0	-	2.220	●
SCD 124-060-140 AP5	12.40	14.00	60.0	77.0	124.00	45.0	-	2.260	●
SCD 125-060-140 AP5	12.50	14.00	60.0	77.0	124.00	45.0	-	2.270	●
SCD 127-060-140 AP5	12.70	14.00	60.0	77.0	124.00	45.0	-	2.310	●
SCD 128-060-140 AP5	12.80	14.00	60.0	77.0	124.00	45.0	-	2.330	●
SCD 130-060-140 AP5	13.00	14.00	60.0	77.0	124.00	45.0	-	2.370	●
SCD 131-060-140 AP5	13.10	14.00	60.0	77.0	124.00	45.0	-	2.380	●
SCD 132-060-140 AP5	13.20	14.00	60.0	77.0	124.00	45.0	-	2.400	●
SCD 133-060-140 AP5	13.30	14.00	60.0	77.0	124.00	45.0	-	2.420	●
SCD 135-060-140 AP5	13.50	14.00	60.0	77.0	124.00	45.0	-	2.460	●
SCD 136-060-140 AP5	13.60	14.00	60.0	77.0	124.00	45.0	-	2.470	●
SCD 137-060-140 AP5	13.70	14.00	60.0	77.0	124.00	45.0	-	2.490	●
SCD 138-060-140 AP5	13.80	14.00	60.0	77.0	124.00	45.0	-	2.510	●
SCD 139-060-140 AP5	13.90	14.00	60.0	77.0	124.00	45.0	-	2.530	●
SCD 140-060-140 AP5	14.00	14.00	60.0	77.0	124.00	45.0	M16	2.550	●
SCD 141-063-160 AP5	14.10	16.00	63.0	83.0	133.00	45.0	-	2.570	●
SCD 142-063-160 AP5	14.20	16.00	63.0	83.0	133.00	45.0	-	2.580	●
SCD 143-063-160 AP5	14.30	16.00	63.0	83.0	133.00	45.0	-	2.600	●
SCD 145-063-160 AP5	14.50	16.00	63.0	83.0	133.00	45.0	-	2.640	●
SCD 146-063-160 AP5	14.60	16.00	63.0	83.0	133.00	45.0	-	2.660	●
SCD 147-063-160 AP5	14.70	16.00	63.0	83.0	133.00	45.0	-	2.680	●
SCD 148-063-160 AP5	14.80	16.00	63.0	83.0	133.00	45.0	-	2.690	●
SCD 149-063-160 AP5	14.90	16.00	63.0	83.0	133.00	45.0	-	2.710	●
SCD 150-063-160 AP5	15.00	16.00	63.0	83.0	133.00	45.0	-	2.730	●
SCD 152-063-160 AP5	15.20	16.00	63.0	83.0	133.00	45.0	-	2.770	●
SCD 153-063-160 AP5	15.30	16.00	63.0	83.0	133.00	45.0	-	2.780	●
SCD 155-063-160 AP5	15.50	16.00	63.0	83.0	133.00	45.0	M18	2.820	●
SCD 157-063-160 AP5	15.70	16.00	63.0	83.0	133.00	45.0	-	2.860	●
SCD 158-063-160 AP5	15.80	16.00	63.0	83.0	133.00	45.0	-	2.880	●
SCD 159-063-160 AP5	15.90	16.00	63.0	83.0	133.00	45.0	-	2.890	●
SCD 160-063-160 AP5	16.00	16.00	63.0	83.0	133.00	45.0	-	2.910	●
SCD 161-071-180 AP5	16.10	18.00	71.0	93.0	143.00	48.0	-	2.930	●
SCD 164-071-180 AP5	16.40	18.00	71.0	93.0	143.00	48.0	-	2.980	●
SCD 165-071-180 AP5	16.50	18.00	71.0	93.0	143.00	48.0	-	3.000	●
SCD 166-071-180 AP5	16.60	18.00	71.0	93.0	143.00	48.0	-	3.020	●
SCD 167-071-180 AP5	16.70	18.00	71.0	93.0	143.00	48.0	-	3.040	●
SCD 168-071-180 AP5	16.80	18.00	71.0	93.0	143.00	48.0	-	3.060	●
SCD 169-071-180 AP5	16.90	18.00	71.0	93.0	143.00	48.0	-	3.080	●
SCD 170-071-180 AP5	17.00	18.00	71.0	93.0	143.00	48.0	-	3.090	●
SCD 171-071-180 AP5	17.10	18.00	71.0	93.0	143.00	48.0	-	3.110	●
SCD 172-071-180 AP5	17.20	18.00	71.0	93.0	143.00	48.0	-	3.130	●
SCD 173-071-180 AP5	17.30	18.00	71.0	93.0	143.00	48.0	-	3.150	●
SCD 174-071-180 AP5	17.40	18.00	71.0	93.0	143.00	48.0	-	3.170	●
SCD 175-071-180 AP5	17.50	18.00	71.0	93.0	143.00	48.0	M20	3.180	●
SCD 176-071-180 AP5	17.60	18.00	71.0	93.0	143.00	48.0	-	3.200	●
SCD 177-071-180 AP5	17.70	18.00	71.0	93.0	143.00	48.0	-	3.220	●
SCD 178-071-180 AP5	17.80	18.00	71.0	93.0	143.00	48.0	-	3.240	●
SCD 179-071-180 AP5	17.90	18.00	71.0	93.0	143.00	48.0	-	3.260	●
SCD 180-071-180 AP5	18.00	18.00	71.0	93.0	143.00	48.0	-	3.280	●
SCD 182-077-200 AP5	18.20	20.00	77.0	101.0	153.00	48.0	-	3.310	●
SCD 183-077-200 AP5	18.30	20.00	77.0	101.0	153.00	48.0	-	3.330	●
SCD 184-077-200 AP5	18.40	20.00	77.0	101.0	153.00	48.0	-	3.350	●
SCD 185-077-200 AP5	18.50	20.00	77.0	101.0	153.00	48.0	-	3.370	●
SCD 186-077-200 AP5	18.60	20.00	77.0	101.0	153.00	48.0	-	3.380	●

- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

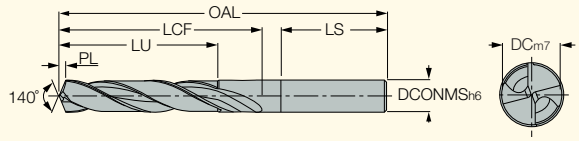
(1) Used for standard thread size

Continued

SOLIDDRILL

SCD-AP5 (5xD)
Solid Carbide Drills without Coolant Holes, Drilling Depth 5xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



M E T R I C

Designation	Dimensions								IC908
	DC	DCONMS	LU	LCF	OAL	LS	FTDZ(1)	PL	
SCD 187-077-200 AP5	18.70	20.00	77.0	101.0	153.00	48.0	-	3.400	●
SCD 188-077-200 AP5	18.80	20.00	77.0	101.0	153.00	48.0	-	3.420	●
SCD 189-077-200 AP5	18.90	20.00	77.0	101.0	153.00	48.0	-	3.440	●
SCD 190-077-200 AP5	19.00	20.00	77.0	101.0	153.00	48.0	-	3.460	●
SCD 191-077-200 AP5	19.10	20.00	77.0	101.0	153.00	48.0	-	3.480	●
SCD 192-077-200 AP5	19.20	20.00	77.0	101.0	153.00	48.0	-	3.490	●
SCD 193-077-200 AP5	19.30	20.00	77.0	101.0	153.00	48.0	-	3.510	●
SCD 194-077-200 AP5	19.40	20.00	77.0	101.0	153.00	48.0	-	3.530	●
SCD 195-077-200 AP5	19.50	20.00	77.0	101.0	153.00	48.0	M22	3.550	●
SCD 196-077-200 AP5	19.60	20.00	77.0	101.0	153.00	48.0	-	3.570	●
SCD 197-077-200 AP5	19.70	20.00	77.0	101.0	153.00	48.0	-	3.590	●
SCD 198-077-200 AP5	19.80	20.00	77.0	101.0	153.00	48.0	-	3.600	●
SCD 199-077-200 AP5	19.90	20.00	77.0	101.0	153.00	48.0	-	3.620	●
SCD 200-077-200 AP5	20.00	20.00	77.0	101.0	153.00	48.0	-	3.640	●

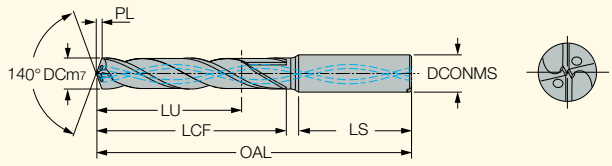
- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

(1) Used for standard thread size

SOLIDDRILL

SCD-ACP5N (5xD)
DIN 6537 Solid Carbide Drills with Coolant Holes, Drilling Depth 5xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



M E T R I C

Designation	Dimensions								WIC908
	DC	DCONMS	OAL	LU	LCF	PL	LS	FTDZ[1]	
SCD 030-023-060 ACP5N	3.00	6.00	66.00	23.00	29.0	0.500	34.0	-	●
SCD 031-023-060 ACP5N	3.10	6.00	66.00	23.00	29.0	0.500	34.0	-	●
SCD 032-023-060 ACP5N	3.20	6.00	66.00	23.00	29.0	0.500	34.0	-	●
SCD 033-023-060 ACP5N	3.30	6.00	66.00	23.00	29.0	0.500	34.0	M4	●
SCD 034-023-060 ACP5N	3.40	6.00	66.00	23.00	29.0	0.500	34.0	-	●
SCD 035-023-060 ACP5N	3.50	6.00	66.00	23.00	29.0	0.600	34.0	-	●
SCD 036-023-060 ACP5N	3.60	6.00	66.00	23.00	29.0	0.600	34.0	-	●
SCD 037-023-060 ACP5N	3.70	6.00	66.00	23.00	29.0	0.600	34.0	-	●
SCD 038-029-060 ACP5N	3.80	6.00	74.00	29.00	37.0	0.600	35.0	-	●
SCD 039-029-060 ACP5N	3.90	6.00	74.00	29.00	37.0	0.600	35.0	-	●
SCD 040-029-060 ACP5N	4.00	6.00	74.00	29.00	37.0	0.600	35.0	-	●
SCD 041-029-060 ACP5N	4.10	6.00	74.00	29.00	37.0	0.700	35.0	-	●
SCD 042-029-060 ACP5N	4.20	6.00	74.00	29.00	37.0	0.700	35.0	M5	●
SCD 043-029-060 ACP5N	4.30	6.00	74.00	29.00	37.0	0.700	35.0	-	●
SCD 044-029-060 ACP5N	4.40	6.00	74.00	29.00	37.0	0.700	35.0	-	●
SCD 045-029-060 ACP5N	4.50	6.00	74.00	29.00	37.0	0.700	35.0	-	●
SCD 046-029-060 ACP5N	4.60	6.00	74.00	29.00	37.0	0.700	35.0	-	●
SCD 047-029-060 ACP5N	4.70	6.00	74.00	29.00	37.0	0.800	35.0	-	●
SCD 048-035-060 ACP5N	4.80	6.00	82.00	35.00	45.0	0.800	36.0	-	●
SCD 049-035-060 ACP5N	4.90	6.00	82.00	35.00	45.0	0.800	36.0	-	●
SCD 050-035-060 ACP5N	5.00	6.00	82.00	35.00	45.0	0.800	36.0	M6	●
SCD 051-035-060 ACP5N	5.10	6.00	82.00	35.00	45.0	0.800	36.0	-	●
SCD 052-035-060 ACP5N	5.20	6.00	82.00	35.00	45.0	0.800	36.0	-	●
SCD 053-035-060 ACP5N	5.30	6.00	82.00	35.00	45.0	0.800	36.0	-	●
SCD 054-035-060 ACP5N	5.40	6.00	82.00	35.00	45.0	0.800	36.0	-	●
SCD 055-035-060 ACP5N	5.50	6.00	82.00	35.00	45.0	0.900	36.0	-	●
SCD 056-035-060 ACP5N	5.60	6.00	82.00	35.00	45.0	0.900	36.0	-	●
SCD 057-035-060 ACP5N	5.70	6.00	82.00	35.00	45.0	0.900	36.0	-	●
SCD 058-035-060 ACP5N	5.80	6.00	82.00	35.00	45.0	0.900	36.0	-	●
SCD 059-035-060 ACP5N	5.90	6.00	82.00	35.00	45.0	0.900	36.0	-	●
SCD 060-035-060 ACP5N	6.00	6.00	82.00	35.00	45.0	0.900	36.0	M7	●
SCD 061-043-080 ACP5N	6.10	8.00	91.00	43.00	54.0	1.000	36.0	-	●
SCD 062-043-080 ACP5N	6.20	8.00	91.00	43.00	54.0	1.000	36.0	-	●
SCD 063-043-080 ACP5N	6.30	8.00	91.00	43.00	54.0	1.000	36.0	-	●
SCD 064-043-080 ACP5N	6.40	8.00	91.00	43.00	54.0	1.000	36.0	-	●
SCD 065-043-080 ACP5N	6.50	8.00	91.00	43.00	54.0	1.000	36.0	-	●
SCD 066-043-080 ACP5N	6.60	8.00	91.00	43.00	54.0	1.000	36.0	-	●
SCD 067-043-080 ACP5N	6.70	8.00	91.00	43.00	54.0	1.100	36.0	-	●
SCD 068-043-080 ACP5N	6.80	8.00	91.00	43.00	54.0	1.100	36.0	M8	●
SCD 069-043-080 ACP5N	6.90	8.00	91.00	43.00	54.0	1.100	36.0	-	●
SCD 070-043-080 ACP5N	7.00	8.00	91.00	43.00	54.0	1.100	36.0	-	●
SCD 071-043-080 ACP5N	7.10	8.00	91.00	43.00	54.0	1.100	36.0	-	●
SCD 072-043-080 ACP5N	7.20	8.00	91.00	43.00	54.0	1.100	36.0	-	●
SCD 073-043-080 ACP5N	7.30	8.00	91.00	43.00	54.0	1.100	36.0	-	●
SCD 074-043-080 ACP5N	7.40	8.00	91.00	43.00	54.0	1.200	36.0	-	●
SCD 075-043-080 ACP5N	7.50	8.00	91.00	43.00	54.0	1.200	36.0	-	●
SCD 076-043-080 ACP5N	7.60	8.00	91.00	43.00	54.0	1.200	36.0	-	●
SCD 077-043-080 ACP5N	7.70	8.00	91.00	43.00	54.0	1.200	36.0	-	●
SCD 078-043-080 ACP5N	7.80	8.00	91.00	43.00	54.0	1.200	36.0	M9	●
SCD 079-043-080 ACP5N	7.90	8.00	91.00	43.00	54.0	1.300	36.0	-	●
SCD 080-043-080 ACP5N	8.00	8.00	91.00	43.00	54.0	1.300	36.0	-	●
SCD 081-049-100 ACP5N	8.10	10.00	103.00	49.00	62.0	1.300	40.0	-	●
SCD 082-049-100 ACP5N	8.20	10.00	103.00	49.00	62.0	1.300	40.0	-	●
SCD 083-049-100 ACP5N	8.30	10.00	103.00	49.00	62.0	1.300	40.0	-	●
SCD 084-049-100 ACP5N	8.40	10.00	103.00	49.00	62.0	1.300	40.0	-	●

- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

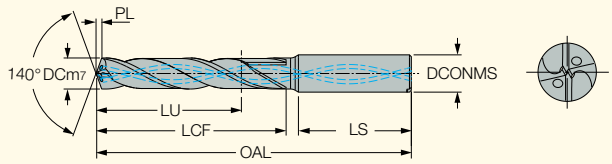
(1) Used for standard thread size

Continued

SOLIDDRILL

SCD-ACP5N (5xD)
DIN 6537 Solid Carbide Drills with Coolant Holes, Drilling Depth 5xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



M E T R I C

Designation	Dimensions								WIC908
	DC	DCONMS	OAL	LU	LCF	PL	LS	FTDZ(1)	
SCD 085-049-100 ACP5N	8.50	10.00	103.00	49.00	62.0	1.300	40.0	M10	●
SCD 086-049-100 ACP5N	8.60	10.00	103.00	49.00	62.0	1.400	40.0	-	●
SCD 087-049-100 ACP5N	8.70	10.00	103.00	49.00	62.0	1.400	40.0	-	●
SCD 088-049-100 ACP5N	8.80	10.00	103.00	49.00	62.0	1.400	40.0	-	●
SCD 089-049-100 ACP5N	8.90	10.00	103.00	49.00	62.0	1.400	40.0	-	●
SCD 090-049-100 ACP5N	9.00	10.00	103.00	49.00	62.0	1.400	40.0	-	●
SCD 091-049-100 ACP5N	9.10	10.00	103.00	49.00	62.0	1.400	40.0	-	●
SCD 092-049-100 ACP5N	9.20	10.00	103.00	49.00	62.0	1.400	40.0	-	●
SCD 093-049-100 ACP5N	9.30	10.00	103.00	49.00	62.0	1.500	40.0	-	●
SCD 094-049-100 ACP5N	9.40	10.00	103.00	49.00	62.0	1.500	40.0	-	●
SCD 095-049-100 ACP5N	9.50	10.00	103.00	49.00	62.0	1.500	40.0	M11	●
SCD 096-049-100 ACP5N	9.60	10.00	103.00	49.00	62.0	1.500	40.0	-	●
SCD 097-049-100 ACP5N	9.70	10.00	103.00	49.00	62.0	1.500	40.0	-	●
SCD 098-049-100 ACP5N	9.80	10.00	103.00	49.00	62.0	1.600	40.0	-	●
SCD 099-049-100 ACP5N	9.90	10.00	103.00	49.00	62.0	1.600	40.0	-	●
SCD 100-049-100 ACP5N	10.00	10.00	103.00	49.00	62.0	1.600	40.0	-	●
SCD 101-056-120 ACP5N	10.10	12.00	118.00	56.00	71.0	1.600	45.0	-	●
SCD 102-056-120 ACP5N	10.20	12.00	118.00	56.00	71.0	1.600	45.0	M12	●
SCD 103-056-120 ACP5N	10.30	12.00	118.00	56.00	71.0	1.600	45.0	-	●
SCD 104-056-120 ACP5N	10.40	12.00	118.00	56.00	71.0	1.600	45.0	-	●
SCD 105-056-120 ACP5N	10.50	12.00	118.00	56.00	71.0	1.600	45.0	-	●
SCD 106-056-120 ACP5N	10.60	12.00	118.00	56.00	71.0	1.700	45.0	-	●
SCD 107-056-120 ACP5N	10.70	12.00	118.00	56.00	71.0	1.700	45.0	-	●
SCD 108-056-120 ACP5N	10.80	12.00	118.00	56.00	71.0	1.700	45.0	-	●
SCD 109-056-120 ACP5N	10.90	12.00	118.00	56.00	71.0	1.700	45.0	-	●
SCD 110-056-120 ACP5N	11.00	12.00	118.00	56.00	71.0	1.700	45.0	-	●
SCD 111-056-120 ACP5N	11.10	12.00	118.00	56.00	72.0	1.700	45.0	-	●
SCD 112-056-120 ACP5N	11.20	12.00	118.00	56.00	72.0	1.800	45.0	-	●
SCD 113-056-120 ACP5N	11.30	12.00	118.00	56.00	72.0	1.800	45.0	-	●
SCD 114-056-120 ACP5N	11.40	12.00	118.00	56.00	72.0	1.800	45.0	-	●
SCD 115-056-120 ACP5N	11.50	12.00	118.00	56.00	72.0	1.800	45.0	-	●
SCD 116-056-120 ACP5N	11.60	12.00	118.00	56.00	72.0	1.800	45.0	-	●
SCD 117-056-120 ACP5N	11.70	12.00	118.00	56.00	72.0	1.900	45.0	-	●
SCD 118-056-120 ACP5N	11.80	12.00	118.00	56.00	72.0	1.900	45.0	-	●
SCD 119-056-120 ACP5N	11.90	12.00	118.00	56.00	72.0	1.900	45.0	-	●
SCD 120-056-120 ACP5N	12.00	12.00	118.00	56.00	72.0	1.900	45.0	M14	●

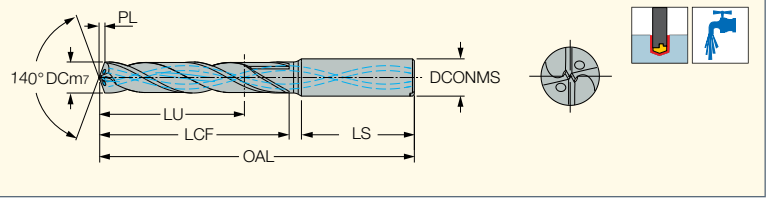
- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

(1) Used for standard thread size

SOLIDDRILL

SCD-ACP5N (5xD)
DIN 6537 Solid Carbide Drills with Coolant Holes, Drilling Depth 5xD

DC	Tolerance m7
.118-.236	.00016-.00063
.236-.394	.00024-.00083
.394-.709	.00028-.00099
.709- .827	.00031-.00114



I N C H

Designation	Dimensions DC	DCONMS	LU	PL	LCF	LS	OAL	FTDZ[1]	IC908
SCD0136-106-0187ACP5N	.136	.187	.8400	.02500	1.06	1.440	2.600	-	●
SCD0141-106-0187ACP5N	.141	.187	.8400	.02600	1.06	1.440	2.600	-	●
SCD0150-106-0187ACP5N	.150	.187	.8400	.02700	1.06	1.440	2.600	-	●
SCD0156-106-0187ACP5N	.156	.187	.8400	.02800	1.06	1.440	2.600	10-30 UNF	●
SCD0159-106-0187ACP5N	.159	.187	.8400	.02900	1.06	1.440	2.600	-	●
SCD0163-138-0187ACP5N	.163	.187	1.1300	.03000	1.38	1.440	2.910	-	●
SCD0180-138-0187ACP5N	.180	.187	1.1300	.03300	1.38	1.440	2.910	-	●
SCD0182-138-0187ACP5N	.182	.187	1.1300	.03300	1.38	1.440	2.910	-	●
SCD0185-138-0187ACP5N	.185	.187	1.1300	.03400	1.38	1.440	2.910	12-28 UNF	●
SCD0201-169-0250ACP5N	.201	.250	1.3700	.03700	1.69	1.440	3.230	-	●
SCD0207-169-0250ACP5N	.207	.250	1.3700	.03800	1.69	1.440	3.230	-	●
SCD0209-169-0250ACP5N	.209	.250	1.3700	.03800	1.69	1.440	3.230	-	●
SCD0213-169-0250ACP5N	.213	.250	1.3700	.03900	1.69	1.440	3.230	1/4-28 UNF	●
SCD0218-169-0250ACP5N	.218	.250	1.3700	.04000	1.69	1.440	3.230	7/32	●
SCD0250-169-0250ACP5N	.250	.250	1.3700	.04500	1.69	1.440	3.230	-	●
SCD0257-197-0312ACP5N	.257	.312	1.5900	.04700	1.97	1.520	3.580	5/16-18 UNC	●
SCD0265-197-0312ACP5N	.265	.312	1.5900	.04800	1.97	1.520	3.580	17/64	●
SCD0272-197-0312ACP5N	.272	.312	1.5900	.04900	1.97	1.520	3.580	-	●
SCD0281-197-0312ACP5N	.281	.312	1.5900	.05100	1.97	1.520	3.580	-	●
SCD0296-197-0312ACP5N	.296	.312	1.5900	.05400	1.97	1.530	3.580	-	●
SCD0312-197-0312ACP5N	.312	.312	1.5900	.05700	1.97	1.530	3.580	3/8-16 UNC	●
SCD0321-236-0375ACP5N	.321	.375	1.9200	.05800	2.36	1.590	4.060	-	●
SCD0328-236-0375ACP5N	.328	.375	1.9200	.06000	2.36	1.590	4.060	3/8-24 UNF	●
SCD0332-236-0375ACP5N	.332	.375	1.9200	.06000	2.36	1.590	4.060	-	●
SCD0339-236-0375ACP5N	.339	.375	1.9200	.06200	2.36	1.590	4.060	-	●
SCD0343-236-0375ACP5N	.343	.375	1.9200	.06200	2.36	1.590	4.060	-	●
SCD0359-236-0375ACP5N	.359	.375	1.9200	.06500	2.36	1.590	4.060	23/64	●
SCD0368-236-0375ACP5N	.368	.375	1.9200	.06700	2.36	1.590	4.060	-	●
SCD0375-236-0375ACP5N	.375	.375	1.9200	.06800	2.36	1.590	4.060	3/8	●
SCD0376-260-0437ACP5N	.376	.437	2.0900	.06800	2.60	1.670	4.370	-	●
SCD0382-260-0437ACP5N	.382	.437	2.0900	.07000	2.60	1.670	4.370	-	●
SCD0390-260-0437ACP5N	.390	.437	2.0900	.07100	2.60	1.670	4.370	25/64	●
SCD0394-260-0437ACP5N	.394	.437	2.0900	.07200	2.60	1.670	4.370	-	●
SCD0406-260-0437ACP5N	.406	.437	2.0900	.07400	2.60	1.670	4.370	-	●
SCD0421-260-0437ACP5N	.421	.437	2.0900	.07700	2.60	1.670	4.370	1/2-13 UNC	●
SCD0434-260-0437ACP5N	.434	.437	2.0900	.07900	2.60	1.670	4.370	-	●
SCD0437-260-0437ACP5N	.437	.437	2.0900	.08000	2.60	1.670	4.370	7/16	●
SCD0453-276-0500ACP5N	.453	.500	2.1900	.08200	2.76	1.790	4.650	1/2-20 UNF	●
SCD0457-276-0500ACP5N	.457	.500	2.1900	.08300	2.76	1.790	4.650	-	●
SCD0468-276-0500ACP5N	.468	.500	2.1900	.08500	2.76	1.790	4.650	9/16-12 UNC	●

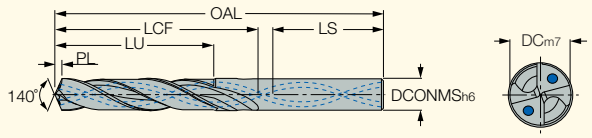
- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

[1] Used for standard thread size

SOLIDDRILL

SCD-ACP5 (5xD)
Solid Carbide Drills with Coolant Holes, Drilling Depth 5xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



M E T R I C

Designation	Dimensions									IC908
	DC	DCONMS	LU	LCF	OAL	FTDZ(1)	ZEFF	LS	PL	
SCD 121-060-140 ACP5	12.10	14.00	60.0	77.0	124.00	-	2	45.0	2.200	●
SCD 122-060-140 ACP5	12.20	14.00	60.0	77.0	124.00	M14	2	45.0	2.220	●
SCD 124-060-140 ACP5	12.40	14.00	60.0	77.0	124.00	-	2	45.0	2.260	●
SCD 125-060-140 ACP5	12.50	14.00	60.0	77.0	124.00	-	2	45.0	2.270	●
SCD 126-060-140 ACP5	12.60	14.00	60.0	77.0	124.00	-	2	45.0	2.290	●
SCD 127-060-140 ACP5	12.70	14.00	60.0	77.0	124.00	-	2	45.0	2.310	●
SCD 128-060-140 ACP5	12.80	14.00	60.0	77.0	124.00	-	2	45.0	2.330	●
SCD 129-060-140 ACP5	12.90	14.00	60.0	77.0	124.00	-	2	45.0	2.350	●
SCD 130-060-140 ACP5	13.00	14.00	60.0	77.0	124.00	-	2	45.0	2.370	●
SCD 131-060-140 ACP5	13.10	14.00	60.0	77.0	124.00	-	2	45.0	2.380	●
SCD 132-060-140 ACP5	13.20	14.00	60.0	77.0	124.00	-	2	45.0	2.400	●
SCD 133-060-140 ACP5	13.30	14.00	60.0	77.0	124.00	-	2	45.0	2.420	●
SCD 135-060-140 ACP5	13.50	14.00	60.0	77.0	124.00	-	2	45.0	2.460	●
SCD 136-060-140 ACP5	13.60	14.00	60.0	77.0	124.00	-	2	45.0	2.470	●
SCD 137-060-140 ACP5	13.70	14.00	60.0	77.0	124.00	-	2	45.0	2.490	●
SCD 138-060-140 ACP5	13.80	14.00	60.0	77.0	124.00	-	2	45.0	2.510	●
SCD 140-060-140 ACP5	14.00	14.00	60.0	77.0	124.00	M16	2	45.0	2.550	●
SCD 141-063-160 ACP5	14.10	16.00	63.0	83.0	133.00	-	2	45.0	2.570	●
SCD 142-063-160 ACP5	14.20	16.00	63.0	83.0	133.00	-	2	45.0	2.580	●
SCD 143-063-160 ACP5	14.30	16.00	63.0	83.0	133.00	-	2	45.0	2.600	●
SCD 145-063-160 ACP5	14.50	16.00	63.0	83.0	133.00	-	2	45.0	2.640	●
SCD 146-063-160 ACP5	14.60	16.00	63.0	83.0	133.00	-	2	45.0	2.660	●
SCD 147-063-160 ACP5	14.70	16.00	63.0	83.0	133.00	-	2	45.0	2.680	●
SCD 148-063-160 ACP5	14.80	16.00	63.0	83.0	133.00	-	2	45.0	2.690	●
SCD 149-063-160 ACP5	14.90	16.00	63.0	83.0	133.00	-	2	45.0	2.710	●
SCD 150-063-160 ACP5	15.00	16.00	63.0	83.0	133.00	-	2	45.0	2.730	●
SCD 151-063-160 ACP5	15.10	16.00	63.0	83.0	133.00	-	2	45.0	2.750	●
SCD 152-063-160 ACP5	15.20	16.00	63.0	83.0	133.00	-	2	45.0	2.770	●
SCD 153-063-160 ACP5	15.30	16.00	63.0	83.0	133.00	-	2	45.0	2.780	●
SCD 155-063-160 ACP5	15.50	16.00	63.0	83.0	133.00	M18	2	45.0	2.820	●
SCD 156-063-160 ACP5	15.60	16.00	63.0	83.0	133.00	-	2	45.0	2.840	●
SCD 157-063-160 ACP5	15.70	16.00	63.0	83.0	133.00	-	2	45.0	2.860	●
SCD 158-063-160 ACP5	15.80	16.00	63.0	83.0	133.00	-	2	45.0	2.880	●
SCD 160-063-160 ACP5	16.00	16.00	63.0	83.0	133.00	-	2	45.0	2.910	●
SCD 161-071-180 ACP5	16.10	18.00	71.0	93.0	143.00	-	2	48.0	2.930	●
SCD 162-071-180 ACP5	16.20	18.00	71.0	93.0	143.00	-	2	48.0	2.950	●
SCD 163-071-180 ACP5	16.30	18.00	71.0	93.0	143.00	-	2	48.0	2.970	●
SCD 164-071-180 ACP5	16.40	18.00	71.0	93.0	143.00	-	2	48.0	2.980	●
SCD 165-071-180 ACP5	16.50	18.00	71.0	93.0	143.00	-	2	48.0	3.000	●
SCD 166-071-180 ACP5	16.60	18.00	71.0	93.0	143.00		2	48.0	3.020	●
SCD 167-071-180 ACP5	16.70	18.00	71.0	93.0	143.00	-	2	48.0	3.040	●
SCD 168-071-180 ACP5	16.80	18.00	71.0	93.0	143.00	-	2	48.0	3.060	●
SCD 169-071-180 ACP5	16.90	18.00	71.0	93.0	143.00	-	2	48.0	3.080	●
SCD 170-071-180 ACP5	17.00	18.00	71.0	93.0	143.00	-	2	48.0	3.090	●
SCD 171-071-180 ACP5	17.10	18.00	71.0	93.0	143.00	-	2	48.0	3.110	●
SCD 172-071-180 ACP5	17.20	18.00	71.0	93.0	143.00	-	2	48.0	3.130	●
SCD 174-071-180 ACP5	17.40	18.00	71.0	93.0	143.00	-	2	48.0	3.170	●
SCD 175-071-180 ACP5	17.50	18.00	71.0	93.0	143.00	-	2	48.0	3.180	●
SCD 176-071-180 ACP5	17.60	18.00	71.0	93.0	143.00	-	2	48.0	3.200	●
SCD 177-071-180 ACP5	17.70	18.00	71.0	93.0	143.00	-	2	48.0	3.220	●
SCD 178-071-180 ACP5	17.80	18.00	71.0	93.0	143.00	-	2	48.0	3.240	●
SCD 179-071-180 ACP5	17.90	18.00	71.0	93.0	143.00	-	2	48.0	3.260	●
SCD 180-071-180 ACP5	18.00	18.00	71.0	93.0	143.00	-	2	48.0	3.280	●
SCD 181-077-200 ACP5	18.10	20.00	77.0	101.0	153.00	-	2	48.0	3.290	●

- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

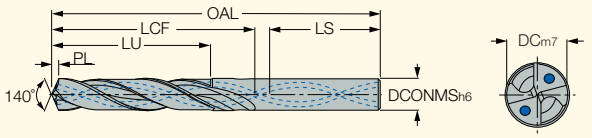
(1) Used for standard thread size

Continued

SOLIDDRILL

SCD-ACP5 (5xD)
Solid Carbide Drills with Coolant Holes, Drilling Depth 5xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



M E T R I C

Designation	Dimensions DC	DCONMS	LU	LCF	OAL	FTDZ(1)	ZEFF	LS	PL	IC908
SCD 182-077-200 ACP5	18.20	20.00	77.0	101.0	153.00	-	2	48.0	3.310	●
SCD 183-077-200 ACP5	18.30	20.00	77.0	101.0	153.00	-	2	48.0	3.330	●
SCD 184-077-200 ACP5	18.40	20.00	77.0	101.0	153.00	-	2	48.0	3.350	●
SCD 185-077-200 ACP5	18.50	20.00	77.0	101.0	153.00	-	2	48.0	3.370	●
SCD 186-077-200 ACP5	18.60	20.00	77.0	101.0	153.00	-	2	48.0	3.380	●
SCD 187-077-200 ACP5	18.70	20.00	77.0	101.0	153.00	-	2	48.0	3.400	●
SCD 188-077-200 ACP5	18.80	20.00	77.0	101.0	153.00	-	2	48.0	3.420	●
SCD 189-077-200 ACP5	18.90	20.00	77.0	101.0	153.00	-	2	48.0	3.440	●
SCD 191-077-200 ACP5	19.10	20.00	77.0	101.0	153.00	-	2	48.0	3.480	●
SCD 192-077-200 ACP5	19.20	20.00	77.0	101.0	153.00	-	2	48.0	3.490	●
SCD 193-077-200 ACP5	19.30	20.00	77.0	101.0	153.00	-	2	48.0	3.510	●
SCD 194-077-200 ACP5	19.40	20.00	77.0	101.0	153.00	-	2	48.0	3.530	●
SCD 195-077-200 ACP5	19.50	20.00	77.0	101.0	153.00	M22	2	48.0	3.550	●
SCD 196-077-200 ACP5	19.60	20.00	77.0	101.0	153.00	-	2	48.0	3.570	●
SCD 197-077-200 ACP5	19.70	20.00	77.0	101.0	153.00	-	2	48.0	3.590	●
SCD 198-077-200 ACP5	19.80	20.00	77.0	101.0	153.00	-	2	48.0	3.600	●
SCD 199-077-200 ACP5	19.90	20.00	77.0	101.0	153.00	-	2	48.0	3.620	●
SCD 200-077-200 ACP5	20.00	20.00	77.0	101.0	153.00	-	2	48.0	3.640	●

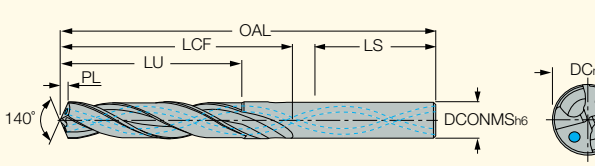
- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

(1) Used for standard thread size

SOLIDDRILL

SCD-ACP5 (5xD)
Solid Carbide Drills with Coolant Holes, Drilling Depth 5xD

DC	Tolerance m7
.118-.236	.00016-.00063
.236-.394	.00024-.00083
.394-.709	.00028-.00099
.709- .827	.00031-.00114



I N C H

Designation	Dimensions DC	DCONMS	LU	LCF	OAL	LS	FTDZ(1)	PL	IC908
SCD 0484-276-0500ACP5	.484	.500	2.190	2.76	4.650	1.790	31/64	.08800	●
SCD 0491-276-0500ACP5	.491	.500	2.190	2.76	4.650	1.790	-	.08900	●
SCD 0500-276-0500ACP5	.500	.500	2.190	2.76	4.650	1.790	9/16-18 UNF	.09100	●
SCD 0508-299-0562ACP5	.508	.562	2.360	2.99	4.880	1.790	-	.09200	●
SCD 0515-299-0562ACP5	.515	.562	2.360	2.99	4.880	1.790	33/64	.09400	●
SCD 0531-299-0562ACP5	.531	.562	2.360	2.99	4.880	1.790	-	.09700	●
SCD 0562-299-0562ACP5	.562	.562	2.360	2.99	4.880	1.790	5/8-18 UNF	.10200	●
SCD 0625-323-0625ACP5	.625	.625	2.540	2.54	5.240	1.910	-	.11400	●
SCD 0656-362-0687ACP5	.656	.687	2.870	3.62	5.630	1.910	21/32	.11900	●
SCD 0687-362-0687ACP5	.687	.687	2.870	3.62	5.630	1.910	3/4-16 UNF	.12500	●
SCD 0750-374-0750ACP5	.750	.750	2.930	3.74	5.830	1.990	-	.13600	●
SCD 0813-441-0875ACP5	.813	.875	3.490	4.41	6.580	2.070	-	.14800	●

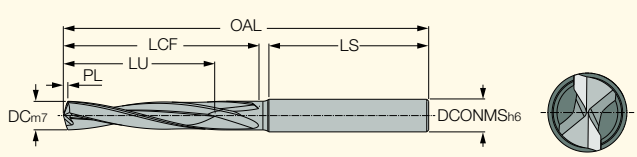
- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

(1) Used for standard thread size

SOLIDDRILL

SCD-AH5 (5xD)
Solid Carbide Drills for Hard Materials, Drilling Depth 5xD

DC	Tolerance m7
3.00-6	0.004-0.016
6.01-10	0.008-0.021
10.01-18	0.007-0.025
18.01-21	0.008-0.029



M E T R I C

Designation	Dimensions DC	LU	LCF	DCONMS	LS	OAL	FTDZ(1)	PL	IC903
SCD 030-015-060 AH5	3.00	15.0	26.0	6.00	35.0	66.00	-	0.550	●
SCD 033-017-060 AH5	3.30	16.5	26.0	6.00	35.0	66.00	M4	0.600	●
SCD 040-020-060 AH5	4.00	20.0	29.0	6.00	32.0	66.00	-	0.730	●
SCD 042-021-060 AH5	4.20	21.0	32.0	6.00	46.0	82.00	M5	0.760	●
SCD 045-023-060 AH5	4.50	22.5	32.0	6.00	46.0	82.00	-	0.820	●
SCD 050-025-060 AH5	5.00	25.0	37.0	6.00	41.0	82.00	M6	0.910	●
SCD 053-027-060 AH5	5.30	26.5	39.0	6.00	37.0	82.00	-	0.960	●
SCD 060-030-060 AH5	6.00	30.0	43.0	6.00	37.0	82.00	M7	1.090	●
SCD 068-034-080 AH5	6.80	34.0	49.0	8.00	39.0	91.00	M8	1.240	●
SCD 070-035-080 AH5	7.00	35.0	49.0	8.00	39.0	91.00	-	1.270	●
SCD 078-039-080 AH5	7.80	42.0	55.0	8.00	34.0	91.00	M9	1.420	●
SCD 080-040-080 AH5	8.00	40.0	55.0	8.00	34.0	91.00	-	1.460	●
SCD 085-043-100 AH5	8.50	42.5	59.0	10.00	46.0	112.00	M10	1.550	●
SCD 088-044-100 AH5	8.80	44.0	63.0	10.00	46.0	112.00	-	1.600	●
SCD 090-045-100 AH5	9.00	45.0	63.0	10.00	46.0	112.00	-	1.640	●
SCD 100-050-100 AH5	10.00	50.0	70.0	10.00	39.0	112.00	-	1.820	●
SCD 105-053-120 AH5	10.50	52.5	71.0	12.00	45.0	122.00	-	1.910	●

- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

(1) Used for standard thread size

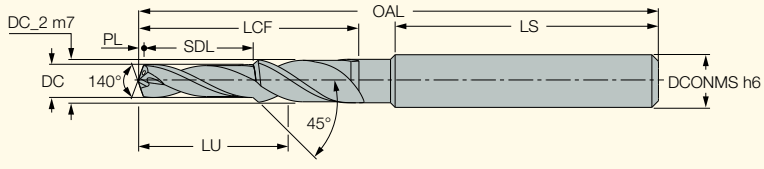
Recommended Machining Conditions for SCD-AH5 Solid Carbide Drills

ISO	Material	Hardness	Material No.	Cutting Speed V_c (m/min)	Feed vs. Drill Diameter (mm/rev) Ø3-5	Ø5.1-8	Ø8.1-12
H	hardened steel	50-55 HRC	38	25-40	0.04-0.07	0.05-0.08	0.06-0.10
	hardened steel	56-60 HRC	39	15-25	0.03-0.06	0.04-0.07	0.05-0.08
	hardened steel	61-70 HRC	39	10-15	0.02-0.04	0.03-0.05	0.03-0.05

Materials over 50 HRC must be used with external coolant while machining.
Use of semi-synthetic or emulsion with more than 6% oil concentration is highly recommended to extend tool life and hole quality.

SOLIDDRILL
PRETHREAD

SCDT
Pre-Thread Solid Carbide Drills with Coolant Holes



M E T R I C

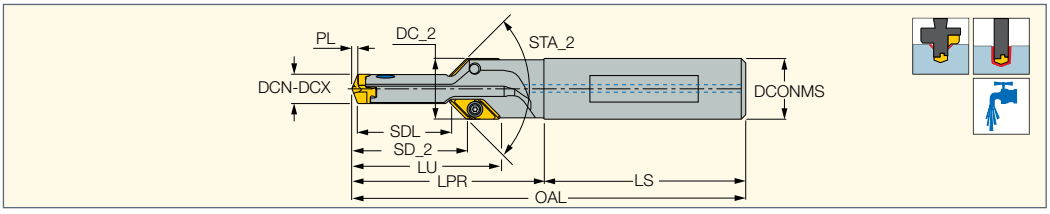
Designation	Dimensions DC	SDL	DCONMS	FTDZ(1)	DC_2	PL	LU	LCF	OAL	LS	IC908
SCDT 025-009-060-M3	2.50	8.8	6.00	M3	4.00	0.450	16.00	20.0	62.00	36.0	●
SCDT 033-011-060-M4	3.30	11.4	6.00	M4	4.50	0.600	19.00	24.0	62.00	36.0	●
SCDT 042-014-060-M5	4.20	13.6	6.00	M5	5.50	0.760	22.00	28.0	66.00	36.0	●
SCDT 050-017-080-M6	5.00	16.5	8.00	M6	6.60	0.910	27.00	34.0	79.00	40.0	●
SCDT 068-021-100-M8	6.80	21.0	10.00	M8	9.00	1.240	38.00	47.0	89.00	40.0	●
SCDT 085-026-120-M10	8.50	25.5	12.00	M10	11.00	1.550	45.00	55.0	102.00	40.0	●

- For user guide and cutting conditions, see pages 62-66, 71-76
- For regrinding instructions, see page 67-70

(1) Used for standard thread size

PRETHREAD

DCT (M8-M24)
Drill Body with Exchangeable Heads, Chamfering Inserts, Internal Coolant and One Flat Shank. Used for Pre-Tread Holes.



	M E T R I C																
Designation	DCN[2]	Dnominal[3]	DCX[4]	DC_2	DCONMS	SDL	LU	LPR	OAL	LS	STA_2	PL	SSC[5]	FTDZ[6]	SD_2	MIID[7]	MIID_2[8]
DCT 068-021-14B-M8 [1]	6.80	6.80	7.40	13.90	14.00	20.9	31.70	43.10	88.14	45.0	90.0	1.240	6.8	M8	25.74	IDI 068	AOMT 06
DCT 085-026-14B-M10	8.30	8.50	8.90	14.00	14.00	26.3	36.60	48.00	93.05	45.0	90.0	1.550	8.0	M10	30.55	IDI 085	AOMT 06
DCT 102-030-14B-M12	10.00	10.20	10.90	14.00	14.00	30.0	39.80	53.90	98.86	45.0	90.0	1.860	10.0	M12	33.76	IDI 102	AOMT 06
DCT 120-035-16B-M14	12.00	12.00	12.90	16.00	16.00	34.9	45.10	60.20	108.18	48.0	90.0	2.180	12.0	M14	39.08	IDI 120	AOMT 06
DCT 140-039-18B-M16	14.00	14.00	14.90	18.00	18.00	39.0	49.60	62.50	110.55	48.0	90.0	2.550	14.0	M16	43.55	IDI 140	AOMT 06
DCT 175-042-20B-M20	17.30	17.50	17.90	21.00	20.00	42.0	53.00	66.20	116.18	50.0	90.0	3.180	17.0	M20	46.98	IDI 175	AOMT 06
DCT 210-048-25B-M24	21.00	21.00	21.90	25.50	25.00	48.2	60.30	72.80	128.82	56.0	90.0	3.820	21.0	M24	54.32	IDI 210	AOMT 06

• Hole tolerance: D+0.05 in average conditions. However, it can be higher or lower according to machine and tooling conditions • Do not mount smaller drilling heads other than the specified range of the drill body

[1] Reduce recommended feed for DCT 6.8 mm drills by 10%
[2] Cutting diameter minimum
[3] Pre-thread hole diameter
[4] Cutting diameter maximum
[5] Seat size code
[6] Used for standard thread size
[7] Master insert identification
[8] Master insert identification 2

Inserts: AOMT-Chamfering • IDI-SG • IDI-SK

	I N C H													
Designation	DCN[1]	Dnominal[2]	DCX[3]	DC_2	DCONMS	SDL	LPR	SD_2	LU	OAL	LS	STA_2	PL	SSC[4]	FTDZ[5]
DCT 0311-100-063B-3/8UNC	.303	.311	.352	.590	.625	1.000	1.860	1.2050	1.4400	3.750	1.89	90.0	.05500	8.0	3/8UNC
DCT 0331-100-063B-3/8UNF	.323	.331	.352	.610	.625	1.000	1.860	1.2090	1.4500	3.750	1.89	90.0	.05900	8.0	3/8UNF
DCT 0366-106-063B-7/16UNC	.358	.366	.392	.630	.625	1.060	1.900	1.2650	1.5000	3.790	1.89	90.0	.06500	9.0	7/16UNC
DCT 0390-106-063B-7/16UNF	.382	.390	.392	.630	.625	1.060	1.900	1.2500	1.4900	3.790	1.89	90.0	.07000	9.0	7/16UNF
DCT 0421-106-063B-1/2UNC	.413	.421	.430	.630	.625	1.060	1.970	1.2450	1.4800	3.860	1.89	90.0	.07500	10.0	1/2UNC
DCT 0453-106-063B-1/2UNF	.445	.453	.471	.630	.625	1.060	1.970	1.2310	1.4700	3.860	1.89	90.0	.08100	11.0	1/2UNF
DCT 0484-106-063B-9/16UNC	.476	.484	.510	.630	.625	1.060	1.980	1.2270	1.4600	3.870	1.89	90.0	.08700	12.0	9/16UNC
DCT 0516-106-063B-9/16UNF	.512	.516	.550	.630	.625	1.060	1.980	1.2130	1.4500	3.870	1.89	90.0	.09300	13.0	9/16UNF
DCT 0531-120-075B-5/8UNC	.524	.531	.550	.750	.750	1.200	2.110	1.4150	1.6500	4.080	1.97	90.0	.09500	13.0	5/8UNC
DCT 0579-120-075B-5/8UNF	.571	.579	.589	.750	.750	1.200	2.130	1.3940	1.6300	4.100	1.97	90.0	.10400	14.0	5/8UNF
DCT 0657-140-075B-3/4UNC	.650	.657	.665	.780	.750	1.400	2.320	1.5680	1.8000	4.290	1.97	90.0	.11800	16.0	3/4UNC
DCT 0689-140-100B-3/4UNF	.681	.689	.707	.880	1.000	1.400	2.320	1.6240	1.8600	4.520	2.20	90.0	.12400	17.0	3/4UNF
DCT 0764-165-100B-7/8UNC	.756	.764	.786	1.000	1.000	1.650	2.620	1.9170	2.1500	4.820	2.20	90.0	.13700	19.0	7/8UNC
DCT 0811-165-100B-7/8UNF	.803	.811	.825	1.000	1.000	1.650	2.630	1.8960	2.1300	4.830	2.20	90.0	.14600	20.0	7/8UNF

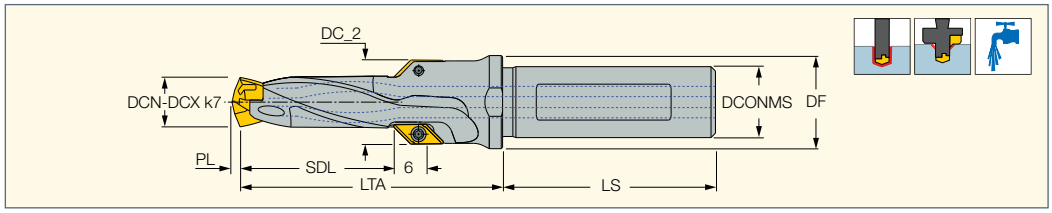
• Hole tolerance: D+.002 in average conditions. However, it can be higher or lower according to machine and tooling conditions • Do not mount smaller drilling heads other than the specified range of the drill body

[1] Cutting diameter minimum
[2] Pre-thread hole diameter
[3] Cutting diameter maximum
[4] Seat size code
[5] Used for standard thread size

Inserts: AOMT-Chamfering • IDI-SG • IDI-SK

PRETHREAD

DCNT (M8-M24)
Drill Body with Exchangeable Heads, Chamfering Inserts, Internal Coolant and One Flat Shank. Used for Pre-Tread Holes



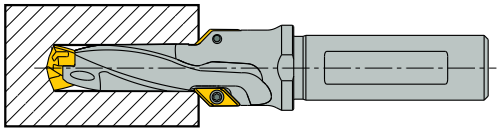
	M E T R I C													
Designation	**Dnominal(1)**	**FTDZ(2)**	**DCN(3)**	**DCX(4)**	**DC_2**	**SDL**	**PL**	**LTA**	**DCONMS**	**DF**	**LS**	**SSC(5)**	**MIID(6)**	**MIID_2(7)**
DCNT 068-021-12A-M8	6.80	M8	6.50	6.90	13.50	21.00	1.240	43.80	12.00	16.00	45.0	6.5	ICP 068	AOMT 06
DCNT 085-026-12A-M10	8.50	M10	8.50	8.90	15.50	26.00	1.200	48.80	12.00	17.00	45.0	8.0	ICP 085	AOMT 06
DCNT 102-030-16A-M12	10.20	M12	10.00	10.40	17.00	30.00	1.500	52.50	16.00	20.00	48.0	10.0	ICP 102	AOMT 06
DCNT 120-035-16A-M14	12.00	M14	12.00	12.40	19.00	35.00	1.800	61.00	16.00	21.00	48.0	12.0	ICP 120	AOMT 06
DCNT 140-039-16A-M16	14.00	M16	14.00	14.40	21.00	39.00	2.100	66.90	16.00	23.00	48.0	14.0	ICP 140	AOMT 06
DCNT 175-042-20A-M20	17.50	M20	17.00	17.90	24.00	42.00	2.700	69.30	20.00	25.00	50.0	17.0	ICP 175	AOMT 06
DCNT 210-048-25A-M24	21.00	M24	21.00	21.90	28.00	48.00	3.200	80.00	25.00	32.00	56.0	21.0	ICP 210	AOMT 06

• Hole tolerance: D+0.05 in average conditions. However, it can be higher or lower according to machine and tooling conditions • Do not mount smaller drilling heads other than the specified range of the drill body

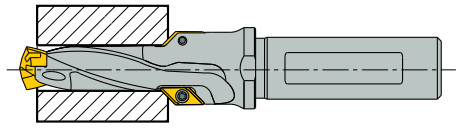
(1) Pre-thread hole diameter
(2) Used for standard thread size
(3) Cutting diameter minimum
(4) Cutting diameter maximum
(5) Seat size code
(6) Master insert identification
(7) Master insert identification 2

Inserts: IHP-BD • ICP • ICP-2M • ICK • ICK-2M • ICM • ICN • QCP-2M • HCP-IQ • FCP • ICG • IHP • AOMT-Chamfering

1 Drilling pre-thread blind holes:
drilling with a 45° chamfer



2 Drilling pre-thread through holes:
drilling with a 45° chamfer



Pre-Thread Recommended Hole Diameters with DCNT Drills

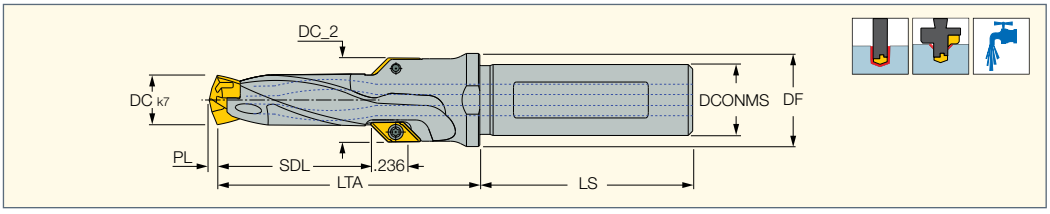
Drill Designation	Dia. Range	M Thread	Head Dia.	MF Head	Head Dia.	TR Thread	Head Dia.	M Helicoil Thread	Head Dia.
DCNT 068-021-12A-M8	6.5-6.99	M8	6.8						
DCNT 085-026-12A-M10	8.5-8.99	M10	8.5	MF10x1 MF10x1.25	8.99 8.8	TR10x1.5	8.6		
DCNT 102-030-16A-M12	10.0-10.99	M12	10.2	MF11x1 MF12x1 MF12x1.25 MF12x1.5	10.0 10.99 10.8 10.5	TR12x2 TR14x4	10.2 10.5	M10	10.5
DCNT 120-035-16A-M14	12.0-12.99	M14	12.0	MF13x1 MF14x1 MF14x1.25 MF14x1.5	12.0 12.99 12.8 12.5	TR14x2 TR16x4	12.2 12.3	M12	12.5
DCNT 140-039-16A-M16	14.0-14.99	M16	14.0	MF16x1 MF16x1.5	14.0 14.99 14.5	TR18x4	14.3	M14	14.99
DCNT 175-042-20A-M20	17.0-17.99	M20	17.5	MF20x2	17.99	TR22x5	17.3		
DCNT 210-048-25A-M24	21.0-21.99	M24	21.0	MF22x1	21.0				

Drill Designation	Dia. Range	UNF Thread	Head Dia.	UNC Thread	Head Dia.	BSW Thread	Head Dia.	BSF Thread	Head Dia.
DCNT 068-021-12A-M8	6.5-6.99								
DCNT 085-026-12A-M10	8.5-8.99	UNF3/8-24	8.5						
DCNT 102-030-16A-M12	10.0-10.99			UNC1/2-13	10.8	BSW1/2-12	10.5	BSF1/2-16	10.99
DCNT 120-035-16A-M14	12.0-12.99			UNC9/16-12	12.3			BSF9/16-16	12.5
DCNT 140-039-16A-M16	14.0-14.99	UNF5/8-18	14.5						
DCNT 175-042-20A-M20	17.0-17.99	UNF3/4-16	17.5						
DCNT 210-048-25A-M24	21.0-21.99								

Drill Designation	Dia. Range	NPT Thread	Head Dia.	BSP Thread	Head Dia.	UNEF Thread	Head Dia.	UNJF Helicoil Thread	Head Dia.
DCNT 068-021-12A-M8	6.5-6.99								
DCNT 085-026-12A-M10	8.5-8.99	NPT1/8-27	8.5	G1/8-28	8.8	UNEF3/8-32	8.7	UNJF3/8-24	8.6
DCNT 102-030-16A-M12	10.0-10.99								
DCNT 120-035-16A-M14	12.0-12.99								
DCNT 140-039-16A-M16	14.0-14.99	NPT3/8-18	14.5			UNEF5/8-24	14.8	UNJF5/8-18	14.5
DCNT 175-042-20A-M20	17.0-17.99	NPT1/2-14	17.5			UNEF3/4-20	17.8		
DCNT 210-048-25A-M24	21.0-21.99								

PRETHREAD

DCNT (M8-M24) (Metric)
Drill Body with Exchangeable Heads, Chamfering Inserts, Internal Coolant and One Flat Shank. Used for Pre-Tread Holes



				I	N	C	H							
Designation	**Dnominal[1]**	**FTDZ[2]**	**DCN[3]**	**DCX[4]**	**DC_2**	**SDL**	**PL**	**LTA**	**DCONMS**	**DF**	**LS**	**SSC[5]**	**MIID[6]**	**MIID_2[7]**
DCNT 068-021-12A-M8	.268	M8	.256	.272	.531	.8268	.04881	1.724	.472	.630	1.772	6.5	ICP 068	AOMT 06
DCNT 085-026-12A-M10	.335	M10	.335	.350	.610	1.0236	.04724	1.921	.472	.669	1.772	8.0	ICP 085	AOMT 06
DCNT 102-030-16A-M12	.402	M12	.394	.409	.669	1.1811	.05905	2.067	.630	.787	1.890	10.0	ICP 102	AOMT 06
DCNT 120-035-16A-M14	.472	M14	.472	.488	.748	1.3780	.07086	2.402	.630	.827	1.890	12.0	ICP 120	AOMT 06
DCNT 140-039-16A-M16	.551	M16	.551	.567	.827	1.5354	.08267	2.634	.630	.906	1.890	14.0	ICP 140	AOMT 06
DCNT 175-042-20A-M20	.689	M20	.669	.705	.945	1.6535	.10629	2.728	.787	.984	1.968	17.0	ICP 175	AOMT 06
DCNT 210-048-25A-M24	.827	M24	.827	.862	1.102	1.8898	.12598	3.150	.984	1.260	2.205	21.0	ICP 210	AOMT 06

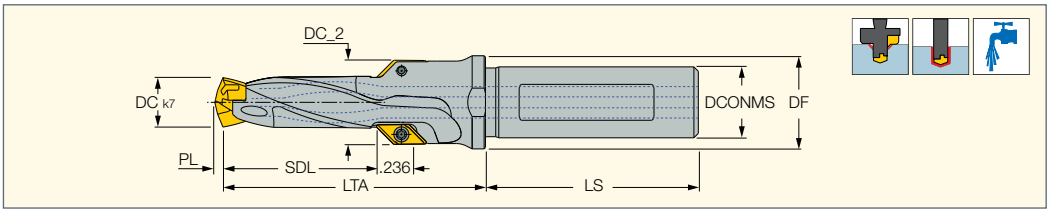
• Hole tolerance: D+.002" in average conditions. However, it can be higher or lower according to machine and tooling conditions • Do not mount smaller drilling heads other than the specified range of the drill body

(1) Pre-thread hole diameter
(2) Used for standard thread size
(3) Cutting diameter minimum
(4) Cutting diameter maximum
(5) Seat size code
(6) Master insert identification
(7) Master insert identification 2

Inserts: IHP-BD • ICP • ICP-2M • ICK • ICK-2M • ICM • ICN • QCP-2M • HCP-IQ • FCP • ICG • IHP • AOMT-Chamfering

PRETHREAD

DCNT (UNC/UNF)
Drill Body with Exchangeable Heads, Chamfering Inserts, Internal Coolant and One Flat Shank. Used for Pre-Tread Holes.



				I	N	C	H						
Designation	**Dnominal[1]**	**FTDZ[2]**	**DCN[3]**	**DCX[4]**	**DC_2**	**SDL**	**PL**	**LTA**	**DCONMS**	**DF**	**LS**	**SSC[5]**	**MIID[6]**
DCNT 0315-100-050A-3/8UNC	.315	3/8	.315	.331	.590	1.0000	.04700	1.950	.500	.669	1.770	8.0	AOMT
DCNT0370-106-050A-7/16UNC	.370	7/8	.354	.370	.630	1.0600	.05600	2.060	.500	.709	1.770	9.0	AOMT
DCNT0425-106-063A-1/2UNC	.425	1/2	.413	.429	.689	1.0600	.06500	2.090	.625	.787	1.890	10.0	AOMT
DCNT0484-106-063A-9/16UNC	.484	9/16	.472	.488	.748	1.0600	.07400	2.150	.625	.827	1.890	12.0	AOMT
DCNT0531-120-063A-5/8UNC	.531	5/8	.512	.528	.787	1.2000	.08100	2.300	.625	.866	1.890	13.0	AOMT
DCNT0650-140-075A-3/4UNC	.650	3/4	.630	.665	.905	1.4000	.09900	2.640	.750	.984	1.970	16.0	AOMT
DCNT0768-165-100A-7/8UNC	.768	7/8	.748	.783	1.024	1.6500	.11700	3.010	1.000	1.260	2.200	19.0	AOMT
DCNT 0335-100-050A-3/8UNF	.335	3/8	.315	.331	.590	1.0000	.05100	1.950	.500	.669	1.770	8.0	AOMT
DCNT0390-106-050A-7/16UNF	.390	7/16	.374	.390	.650	1.0600	.06000	2.060	.500	.709	1.770	9.0	AOMT
DCNT0453-106-063A-1/2UNF	.453	1/2	.453	.469	.728	1.0600	.06900	2.120	.625	.787	1.890	11.0	AOMT
DCNT0508-106-063A-9/16UNF	.508	9/16	.492	.508	.768	1.0600	.07800	2.170	.625	.827	1.890	12.0	AOMT
DCNT0571-120-063A-5/8UNF	.571	5/8	.571	.587	.827	1.2000	.08700	2.340	.625	.906	1.890	14.0	AOMT
DCNT0689-140-075A-3/4UNF	.689	3/4	.669	.705	.945	1.4000	.10600	2.700	.750	1.063	1.970	17.0	AOMT
DCNT0807-165-100A-7/8UNF	.807	7/8	.787	.823	1.063	1.6500	.12200	3.080	1.000	1.260	2.200	20.0	AOMT

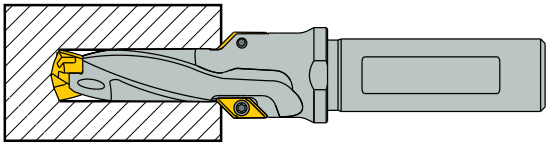
• Hole tolerance: D+.002" in average conditions. However, it can be higher or lower according to machine and tooling conditions • Do not mount smaller drilling heads other than the specified range of the drill body.

(1) Pre-thread hole diameter
(2) Used for standard thread size
(3) Cutting diameter minimum
(4) Cutting diameter maximum
(5) Seat size code
(6) Master insert identification

Inserts: IHP • IHP-BD • ICP • ICP-2M • ICK • ICK-2M • ICM • ICN • QCP-2M • HCP-IQ • FCP • ICG • AOMT-Chamfering

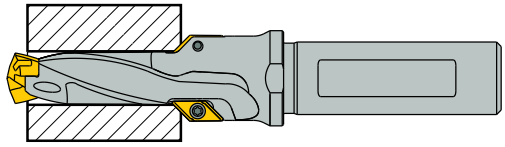
1 Drilling pre-thread blind holes:

drilling with a 45° chamfer



2 Drilling pre-thread through holes:

drilling with a 45° chamfer



Pre-Thread Recommended Hole Diameters with DCNT Drills

Drill Designation	Dia. Range	UNF Thread	Head Dia.	UNC Thread	Head Dia.	UNC Helicoil Thread	Head Dia.	BSW Thread	Head Dia.	BSF Thread	Head Dia.
DCNT 0315-100-050A-3/8UNC	.315 - .354	UNF3/8-24	.335	UNC3/8-16	.315	UNC5/16-18	.331				
DCNT 0370-106-050A-7/16UNC	.354 - .393	UNF7/16-20	.390	UNC7/16-14	.370						
DCNT 0425-106-063A-1/2UNC	.413 - .429			UNC1/2-13	.425			BSW1/2-12	.413	BSF1/2-16	.429
DCNT 0484-106-063A-9/16UNC	.472 - .511	UNF9/16-18	.508	UNC9/16-12	.484					BSF9/16-16	.492
DCNT 0531-120-063A-5/8UNC	.512 - .551			UNC5/8-11	.531						
DCNT 0650-140-075A-3/4UNC	.630 - .669			UNC3/4-10	.650						
DCNT 0768-165-100A-7/8UNC	.748 - .787			UNC7/8-9	.768						

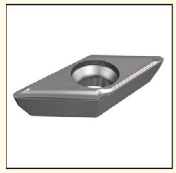
Drill Designation	Dia. Range	NPT Thread	Head Dia.	BSP Thread	Head Dia.	UNEF Thread	Head Dia.	UNJF Helicoil Thread	Head Dia.
DCNT 0315-100-050A-3/8UNC	.315 - .354	NPT1/8-27	.335	G1/8-28	.346	UNEF3/8-32	.343	UNJF3/8-24	.339

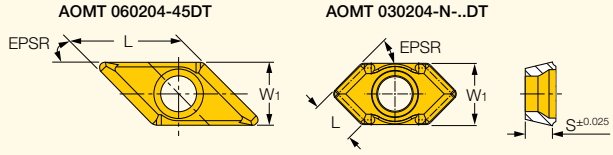
Drill Designation	Dia. Range	UNF Thread	Head Dia.	UNC Thread	Head Dia.	UNC Helicoil Thread	Head Dia.	BSF Thread	Head Dia.
DCNT 0335-100-050A-3/8UNF	.315 - .354	UNF3/8-24	.335	UNC3/8-16	.315	UNC5/16-18	.331		
DCNT 0390-106-050A-7/16UNF	.374 - .393	UNF7/16-20	.390						
DCNT 0453-106-063A-1/2UNF	.453 - .472	UNF1/2-20	.453						
DCNT 0508-106-063A-9/16UNF	.492 - .511	UNF9/16-18	.508					BSF9/16-16	.492
DCNT 0571-120-063A-5/8UNF	.551 - .590	UNF5/8-18	.571						
DCNT 0689-140-075A-3/4UNF	.669 - .708	UNF3/4-16	.689						
DCNT 0807-165-100A-7/8UNF	.787 - .826	UNF7/8-14	.807						

Drill Designation	Dia. Range	NPT Thread	Head Dia.	BSP Thread	Head Dia.	UNEF Thread	Head Dia.	UNJF Helicoil Thread	Head Dia.
DCNT 0335-100-050A-3/8UNF	.315 - .354	NPT1/8-27	.335	G1/8-28	.346	UNEF3/8-32	.343	UNJF3/8-24	.339
DCNT 0571-120-063A-5/8UNF	.551 - .590	NPT3/8-18	.571			UNEF5/8-24	.583	UNJF5/8-18	.571
DCNT 0689-140-075A-3/4UNF	.669 - .708	NPT1/2-14	.689			UNEF3/4-20	.701		

PRETHREAD

AOMT-Chamfering
Chamfering Inserts





M E T R I C

Designation	Dimensions L	W1	S	EPSR	Tough ↔ Hard IC1008	IC508	IC908
AOMT 060204-45DT	5.66	4.50	1.96	45.5		●	●
AOMT 060204-45HD (1)	5.66	4.50	1.96	45.5			●
AOMT 030204-N-45DT (2)	2.80	4.00	1.59	45.5	●		
AOMT 030204-N-30DT (2)	4.00	4.00	1.59	30.5	●		

- The cutting speed is dependent on the drilling insert being used

(1) For low carbon steel

(2) Used for specially tailored tools

Inserts: IHP-BD • ICP • ICP-2M • ICK • ICK-2M • ICM • ICN • QCP-2M • HCP-IQ • FCP • ICG • IHP • AOMT-Chamfering

I N C H

Designation	Dimensions L	W1	S	EPSR	Tough ↔ Hard IC1008	IC508	IC908
AOMT 060204-45DT	.223	.177	.077	45.5		●	●
AOMT 060204-45HD (1)	.223	.177	.077	45.5			●
AOMT 030204-N-45DT (2)	.110	.157	.063	45.5	●		
AOMT 030204-N-30DT (2)	.157	.157	.063	30.5	●		

- The cutting speed is dependent on the drilling insert being used

(1) For low carbon steel

(2) Used for specially tailored tools

Inserts: IHP • IHP-BD • ICP • ICP-2M • ICK • ICK-2M • ICM • ICN • QCP-2M • HCP-IQ • FCP • ICG • AOMT-Chamfering

Materials

Material Groups

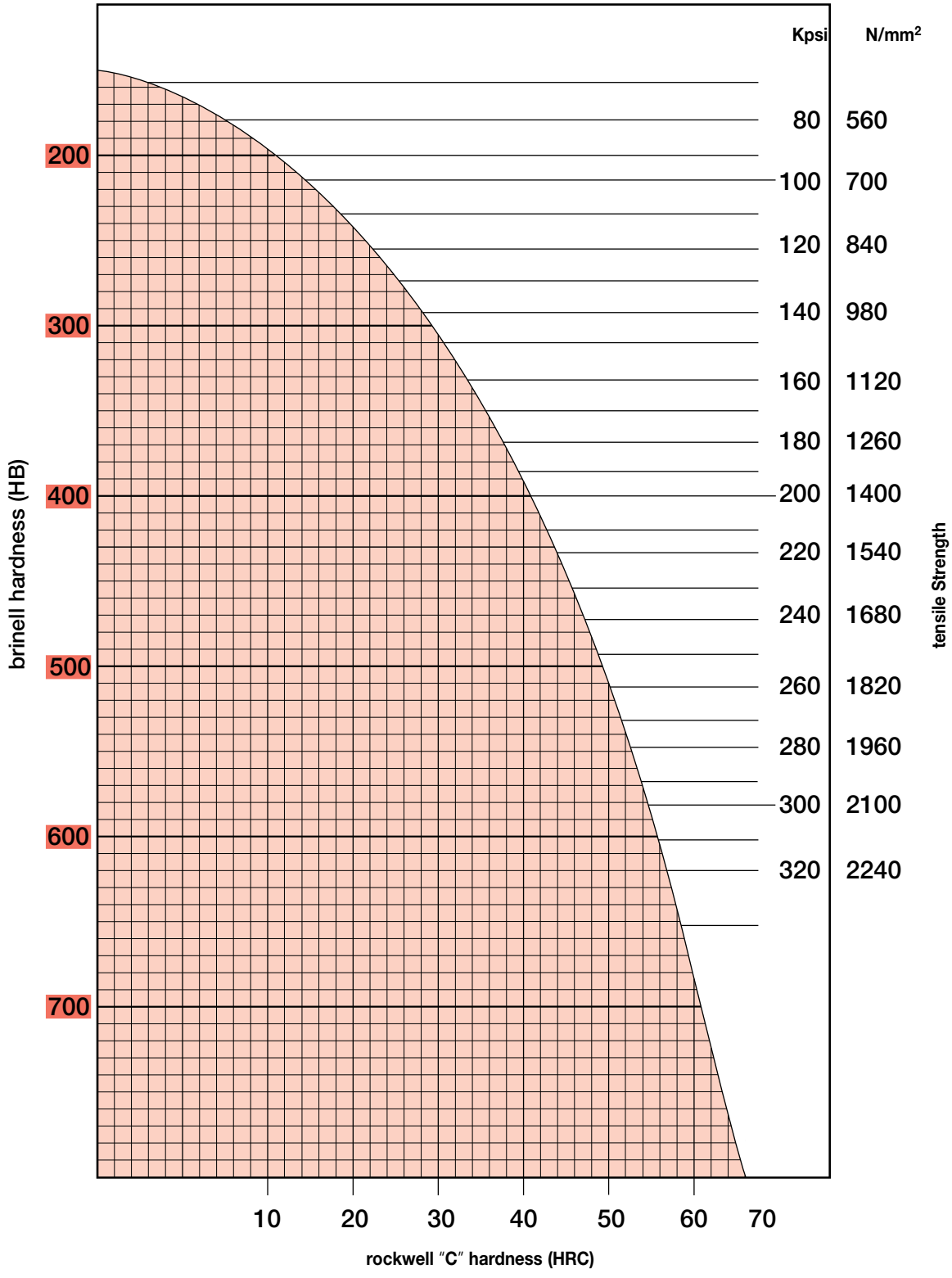
According to DIN / ISO 513 and VDI 3323

ISO	Material		Condition	Tensile Strength [N/mm²]	Kc1(1) [N/mm²]	mc(2)	Hardness HB	Material Group No.
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	1350	0.21	125	1
		≥0.25% C	annealed	650	1525	0.22	190	2
		<0.55% C	quenched and tempered	850	1675	0.24	250	3
		≥0.55% C	annealed	750	1675	0.24	220	4
			quenched and tempered	1000	1900	0.24	300	5
	low alloy and cast steel (less than 5% of alloying elements)		annealed	600	1775	0.24	200	6
			quenched and tempered	930	1675	0.24	275	7
				1000	1725	0.24	300	8
				1200	1800	0.24	350	9
	high alloyed steel, cast steel and tool steel		annealed	680	2450	0.23	200	10
			quenched and tempered	1100	2500	0.23	325	11
	stainless steel and cast steel		ferritic / martensitic	680	1875	0.21	200	12
			martensitic	820	1875	0.21	240	13
M	stainless steel and cast steel		austenitic, duplex	600	2150	0.20	180	14
K	gray cast iron (GG)		ferritic / pearlitic		1150	0.20	180	15
			pearlitic / martensitic		1350	0.28	260	16
	nodular cast iron (GGG)		ferritic		1225	0.25	160	17
			pearlitic		1350	0.28	250	18
	malleable cast iron		ferritic		1225	0.25	130	19
			pearlitic		1420	0.3	230	20
N	aluminum-wrought alloys		not hardenable		700	0.25	60	21
			hardenable		800	0.25	100	22
	aluminum-cast alloys	≤12% Si	not hardenable		700	0.25	75	23
			hardenable		700	0.28	90	24
		>12% Si	high temperature		750	0.25	130	25
	copper alloys	>1% Pb	free cutting		700	0.27	110	26
			brass		700	0.27	90	27
			electrolytic copper		700	0.27	100	28
	non metallic		duroplastics, fiber plastics		200	0.20	70 Shore D	29
			hard rubber		200	0.20	55 Shore D	30
S	high temperature alloys	Fe based	annealed		2600	0.24	200	31
			hardened		3100	0.24	280	32
		Ni or Co based	annealed		3300	0.24	250	33
			hardened		3300	0.24	350	34
			cast		3300	0.24	320	35
	titanium alloys		pure	400	1160	0.24	190	36
			alpha+beta alloys, hardened	1050	1245	0.24	310	37
H	hardened steel		hardened		4600	0.25	55 HRC	38
			hardened		4700	0.25	60 HRC	39
	chilled cast iron		cast		4600	0.27	400	40
	cast iron		hardened		4500	0.27	55 HRC	41

steel
stainless steel
cast iron
non-ferrous metals
superalloys and titanium
hard materials

(1) Specific cutting force for 1 mm² chip section.
(2) Chip thickness factor.

Hardness Conversion Table



ISCAR MATERIAL GROUPS

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	Euronorm
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	1020; G10200; K02301; K02595; K02596; K02597; K02598; K02599; K02702; K0300	1.0044	S275JR; St 44-2; Fe 430 B	EN 43 B; Fe 430 B FN; 43/25 HR; 43/25HS; 43 B; HFW4; HFS4; ERW 3	E 28-2	1411; 1412	Fe 430 B FN; Fe 430 B	AE 275 B; Fe 430 B FN	SN 400 B; SN 400 C; SN 490 B; SN 490 C; SS 400; STK 400; STKM 19 C; STKR 400; 19 C; SS 41; STK 41	St4ps; St4sp	S275JR
1		1.0050	E295; St 50-2; Fe 490-2; ST 50-2 G (E295+CR)	Fe 490-2 FN; 50 B	A 50-2	1550; 2172	Fe 490	A 490-2; Fe 490-2 FN	SS 490; SS 50	St5ps; St5sp	
1	K02404; K02702	1.0045	S355JR; Fe 510 B	50 B; 4360-50 B	E 36-2		Fe 510 B FN	AE 355 B	SN 400 B; SN 400 C; SN 490 B; SN 490 C; SS 490; SS 50		S355JR
1	K02702	1.0143	S275J0; St 44-3 U; Fe 430 C	43C; 4360-43C	E 28-3	1414-01	Fe 430 C FN	AE 275 D			S275J0
1		1.0130	P265S; SPH 265	164-400B LT 20	SPH 265; A 42 AP			SPH 265			P265S
1	A 619	1.0333	DC03G1; USt 3; USt 13	2 CR; 3 CR	E		FeP 02	AP 02	SPCD		DC03G1
1	K02601; K03000; A 573 Gr. 70; A 611 Gr.D	1.0144	S275J2G3 (S275J2); St 44-3 (Fe 430 D 1)	Fe 430 D1 FF; 4360-43 C; 4360-43 D	E 28-3; E 28-4	1411; 1412; 1414	Fe 430 B; Fe 430 C (FN); Fe 430 D (FF)	AE 275 D; Fe 430 D1 FF	SM 400 A; SM 400 B; SM 400 C; SS 400; STK 400; STKR 400; SM 41 A; SM 41 B; SM 41 C	St4kp; St4ps; St4sp	
1	1008; G10080; A 621	1.0330	DC01; DC 01; St 2; St 12	CR 4; CS 4	C; TC	1142	FeP 01; FeP 00	AP 11; FeP 01; AP 00	SPCC; CR 1		DC01 (FeP 05)
1	1015; G10150; K02401	1.0037	S235JR (Fe 360 B); St 37-2	Fe 360 B; 4360-40 B; ERW 3; CEW 3; 37/23 HR; 37/23 HS; 37/23 CR; 37/23 CS	E 24-2	1311	Fe 360 B; 1449 37/23 HR	AE 235 B; Fe 360 B	STKM 12 A; STKM 12 AC		
1		1.0035	S185 (Fe 310-0); St 33	Fe 310-0; 15 HR; 15 HS; 1449 15 HR; 1449 15 HS	A 33	1300	Fe 320	Fe 310-0; A 310-0	SGP; SS 330; SS 34	St0	S185
1	K02502	1.0034	E195; RSt 34-2	CEW 2; 34/20 HR; 34/20 HS; 34/20 CR; 1449 34/20CS	A 34-2 NE		Fe 330 BFN			St2ps; St2sp	E195
1		1.0334	DD12G1; UStW 23		2 C		FeP 12	AP 12	SPHD	10kp	
1	1006; G10060	1.0335	DD13; StW 24	1 CR; 1 CS; 1 HR; 2 HR; 2 HS; 2 CR; 2 CS	3 C		FeP 13	AP13	SPHE	08kp	DD13
1	A 620	1.0338	DC04; St 4; St 14	CR 1; CR 2	ES	1147	FeP 04	AP 04; FeP 04	SPCE; HR 4	08JuA	DC04 (FeP 04)
1	K01700; K02001; K02200; K02201; K02203; K02503; K02601; K02801	1.0345	P235GH; HI; H I	141-360; 151-360; 154-360; 161-360; 164-360	A 37 CP	1330; 1331	FeE 235; Fe 360 1 KW; Fe 360 1 KG; Fe 360 2 KW; Fe 360 2 KG	A 37 Grado RA II; A 37 Grado RC I	SGV 410; SGV 450; SGV 480; SPV 235; SPV 450; SPV 490; SGV 42; SGV 46; SGV 49; SPV 24; SPV 46; SPV 50		P235GH

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	Euronorm
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	1010; G10100	1.0301	C10; C 10	040 A 10; 045 M 10; En 2 A; En 2 A/1; En 2 B; En 32 A; 10 CS	C10RR; XC 10; C 10; AF 34 C 10		1 C 10; C 10	F.151; F.151.A	S 10C	10	C10
1		1.0149	S275JOH; St 44-3 U; RoSt 44-2	43 C; 4360-43C	E 28-3	1412-04	Fe 430 C	Fe 430 C; AE 275 C			S275JOH
1		1.0226	DX51D; St 02 Z	Z2	GC	1151 10	FeP 02 G	FeP 02 G	SGC C		
1	A 1011 (SS Grade 36 (230) Type 2); A1011 (SS Grade 36 (250) Type 1)	1.0114	S235JO; St 37-3 U; Fe 360 C	40 C; 4360-40C	E 24-3		Fe 360 C FN	AE 235 C	SS 330; SS 34		S235JO
1	A572-60	1.8900	S380N; StE 380	4360 55 E		2145	FeE 390 KG		S 25 C		S380N
1	A 572 Gr. 65	1.0060	E335; St 60-2 (Fe 590-2 B)	En 55 C; Fe 590-2-FN; 55 E; 4360-55 E	A 60-2	1650	Fe 590; Fe 60-2	A 590; Fe 590-2 FN	SM 570; SM 58	St6ps; St6sp	E335
1		1.0028	S250G1T; USt 34-2		A 34-2		Fe 330; Fe 330 B FU		SS 330; SS 34		
1	K01700; K02200; K02801	1.0112	P235S; SPH 235	164-360B LT20; 1501-164-360B LT20	A 37 AP; SPH 235		Fe 360 C	AE 235 C			P235S
1		1.0722	10SPb20; 10 SPb 20		10 PbF 2		CF 10 SPb 20	10 SPb 20; F.2122			10SPb20
1	1108; 1109; 1111; B1111; B 1111; G11080; G11090	1.0721	10S20; 10 S 20		10 F 2		CF 10 S 20	10 S 20; F. 2121			10S20
1	12L13; 12L14; 12 L 13; 12 L 14; G12134; G12144	1.0718	11SMnPb30; 9 SMnPb 28	230 M 07 Pb; En 1A Pb	S 250 Pb	1914	CF 9 SMnPb 28	F.210.C; F.210.M; 11 SMnPb 28; F.2112	SUM 22 L; SUM 23 L; SUM 24 L		11SMnPb30
1	1213; 1215; G12130; G12150	1.0715	11SMn30; 9 SMn 28	230 M 07; En 1 A	S 250	1912	CF 9 S 22	F.210.A; F.210.L; 11 SMn 28; F.2111	SUM 22		11SMn30
1	1020; 1023; G10200; G10230	1.1151	C22E; Ck 22	055 M 15; 070 M 20; En 3 A; En 3 C; En 2	XC 25; XC 18; 2 C 22	1450	C 20; C 25	F.1120; C 25 K	S 20 C; S 20 CK; S 22 C	20	C22E
1	A 1008 (HSLAS-F Grade 80 [550]); A 1011 (HLAS-F Grade 80 [550])	1.0986	S500MC; QStE 500 TM	60F55 HR; 60F55 HS; 60F55 CS	E 560 D; S 560 MC		FeE 560 TM				S500MC
1	A 1008 (HSLAS-F Grade 70 [480]); A 1008 (HSLAS Grade 70 [480] Class 1)	1.0984	S500MC; QStE 500 TM		E 490 D; S 490 MC	2662	FeE 490 TM				S500MC
1	A 1008 (HSLAS Grade 65 [450] Class 1); A 1008 (HSLAS Grade 65 [450] Class 2)	1.0982	S460MC; QStE 460 TM	1501-50F45; 50F45 HR; 50F45 HS; 50F45 CS							S460MC
1	A 1008 (HSLAS Grade 50 [340] Class 1); A 1008 (HSLAS Grade 50 [340] Class 2)	1.0976	S355MC; QStE 360 TM	46F40 HR; 46F40 HS; 46F40 CS	E 355 D	2642	FeE 355 TM				S355MC

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	Euronorm
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	A 1008 (HSLAS Grade 50 [340]); A 1008 (HSLAS Grade45 [310] Class 2); A 1011 (HSLAS-F Grade 50 [340])	1.0972	S315MC; QStE 300 TM	1501-40F30; 43F35 HR; 43F35 HS; 43F35 CS	E 315 D						
1	K01600; K02007; K02700; K02701; K02803; K02900; K03009; K03300; K11803; K12000; K12001; K12037	1.0562	P355N; StE 355	225-490A	FeE 355 KG N; E 355 R/FP; A 510 AP	2106	FeE 355; FeE 355 KG; FeE 355 KW	AE 355 KG; AE 355 DD	SM 490 A; SM 490 B; SM 490 C; SM 490 YA; SM 490YB STK 490 YB; STK 490; STK 500; SM 50 A; SM 50 B	15GF	P355N
1	1024; K03011; K03014; K12037; K12709	1.0570	S355J2G3 (S355J2); St 52-3 N (Fe 510 D1)			2132; 2134	fE 510	AE 355 D; Fe 510 D1 FF	SM 490 A; SM 490 B; SM 490 C; SM 490 YA; SM 490 YB; SM 520 B; SM 520 C; STK 490; STK 500; STKM 16 C	17GS; 17G1S	S355J2G3
1	K01600; K02302; K02700; K02701; K02803; K03301; K11803; K12037; K12609; A 299 (A); A 299 (B)	1.0566	P355NL1; TStE 355	225-490 A	A 510 FP	2107	Fe E 355 KT		SLA 365; STK 490; STK 500; SLA 37; STK 50; STK 51		P355NL1
1	K01600; K02007; K02701; K02803; K117803; K12001; K12037; K12609	1.0565	P355NH; WStE 355	225/490; 225-490 A; 500 Nb	A 510 AP	2106	FeE 355-2; FeE 355 KW				P355NH
1	K12037	1.0549	S355 NLH; TStE 355	50 EE		2135	Fe 510 D	FeE 355 KTM			S355 NLH
1	K12000	1.0553	S355JO; St 52-3 U; Fe 510 C	50 C; 4360-50C	E 36-3		Fe 510 C FN	AE 355 C	SCC 3		S355JO
1	A 252 (1); A 252 (2); A 252 (3)	1.0547	S355JOH; St 52-3 U	50 C; 4360-50C	TSE 355-3; E 36-3		Fe 510 C	AE 355 C; Fe 510 C			S355JOH
1	K02502	1.0036	S235JRG1; S235JR; Fe 360 B; USt 37-2	Fe 360 B FU; Fe 360 B FN		1311; 1312	Fe 360 B; Fe 360 C; Fe 360 D	AE 235 B; Fe 360 B		16D; St3Kp	
1	1020; 1022; 1023; G10200; G10220; G10230	1.0402	C22	055 M 15; 070 M 20; En 3 A; En 3 B; En 3 C; En 2; 22 HS; 22 CS	AF 42 C 20; XC 25; 1 C 22	1450	C 20; C 21	F.112; 1 C 22	S 20 C; S 22 C	20	C22; 2C/2D
1	K01701; K02505; K02704; K02801	1.0425	P265GH; H II	151-400; 154-400; 161-400; 164-400	A 42 CP; A 42 AP	1431; 1430; 1432	Fe 410 1 KW; Fe 410 1 KG; Fe 410 1 KT; Fe 410 2 KW; Fe 410 2 KG	A 42 Grado RC I; A 42 Grado RC II; F.6306; F.6307	SG 295; SGV 410; SGV 450; SGV 480; SPV 315; SPV 355; SG 30; SGV 42; SGV 46; SGV 49; SPV 32; SPV 36	16K; 20K	P265GH
1	A27 65-35	1.0443	HX300PD; H300PD; H 300 PD		E 23-45 M	1305					HX300PD

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	Euronorm
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	K12000; K12037	1.0546	S355NL; TStE 355	50 EE; 4360-50EE	E 355 FP	2135; 2135-01	FeE 355 KT	AE 355 Grado KT			
1	K12709	1.0545	S355N; StE 355	50 E; 4360-50E	E 355 R	2134	FeE 355 KG	AE 355 Grado KG	SM 490 A; SM 490 B; SM 490 C; SM 490 YA; SM 490 YB; SM 50 A; SM 50 B; SM 50 C; SM 50 YA; SM 50 YB		S355N
1	K02705; K02305; K12709	1.0539	S355NH; StE 335 N	S355NH	S355NH; TSE 355-4	2134-04	Fe 510 B	Fe 355 KGN			S355NH
1	1213; 1215; G12130; G12150	1.0715	11SMn30; 9 SMn 28	230 M 07; 220 M 07	S 250	1912	CF 9 S 22	F.210.A; F.210.L; 11 SMn 28; F.2111	SUM 22		11SMn30
1		1.0722	10SPb20; 10 SPb 20		10 PbF 2		CF 10 SPb 20	10 SPb 20; F.2122			10SPb20
1	1215; G12150; A 29 (1215); A 108 (1215); A 510 (1215); A 510 (1215); A 519 (1215); A 521 (1215)	1.0736	11SMn37; 9 SMn 36		S 300		CF 9 Mn 36	12 SMn 35; F.2113	SUM 25		11SMn37
1	12L14; 12 L 14; G12144	1.0737	11SMnPb37; 9 SMnPb 36		S 300 Pb	1926	CF 9 SMnPb 36	12 SMnPb 35; F.2114			11SMnPb37
1	1010; G10100	1.1121	C10E; Ck 10	040 A 10; 045 M 10; En 2 A; En 2 A/1; En 2 B; En 32 A	C10RR; XC 10	1265	2 C 10; 2 C 15; 1 C 10; C 10	C 10 k; F.1510	S 09 CK; S 10 C	08; 10	C10E
1	1015; 1017; G10150; G10170	1.1141	C15E; Ck 15	080 A 15; 080 M 15; En 32 C	XC 12; XC 15; XC 18	1370	1 C 15; C 15	C 16 k; F.1511; F.1110; C 15 k	S 15 C; S 15 CK	15	C15E
1	1020; G10200; K02301; K02595; K02596; K02597; K02598; K02599; K02702; K03000	1.0044	S275JR; St 44-2; Fe 430 B	En 43 B; Fe 430 B; 43/25 HR; 43/25 HS; 43 B; HFW 4; HFS 4; ERW 3; CEW 4; SAW 4	E 28 A; NFA 35-501 E 28	1411; 1412	Fe 430 B FN	AE 275 B; Fe 430 B FN	SN 400 B; SN 400 C; SN 490 B; SN 490 C; SS 400; STK 400; STKM 19 C; STKR 400; 19 C; SS 41; STK 41	St4ps; St4sp	S275JR
1		1.0250	S320GD; StE 320-3 Z		S 320 GD				SGC 440; SZAC 440; SZAH 440; SGLH 440		S320GD
1		1.0453	P265NL; P 265 NL								P265NL
1		1.0338	DC04; St 4; St 14	CR 1; CS 2	ES	1147	FeP 04	AP 04; FeP 04	SPCE; HR 4	08JuA	DC04
1	K02001; K02601; K02701	1.0116	S235J2G3 (S235J2); St 37-3 N; Fe 360 D 1	Fe 360 D1 FF; 37/23 CR; 37/23 CS; 37/23 HR; 37/23 HS; 40 D; HFW 4; HFS 4	E 24-3; E 24-4; E 24-U	1312; 1313	Fe 360 C; D; Fe 360 C FN; Fe 360 D FF; Fe 37-2		SS 330; SS 34	16D; St3sp	S235J2G3
1	1015; 1017; G10150; G10170	1.0401	C15; C 15	080 A 15; 080 M 15; En32 C; 17 CS; 17 HS	C18RR; XC 18; C 18; AF 37 C 12	1350	1 C 15; C15; C16	F.111	S 15 C		C15
1		1.0347	DC03; RRSt; RRSt 13	CR2; CR3; CS3; 1449 3 CR; 1449 2 CR	E	1146	FeP 02; FeP 03	AP 02; AP02; FeP03	SPCD; CR 3	08Ju	DC03

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1	K01500; K01702; K02401; K02502; K03000; A570.36	1.0038	S235JR; S235JRG2; RSt 37-2; Fe 360 B	Fe 360 B FU; 37/23 CR; 37/23 CS; 37/23 HR; 37/23 HS; HFW 3; HFS 3; 40 B	E 24-2 NE	1312	Fe 360 B FN	AE 235 B FN; AE 235 B FU; Fe 360 B FN; Fe 360 B FU	SS 330; SS 34	St3ps; St3sp	S235JR
1	J03001	1.0446	GE240; GS-45	A 1					230-450; 230-450 W	25L-3	GE240
2	1035; G10350	1.0501	C35G; C 35 G	080 M 30; En 5; 080 M 36	C 35; AF 55; 1 C 35; XC 38	1572; 1550	C 35; 1 C 35	F.113	S 35 C; S 35 CM		C35G
2	1035; G10350	1.1183	C35G; C 35 G; Cf 35	080 A 35	XC 38 TS	1572	C 36; C 38	F.1130; C 35 k	S 35 C; S 35 CM	35	C35G
2	1039; G10390	1.1157	40Mn4; 40 Mn 4		35 M 5					40G	
2	1040; G10400	1.0511	C40; C 40	En 8; 080 M 40	AF 60; C 40; 1 C 40		C 40; 1 C 40	F.114.A			C40
2	1045; 1045 H; 1042; G10450; H10450; G10420	1.1191	C45E; Ck 45	080 H 46; 080 M 46	C45RR; XC 45; XC 48 H-1	1672	C 45	F.1140; F.1142; C 45 k; C48 k	S 45 C; S 45 CM; S 48 C	45	C45E
2	1025; G10250	1.1158	C25E; Ck 25	070 M 26	2 C 25; XC 25		C 25	F.1120; C 25 k	S 25 C; S 28 C	25	C25E
2	1043; 1045; G10430; G10450	1.0503	C45; C 45	080 M 46	C 45; AF 65; C 45; 1 C 45	1650	C 45; 1 C 45	F.114	S 45 C; S 45 CM	45	C45
2	1050; 1055; G10500; G10550	1.1213	C53G; C53E; Cf 53		XC 48 TS		C 53		S 50 C; S 50 CM	50	
2	1140; G11400	1.0726	35S20; 35 S 20	212 M 36	35 MF 4	1957		F.210.G; 35 MnS 6; F.2131			35S20; 8M
2	1139; 1146; G11390; G11460	1.0727	46S20; 45 S 20		45 MF 4						46S20
2	K12000	1.0553	S355J0; St 52-3 U; Fe 510-C	50 C	E 36-3		Fe 510 C FN	AE 355 C	SCC 3		S355J0
2		1.0551	S355JRC								S355JRC
2	K02700; K02803; K03103; K03300; K12437	1.0473	P355GH; 19 Mn 6		A 52 CP	2101; 2102	Fe E 355-2	A 52 RC I, RA II	SGV 410; SGV 450; SGV 480		P355GH
2		1.0416	C18D; GS-38		20-400 M	1306					C18D
2	K12447	1.0577	S355J2; S355J2G4; Fe 510 D2		A 52 FP	2107		A 52 RB II; AE 355 D			
2	1049; 1050; G10490; G10500	1.1206	C50E; Ck 50	080 M 50	XC 50; 2 C 50	1674	C 50			50	C50E
2	1330; 1527; G13300; G15270	1.1170	28Mn6	150 M 19; En 14 A; En 14 B	20 M 5		C 28 Mn		SCMn 1	30G	28Mn6
2	1034; 1035; 1038; G10340; G10350; G10380; C 1034	1.1181	C35E; Ck 35	080 M 30; En 5; 080 M 36	XC35RR; XC32; XC 35; XC 38 H 2; XC 38 H 1; 2 C 35	1572	C 35	F.1130; C 35 k	S 35 C; S 35 CM; S 38 C	35	C35E
2		1.1180	C35R; Cm 35	080 A 35	XC 38 H 1 u; Cm 35		C 35	F.1135; C 35 k-1			C35R
2	1030; G10300	1.1178	C30E; Ck 30	080 M 30; En 5	XC 32		C 30	2 C 30	S 30 C; S 30 CM		C30E
2	1049; 1050; G10490; G10500	1.0540	C50	En 43 A; 080 M 50	C50	1674	C 50	1 C 50	S 50 C		C50

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
2	1536; G15360	1.1166	34Mn5					TO.B	SMn 433 H; SMn 433 HRCH; SMn 433 RCH; SMn 1 H		
2	1025; G10250	1.0406	C25	070 M 26	1 C 25		C 25; 1 C 25				
2		1.0723	15S22; 15 S 20	210 A 15; 210 M 15		1922		F.210F; F.210.F	SUM 32		
2		1.1730	C45U; C45W; C 45 U; C 45 U								C45U
3	1045; 1049; G10450; G10490	1.1201	C45R; Cm 45	080 M 46	3 C 45; XC 42 H 1; XC 48 H 1 u	1660	C 45	F.1145; F.1147; C 45 k-1; C 48 k-1	S 45 C; S 45 CM	45	C45R
3	1040; G10400	1.1186	C40E; Ck 40	080 M 40; En 8	2 C 40; XC 42 H 1		C 40		S 40 C	40	C40E
3	1074; 1075; G10740; G10750	1.0614	C76D; C 76 D; D 75-2		XC 75		3 CD 75			75	C76D
3	1095; G10950	1.0618	C92D; C 92 D; D 95-2	95 HS; 95 CS	XC 90		3 CD 95				C92D
3	1086; G10860	1.0616	C86D; C 86 D; D 85-2	80 HS; 80 CS	XC 80		C 85; 3 CD 85				C86D
3		1.1165	G28Mn6; GS-30 Mn 5	A 5; A 6				30 Mn 5; AM 30 Mn 5; F.120.D; F.8211; F.8311	SCMn 2	27ChGSNMDTL; 30GSL	G28Mn6
3	K01700; K02001; K02200; K02201; A 516 Gr.70; A 515 Gr. 70; A 414 Gr.F; A 414 Gr.G	1.0481	P295GH; 17Mn4; 17 Mn 4	224-469 B	A 48 CP; A 48 AP	2102	Fe 295	A 47 RC I; RA II	SG 365; SGV 410; SGV 450; SGV 480; SPV 315; SG 37; SGV 42; SGV 46; SGV 49; SPV 32	14G2	P295GH
3	1043; 1045; G10430; G10450	1.0503	C45; C 45	080 M 46	C 45; AF 65; C 45; 1 C 45	1650	C 45; 1 C 45	F.114	S 45 C; S 45 CM		C45
3	1335; 1335 H; 1541; 1541 H; G13350; G15410; H13350; H15410	1.1167	36Mn5; 36 Mn 5	150 M 36	40 M 5; 35 Mn 5	2120		F. 1203-36 Mn 6; F. 8212-36 Mn 5	SMn 438; SMn 438H; SCMn 3	35G2; 35GL	36Mn5
3	1045; 1045 H; 1042; G10450; H10450; G10420	1.1191	C45E; Ck 45	089 H 46; 080 M 46	C45RR; XC 45; XC 48 H 1	1672	C 45	F.1140; F.1142; C 45 k; C 48 k	S 45 C; S 45 CM; S 48 C	45	C45E
3		1.1303	38MnVS6; 38 MnVS 6								38MnVS6
4	1055; G10550	1.0535	C55	070 M 55; En 9	C54; 1 C 55; AF 70; C 55	1655	C 55; 1 C 55	F.115	S 55 C; S 55 C-CSP; S 55 CM	55	C55
4	1055; G10550	1.1203	C55E; Ck 55	070 M 55; En 9	C50RR; XC 54; XC 50; 2 C 55; XC 55 H 1	1655	C 55	F.1150; C 55 K	S 55 C; S 55 C-CSP; S 55 CM	55	C55E
4	1060; G10600	1.0601	C60	060 A 62; En 43 D	C60; 1 C 60		C 60; 1 C 60		S 58 C; S 60-C-CSP; S 60 CM; S 65 C-CSP; S 65 CM	60; 60G	C60; 43D
4	1070; G10700	1.1231	C67S; Ck 67	060 A 67; 080 A 67; En 43 E	C68RR; XC 68	1770	C 67		S 70 C-CSP; S 70 CM	65GA; 68GA	C67S

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4	1074; 1075; 1078; G10700; G10750; G10780	1.1248	C75S; Ck 75	060 A 78; 80	C75RR; XC 75	1774	C 75		S 75 CM	75A	C75S
4	1095; G10950	1.1274	C100S; Ck 101	95	C100RR; XC 100	1870	C 100		SK 95 -CSP		C100S
4	W112; W1; T72301	1.1563	C125U; C 125 W		Y2 120; C120E3U		C 120 KU	F.5123; C 120	SK 120; SK 120 M; SK 2; SK 2 M; TC 120	U12-1	C125U
4	1086; G10860	1.1269	C80S; Ck 85; C 85 E		C90RR; XC 90		C 85		SK 85-CP	85A	C80S
4	1055; G10550	1.1209	C55R; Cm 55	070 M 55; En 9	3 C 55; XC 55 H 1		C 55	F.1155; C 55 k-1			C55R
4	1074; 1075; G10740; G10750	1.0605	C75	060 A 78	C 75		C 75			75	
4	1070; G10700	1.0603	C67	060 A 67; 080 A 67; En 43 E; 1449 70 HS	C68; XC 65		C 67		S 70 C-CSP; S 70 CM		C67
4		1.1219	C56E2; Cf 54						C56E2; S55C		C56E2
5	1055; G10550	1.1220	C56D2; C 56 D 2		C 56 D 2						C56D2
5		1.1217	C90S; C 90 S	CS95	C90RR; XC 90; XC90; C90E2U				SK 95		C90S
5	1060; 1064; G10600; G10640	1.1221	C60E; Ck 60	060 A 62; 070 M 60; En 43 D	C60RR; XC 60; X 65; 2 C 60	1678	C 60		S 58 C; S 60 C-CSP; S 60 CM; C 65 C-CSP; C 60 CM	60GA	C60E
5	1055; G10550	1.1203	C55E; Ck 55	070 M 55; En 9	C50RR; XC 54; XC 50; XC 55 H 1; 2 C 55	1655	C 55	F.1150; C 55 k	S 55 C; S 55 C-CSP; S 55 CM	55	C55E
6	9260; G92600	1.5028	65Si7; 65 Si 7		60 S 7				50 P 7; SUP 6; SUP 6 M; SUP 7; SWOSM	60S2G	
6	9260 H; H92600; 9260; G92600	1.5027	60Si7	251 A 60; 251 H 60	60 S 7		60 Si 7	F.144.B; F.1441		60S2	
6	9255; G92550	1.5026	56Si7; 56 Si 7; 55Si7; 55 Si 7	251 A 58; En 45 A	55 S 7	2085; 2090	55 Si 7	F.144; F.144.A; 56 Si 7; F.1440		55S2; 60S2	565Si7; 55Si7
6	9255; G22550	1.5025	51Si7; 51 S 7		50S7; 51 Si 7		48 Si 7; 50 Si 7	F.145.B			51Si7
6		1.5024	46Si7		45 S 7; Y 46 S 7; 46 SI 7			F.1451			46Si7
6	G50986; ASTM Grade E50100; ASTM Grade G15116; SAE E50100	1.3501	100Cr2; 100 Cr 2	GCr6; B00040; GCr4	100C2					SchCh4	
6	K21390; K21590; ASTM A 182 F22	1.7380	10CrMo9-10; 10 CrMo 9 10	622; 622-490; 622/515; 622/690	12 CD 9-10; 10 CD 9.10	2218	12 CrMo 9 10	TU.H	SCMQ4E; SCMV 4; SFVA F 22.A; SFVA F 22.B; SFVCM F22B; STBA 24; STFA 24; STPA 24	12Ch8	10CrMo9-10
6	O2; T31502	1.2842	90MnCrV8; 90 MnCrV 8	BO 2; BO2	90 MnV 8; 90 MV 8		90 MnVCr 8 KU	90 MnCrV 8; F.5229			90MnCrV8
6		1.2550	60WCrV7; 60 WCrV 7	BS1; BS 1	55 WC 20	2710	55 WCrV 8 KU; 58 WCr 9 KU	60 WCrSiV 8; F.5242			60WCrV7
6		1.2241	51CrMnV4; 51 CrV 4; 50 CrV 4								

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
6	L2; T61202	1.2210	115CrV3; 115 CrV 3		100 C 3		107 CrV 3 KU	F.520.L; F.5125			115CrV3
6		1.2419	105WCr6; 105 WCr 6	105WC 13	105 WCr 5; 105 WC 13	2140	107 WCr 5 KU	F.5233; 105 WCr 5	SKS 2; SKS 2 M; SKS 3; SKS 31	ChW1G; ChWG	105WCr6
6	4820; 5120; 5120H; G48200; G51200; H51200	1.7147	20MnCr5; 20 MnCr 5	150 M 19	20 MC 5	2172	20 MnCr 5; Fe52	F.150.D	SMnC 420 H; SMnC 420 RCH; SMnC 21 H	18ChG	20MnCr5
6	9255; G92550	1.0904	55Si7; 55 Si 7	250A53	55 S 7	2085	55 Si 8	56 Si 7			
6	9254; G92550	1.0904	55Si7; 55 Si 7	250 A 53	55 S 7	2090					
6	9262; G95620	1.0961	HDT 450 F; S340 MGC		60 SC 6		60 SiCr 8	60 SiCr 8; F.1442		60S2; 55S2; 50ChFA	
6	4135; 4137; 4135H; 4137H; G41350; G41370; H41350; H41370	1.7220	34CrMo4; GS34 CrMo 4; G34 CrMo 4	708 A 30	34 CD 4; 34CrMo4RR; 35 CD 4;	2234	34 CrMo 4 KB; 35 CrMo 4	35 CrMo 4 DF; F.125.A; F.125.B; F.1254; F.1250	SCM 435 H; SCM 435 HRCH; SCM 435 M; SCM 435 RCH; SCM 435TK; SCM 3 H; STKS 3	35ChM; AS38ChGM	34CrMo4
6		1.5120	38MnSi4; 38 MnSi 4								
6	L3; T61203	1.2067	102Cr6; 102 Cr 6; 100Cr6	BL 3; BL3	100Cr6RR; 100 C 6; 100Cr6; Y 100 C 6		102 Cr 6 KU	F.5230; 100 Cr 6	SUJ 2	Ch	102Cr6
6	L1	1.2108	90CrSi5; 90 CrSi 5			2092	105 WCr 5				90CrSi5
6	P20; T51620	1.2330	35CrMo4; 35 CrMo 4	708 A 37	34 CD 4	2234	35 CrMo 4				35CrMo4
6	O1; T31501	1.2510	100MnCrW4; 100 MnCrW 4	BO1; BO0; BO 1; BO 0	90MnWCrV5; 90 MWCV 5; 8 MO 8	2140	95 MnWCr 5 KU; 10 WCr 6	F.522.A; F.5220; 95 MnCrW5; 105 WCr 5	SKS 31		100MnCrW4
6	S1; T41901	1.2542	45WCrV7; 45 WCrV 7	BS1; BS 1	45 WCrV 8; 45 WCrV 20	2710	45 WCrV 8 KU	F.524; F.5241; 45 WCrSi 8		5ChW25F	45WCrV7
6	L6; T61206	1.2713	55NiCrMoV6; 56NiCrMoV6; 55 NiCrMoV 6; 56 NiCrMoV 6	BH 224; BH 225	55 NCDV 7			F.520.S	SKT 4	5ChNM	55NiCrMoV6
6		1.2721	50NiCr13		55 NCV 6	2550		F.528			
6	E52100; G52986	1.3505	100Cr6; 100 Cr 6	2 S.135; 535 A 99	100Cr6RR; 100 C 6; 100Cr6	2258	100 Cr 6	F.131; 100 Cr 6; F.1310	SUJ 2; SUJ 4	SchCh 15	100Cr6
6	K11820; K12020; K12320; A204 Grade A; A182 Grade F1	1.5415	16Mo3; 15 Mo 3	1503-243 B	15 D 3	2912; 16Mo3	16 Mo 3 KG; 16 Mo 3 KW; 16 Mo 5 KG; 16 Mo 5 KW	F. 2601; 16 Mo 3	STBA 12; STFA 12; STPA 12		
6	4422; G44220; J12522	1.5419	G20Mo5; 20Mo4; GS-22 Mo 4	245; B 1; B1					SCPH 11		G20Mo5
6	A 350-LF 5; K13050; K21703; K22103	1.5622	14Ni6; 14 Ni 6		16 N 6		14 Ni 6 KG; 14 Ni 6 KT	F.2641; 15 Ni 6			14Ni6
6	3415	1.5732	14NiCr10; 14 NiCr 10		14 NC 11		16 NiCr 11	15 NiCr 11	SNC 415; SNC 415 H; SNC 415 M	12ChN3A	14NiCr10
6	3310; 3310 RH; 3312; 3316; 9315; E 3310; E 3316; E9315; G33106	1.5752	15NiCr13; 14NiCr14; 15 NiCr 13; 14NiCr14	655 M 13; 655 H 13; En 36 A	10 NC 12; 12 NC 15; 14 NC 12; 16 NC 12; 16 NCD 13			15 NiCr 11; F.1540	SNC 815 H; SNC 815 HRCH; SNC 815 RCH; SNC 22 H		15NiCr13
6		1.7262	15CrMo5; 15 CrMo 5		12 CD 4			12 CrMo 4; F.150.J; F155; F.1551	SCM 415 H; SCM 415 HRCH; SCM 415 M; SCM 415 RCH; SCM 415 TK; SCM 21 H		15CrMo5

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6		1.6587	17CrNiMo6; 17 CrNiMo 6	820A16	18 NCD 6			14 NiCrMo 13			
6	9310; 9310H; 9310 RH; E 9310 H; G93106; H93100; H93106	1.6657	14NiCrMo13-4; 14 NiCrMo 13 4	832 H 13; 832 M 13; S.157; En 36 C	16 NCD 13		15 NiCrMo 13; 16 NiCrMo 12	14 NiCrMo 13; 14 NiCrMo 13-1; F.1560; F.1569			
6	5015; G50150	1.7015	15Cr3; 15 Cr 3	523 M 15	12 C 3; 15Cr2RR; 15 C 2				SCr 415; SCr 415 H; SCr 415 HRCH; SCr 415 RCH; SCr 21 H	15Ch	15Cr3
6	5132; 5132 H; G51320; H51320	1.7033	34Cr4; 34 Cr 4	530 A 32; 530 H 32; 530 M 32	32 C 4		34 Cr 4; 34 Cr KB	35 Cr 4; F.8221	SCr 430; SCr 430 H; SCr 430 HRCH; SCr 430 RCH; SCr 2 H	35Ch	34Cr4
6	5140; 5140 H; 5140 RH; G51400; H51400	1.7035	41Cr4; 41 Cr 4	530 A 40; 530 M 40; 530 H 40; En 18	42 C 4		41 Cr 4; 41 Cr 4 KB	41 Cr 4 DF; F.1211; F.1202	SCr 440; SCr 440 H	40Ch	41Cr4
6	5140; G51400	1.7045	42Cr4; 42 Cr 4	530 A 40	42 C 4 TS	2245	41 Cr 4	42 Cr 4	SCr 440		
6	5115; 5117; G51150; G51170	1.7131	16MnCr5; 16 MnCr 5	527 M 17; 590 H 17; 590 M 17	16MnCr5RR; 16 MC 5	2173	16 MnCr 5	F.1516		18ChG	16MnCrS5
6		1.7139	16MnCrS5; 16 MnCrS 5		BGH 7139; BOHLER E 411; VW 4221; OPEL QS1916; PROCONS 7139; E411; SES	2127					16MnCrS5
6	5155; 5155 H; 5150; G51550; H51550; G51600	1.7176	55Cr3; 55 Cr 3	525 A 58; 525 A 60; En 48	55 C 3; 55Cr3	2253	55 Cr 3	F.1431	SUP 9; SUP 9 A; SUP 9 M	50ChGA	55Cr3
6	4142; G41420	1.7223	41CrMo4; 41 CrMo 4		MOC 2; V320		41 CrMo 4	42 CrMo 4	SNB 22-1	40ChFA	
6	4140; 4140 H; 4140 RH; 4142; 4142 H; 4145; G41400; H41400; G41420; H41420; K14248; K14047	1.7225; 1.7227	42CrMo4; 42CrMo4V; 42 CrMo 4; 42 CrMo 4 V	708 M 40; 709 M 40; En 19; En 19 A	42 CD 4; 40 CD 4; 42CrMo4RR	2244; 42CrMo4	42 CrMo 4; 38 CrMo 4 KB; 41 CrMo 4	TO.D; TU.L	SCM 440 H; SCM 440 HRCH; SCM 440 M; SCM 440 RCH; SCM 440 TK; SNB 7 Class 2; SCM 4 H; SNB 22-1	40ChFA	42CrMo4
6	4147; 4147 H; 4150; 4150 H; 8650; 8650 H; G41470; G41500; G86500; H41470; H41500; H86500	1.7228	50CrMo4; 50 CrMo 4	708 M 40; 708 A 47		2512	653 M 31		SCM 445 H; SCM 445 HRCH; SCM 445 RCH; SCM 5 H		50CrMo4
6	8620; G86200	1.7321	20MoCr4; 20 MoCr 4			2625				BGH 7321; E320; SIQUAL 7321	20MoCr4
6	K11547; K11562; K11564; K11757; K11789; K12052; ASTM A182 F12	1.7335	13CrMo4-5; 13 CrMo4 4	620; 620-440; 620-470; 620-540; 621	15 CD 4-05	2216	14 CrMo 3; 14CrMo4 5	TU.E; TU.F; F.2631; 14 CrMo 4 5	SCMV 2; SFVA 12; STBA 22; STFA 22; STPA 20; STPA 22	12ChM; 15ChM	13CrMo4-5

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
6	K21390; K21590; ASTM A182 F22	1.7380	10CrMo9-10; 10 CrMo 9 10; GS-12CrMo9-10; GS-12 CrMo 9 10; G 12 CrMo9-12	622; 622-490; 622/515; 622/690; 1502-622	12 CD 9-10; 10 CD 9.10	2218	12 CrMo 9; 12 CrMo 10	TU.H	SCMQ 4 E; SCMV 4; SFVA F 22 A; SFVA F 22 B; SFVCM F 22 B; STBA 24; STFA 24; STPA 24	12Ch8	10CrMo9-10
6		1.7715	14MoV6-3; 14 MoV 6 3	1503-660-440				13 MoCrV 6			
6	E71400; K24065; K24728; A355 Class A	1.8509	41CrAlMo7-10; 41CrAlMo7; 41 CrAlMo 7	905 M 39; En 41 B	40 CAD 6.12	2940	41 CrAlMo 7	F.174; 41 CrAlMo 7; F1740	SACM 645; SACM 1	38Ch2MJuA	41B
6		1.6566	17NiCrMo6-4								17NiCrMo6-4
6	P20+S	1.2312	40CrMnMoS8-6		40 CMD 8 S						
6		1.7149	20MnCrS5; 20 MnCrS 5								20MnCrS5
6	P20+Ni	1.2738	40CrMnNiMo8-6-4; 40 CrMnNiMo 8 6 4		40 CMND 8					40Ch2GNM	40CrMnNiMo8-6-4
6		1.2311	40CrMnMo7; 40 CrMnMo 7		40 CMD 8		35 CrMo 8 KU	F.5302			40CrMnMo7
6		1.7238	49CrMo4; 49 CrMo 4								
6	4150; G41500	1.7701	52CrMoV4; 51CrMoV4; 51 CrMoV 4		51 CDV 4; 51CrMoV4		51 CrMoV 4				51CrMoV4
6		1.7337	16CrMo4-4; 16 CrMo 4 4				A 18 CrMo 45 KW		SCM 415 M; SCM 415; STBA 22; SFVA F12		
6		1.7242	16CrMo4; 16 CrMo 4		15 CD 3.5		18 CrMo 4	F.1550; 18 CrMo 4	SCM 418 H; SCM 418 HRCH; SCM 418 RCH; SCM 418 TK		16CrMo4
6	4419; 4419 H; 4520; G44190; H44190; G45200; K11522; K11820; K12020; K12023; K12320; K12821	1.5423	16Mo5				16 Mo 5 KG; 16 Mo 5 KW	TU.D; F.2602	SB 450 M; SB 480 M; SB 46 M SB 49 M		
6										30ChGSA	
6	HY-80; HY 80; HY80; K31820; MIL-S-21952										
6				605 M 36; En 16; En 16T							
7	4130; 4130 H; 4130 RH; G41300; H41300	1.7218	25CrMo4; 25 CrMo 4; GS-25 CrMo 4; G 25 CrMo 4	708 A 25	25 CD 4	2225	25 CrMo 4; 25 CrMo KB	F.222; F.1256	SCM 420 TK; SCM 430 M; SCM 430 RCH; SCM 430 TK; STKS 1	20ChM; 30ChM	25CrMo4
7		1.8070	21CrMoV5-11; 21 CrMoV 5 11				35 NiCr 9				
7		1.7755	GS-35 CrMoV 10 4; G35 CrMoV 10-4								
7		1.7733	24CrMoV5-5		20 CDV 6		21 CrMoV 5 11				
7	4340; 4340 H; 9850; G43400; G98500; H43400; K23028	1.6565	40NiCrMo6; 40 NiCrMo 6	817 M 40; En 24				F.1275; 40 NiCrMo 7	SNB 24-1; SNB 24-2; SNB 24-3; SNB 24-4; SNB 24-5; SNCM 439 RCH	40Ch2N2MA	40NiCrMo6
7	8640; 8640 H; 8740; 8740 H; 8742; G86400; G87400; G87420; H86400; H87400; K11640	1.6546	40NiCrMo2-2; 40 NiCrMo 2 2		40 NCD 2; 40 NCD TS		40 NiCrMo 2; 40 NiCrMo 2 KB	40 NiCrMo 2 DF; F.1205; F.1204; TO.E	SNCM 240; SNCM 240 RCH	38ChGNM	

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
7	8617; 8617 H; 8620; 8620 H; 8620 RH; 8617; G86170; G86200; H86170; H86200; K12147	1.6523	20NiCrMo2-2; 21NiCrMo2; 21 NiCrMo 2	805 H 20; 805 M 20; 806 M 20; En 362	20 NCD 2	2506	20 NiCrMo 2	20 NiCrMo 2; 20 NiCrMo 3-1; F.1522; F.1534	SNCM 220; SNCM 220 H; SNCM 220 HRCH; SNCM 220 M; SNCM 220 RCH; SNCM 21 H	20ChGNM	20NiCrMo2-2
7		1.5755	31NiCr14; 31 NiCr 14	653 M 31	18 NC 13						
7	3135	1.5710	36NiCr6; 36 NiCr 6	640 A 35	35 NC 6				SNC 236		36NiCr6
7	4340; G43400; 4337; G43370	1.6582	34CrNiMo6; 34 CrNiMo 6	816 M 6; 817 M 40	34 CrNiMo 8; 35 NCD 6	2541	35 NiCrMo 6 KB	F.1272		38Ch2N2MA	34CrNiMo6
7		1.8519	31CrMoV9; 31 CrMoV 9							30Ch3MF	31CrMoV9
7	8630	1.6545	30NiCrMo2-2; 30 NiCrMo 2 2		30 NCD 2		30 NiCrMo 2 KB				
7	4340; G43400	1.6580	30CrNiMo8	823 M 30	30 CND 8; 30 NCD 8			30 CrNi Mo 8	SNCM 431		
7	K01907	1.5217	20MnV6; 20 MnV 6 N	55 C; GR 55; Grade 55	20MV6; TS E 455 4; TU E 455 4						20MnV6; S460
7	300M; 4340M; K44220	1.6928	41SiNiCrMoV7-6	S 155							
8		1.8523	40CrMoV13-9; 39CrMoV13-9; 39 CrMoV 13 9	897 M 39			36 CrMoV 12				40CrMoV13-9
8		1.8515	31CrMo12; 31 CrMo 12	722 M 24	30 CD 12	2240	32 CrMo 12	F.1712; F.124.A			31CrMo12; 40B
8		1.8161	58CrV4; 58 CrV 4								
8		1.7361	32CrMo12; 32 CrMo 12	722 M 24	30 CD 12	2240	30 CrMo 12	F.124.A			32CrMo12
8	9840; G98400	1.6511	36CrNiMo4; 36 CrNiMo 4	817 M 37; 816 M 40	40 NCD 3; 35 NCD 5		39 NiCrMo 4; 39 NiCrMo 4 KB	F.128; F.1280; 35 NiCrMo 4	SUP 10	40ChGNM; 40ChN2MA	36CrNiMo4
8	6145; 6150; 6150 H; G61500; H61500	1.8159	51CrV4; 50CrV4; 50 CrV 4	735 A 50; 735 A 51; 735 H 51; 735 M 50; En 47	50CrV4RR; 50 CV 4; 51 CV 4	2230	50 CrV 4	F.143; F.143.A; 51 CrV 4; F.1430	SUP 10; SUP 10-CSP; SUP 10 M	50ChFA; 50ChGFA	51CrV4
8	3435	1.5736	36NiCr10; 36 NiCr 10		30 NC 11				SNC 631; SNC 631 H; SNC 631 M		
8	A128 Grade A; J91109; J91129; J91139; J91149	1.3401; 1.3403	X120Mn12; X 120 Mn 12; G-X120 Mn 12	BW 10	Z 120 M 12	2183	GX 120 Mn 12	F.240.A; F.240.A1; AM-X 120 Mn 12; F.8251	SCMnH 1; SCMnH 11	110G13L	
8	4142; G41420	1.2332	47CrMo4	708 M 40	42 CD 4	2244	42 CrMo 4	42 CrMo 4	SCM; SCM 440		47CrMo4
8	4140 H; 4140 RH; 4140 HT		42CrMo4+QT								
8		1.8705	21MnCr6-5								
9		1.6659	31NiCrMo13-4	830 M 31		2534		F.270			
9		1.5864	35NiCr18								
9		1.8715	17MnCr5-3								17MnCr5-3
10	K71340; K81340	1.5662	X8Ni9	1501-509; 1501-510; 502-650; 509-690	9 Ni; Z 8 N 09		X 10 Ni 9; X 12 Ni 09	F.2645; XBNi 09	SL9N520; SL9N590; STBL 690; STPL 690; SL9N53; SL9N60; STBL 70; STPL 70		X8Ni9
10	2515; A2515; 2517; E2517; K41583	1.5680	X12Ni5; 12Ni19;		Z 18 N 5; Z 10 N 05; 5 Ni				SL5N590; SL5N60		X12Ni5
10	D4; T30404; D6; T30406	1.2436	X210CrW12; X 210 CrW 12	BD6	Z 200 CD 12; Z 210 CW 12-01; X210CrW12-1	2312	X 215 CrW 12 1 KU	F.5213; X210 CrW 12	SKD 2		X210CrW12

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
10	H13; T20813	1.2344	X40CrMoV5-1; X40 CrMoV 5 1	BH 13	X 40 CrMoV 5; Z 40 CDV 5	2242	X 40 CrMoV 5 1 1 KU	F.5318; X 40 CrMoSiV 5	SKD 61	4Ch5MF1S	X40CrMoV5-1
10	A2; T30102	1.2363	X100CrMoV5; X100CrMoV5-1; X 100 CrMoV 5 1	BA 2	X 100 CrMoV 5; Z 100 CDW 5	2260	X 100 CrMoV 5 1 KU	F.536; F.5227; X 100 CrMoV 5	SKD 12		X100CrMoV5
10	H21; T20821	1.2581	X30WCrV9-3; X30WCrV9 3	BH 21	Z 30 WCV 9		X 30 WCrV 9 3 KU	F.5323; X 30 WCrV 9	SKD 5	3Ch2W8F	X30WCrV9-3; X30WCrV9 3
10		1.2601	X165CrMoV12; X 165 CrMoV 12			2310	X165CrMoW 12KU				X165CrMoV12
10		1.2316	X36CrMo17; X38CrMo16								X38CrMo16
10	M2; T11302	1.3343	HS6-5-2; HS 6-5-2; S 6-5-2	BM 2; BM2	Z 85 WDCV 06-05-04-02; 6-5-2; HS6-5-2	2722		F.550.A; F.5604	SKH 51	R6M5	HS6-5-2
10	H11; T20811	1.2343	X37CrMoV5-1; X38CrMoV5-1	BH 11	Z 38 CDV 5; X38CrMoV		X 37 CrMoV 5 1 KU	F.520.G; F.5137; X 37 CrMoSiV 5	SKD 6	4Ch5MFS	X37CrMoV5-1
10	H12; T20812	1.2606; 1.2605	X37CrMoW5-1; X 37 CrMoW 5 1; X35CrWMoV5; X 35 CrWMoV 5	BH 12	Z 35 CWDV 5; X35CrWMoV5		X 35 CrMoW 05 KU	F.537	SKD 62	5ChNM	X37CrMoW5-1; X35CrWMoV5
10	D2; T30402	1.2379	X153CrMoV12; X155CrVMo12-1; X155 CrVMo 12 1	BD 2	X 160 CrMoV 12; Z 160 CDV 12	2310	X 155 CrVMo 12 1 KU	F.520.A	SKD 10; SKD 11		X153CrMoV12
10		1.2085	X33CrS16; X 33 CrS 16		Z 35 V CD 17.S						X33CrS16
10		1.2162	21MnCr5; 21 MnCr 5		20 MC 5						21MnCr5
10		1.2767	X45NiCrMo4; 45NiCrMo16; X 45 NiCrMo 4		45 NCD 16		40 NiCrMoV 8 KU				X45NiCrMo4
10		1.2764	X19NiCrMo4; X 19 NiCrMo 4; GX19NiCrMo4								X19NiCrMo4
10	D3; T30403	1.2080	X210Cr12; X 210 Cr 12	BD 3	X200Cr12; Z 200 C 12		X 205 Cr 12 KU	F.521; F.5212; X 210 Cr 12	SKD 1	Ch12	X210Cr12
10		1.2367	X38CrMoV5-3; X 38 CrMoV 5 3								X38CrMoV5-3
10		1.6957	27NiCrMoV15-6; 26NiCrMoV14-5; 26 NiCrMoV 14 5								
10	501; 502; S50100; S50200; K41545	1.7362	X12CrMo5; X 11 CrMo 5; 12CrMo19-5; 12 CrMo 19 5					F.240.B; TU.J	SCMV 6; SFVA F 5 A; SFVA F 5 B; SFVA F 5 C; SFVA 5 D; SNB 5 Class 1; STBA 29; STFA 25; STPA 25		X12CrMo5
11	M33; T11333; M34; T11334	1.3249	HS2-9-2-8; S 2-9-2-8	BM 34				2-9-2-8; F.5611			
11	M41; T11341	1.3246	HS7-4-2-5; S 7-4-2-5		Z 110 WKCDV 07-05-04-04-02			F.5615; HS 7-4-2-5			HS7-4-2-5
11	M42; T11342	1.3247	HS2-10-1-8; S 2-10-1-8	BM 42	Z 110 DKCWV 09-08-04-02-01; 2-9-1-8; HS2-9-1-8	2716	HS 2-9-1-8	F.5617; HS 2-10-1-8	SKH 59		HS2-10-1-8
11		1.3207	HS10-4-3-10; S 10-4-3-10	BT 42	Z 130 WKCDV 10-10-04-04-03; 10-4-3-10; HS10-4-3-10		HS 10-4-3-10	F.550.B; F.5553; HS 10-4-3-10	SKH 57	R12F3K10M3-SCh	HS10-4-3-10
11	T15; T12015	1.3202	HS12-1-4-5; S 12-1-4-5	BT 15	HS12-1-4-5		HS 12-1-5-5	F.5563; HS 12-1-5-5		R13F4K5	
11		1.3243	HS6-5-2-5; S 6-5-2-5	BM 35	6-5-2-5; 6-5-2-5 HC; HS6-5-2-5; HS6-5-2-5HC; Z 85 WDKCV 06-05-05-04-02; Z 90 WDKCV 06-05-05-04-02	2723	HS 6-5-2-5	F.550.C; F.5613; HS 6-5-2-5	SKH 55	R6M5K5	HS6-5-2-5
11	M7; T11307	1.3348	HS2-9-2; S 2-9-2		Z 100 DCWV 09-04-02-02; 2-9-2; HS2-9-2	2782	HS 2 9 2	F.5607; HS 2-9-2	SKH 58		HS2-9-2

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
11	T4; T12004	1.3255	HS18-1-2-5; S 18-1-2-5	BT 4	Z 80 WKCV 19-05-04-01; HS 18-1-1-5		HS 18-1-1-5	F.5530; HS 18-1-1-5	SKH 3		HS18-1-2-5
11	T1; T12001	1.3355	HS18-0-1; S 18-0-1	BT 1	18-0-1; HS 18-0-1; Z 80 WCV 18-04-01	2750	HS 18-0-1	F.5520; HS 18-0-1	SKH 2	R18	HS18-0-1
11			X10NiMoCrV6								
12	430 F; S43020	1.4104	X12CrMoS17; X 12 CrMoS 17		Z 13 CF 17	2383	X 10 CrS 17	F.3413	SUS 430 F		X12CrMoS17
12	S31500	1.4417	GX2CrNiMoN25-7-3			2376					GX2CrNiMoN 25-7-3
12		1.4742	X10CrAlSi18; X10CrAl18		Z 12 CAS 18			F.3113; X 10 CrAl 18	SUS 21	15Ch18SJu	X10CrAlSi18
12		1.4724	X10CrAlSi13; X10CrAl13; X 10 CrAl 13				X 10 CrAl 12	F.3152; X 10 CrAl 13		10Ch13SJu	X10CrAlSi13
12	434; S43400	1.4113	X6CrMo17-1; X 6 CrMo 17 1	434 S 17	Z 8 CD 17-01	2325		F.3116	SUS 434		X6CrMo17-1
12	HNV-6; HNV6; S65006	1.4747	X80CrNiSi20; X 80 CrNiSi 20	443 S 65	Z 80 CSN 20-02		X 80 CrSiNi 20	F.320B	SUH 4		
12	446; S44600	1.4762	X10CrAlSi25; X10CrAl24; X 10 CrAl 24		Z 10 CAS 24	2322		F.3154	SUH 446		X10CrAlSi25
12	EV 8; S63008	1.4871	X53CrMnNiN21-9; X 53 CrMnNiN 21 9	349 S 52	Z 52 CMN 21-9 Az		X 53 CrMnNiN 21 9	F.3217	SUH 35, SUH 36	55Ch20G9AN4	X53CrMnNiN21-9
12		1.4001	X7Cr14; X 7 Cr 14; G-X 7 Cr 13		Z 8 C 13 FF				SUS 4105		X7Cr14
12	440 B; S44003	1.4112	X90CrMoV18		X 89 CrMoV 18-1			SUS 440B			X90CrMoV18
12	410 S; 403; S41008; S40300	1.4000	X6Cr13; X 6 Cr 13	403 S 17	Z 8 C 12	2301	X 6 Cr 13	F.3110	SUS 403; SUS 403 FB; SUS 410 S	08Ch13	X6Cr13
12	410; S41000; S41001; CA-15	1.4006	X12Cr13; GX12Cr13; X 12 Cr 13; X 10 Cr 13	410 S 21; ANC 1 grade A; En 56 A	Z 10 C 13; Z 13 C 13	2302	X 12 Cr 13 KG; X 12 Cr 13 KW	F.3401	SUS 410; SUS 410 FB; SUS 410 TB; SUS 410 TKA; SUS 410 TKC; SUS F 410-A; SUS F 410-B; SUS F 410-C	12Ch13; 15Ch13L	X13Cr13
12	405; S40500	1.4002	X6CrAl13; X 6 CrAl 13	405 S 17	Z 8 CA 12		X 6 CrAl 13	F.3111	SUS 405; SUS 405 TB; SUS 405 TP		X6CrAl13
12	416; S41600	1.4005	X12CrS13; X 12 CrS 13	416 S 21; En 56 AM	Z 11 CF 13	2380	X12 CrS 13	F.3411	SUS 416		X12CrS13
12		1.4015	X8Cr17								
12	430; S43000	1.4016	X6Cr17; X 6 Cr 17	430 S 17; 430 S 15; 430 S 18	Z 8 C 17	2320	X 8 Cr 17	F.310.D; F.3113	SUS 430; SUS 430 TB; SUS 430 TKA; SUS 430 TKC; SUS 430 TP	12Ch17	X6Cr17
12		1.4027	GX20Cr14	ANC 1 grade B; ANC 1 grade C; 420 C 24; 420 C 29	Z 20 C 13 M				SCS 2	20Ch13L	
12	420 F; S42020	1.4028	X30Cr13; X 30 Cr 13	420 S 37; 420 S 45; En 56 C; En 56 D	Z 33 C 13 Cl; Z 33 C 13; Z 30 C 13	2304	X 30 Cr 13	F.3403	SUS 420 F; SUS 420 J 2; SUS 420 J 2-CSP; SUS 420 J 2 FB; SUS 420 J 2 TKA	30Ch13	X30Cr13
12		1.4086	GX120Cr29; G-X 120 Cr 29	452 C 11							
12		1.4340	GX40CrNi27-4; G-X 40 CrNi 27 4								
12		1.4720	X20CrMo13; X 20 CrMo 13								
12	439; 430 Ti; S43035; S43036; XM 8	1.4510	X3CrTi17; X 6 CrTi 17		Z 4 CT 17		X 6 CrTi 17	F.3115; X 5 CrTi 17	SUS 430 LX; SUS 430 LXTB; SUS XM8TB	08Ch17T	X3CrTi17
12	446-1	1.4749	X18CrN28		Z 12 C 25						X18CrN28
12		1.4511	X3CrNb17; X 6 CrNb 17		Z 4 CNb 17		X 6 CrNb 17	F.3122; X 5 CrNb 17	SUS 430 LX; SUS 430 LXTB		X3CrNb17

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
12	409; S40900	1.4512	X2CrTi12; X 6 CrTi 12	LW 19; 409 S 19	Z 3 CT 12		X 6 CrTi 12	F.3121	SUH 409 L; SUS 409 LTB; SUS 409 TB		X2CrTi12
12		1.4418	X4CrNiMo16-5-1; X 4 CrNiMo 16 5		Z 6 CND 16-04-01	2387					X4CrNiMo16-5-1
12	420; S42000	1.4021	X20Cr13; X 20 Cr 13	420 S 37; 420 S 29; En 56 C	Z 20 C 13 Cl; Z 20 C 13	2303	X 20 Cr 13	F.310.J; F.3402	SUS 420 J 1; SUS 420 J 1 FB; SUS 420 J 1 TKA	20Ch13	X20Cr13
13	420; S42000; S42080	1.4031	X39Cr13; X 38 Cr 13		Z 40 C 14 Cl; Z 40 C 14	2304	X 40 Cr 14	F.3404; X40 Cr 13	SUS 420 J 2	40Ch13	X39Cr13
13		1.4922	X20CrMoV11-1; X20CrMoV12-1; X 20 CrMoV 12 1	BS 762		2317	X 20 CrMoNi 12 01				X20CrMoV11-1; X20CrMoV12-1
13		1.4923	X22CrMoV12-1; X21CrMoNiV12-1; X 22 CrMoV 12 1								X22CrMoV12-1; X21CrMoNiV12-1
13	420; S42000	1.4021	X20Cr13; X 20 Cr 13	420 S 37; 420 S 29; En 56 C	Z 20 C 13 Cl; Z 20 C 13	2303	X 20 Cr 13	F.310.J; F.3402; X 20 Cr 13	SUS 420 J 1; SUS 420 J 1 FB; SUS 420 J 1 TKA	20Ch13	X20Cr13
13	420; S42000	1.4034	X46Cr13; X 46 Cr 13		Z 44 C 14 Cl; Z 44 C 14; Z 38 C 13 M		X 40 Cr 14	F.3405; X 40 Cr 13		40Ch13	X46Cr13
13	431; S43100	1.4057	X17CrNi16-2; X 20 CrNi 17 2; X 22 CrNi 17	431 S 29; En 57	Z 15 CN 16.02 Cl; Z 15 CN 16-02	2321	X16 CrNi 16	F.313; F.3427; X 19 CrNi 17 2	SUS 431; SUS 431 FB	14Ch17N2; 20Ch17N2	X17CrNi16-2
13	CA 6-NM; S41500; J91540	1.4313	X3CrNiMo13-4; X 4 CrNi 13 4		Z 6 CN 13-04; Z 6 CN 13-4; Z 4 CND 13.4 M	2384					X3CrNiMo13-4
13		1.4122	X39CrMo17-1; X 35 CrMo 17				X 39 CrMo 17-1				X39CrMo17-1
13	422; S42200	1.4935	X20CrMoWV12-1; X 20 CrMoWV 12 1								X20CrMoWV12-1
13	HNV 3; S65007	1.4718	X45CrSi9-3; X 45 CrS 9 3; G-X 45 CrNi 9 3	401 S 45; En 52	Z 45 CS 9		X 45 CrSi 8	F.322; F.3220	SUH 1	40Ch9S2; 4Ch9S2	X45CrSi9-3
13		1.2083; 1.2083 ESR	X40Cr14; X 42 Cr 13		X40Cr14; Z 40 C 14	2314	X 41 Cr 13 KU	F.5263; X 40 Cr 13	SUS 420 J 2		X40Cr14
13	CA 6-NM; J91540	1.4317	GX4CrNi13-4; G-X 5 CrNi 13 4	425 C 11; 425 C 12	Z 4 CND 13 4 M		GX 6 CrNi 13 04		SCS 6; SCS 6X		GX4CrNi13-4
13	S13800; XM-13	1.4534	X3CrNiMoAl 13-8-2; X 3 CrNiMoAl 13 8 2	FE-PM1503							X3CrNiMoAl 13-8-2
14	15-5PH; 15-5 PH; XM-12; S15500; J92110	1.4545; 1.4545.9	X5CrNiCuNb15-5		Z 7 CNU 15-05						X5CrNiCu15-3
14	329; S31260; S32900	1.4460	X3CrNiMo27-5-2; X 4 CrNiMo 27 5 2		Z 3 CND 25-07 Az; Z 5 CND 27-05 Az	2324		F.3552; F.3309; X 8 CrNiMo 27-05; X 8 CrNiMo 26 6	SUS 329 J 1; SUS 329 J 1 FB; SUS 329 J 1 TB; SUS 329 J 1 TP	10Ch26N5M	X3CrNiMo27-5-2
14	321; S32100	1.4541	X6CrNiTi18-10	321 S 31; LW 18; LW 24; LWCF 18; LWCF 24; 321 S 12; 321 S 50; 321 S 51; 321 S 50-490; 1010; 1115	Z 6 CNT 18-10	2337	X 6 CrNiTi 18 11; X 6 CrNiTi 18 11 KG; X 6 CrNiTi 18 11 KW; X 6 CrNiTi 18 11 KT	F.332; F.3523; X 6 CrNiTi 18 10	SUS 321	06Ch18N10T; 08Ch18N10T; 09Ch18N10T; 12Ch18N10T	X6CrNiTi18-10
14		1.4425	X2CrNiMo18-13-3								
14	316; 316H; 316 H; S31600; S31609	1.4401	X5CrNiMo17-12-2; X 5 CrNiMo 18 10	316 S 31; 316 S 33; 316 S 17; 316 S 19; 316 S 40; 316 S 41; 845	Z 6 CND 17-11; Z 6 CND 17-11-02-FF; Z 7 CND 17-11-02; Z 7 CND 17-12-02	2347	X 5 CrNiMo 17 12; X 5 CrNiMo 17 12 KG; X 5 CrNiMo 17 12 KW	F.310.A; F.3534; X 5 CrNiMo 17 12 2	SUS 316; SUS 316 A; SUS 316 FB; SUS 316 HFB; SUS 316 HTB; SUS 316 HTP; SUS 316 TB; SUS 316 TBS	08Ch16N11M3	X5CrNiMo17-12-2
14		1.4821	X20CrNiSi25-4		Z20CNS25.04						X20CrNiSi25-4
14	J92701	1.4312	GX10CrNi18-8	ANC 3 grade A; ANC 3 A; 302 C 25	Z 10 CN 18.9 M				SCS 12; SCS 13A	10Ch18N9L	
14	J92605; J93005	1.4823	GX40CrNiSi27-4; G-X 40 CrNiSi 27 4						SCH 11 X		GX40CrNiSi27-4

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	Euronorm
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
14		1.4585	GX7CrNiMoCuNb18-18; G-X 7 CrNiMoCuNb 18 18				X 6 CrNiMoTi 17 12				
14	347; J92640; J82710	1.4552	GX5CrNiNb19-11; G-X 5 CrNiNb 18 9	347 C 17; 821 grade Nb	Z 4 CNNb 19.10 M; Z 6 CNNb 18.10 M			AM-X 7 CrNiNb 20 10; F.8413	SCS 21; SCS 21 X		GX5CrNiNb19-11
14		1.4500	GX7NiCrMoCuNb25-20; G-X 7 NiCrMoCuNb 25-20		23 NCDU 25.20 M						
14	304; S30400	1.4301	X5CrNi18-10; X 5 CrNi 18 9	304 S 15; 304 S 31; LW 13; LW 15; LW 21; LWCF 13; LWCF 15; 302 S 17; 304 S 16; 304 S 17; 304 S 40	Z 4 CN 19-10 FF; Z 5 CN 17-08; Z 6 CN 18-09; Z 7 CN 18-09	2333; 2332	X 5 CrNi 18 10; X 5 CrNi 18 10 KG; X 5 CrNi 18 10 KW; X 5 CrNi 18 10 KT	F.3504; X 5 CrNi 18 10	SUS 304; SUS 304 A; SUS 304-CSP; SUS 304 FB; SUS 304 TB; SUS 304 TBS; SUS 304 TKA; SUS 304 TKC	08Ch18N10	X5CrNi18-10
14	304L; 304 L; S30403; J92500; J92600	1.4306; 1.4309	X2CrNi19-11; GXCrNi19-11	304 S 11; LW 20; LWCF 20; S.536; T.74; 304 C 12; 305 S 11	Z 1 CN 18-12; Z 2 CN 18-10; Z 3 CN 19.10 M; Z 3 CN 18-10; Z 3 CN 19-11; Z 3 CN 19-11 FF	2352	X 3 CrNi 18 11; X 2 CrNi 18 11; GX 2 CrNi 19 10	F.310.G; F.3503; X 2 CrNi 19 10; AM-X 2 CrNi 19 10; F.8412	SCS19	03Ch18N11	X2CrNi19-11; GXCrNi19-11
14	304H; 304 H; CF-8; J92590; J92600; J92650; J92710	1.4308	GX5CrNi19-10; G-X 6 CrNi 18 9	304 C 15	Z 6 CN 18.10 M; Z 6 CN 19.9 M			AM-X 7 CrNi 20 10; F.8411	SCS 13; SCS 13 A; SCS 13 X	07Ch18N9L	GX5CrNi19-10; 58E
14	J92701	1.4312	GX10CrNi18-8; G-X 10 CrNi 18 8	ANC 3 grade A; ANC 3 A; 3025 S 25	Z 10 CND 18.9 M				SCS 12	10Ch18N9L	GX10CrNi18-8
14	S32304	1.4362	X2CrNiN23-4; X 2 CrNiN 23 4		Z 3 CN 23-04 Az	2327					X2CrNiN23-4
14	201; S20100	1.4372	X12CrMnNiN17-7-5		Z 12 CMN 17-07 Az				SUS 201		X12CrMnNiN 17-7-5
14	316; S31600	1.4436	X3CrNiMo17-13-3; X 5 CrNiMo 17 13 3	316 S 31; 316 S 33; LW 23; LWCF 23; 316 S 19; 316 S 40; 316 S 41; 1.4436	Z 6 CND 18-12-03; Z6 CND 18-13; Z 7 CND 18-12-03	2343	X 5 CrNiMo 17 13; X 8 CrNiMo 17 13	F.3538; X 5 CrNiMo 17 13 3	SUS 316; SUS 316 A; SUS 316 FB; SUS 316 TB; SUS 316 TBS; SUS 316 TKA; SUS 316 TKC; SUS 316 TP		X3CrNiMo17-13-3
14	316L; 316 L; S31603; J92700; J92800	1.4404	X2CrNiMo17-12-2; X2CrNiMo17-13-2; X 2 CrNiMo 17 12 2; X 2 CrNiMo 17 13 2	316 S 11; 316 S 13; 316 S 14; 316 S 30; S.161; S.537; T.75	Z 2 CND 17-12; Z 3 CND 17-11-02; Z 3 CND 17-12-02; Z 3 CND 17-12-02 FF; Z 3 CND 18-12-03	2348	X 2 CrNiMo 17 12	F.310.K; F.3533; F.3537	SUS 316 L; SUS 316 LFB; SUS 316 LTBS; SUS 316 LTP; SUS 316 F 316 L		X2CrNiMo17-13-2
14	316LN; 316 LN; S31653	1.4406	X2CrNiMoN17-11-2; X2CrNiMoN17-12-2; X 2 CrNiMoN 17 12 2	316 S 61; 316 S 63	Z 2 CND 17-11 Az		X 2 CrNiMoN 17 12	F.3542; X 2 CrNiMoN 17 12 2	SUS 316 LN; SUS F 316 LN		X2CrNiMoN 17-11-2
14	CF-8M; J92900	1.4408	GX5CrNiMo 19-11-2; G-X 6 CrNiMo 18 10	ANC 4 grade B; ANC 4 B; 316 C 16; 845 grade B				AM-X 7 CrNiMo 20 10; F.8414	SCS 14; SCS 14 A; SCS 14 X	07Ch18N10G2S2M2L	GX5CrNiMo 19-11-2
14	S32750	1.4410	X2CrNiMoN25-7-4; X 10 CrNiMo 18 9		Z 5 CND 25-06 Az	2328					X2CrNiMoN 25-7-4
14	316LN; 316 LN; S31563	1.4429	X2CrNiMoN17-13-3; X 2 CrNiMoN 17 13 3	316 S 63; 1.4429	Z 3 CND 17-12 Az	2375	X 2 CrNiMoN 17 13	F.3543; X 2 CrNiMoN 17 13 3	SUS 316 LN; SUS F 316 LN		X2CrNiMoN 17-13-3
14	316L; 316 L; S31603; J92800	1.4435	X2CrNiMo18-4-3; X 2 CrNiMo18 14 3	316 S 13; 316 S 11; 316 S 14; 316 S 31; LW 22; LWCF 22; 845 B	Z 3 CND 17-12-03; Z 3 CND 18-14-03	2353	X 2 CrNiMoN 17 13; X 2 CrNiMoN 17 13 KG; X 2 CrNiMoN 17 13 KW	F.3533-X2 CrNiMo 17 13 2	SUS 316 L; SUS 316 LFB; SUS 316 LTBS; SUS 316 LTP; SUS F 316 L	O3Ch17N14M3	X2CrNiMo18-4-3
14	S31726	1.4439	X2CrNiMoN17-13-5; X 2 CrNiMoN 17 13 5		Z 3 CND 18-14-05 Az			F.3544; X 2 CrNiMoN 17 13 5			X2CrNiMoN 17-13-5

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	Euronorm
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
14	317; S31700	1.4449	X3CrNiMo18-12-3	317 S 16			X 5 CrNiMo 18 15		SUS 317; SUS 317 TB; SUS 317 TP; SUS F 317		X3CrNiMo18-12-3
14	329; S31260; S32900	1.4460	X3CrNiMoN27-5-2; X 4 CrNiMoN 27 5 2		Z 5 CND 27-05 Az; Z 3 CND 25-07 Az	2324		F.3552; F.3309; X 8 CrNiMo 27-05; X 8 CrNiMo 26 6	SUS 329 J 1; SUS 329 J 1 FB; SUS 329 J 1 TB; SUS 329 J 1 TP	10Ch26N5M	X3CrNiMoN27-5-2
14	S31803; S31260; S32900	1.4462	X2CrNiMoN22-5-3; X 2 CrNiMoN 22 5 3	318 S 13; 1.4462	Z 2 CND 24-08 Az; Z 3 CND 25-06-03 Az; Z 3 CND 25 -05 Az	2377			SUS 329 J 3 L; SUS 329 J 3 LTB; SUS 329 J 3 LTP		X2CrNiMoN22-5-3
14	631; 17-7PH; 17-7 PH; S17700	1.4568; 1.4564; 1.4504	X7CrNiAl17-7; X 7 CrNiAl 17 7	301 S 81	Z 9 CNA 17-07; Z 8 CNA 17-07	2388		X 2 CrNiMo 17 12	SUS 631; SUS 631 J 1; SUS 631-CSP	09Ch17N7Ju1	X7CrNiAl17-7
14	443; 444; S44300; S44400	1.4521	X2CrMoTi18-2; X 2 CrMoTi 18 2		Z 3 CDT 18-02; Z 3 CDT 18-2	2326		F.3123; X 2 CrMoTiNb 18 2	SUS 444; SUS 444 TB; SUS 444 TP		X2CrMoTi18-2
14	904L; 904 L; N08904	1.4539	X1NiCrMoCu25-20-5; X 1 NiCrMoCuN 25 20 5	904 S 13	Z 2 NCDU 25-20	2562					X1NiCrMoCu 25-20-5
14	630; 17-4PH; 17-4 PH; S17400	1.4542	X5CrNiCuNb16-4; X 5 CrNiChNb 17 4		Z 7 CNU 15-05; Z 7 CNU 16-04; Z 7 CNU 17-04				SUS 630; SUS 630 FB; SUS F 630		X5CrNiCuNb16-4
14	S31254	1.4547	X1CrNiMoN20-18-7			2378					X1CrNiMoN 20-18-7
14	631; 17-7PH; 17-7 PH; S17700	1.4568	X7CrNiAl17-7; X 7 CrNiAl 17 7	301 S 81	Z 9 CNA 17-07; Z 8 CNA 17-07	2388		X 2 CrNiMo 17 12	SUS 631; SUS 631 J 1; SUS 631-CSP	09Ch17N7Ju1	X7CrNiAl17-7
14	316 Ti; S31635	1.4571	X6CrNiMoTi17-12-2; X 6 CrNiMoTi 17 12 2	320 S 31; 320 S 18	Z 6 CNDT 17-12	2350	X 6 CrNiMoTi 17 12; X 6 CrNiMoTi 17 12 KG; X 6 CrNiMoTi 17 12 KW	F.310.B; F.3535; X 6 CrNiMoTi 17 12 2	SUS 316 Ti; SUS 316 TiTB; SUS 316 TiTP	08Ch16N11M3T; 08Ch17N13M2T; 10Ch17N13M2T	X6CrNiMoTi 17-12-2
14	309S; 309 S; 309; S30908; S30900	1.4833	X12CrNi23-13; X 7 CrNi 23 14	309 S 24	Z 15 CN 23-13; Z 15 CN 24-13		X 6 CrNi 23 14		SUS 309 S; SUS 309 S TB; SUS 309 S TP		X12CrNi23-13
14	S30415	1.4891	X4CrNiSiN18-10; X 4 CrNiSiN 18 10			2372					X4CrNiSiN 18-10
14	S30815	1.4893	X9CrNiSiNCe21-11-2; X 8 CrNiSiN 21 11			2368					X9CrNiSiNCe 21-11-2
14	304H; 304 H; S30409; S30480	1.4948	X6CrNi18-10; X6CrNi18-11; X 6 CrNi 18 11;	304 S 50; 304 S 51; 801 grade A	Z 5 CN 18-09				SUS 302		X6CrNi18-10
14		1.4581	GX5CrNiMoNb19-11-2; G X 5 CrNiMoNb 18 10	ANC 4 grade C; ANC 4 C; 318 C 17; 845 grade Nb	Z 4 CNDNb 18.12 M		GX 6 CrNiMoNb 20 11		SCS 22		GX5CrNiMoNb 19-11-2
14	303; S30300	1.4305	X8CrNiS18-9; X 10 CrNiS 18 9	303 S 31	Z 8 CNF 18-09	2346	X 10 CrNiS 18 09	F.310.C; F.3508; X 10 CrNiS 18-09	SUS 303	30Ch18N11	X8CrNiS18-9; 58M
14	304L; 304 L; S30403	1.4306	X2CrNi19-11; X 2 CrNi 19 11	304 S 11; LW14; LW 20; LWCF 14; LWCF 20; S.536; T.74; 304 C 12; 304 S 11	Z 1 CN 18-12; Z 3 CN 18-10; Z 3 CN 19-11; Z 3 CN 19-11 FF	2352	X 2 CrNi 18 11; X 3 CrNi 18 11	F.310.G; F.3503; X 2 CrNi 18 10	SUS 304 L; SUS 304 LFP; SUS 304 LTB; SUS 304 LTBS; SUS 304 LTP; SUS F 304 L	03Ch18N11	X2CrNi19-11
14	301; J 230; S30100; S30200	1.4310	X10CrNi18-8; X 12 CrNi 17 7	301 S 21; 301 S 22	Z 11 CN 17-08; Z 11 CN 18-08; Z 12 18-09	2331	X 12 CrNi 17 07	F.3517; X 2 CrNiN 18 10	SUS 301; SUS 301-CSP; SUS 302; SUS 302 FB	12Ch18N9	X10CrNi18-8
14	304LN; 304 LN; S30453	1.4311	X2CrNiN18-10; X 2 CrNiN 18 10	304 S 61	Z 3 CN 18-10 Az; Z 3 CN 18-07 Az	2371	X 2 CrNiN 18 11	F.3541; X 2 CrNiN 18 10	SUS 304 LN; SUS F 304 LN		X2CrNiN18-10

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	Euronorm
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
14	304B1; 304B2; 304B3; 304 B1; 304 B2; 304 B3; S30461; S30462; S30463	1.4350	X5CrNi18-9	304 S 31	Z 6 CN 18.09	2332; 2333	X 5 CrNi 18 10	F.3551			58E
14	317L; 317 L; S31703	1.4438	X2CrNiMo18-15-4; X2 CrNiMo 18 16 4	317 S 12	Z 2 CND 19-15-04; Z 3 CND 19-15-04	2367	X 2 CrNiMo 18 16	F.3539; X2 CrNiMo 18 16 4	SUS 317 L; SUS 317 LFB; SUS 317 LTB; SUS 317 LTP; SUS F 317 L; SUS Y 317 L		X2CrNiMo18-15-4
14	321H; 321 H; S32109	1.4878	X12CrNiTi18-10; X 12 CrNiTi 18-9	321 S 31	Z 6 CNT 18-10	2337	X 6 CrNiTi 18.11	F.3553	SUS 321; SUS 321 HFB; SUS 321 HTB; SUS 321 HTP; SUS 321 TKA; SUS 321 TP; SUS F 321; SUS Y 321		X12CrNiTi18-10; 58B
14	347; 348; S34700; S34800	1.4550	X6CrNiNb18-10; X 6 CrNiNb 18 10	347 S 31; ANC 3 grade B; ANC 3 B; 347 S 20; 347 S 40; 347 S 50; 347 S 51	Z 6 CNNb 18-10	2338	X 6 CrNiNb 18 11; X 6 CrNiNb 18 11 KG; X 6 CrNiNb 18 11 KW; X 6 CrNiNb 18 11 KT	F.3524; X 6 CrNiNb 18 10	SUS 347; SUS 347 FB; SUS 347 HTB; SUS 347 TB; SUS 347 TKA; SUS 347 TP; SUS F 347	08Ch18N12B	X6CrNiNb18-10; 58F;
14	318; S31803	1.4583	X10CrNiMoNb18-12; X 10CrNiMoNb 18 12		Z 6 CNDNb 18-12		X 6 CrNiMoNb 20 11				
14	310H; 310 H; 310S; 310 S; S31008; S31009	1.4845	X8CrNi25-21; X 12 CrNi 25 21	310 S 16; 310 S 24; 310 S 25; 310 S 31	Z 8 CN 25-20; Z 12 CN 25-20; Z 12 CN 26-21	2361	X 6 CrNi 25 20 (X 6 CrNi 25 20)	F.331	SUS 310 S; SUS 310 FB; SUS 310 STG; SUS 310 STP; SUS310 TB; SYS Y 310 S	10Ch23N18; 20Ch23N18	X12CrNi25-21
14		1.4465; 1.4466	X1CrNiMoN25-22-2; X 2 CrNiMoN 25 22 7								X1CrNiMoN 25-22-2
14	309; S30900	1.4828	X15CrNiSi20-12; X 15 CrNiSi 20 12	309 S 24	Z 9 CN 24-13; Z 17 CNS 20-12		X 16 CrNi 23 14	F.3312; X 15 CrNiSi 20-12	SUH 309; SUS 309 TB; SUS 309 TP	20Ch20N14S2	58C; X15CrNiSi20-12
14	HK; J94203; J94204; J94224	1.4848	GX40CrNiSi25-20; G-X 40 CrNiSi 25 20	310 C 40; 310 C 45			G X 40 CrNi 26 20	AM-X 40 CrNi 25 20; F.8452	SCH 21; SCH 22; SCH 22 X		GX40CrNiSi25-20
14	HK 30; J93503; J94003; J94013; HH	1.4837; 1.4848+Nb	GX40CrNiSi25-12; G-X 40 CrNiSi 25 12	309 C 30			G X 35 CrNi 25 12		SCH 13; SCH 13 A; SCH 13 X; SCH 17; SCS 17	40Ch24N12SL	GX40CrNiSi25-12
14	310; 314; S3100; S31400; S31500	1.4841	X15CrNiSi25-21; X 15 CrNiSi 25 20	314 S 25	Z 15 CNS 25-20		X 16 CrNiSi 25 20	F.3310; X 15 CrNiSi 25-20	SUH 310; SUS 310 TB; SUS Y 310	20Ch25N20S2	X15CrNiSi25-21
14		1.4849	GX40NiCrSiNb38-19; G-X 40 NiCrSi 38 18								GX40NiCrSiNb 38-19
14	S32760; SA351/995; 25Cr-7Ni-Mo-N	1.4501	X2CrNiMoCuWN25-7-4	1.4501	Z 3 CNDU 25-06 Az						X2CrNiMoCuWN 25-7-4
14	348; S34800	1.4546	X5CrNiNb18-10	2 S.130; 2 S.143; 3 S.144; 3 S.145; S.525; S.527							
14		1.4544; 1.4544.9		S.524; S.526; 2 S 129	Z 10 CNT 18-11; 9160/C 63; 9160C201		X 6 CrNiTi 18 11			08Ch18N12T	FE-PA 13
14		1.6900	X12CrNi18-9; X 12 CrNi 18 9								
14		1.4829	X12CrNi22-12; X 12 CrNi 22 12								
14		1.4882	X50CrMnNiNbN21-9		Z 50 CMNNb 21.09						X50CrMnNiNbN 21-9
14	316N; 316 N; J92804	1.4409	GX2CrNiMo19-11-2; G-X 2 CrNiMo 19 11 2		Z 3 CND 19.10 M		GX2 CrNiMo 19 11	AM-X 2 CrNiMo 19 11; F.8415	SCS 16 A; SCS 16 AX SCS 16 AXN		GX2CrNiMo 19-11-2
14	304L; 304 L J92500; J92620	1.4309	GX2CrNi19-11	304 C 12	Z 3 CN 19.10 M		GX 2 CrNi 19 10	AM-X 2 CrNi 19 10; F.8412	SCS 19; SCS 19 A		GX2CrNi19-11

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	Euronorm
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
15	A48 25 B; Class 25; No 25 B	0.6015	EN-GJL-150; GG 15; EN-JL 1020	Grade 150	Ft 15 D; R 15 D	01 15-00	G 14; G 15	FG 15	FC 15; FC 150	SCh 15	EN-GJL-150; EN-JL 1020
15	A48-30 B; Class 30, No.30 B	0.6020	EN-GJL-200; GG 20; EN-JL 1030	Grade 220	Ft 20 D	01 20-00	G 20; Gh 190	FG 20	FC 20; FC 200	SCh 20	EN-GJL-200; EN-JL 1030
15	A48-20 B; Class 20; No 20 B	0.6010	EN-GJL-100; GG 10; EN-JL 1010		Ft 10 D	01 10-00	G 10	FG 10	FC 10; FC 100	SCh10	EN-GJL-100; EN-JL 1010
16	A48-45 B; Class 45; No 45 B	0.6030	EN-GJL-300; GG 30; EN-JL 1050	Grade 300	Ft 30 D	01 30-00	G 30	FG 30	FC 30; FC 300	SCh 30	EN-GJL-300; EN-JL 1050
16	A48-50 B; Class 50; No 50 B	0.6035	EN-GJL-350; GG 35; EN-JL 1060	Grade 350	Ft 35 D	01 35-00	G 35	FG 35	FC 35; FC350	SCh 35	EN-GJL-350; GG 35; EN-JL 1060
16	A48-60 B; Class 60; No 60 B	0.6040	EN-JLZ; GG 40	Grade 400	Ft 40 D	01 40-00				SCh 40	EN-JLZ
16	A48-40 B; Class 40; No 40 B	0.6025	EN-GJL-250; GG 25; EN-JL 140	Grade260	Ft 25 D	01 25-00	G 25	FG 25	FC 25	SCh 25	EN-GJL-250; EN-JL 140
17		0.7033	EN-GJS-350-22-LT; GGG 35.3	350/22 L 40	FGS 370-/17	0717-15	GS 370-17	FNG 38-17	FCD 350-22L	VCh42-12	EN-GJS-350-22-LT
17	60-40-18; A536 60-40-18	0.7043	EN-GJS-400-18; EN-GJS-400-18-LT; GGG-40.3; EN-GJS-400-18A-LT	370/7; SNG 370/17	FGS 370-17	0717-15	GSO 400-12			VCh 42-2	EN-GJS-400-18; EN-GJS-400-18-LT; EN-GJS-400-18A-LT
17	60-40-18; A536 60-40-18	0.7040	EN-GJS-400-15; EN-JS 1030; GGG-40	420/12; SNG 420/12	FCS 400-12	0717-02	GS 400-12	FGE 38-17	FCD 40	VCh 42-12	EN-GJS-400-15; EN-JS 1030
17	65-45-12; A536 65-45-12	5.3107	EN-GJS-450-10	450/10; SNG 450/10	FGS 450-10		GS 400-12	FGE 42-12	FCD450	VCh 45	EN-GJS-450-10
18	65-45-12; A536 65-45-12	0.7050	EN-GJS-500-7; EN-GJS-500-7A; EN-JS 1050; GGG-50	500/7	FGS 500-7	0727-02	GS 500/7	FGE 50-7	FCD 50; FCD 500; FCD 500-7	VCh 50-2	EN-GJS-500-7; EN-GJS-500-7A; EN-JS 1050
18	80-55-06; A536 80-55-06	0.7060	EN-GJS-600-3; EN-GJS-600-3A; EN-JS 1060; GGG-60	600/3	FGS 600-3	0732-03	GS 600/3	FGE 60-2	FCD 60; FCD 600; FCD 600-3		
18		0.7652	GGG-NiMn 13 7	S-NiMn 13 7	S-NM 13 7	07 32-03	GGG 60	GGG 60			
18	100-70-03; A536 100-70-03	0.7070	EN-GJS-700-2; EN-JS 1070; GGG-70	700/2; SNG700/2	FGS 700-2	0737-01	GS 700-2	FGE 70-2	FCD 70; FCD 700; FCD 700-2	VCh 70-2	EN-GJS-700-2; EN-JS 1070
18	A439 Type D-2	0.7660	GGG-NiCr 20 2	S-NiCr 20 2	S-NC 20-2						
18	A439 Type D-2 B	0.7661	GGG-NiCr 20 3	S-NiCr 20 3	S-NC 20 3						
19	A47-32510; A47 Class 32510; A47 Grade 32510; 32510	0.8135	EN-GJMB-350-10; EN-JM 1130; GTS-35-10; GTS-35	B 340/12; 310 B340/12	MN 35-10; A32-702 MN 350-10	0810	B 35-10	GTS 35; 36114 Type A	FCMB 340; G5703 FCMB 340	KCh 35-10	EN-GJMB-350-10; EN-JM 1130
19	A47-35018, A47 Class 35018; A47 Grade 35018				MN 380-18; A32-702 MN 380-18					KCh 37-12	
19	A47-22010; A47 Class 22010; A47 Grade 22010; UNS F22200			B 32-10; 6681 B 32-10					FCMB 310	KCh 33-8	
20	A220-50005; A220 Class 50005; A220 Grade 50005	0.8155	EN-GJMB-550-4; EN-JM1160; GTS-55-04	P 55-04; P 510/4	MP 60-3; A32-703 MP 60-3; Mn 550-4	0856-00	P 55-04	Type C; 36116 Type C	FCMP 540	KCh 55-4; KCh60-3	EN-GJMB-550-4; EN-JM1160
20	A220-70003; A220 Class 70003; A220 Grade 70003	0.8165	EN-GJMB-650-2; EN-JM1180; GTS-65-02	P 65-02; 6681 P 65-02; P 570/3	Mn 650-3	0862-030	GMN 65		FCMP 590	KCh 63-3	EN-GJMB-650-2; EN-JM1180
20	A220-70003; A220 Class 70003; A220 Grade 70003	0.8170	EN-GJMB-700-2; EN-JM1190; GTS-70-02	P 70-2; 6681 P 70-2; P 690/2	MP 70-2; A 32-703 MP 70-2; Mn 700-2	0862-03	P 70-2; GMN 70	36116 Type A	FCMP 690	KCh 70-2	EN-GJMB-700-2; EN-JM1190

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
20	A220-45006; A220 Class 45006; A220 Grade 45006 A220-45008; A220 Class 45008; A220 Grade 45008	0.8145	EN-GJMD-450-6; EN-JM1140; GTS-45-06; GTS-45	P 45-06; 6681 P 45-06	MP 50-5; A32-703 MP 50-5	0854-00	P 45-06	Type E; 36116 Type E		KCh 45-7	EN-GJMD-450-6; EN-JM1140
20	A220-80002; A220 Class 80002; A220 Grade 80002			P 70-2	MN 700-2	854			FCMP 70; FCMP 700	KCh 80-1.5	
20	A220-90001; A220 Class 90001; A220 Grade 90001										
20	A220-60004; A220 Class 60004; A220 Grade 60004										
20	A220-40010; A220 Class 40010; A220 Grade 40010					0852-00					
20		0.8040	EN-GJMW-400-5; GTW-40-05	W 40-05	MB 400-5		W 40-05	36113 Type A	FCMW 370		EN-GJMW-400-5; EN-JM1030
20		0.8035	EN-GJMW-350-4; GTW-35-04	W 35-04	MB 35-7		W 35-04	36113 Type B	FCMW 330		EN-GJMW-350-4; EN-JM1010
21	AA5005; AA5006; A95005; A95006; 5005; 5005A; 5006	3.3315	AlMg1; AlMg1C	N41	A G0-6	144106	L3350		A5005	1510; AMg1	AlMg1C; 5005A
21	AA1050; A91050; 1050; 1050A	3.0255	Al99,5; Al99.5	1B	A5	14407	9001/2	L-3051		AD0	Al99.5; Al99,5; 1050A
21	AA1200; A91200 ; 1200; 1200A	3.0205	Al99,0; Al99.0; Al99	1C	A4	144010	Al99.0	L-3001	A1200	A0	Al99.0; AL99,0; 1200
22	AA2017; A92017; 2017; 2017A	3.1325; 3.1124	AlCu2,5Si(A); AlCu2.5Si(A); AlCuMg1		A-U4G			L-3120		V65	AlCu2,5Si(A); AlCu2.,5Si(A); 2017A
22		3.2315	AlMgSi1	H30	A-SGM0.7	144312	9006/4	L-3453		AD35	AlSiMgMn; 6082
22		3.4345	AlZnMgCuO,5; AlZnMgCuO.5								AlZnMgCu0.5; AlZnMgCu0,5; 7022
22		3.1655	AlCu6BiPb; AlCuBiPb	FC1	A-U5PbBi	144355	9002/5	L-3192	A2011		AlCu6BiPb; 2011
22	AA7075; A97075; 7075	3.4365; 3.4364	AlZn5,5MgCu; AlZn5.5MgCu; AlZnMgCu1,5; AlZnMgCu1.5	7075; L95; L96	A-Z5GU		9007/2	L-3710	A7075	B95	AlZn5.5MgCu; AlZn5,.5MgCu; AW-7075; 7075
22	AA2024; A92024; 2024	3.1355; 3.1354	AlCuMg2	2024; 2L97	A-U4G1		9002/4; 3583	L-3140	A2024	D16	AlCu4Mg1; 2024
22		3.4335	AlZn4,5Mg1; AlZn4.5Mg1	H17	A-Z5G	144425	9007/1	L-3741			AlZn4.5Mg1; AlZn4,5Mg1; 7020
22	AA6061; A96061; 6061	3.3211; 3.3214	AlMg1SiCu	H20	A-GSUC		9006/2	L-3420	A6061	AD33	EN AW-6061; EN AW-AlMg1SiCu; AlMg1SiCu
23		3.3261	G-AlMg5Si; GK-AlMg5Si; AlMg5Si; VDS 245	LM5		144163				AL13	EN AC-51400; EN AC-AlMg5Si; G-AlMg5Si; AlMg5Si
23		3.2982	GD-AlSi12(Cu); G-AlSi12(Cu); AlSi12(Cu); VDS 231 D		A-S12U		3048				EN AC-47100; EN AC-AlSi12C; G-AlSi12Cu; AlSi12Cu; AlSi12Cu1(Fe)

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
23	520.0; AA 520.0; A05200				A-G10S		3056	L-2310	AC7B	A18	
23	222.0; AA 222.0; A02220			LM12			3041	L-2110			
23	518.0; AA 518.0; A05180	3.3292	G-AlMg9; GD-AlMg9; AlMg9; VDS 349								EN AC-51200; EN AC-AlMg9; G-AlMg9; AlMg9
23	203.0; AA 203.0; A02030	3.1754	G-AlCu5Ni1,5; G-AlCu5Ni1.5		AU5NKZr						
23	ER4047; A94047	3.2585	SG-AlSi12	4047A; NG2		144262					SG-AlSi12; EL-AlSi12
23	712.0; AA 712.0; A07120		G-AlZn10Si8Mg; GK-AlZn10Si8Mg; AlZn10Si8Mg; VDS 108		A-Z5GF		3602				EN AC-71100; EN AC-AlZn10Si8Mg; G-AlZn10Si8Mg; AlZn10Si8Mg
23	514.0; 514.1; AA 514.0; AA 514.1; A05140; A05141	3.3561	G-AlMg5; GK-AlMg5; AlMg5; EN AC-51300; VDS 244		A-G6		3058	L-2331		AL28; AMg5Mz;	EN AC-51300; EN AC-AlMg5; G-AlMg5; AlMg5
23	B413.0; AA B413.0; A24130; B213.0; AA 213.0; A22130	3.2581; 3,2582	G-AlSi12; GK-AlSi12; GD-AlSi12; AlSi12	LM6	A-S13	144261	4514	L-2520	AC3		EN AC-44200; EN AC-AlSi12; G-AlSi12; GD-AlSi12; AlSi12
23		3.2211	G-AlSi11; GK-AlSi11; AlSi11								EN AC-44000; EN AC-AlSi11; G-AlSi11
23	A444.0; AA A444.0; A14440									AK7	
23		3.3541	G-AlMg3; GK-AlMg3; GF-AlMg3; AlMg3; VDC 244	H20	A-G3T	144224	3059	L-2341	ADC6		EN AC-51100; EN AC-AlMg3; G-AlMg3; AlMg3
24	515.0; AA 515.0; A05150	3.3241	G-AlMg3Si; GK-AlMg3Si; GF-AlMg3Si; AlMg3Si; AlMg3Si1								G-AlMg3Si1; AlMg3Si
24		3.2373	G-AlSi9Mg; GK-AlSi9Mg; AlSi9Mg		A-S9G		3051		AC4A	AK9	G-AlSi9Mg; AlSi9Mg
24	A356.0; AA A356.0; A13560; A356.2; AA A356.2; A13562	3.2371	G-AlSi7Mg; GK-AlSi7Mg; GF-AlSi7Mg; AlSi7Mg	2L99	A-S7G03			L-2651	AC4CH	AL9	G-AlSi7Mg; AlSi7Mg
24	204.0; AA 204.0; A02040	3.1371	G-AlCu4TiMg; GK-AlCu4TiMg; GF-AlCu4TiMg; AlCu4TiMg		AU5GT			L-2140	AC1B		EN AC-21000; EN AC-AlCu4TiMg; G-AlCu4TiMg
24	A333.0; AA A333.0; A13330	3.2161	G-AlSi8Cu3; GK-AlSi8Cu3			144163				AL13	EN AC-AlSi8Cu3; EN AC-AlSi8Cu3; G-AlSi8Cu3
24	380.0; AA 380.0; A03800	3.2163	G-AlSi9Cu3; GD-AlSi9Cu3; AlSi9Cu3; VDS 226	LM24	A-S9U3	144252	3610	L-2630	AC4B	AK8M3; AK8	EN AC-46200; EN AC-AlSi8Cu3; G-AlSi9Cu3; AlSi8Cu3
24	365.0; AA 365.0; A03650		G-AlSi10MnMg								EN AC-43500; EN AC-AlSi10MnMg; G-AlSi10MnMg
24	319.0; AA 319.0; A03190	3.2151	G-AlSi6Cu4; GK-AlSi6Cu4; AlSi6Cu4; VDS 225	LM21	A-S5UZ	144230	7369/4	L-2620	AC2B	AK5M	EN AC-45000; EN AC-AlSi6Cu4; G-AlSi6Cu4; AlSi6Cu4
24		3.2383	G-AlSi10MgCu; GK-AlSi10MgCu; G-AlSi10Mg(Cu); GK-AlSi10Mg(Cu); AlSi10MgCu; AlSi10Mg(Cu)		A-S10UG						

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
24		3.2381; 3.2385	G-AlSi10Mg; GK-AlSi10Mg; GD-AlSi10Mg; AlSi10Mg; VDS 239		A-S10G	144253					EN AC-43000; EN AC-AlSi10Mg; G-AlSi10Mg; AlSi10Mg
24		3.1841	G-AlCu4Ti; AlCu4Ti							AL19	EN AC-21100; EN AC-AlCu4Ti; G-AlCu4Ti; AlCu4Ti
25	390.0; AA 390.0; A03900		G-AlSi17Cu4Mg	LM30		4282					EN AB-48100; EN AC-48100; G-AlSi17Cu4Mg; AlSi17Cu4Mg
25	393.0; AA 393.0; A03930		G-AlSi20CuMgNi; AlSi20CuMgNi	LM29						AK21M2N2	
25			G-AlSi18Cu1MgNi; AlSi18Cu1MgNi	LM28							
26	C36000	2.0375	CuZn36Pb3	CZ124	CuZn36Pb3		12167		C3600; C3601; C3602		CuZn36Pb3; CW603N
26	C83810	2.1098	CuSn3Zn8Pb5-C; G-CuSn2ZnPb	LG1							CuSn3Zn8Pb5-C
26	C83600	2.1096; 2.1096.01	CuSn5Zn5Pb5-C; G-CuSn5ZnPb; Rg 5	LG2	CuPb5Sn5Zn5; UE5; U-E 5 Pb 5 Z 5	5204-15			H5111; H2203	BrO5Ts5S5	CuSn5Zn5Pb5-C
26	C93200	2.1090	CuSn7Zn4Pb7-C; G-CuSn7ZnPb; GC-CuSn7ZnPb; GZ-CuSn7ZnPb; Rg 7	GC 493K	CuSn7Pb6Zn4; UE7; U-E 7 Z 5 Pb 4						CuSn7Zn4Pb7-C
26	C93800	2.1182	CuSn7Pb15-C; G-CuPb15Sn; GC-CuPb15Sn; GZ-CuPb15Sn	LB1	U-Pb15E8; U-Pb 15 E8			C-3300			CuSn7Pb15-C; CC496K
26	C93700	2.1176	CuSn10Pb10-C; G-CuPb10Sn; GC-CuPb10Sn; GZ-CuPb10Sn	LB2	U-Pb10						CuSn10Pb10-C
27	C22000	2.0230	CuZn10; Ms90	CZ101	U-Z10; CuZn10		P-CuZn10; P-OT90		C2200	L90	CuZn10; CW501L
27	C86200; SAE 430A	2.0596	CuZn34Mn3Al2Fe1-C; G-CuZn34Al2; GK-CuZn34Al2; GZ-CuZn34Al2	HTB 1	U-Z36N3; CuZn19Al6Y20				HBSC4; H5102/class 3; H5102/class 4	LTs23A; LTs23A6Zh3MTs2	CuZn34Mn3Al2 Fe1-C; CC764S
27	C27200	2.0335	CuZn36; Ms64	CZ108	U-Z36; CuZn 36		C 2700			L63	CuZn36; CW507L
27	C27400	2.0321	CuZn37; Ms63	CZ108			P-CuZn37; P-OT63		C2720	L63	CuZn37; CW508L
27	C86400	2.0592	CuZn35Mn2Al1Fe1-C; G-CuZn35Al1; GK-CuZn35Al1; GZ-CuZn35Al1; G-Ms60	HTB 1					HBSC1; CAC301		CuZn35Mn2Al1 Fe1-C; CC765S
27	C46400	2.0530	CuZn38Sn1As; CuZn38Sn1	CZ112			P-CuZn39Sn1		C4640	LO60-1	CuZn38Sn1As; CW717R
27	C23000; 85Cu-15Zn	2.0240	CuZn15 ; CuZn 15	CZ102	U-Z15; CuZn15	5112-02; 5112-04; 5112-05			C2300		CuZn15; CW502L
27	C24000; 80Cu-20Zn	2.0250	CuZn20; CuZn 20; Ms80	CZ103	CuZn20	5114-02; 5114-04; 5114-05			C2400		CuZn20; CW503L
27	C26000; CA260	2.0265	CuZn30; CuZn 30	CZ106	CuZn30				C2600		CuZn30; CW505L
28	C63000	2.0966	CuAl10Ni5Fe4; CuAl 10 Ni 5 Fe 4	CA 104	U-A10N; CuAl9Ni5Fe3		P-CuAl10Ni5Fe5		C6301	BrAD; BrAZhN10-4-4; N10-4-4	CuAl10Ni5Fe4; CW307G
28	C90700	2.1050	CuSn10-C; G-CuSn 10; SnBz10	CT1	CuSn8						CuSn10-C; CC480K
28	C90800; C91700	2.1052; 2.1052.01; 2.1052.04; 2.1052.03	CuSn12-C; G-CuSn12; GZ-CuSn12; SnBz12, Gbz12	PB2	UE12P				CAC502C; PBC2C		CuSn12-C; CC483K
28	C95800; C95810	2.0975	G-CuAl10Fe5Ni5-C; G-CuAl 10 Ni; NiAlBz-F60		CuAl10Fe5Ni5 Y70				CAC703C		CC333G
28	C11000	2.0060	Cu-ETP; E-Cu57; E Cu 57	C101	Cu-B		Cu-DHP	C11020	C1100	M1	Cu-ETP; E-Cu57; CW004A
28	C81500	2.1292	G-CuCrF 35	CC1-FF	U-Cr0.8Zr						

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
28	C10300	2.0070	Cu-HCP; Cu-PHC; SE-Cu						C103	LS60-2	Cu-HCP; CW020A; Cu-PHC; CW021A
28	C10100; C10200	2.0040	Cu-OF; OF-Cu	C103; C110	Ci-c1; Cu-c2			C-1120	C1011; C1020	M0b	Cu-OF; CW008A
28	C86550	2.0590	G-CuZn40Fe; G-SoMsF30								G-CuZn40Fe
28	C18100; C18150	2.1293	CuCr1Zr; CuCrZr	CC102	U-C1Z; U-Cr0.8Zr						CuCr1Zr; CW106C
28	C11000; C12200	2.0090	Cu-DHP; E-Cu58; E Cu 58 SF-Cu	C106	Cu-B				C1100; C1220	M1f	Cu-DHP; E-Cu58; CW024A
28	C95500	2.0971	CuAl9Ni3Fe2		UA9					BrA10Zh4N4L	
28	C61000	2.0920	CuAl8; Cu Al 8		CuAl8					BrA7	CuAl8
31	330; N08330	1.4864	X12NiCrSi35-16; X12NiCrSi36-16; X12 NiCrSi 36 16	NA 17; INCOLOY alloy DS	Z 20 NCS 33-16; Z 12 NCS 37-18; Z 12 NCS 35-16			F.3313	SUH 330		
31	N08002; N08004; N08005; N08030	1.4865	GX40NiCrSi38-19 GX40NiCrSi38-18; G-X40 NiCrSi38 18	330 C 11; 330 C 40; 331 C 40			GX 50 NiCr 39 19		SCH 15; SCH 16		GX40NiCrSi38-18
31		1.4558	X2NiCrAlTi32-20; X2 NiCrAlTi 32 20	NA 15					NCF 800		X2NiCrAlTi32-20
31	N08031	1.4562	X1NiCrMoCu32-28-7; X1 NiCrMoCu 32 28 7								X1NiCrMoCu 32-28-7
31		1.4958	X5NiCrAlTi31-20; X5 NiCrAlTi 31 20	NA 15					NCF 800 H; NCF 718		X5NiCrAlTi31-20
31	N08811	1.4959	X8NiCrAlTi32-21; X8 NiCrAlTi 32 21	NA 15; NA 15 H	Z 8 NC 33-21; Z 10 NC 32-21						X8NiCrAlTi32-21
31	N08028	1.4563	X1NiCrMoCu31-27-4; X1 NiCrMoCu 31 27 4		Z 2 NCDU 31-27; Z 1 NCDU 31-27-03	2584				EK77; ChN30MDB	X1NiCrMoCu 31-27-4
31	B 163; N08800; N08810; N08332; N08811	1.4876	X10NiCrAlTi32-21; X10NiCrAlTi32-20; X10 NiCrAlTi 32 20	NA 15; NA 15 H	Z 10 NC 32-21; Z 8 NC 33-21			F.3314; F.3545	NCF 800; NCF 800 TB; NCF 800 TP		X10NiCrAlTi32-21
32	S590; J 467	1.4977	X40CoCrNi20-20; X40 CoCrNi 20 20		Z 42 CNKDWNb						
32	660; S66286	1.4980	X6NiCrTiMoVB25-15-2; X5NiCrTi26-15 X6 NiCrTiMoVB 25 15 2; X5 NiCrTi 26 15	HR 51; HR 52	Z 3 NCT 25; Z 6 NCTDV 25.15 B						X6NiCrTiMoVB 25-15-2; X5NiCrTi26-15
32		1.4943; 1.4944	X4NiCrTi25-15; X5NiCrTi26-15	HR 51	Z 6 NCTDV 25-15 B	2570					X4NiCrTi25-15; X5NiCrTi26-15
32	661; R30155	1.4971	X12CrCoNi21-20; X12 CrCoNi 21 20								X12CrCoNi21-20
32	Haynes 556; R30556										
33	Incoloy 825; N08825;	2.4858	NiCr21Mo	NA 16	NC 21 Fe DU					ChN38VT	
33	Hastelloy C-4; N06455	2.4610	NiMo16Cr16Ti								
33	Nimonic 75; N06075; AMS 5715	2.4630; 2.4951	NiCr20Ti	HR 5; HR 203-4	NC 20 T						
33	Inconel 625; N06625; AMS 5666	2.4856	NiCr22Mo9Nb	NA 21	NC 22 FeDNb						
33	Inconel 690; N06690	2.4642	NiC29Fe		NC 30 Fe						
33	Monel 400; N04400	2.4360; 2.4361	NiCu30Fe	NA 13	NU 30						
33	Hastelloy X; N06002; 5390A; AMS 5754; AMS 5536	2.4603; 2.4665	NiCr30FeMo; NiCr22Fe18Mo; NiCr21Fe18Mo9	HR 6	NC 22 FeD						
33	Inconel 617; N06617; AMS 5887	2.4663a	NiCr23Co12Mo		NC 14 K 9 T 5 DWA						

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
33	Nimonic 90; N07090; AMS 5829	2.4632; 2.4969	NiCr20Co18Ti; NiCr 20 Co 18 Ti	HR 2; HR202; HR 402; HR 501; HR 502; HR 503	Z 8 NCDT 42						NiCr20Co18Ti
33	Haynes 214; NO7214	2.4646	NiCr16Al								
33	Rene 41; N07041; AMS 5712; AMS 5713	2.4973	NiCr19Co11MoTi; NiCr 19 CoMo		NC 19 KDT						
33	Hastelloy B2; N10665	2.4617; 2.4616; 2.4615	NiMo28; EL-NiM29; SG(UP)-NiMo27						YNiMo-7		NiMo28
33	Udimet L-605; R30605	2.4964	CoCr20W15Ni								
33	Monel R-405; N04405	2.4360; 2.4361	NiCu30Fe	NA 13	NU 30						
33	Inconel 600; N06600; AMS 5665	2.4816	NiCr15Fe8; NiCr 15 Fe	NA 14	NC 16 FeT					ChN78T	NiCr15Fe8
33	Inconel 601; N06601	2.4851	NiCr23Fe15A; NiCr 23 Fe		N C 23 FeA					ChN60Yu	NiCr23Fe15A
33	Nimonic 263; N07263; AMS 5872; AMS 5886	2.4650	NiCo20Cr20MoTi; NiCo 20 Cr 20 MoTi MoTi	HR 10; HR 206; HR 404	NCK 20 D						NiCo20Cr20MoTi
34	Haynes 188; Jetalloy 209; R30188; AMS 5772	2.4964	CoCr22W14Ni		KC22WN						
34	Monel K-500; N05500	2.4375	NiCu30Al3Ti; NiCu 30 Al	NA 18	NU 30 AT						NiCu30Al3Ti
34	Inconel 718; N07718; AMS 5596; AMS 5589	2.4668	NiCr19Nb5Mo3; NiCr 19 NbMo; NiCr19Fe19Nb5Mo3	HR 8	NC 19 Fe Nb						NiCr19Nb5Mo3
34		2.4955	NiFe25Cr20NbTi; NiFe 25 Cr 20 NbTi		NiFe25Cr20NbTi						NiFe25Cr20NbTi
34	Incoloy 925; N09925	2.4670									
34	Nimonic 901; N09901; AMS 5660; AMS 5661	2.4662	NiFe35Cr14MoTi; NiCr13Mo6Ti3; NiCr 13 Mo 6 Ti 3		Z8 NCDT 42						
34	Udimet 500; N07500; AISI 684	2.4983	NiCr18Co18MoAlTi		NCK 19 DAT						NiCr18Co18MoAlTi
34	Nimonic 80A; N07080	2.4631; 2.4952	NiCr20TiAl; NiCr 20 TiAl	HR 401; HR 601	NC 20 TA				NCF 80 A	ChN77TYuR; ChN56VMTYu	NiCr20TiAl
34	Jetalloy 209; AMS 5772		CoCr22W14Ni		KC 22 WN						
34	Altemp S-816	2.4989	CoCr20Ni20W							Altemp S-816	
34	MAR-M 246	2.4675	NiCr23Mo16Cu; NiCr 23 Mo 16 Cu								NiCr23Mo16Cu
34	Inconel 722; N07722; AMS 5411										
34	Waspaloy; N07001; AISI 685; AMS 5704; AMS 5706; AMS 5708; AMS 5544	2.4654	NiCr20Co13Mo4Ti3AL; NiCr 19 Co 14 Mo 4 Ti		NC 20 K 14						NiCr20Co 13Mo4Ti3AL
34	Rene 80				NC14 K9 T5 DWA						
35	5388C; N30002; CW-12MW;	2.4883	G-NiM16CrW								
35	N7M; N-7M; N30007	2.4685	G-NiMo28		ND 30 M						
35	N12MV; N-12MV; N30012	2.4882; 9.4810; 2.4810/9.4810	G-NiMo30								
35	Nimocast PK24; N13100; AMS 5397	2.4674	G-NiCo15Cr10AlTiMo	HC 204	NK 15 CAT						

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35	Jethete M-252; N07252; AMS 5551	2.4916	G-NiCr19Co; G-NICR 19 Co								
35	Nimocast 713; N07713; AMS 5391; Inconel 713LC	2.4670	G-NiCr13Al6MoNb	HC 203	NC 13 AD						
35	M-35-1; N214135	2.4365; 2.4365/9.4365	G-NiCu40Nb						NiCuC		
36	Titanium Grade 1; R50250; ASTM GR. 1	3.7024; 3.7025	Ti 1; Ti 99.8	TA1	T-35		Ti1-Type 1	Ti-PO1	Class 2; Gr-1	VT1-00	Ti 99.8
36	Titanium Grade 2; R50400; AMS 4902; AMS 4941; AST M Gr. 2	3.7034; 3.7035; 3.7036	Ti 2; Ti 99.7	TA2; TA3; TA4; TA5	T-40		Ti1-Type 2	Ti-PO2	Class 2; Gr-2	VT1-0	Ti 99.7
36	Titanium Grade 3; R50500; ASTM Gr. 3	3.7055; 3.7056	Ti 3; Ti 99.6	DTD 5023, DTD 5273	T-50		Ti1-Type 3		Class 3; Gr-3		Ti 99.6
36	Titanium Grade 4; R50700; ASTM Gr. 4	3.7064; 3.7065; 3.7066	Ti 4; Ti 99.5	TA7; TA8; TA9	T-60		Ti1-Type 4		Class 4; Gr-4		Ti 99.5
36	Titanium Grade 7; R52400; Ti-0.15Pd	3.7235					Ti2Pd-Type 7		Class 13; Gr-13		
37	Titanium Grade 5; R56400; Ti-6Al-4V	3.7165; 3.7164	Ti6Al4V	TA10; TA11; TA12; TA13; TA 28; TA56; Ti-Al-V	TA6V; T-A 6 V; Ti-P.63		TiAl6V4-Type 5	Ti-P63	Class 6 0; Gr 6 0; SAT-64	VT6	Ti6Al4V
37	Titanium Grade 6Al-2Sn-4Zr-2Mo; R54620; 6Al-2Sn-4Zr-2Mo	3.7145; 3.7144	TiAl6Sn2Zr4Mo2							VT25	TiAl6Sn2Zr4Mo2
37		3.7175; 3.7174	TiAl6V6Sn2								
37	Titanium Grade 9; R56320; Ti-3Al-2.5V	3.7195; 3.7194	Ti6Al2.5V				TiAl3V2.5-Type 9		Class 6 1; Gr 6 1	PT-3V	Ti6Al2.5V
37		3.7124	TiCu2	TA 21; TA22; TA23; TA24	T-U2			Ti-P11			
37		3.7185; 3.7184	Ti4Al4Mo2Sn; TiAl4Mo4Sn4Si0.5	TA45; TA46; TA47; TA48; TA49; TA50; TA57	T-A4DE			Ti-P68			
37	Titanium Grade 6; R54520; Ti-5Al-2.5Sn	3.7115.1; 3.7115	TiAl5Sn2.5; TiAl 5 Sn 22	TA14; TA17	T-A5E; Ti-P.65				SAT-525	VT5-1	TiAl5Sn2.5
37	R56410; Ti-10V-2Fe-3Al										
37	Titanium grade 23; R56401; Ti-6Al-4V-ELI		Ti6Al4V ELI	TA11			TiAl6V4ELI-Type 5.1		Class 6 1; Gr 6 1		
37										VST 5553	Ti5Al5V5Mo3Cr; Ti-5Al-5V-5Mo-3Cr
37	Ti-4Al-3Mo-1V				T-A4D3V					VT14	
37										VT22	
38		1.2762	75CrMoNiW6-7; 75 CrMoNiW 6 7								75CrMoNiW6-7
38	W1; T72301	1.1625	C80W2; C 80 W2	BW 18				F.520.U; F.5107; C 80	SK 75; SK 85; SK 85 M; SK 5; SK 5 M; SK 6	U8-1	C80W2

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38	W110; T72301	1.1545	C105U; C 105 W 1; C 105 U		C 105 E 2 U; Y1 105; C105E2U	1880	C 100 KU	F.515; F.516	SK 105; SK 3; TC 105	U10A-1; U10A-2; U11-1	C105U
38		1.6746	32NiCrMo14-5; 32 NiCrMo 14-5	832 M 31	35 NCD 14			F.1262-32 NiCrMo 12			32NiCrMo14-5
38	W210; T72302	1.2833	100V1; 100 V 1	BW 2	C 105 E 2 UV 1; Y1 105 V; 100 V 2		102 V 2 KU		SKS 43		100V1
38	6145; 6150; 6150 H; G61500; H61500	1.8159	51CrV4; 50CrV4; 50 CrV 4	735 A 50; 735 A 51; 735 H 51; 735 M 50; En 47	50CrV4RR; 50 CV 4; 51 CV 4	2230	50 CrV 4	F.143; F.143.A; 51 CrV 4; F.1430	SUP 10; SUP 10-CSP; SUP 10 M	50ChFA; 50ChGFA	51CrV4
38	P20; T51620	1.2330	35CrMo4; 35 CrMo 4	708 A 37	34 CD 4	2234	35 CrMo 4				35CrMo4
38		1.8721	26MnCr6-3								26MnCr6-3
38		1.2083; 1.2083 ESR	X40Cr14; X 42 Cr 13		X40Cr14; Z 40 C 14	2314	X 41 Cr 13 KU	F.5263; X 40 Cr 13	SUS 420 J 2		X40Cr14
38	300M; 4340M; K44220	1.6928	41SiNiCrMoV7-6								S 155
38										30ChGSA	
39	A2; T30102	1.2363	X100CrMoV5; X100CrMoV5-1; X 100 CrMoV 5 1	BA 2	X 100 CrMoV 5; Z 100 CDW 5	2260	X 100 CrMoV 5 1 KU	F.536; F.5227; X 100 CrMoV 5	SKD 12		X100CrMoV5
39	D2; T30402	1.2379	X153CrMoV12; X155CrVMo12-1; X155 CrVMo 12 1	BD 2	X 160 CrMoV 12; Z 160 CDV 12	2310	X 155 CrVMo 12 1 KU	F.520.A	SKD 10; SKD 11		X153CrMoV12
39	D3; T30403	1.2080	X210Cr12; X 210 Cr 12	BD 3	X200Cr12; Z 200 C 12		X 205 Cr 12 KU	F.521; F.5212; X 210 Cr 12	SKD 1	Ch12	X210Cr12
39	L3; T61203	1.2067	102Cr6; 102 Cr 6; 100 Cr 6	BL 3; BL3	100Cr6RR; 100 C 6; 100Cr6; Y 100 C 6		102 Cr 6 KU	F.5230; 100 Cr 6	SUJ 2	Ch	102Cr6
39	M1; H41; T11301; T20841	1.3346	HS2-9-1; S 2-9-1	BM 1	HS 2-8-1; Z 85 DCWV 08-04-02-01						HS2-9-1
39	T1; T12001	1.3355	HS18-0-1; S 18-0-1	BT 1	18-0-1; HS 18-0-1; Z 80 WCV 18-04-01	2750	HS 18-0-1	F.5520; HS 18-0-1	SKH 2	R18	HS18-0-1
39	O2; T31502	1.2842	90MnCrV8; 90 MnCrV 8	BO 2; BO2	90 MnV 8; 90 MV 8		90 MoVCr 8 KU	90 MnCrV 8; F.5229			90MnCrV8
39	H13; T20813	1.2344	X40CrMoV5-1; X40 CrMoV 5 1	BH 13	X 40 CrMoV 5; Z 40 CDV 5	2242	X 40 CrMoV 5 1 1 KU	F.5318; X 40 CrMoSiV 5	SKD 61	4Ch5MF1S	X40CrMoV5-1
39	440C; S44004; S44025	1.4125	X105CrMo17; X105 CrMo 17		Z 100 CD 17 Cl; Z 100 CD 17				SUS 440 C	95Ch18; 110Ch18M-SChD	X105CrMo17
40	A 532 III A 25% Cr	0.9650	G-X 260 Cr 27	Grade 3 D		0466-00				ChWG	
40	Ni-Hard 4	0.9630	G-X 300 CrNiSi 9 5 2								
40	Ni-Hard 1	0.9625	G-X 330 NiCr 4 2	Grade 2 B		0513-00					
40	A 532 III A 25% Cr	0.9655	G-X 300 CrMo 27 1	Grade 3 E						20Ch25N20S2	
40	Ni-Hard 2	0.9620	G-X 260 NiCr 4 2	Grade 2 A		0512-00					
41	A532 IID20%CrMo-LC	0.9645; 5.5609	G-X 260 CrMoNi 20 2 1	Grade 3C							EN-GJN-HV600(XCr23)
41	A532 IIC15%CrMo-HC	0.9635; 0.9640	G-X 300 CrMo 15 3; G-X 300 CrMoNi 15 2 1	Grade 3A; Grade 3B							EN-GJN-HV600(XCr14)

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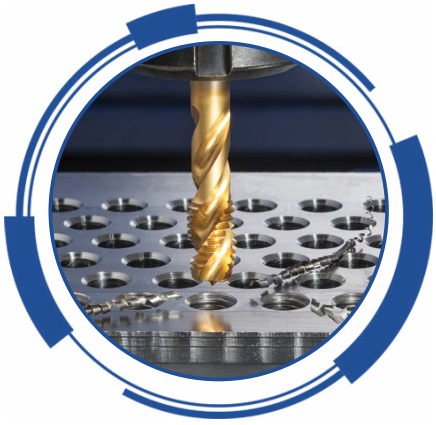

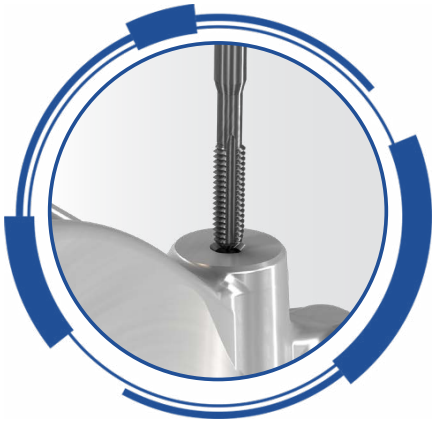

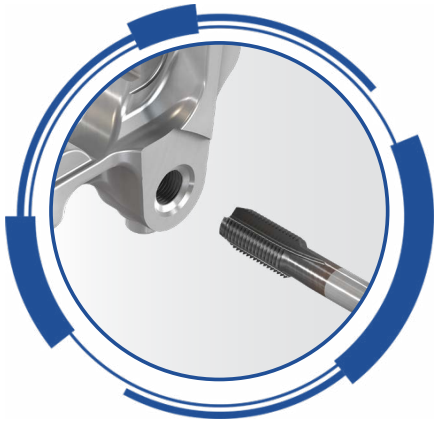

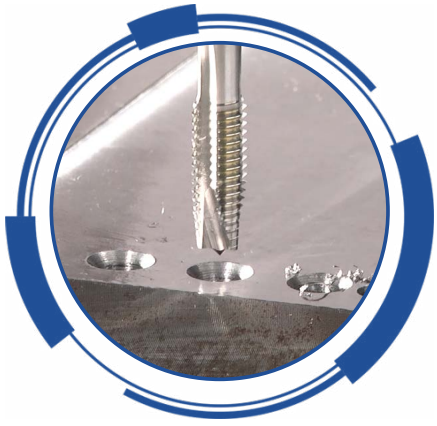

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