

TOTIME U drill, featuring uniquely designed insert, offers highly economical drilling with enhanced stability and long tool life.

Inserts:

Available in the sizes SPMX/GX05,06,07,09,11and14
Each has 4 cutting edges

Drill bodies:

ZD: Available in L/D=2, 3,4 and 5 in metric shank sizes
from \varnothing Dc 13 to 60mm Tolerance: -0.1~+0.2mm

Grades:

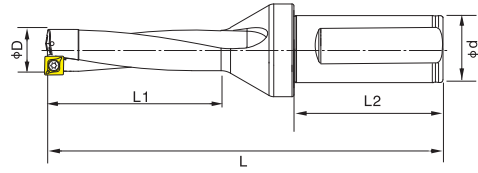
T1620: First choice for general purpose

TN200: Suitable for Non-ferrous metal processing

TZ650:

New PVD coating Suitable for medium and high speed machining of general-purpose materials, with high wear resistance and impact resistance.





2D-SP U DRILL

Unit (mm)

Model No.	Size					Insert	Screw	Wrench	Stock
	D	L1	L	L2	d				
ZD02-36.0-XP32-SP11-02	36	72	163	60	32	SP□X110408	ST4010	T15	●
ZD02-36.5-XP32-SP11-02	36.5	73	164						●
ZD02-37.0-XP32-SP11-02	37	74	165						●
ZD02-37.5-XP32-SP11-02	37.5	75	166						●
ZD02-38.0-XP32-SP11-02	38	76	167						●
ZD02-38.5-XP32-SP11-02	38.5	77	168						●
ZD02-39.0-XP32-SP11-02	39	78	169						●
ZD02-39.5-XP32-SP11-02	39.5	79	170						●
ZD02-40.0-XP32-SP11-02	40	80	171						●
ZD02-41.0-XP32-SP14-02	41	82	173						●
ZD02-42.0-XP32-SP14-02	42	84	175	65	40	SP□X140512	ST5010	T20	●
ZD02-43.0-XP40-SP14-02	43	86	186						●
ZD02-44.0-XP40-SP14-02	44	88	188						●
ZD02-45.0-XP40-SP14-02	45	90	190						●
ZD02-46.0-XP40-SP14-02	46	92	192						●
ZD02-47.0-XP40-SP14-02	47	94	194						●
ZD02-48.0-XP40-SP14-02	48	96	196						●
ZD02-49.0-XP40-SP14-02	49	98	198						●
ZD02-50.0-XP40-SP14-02	50	100	200						●
ZD02-51.0-XP40-SP14-02	51	102	202						●
ZD02-52.0-XP40-SP09-04	52	104	204	65	40	SP□X090408	ST3508	T15	●
ZD02-53.0-XP40-SP09-04	53	106	206						●
ZD02-54.0-XP40-SP09-04	54	108	208						●
ZD02-55.0-XP40-SP09-04	55	110	210						●
ZD02-56.0-XP40-SP09-04	56	112	212						●
ZD02-57.0-XP40-SP09-04	57	114	214						●
ZD02-58.0-XP40-SP09-04	58	116	216						●
ZD02-59.0-XP40-SP09-04	59	118	218						●
ZD02-60.0-XP40-SP09-04	60	120	220						●

● Stock ○ Non-stock

Carbide Drills

U Drills

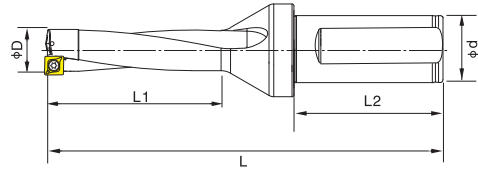
Head Exchangable Drills

Deep Hole Drills

CDR 45° Chamfer Cutter

Non-standard Tools

Carbide Drills



U Drills

Head Exchangable Drills

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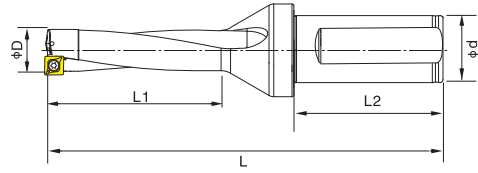
Non-standard Tools

3D-SP U DRILL

Unit (mm)

Model No.	Size					Insert	Screw	Wrench	Stock		
	D	L1	L	L2	d						
ZD03-13.0-XP25-SP05-02	13	39	117	56	25	SP□X050204	ST0205	T6	●		
ZD03-13.5-XP25-SP05-02	13.5	40.5	118						●		
ZD03-14.0-XP25-SP05-02	14	42	120						●		
ZD03-14.5-XP25-SP05-02	14.5	43.5	122						●		
ZD03-15.0-XP25-SP05-02	15	45	123						●		
ZD03-15.5-XP25-SP06-02	15.5	46.5	124						●		
ZD03-16.0-XP25-SP06-02	16	48	126						●		
ZD03-16.5-XP25-SP06-02	16.5	49.5	127						●		
ZD03-17.0-XP25-SP06-02	17	51	129						●		
ZD03-17.5-XP25-SP06-02	17.5	52.5	130						●		
ZD03-18.0-XP25-SP06-02	18	54	132			●					
ZD03-18.5-XP25-SP06-02	18.5	55.5	133			●					
ZD03-19.0-XP25-SP06-02	19	57	135			●					
ZD03-19.5-XP25-SP06-02	19.5	58.5	135			●					
ZD03-20.0-XP25-SP06-02	20	60	139			●					
ZD03-20.5-XP25-SP06-02	20.5	61.5	140			●					
ZD03-21.0-XP25-SP06-02	21	63	142			●					
ZD03-21.5-XP25-SP06-02	21.5	64.5	143			●					
ZD03-22.0-XP25-SP07-02	22	66	145			60	32	SP□X07T308	ST2506	T8	●
ZD03-22.5-XP25-SP07-02	22.5	67.5	148								●
ZD03-23.0-XP25-SP07-02	23	69	148	●							
ZD03-23.5-XP25-SP07-02	23.5	70.5	149	●							
ZD03-24.0-XP25-SP07-02	24	72	151	●							
ZD03-24.5-XP25-SP07-02	24.5	73.5	152	●							
ZD03-25.0-XP32-SP07-02	25	75	166	60	32			SP□X090408	ST3508	T15	●
ZD03-25.5-XP32-SP07-02	25.5	76.5	167								●
ZD03-26.0-XP32-SP07-02	26	78	169								●
ZD03-26.5-XP32-SP07-02	26.5	79.5	170								●
ZD03-27.0-XP32-SP07-02	27	81	172			●					
ZD03-27.5-XP32-SP09-02	27.5	82.5	173			SP□X110408	ST4010		●		
ZD03-28.0-XP32-SP09-02	28	84	175						●		
ZD03-28.5-XP32-SP09-02	28.5	85.5	176						●		
ZD03-29.0-XP32-SP09-02	29	87	178						●		
ZD03-29.5-XP32-SP09-02	29.5	88.5	179						●		
ZD03-30.0-XP32-SP09-02	30	90	181						●		
ZD03-30.5-XP32-SP09-02	30.5	91.5	182						●		
ZD03-31.0-XP32-SP09-02	31	93	184						●		
ZD03-31.5-XP32-SP09-02	31.5	94.5	185						●		
ZD03-32.0-XP32-SP09-02	32	96	187						●		
ZD03-32.5-XP32-SP09-02	32.5	97.5	188	●							
ZD03-33.0-XP32-SP09-02	33	99	190	●							
ZD03-33.5-XP32-SP11-02	33.5	100.5	191	●							
ZD03-34.0-XP32-SP11-02	34	102	193	●							
ZD03-34.5-XP32-SP11-02	34.5	103.5	194	●							
ZD03-35.0-XP32-SP11-02	35	105	196	●							
ZD03-35.5-XP32-SP11-02	35.5	106.5	197	●							

● Stock ○ Non-stock



3D-SP U DRILL

Unit (mm)

Model No.	Size					Insert	Screw	Wrench	Stock
	D	L1	L	L2	d				
ZD03-36.0-XP32-SP11-02	36	108	199	60	32	SP□X110408	ST4010	T15	●
ZD03-36.5-XP32-SP11-02	36.5	109.5	200						●
ZD03-37.0-XP32-SP11-02	37	111	202						●
ZD03-37.5-XP32-SP11-02	37.5	112.5	203						●
ZD03-38.0-XP32-SP11-02	38	114	205						●
ZD03-38.5-XP32-SP11-02	38.5	115.5	206						●
ZD03-39.0-XP32-SP11-02	39	117	206						●
ZD03-39.5-XP32-SP11-02	39.5	118.5	209						●
ZD03-40.0-XP32-SP11-02	40	120	211						●
ZD03-41.0-XP32-SP14-02	41	123	214						65
ZD03-42.0-XP32-SP14-02	42	126	217	●					
ZD03-43.0-XP40-SP14-02	43	129	229	●					
ZD03-44.0-XP40-SP14-02	44	132	232	●					
ZD03-45.0-XP40-SP14-02	45	135	235	●					
ZD03-46.0-XP40-SP14-02	46	138	238	●					
ZD03-47.0-XP40-SP14-02	47	141	241	●					
ZD03-48.0-XP40-SP14-02	48	144	244	●					
ZD03-49.0-XP40-SP14-02	49	147	247	●					
ZD03-50.0-XP40-SP14-02	50	150	250	●					
ZD03-51.0-XP40-SP14-02	51	153	253	SP□X090408	ST3508	T15	●		
ZD03-52.0-XP40-SP09-04	52	156	256				●		
ZD03-53.0-XP40-SP09-04	53	159	259				●		
ZD03-54.0-XP40-SP09-04	54	162	262				●		
ZD03-55.0-XP40-SP09-04	55	165	265				●		
ZD03-56.0-XP40-SP09-04	56	168	268				●		
ZD03-57.0-XP40-SP09-04	57	171	271				●		
ZD03-58.0-XP40-SP09-04	58	175	274				●		
ZD03-59.0-XP40-SP09-04	59	177	277				●		
ZD03-60.0-XP40-SP09-04	60	180	280				●		

● Stock ○ Non-stock

Carbide Drills

U Drills

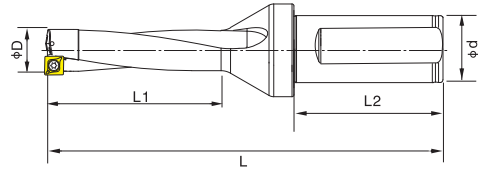
Head Exchangable Drills

Deep Hole Drills

CDR 45° Chamfer Cutter

Non-standard Tools

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U Drills

Head Exchangable Drills

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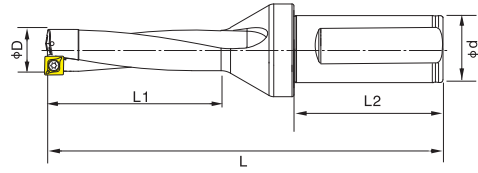
Non-standard Tools

4D-SP U DRILL

Unit (mm)

Model No.	Size					Insert	Screw	Wrench	Stock
	D	L1	L	L2	d				
ZD04-13.0-XP25-SP05-02	13	52	130	56	25	SP□X050204	ST0205	T6	●
ZD04-13.5-XP25-SP05-02	13.5	54	132						●
ZD04-14.0-XP25-SP05-02	14	56	134						●
ZD04-14.5-XP25-SP05-02	14.5	58	136						●
ZD04-15.0-XP25-SP05-02	15	60	138						●
ZD04-15.5-XP25-SP06-02	15.5	62	140						●
ZD04-16.0-XP25-SP06-02	16	64	142			●			
ZD04-16.5-XP25-SP06-02	16.5	66	144			●			
ZD04-17.0-XP25-SP06-02	17	68	146			●			
ZD04-17.5-XP25-SP06-02	17.5	70	148			●			
ZD04-18.0-XP25-SP06-02	18	72	150			●			
ZD04-18.5-XP25-SP06-02	18.5	74	152			●			
ZD04-19.0-XP25-SP06-02	19	76	154			●			
ZD04-19.5-XP25-SP06-02	19.5	78	155			●			
ZD04-20.0-XP25-SP06-02	20	80	159	60	32	SP□X060204	ST2205	T8	●
ZD04-20.5-XP25-SP06-02	20.5	82	161						●
ZD04-21.0-XP25-SP06-02	21	84	163						●
ZD04-21.5-XP25-SP06-02	21.5	86	165						●
ZD04-22.0-XP25-SP07-02	22	88	167						●
ZD04-22.5-XP25-SP07-02	22.5	90	169						●
ZD04-23.0-XP25-SP07-02	23	92	171			●			
ZD04-23.5-XP25-SP07-02	23.5	94	173			●			
ZD04-24.0-XP25-SP07-02	24	96	175			●			
ZD04-24.5-XP25-SP07-02	24.5	98	177			●			
ZD04-25.0-XP32-SP07-02	25	100	191			●			
ZD04-25.5-XP32-SP07-02	25.5	102	193			●			
ZD04-26.0-XP32-SP07-02	26	104	195			●			
ZD04-26.5-XP32-SP07-02	26.5	106	197			●			
ZD04-27.0-XP32-SP07-02	27	108	199	60	32	SP□X07T308	ST2506	T15	●
ZD04-27.5-XP32-SP09-02	27.5	110	201						●
ZD04-28.0-XP32-SP09-02	28	112	203						●
ZD04-28.5-XP32-SP09-02	28.5	114	205						●
ZD04-29.0-XP32-SP09-02	29	116	207						●
ZD04-29.5-XP32-SP09-02	29.5	118	209						●
ZD04-30.0-XP32-SP09-02	30	120	211			●			
ZD04-30.5-XP32-SP09-02	30.5	122	213			●			
ZD04-31.0-XP32-SP09-02	31	124	215			●			
ZD04-31.5-XP32-SP09-02	31.5	126	217			●			
ZD04-32.0-XP32-SP09-02	32	128	219			●			
ZD04-32.5-XP32-SP09-02	32.5	130	221			●			
ZD04-33.0-XP32-SP09-02	33	132	223			●			
ZD04-33.5-XP32-SP11-02	33.5	134	225			●			
ZD04-34.0-XP32-SP11-02	34	136	227	●					
ZD04-34.5-XP32-SP11-02	34.5	138	229	●					
ZD04-35.0-XP32-SP11-02	35	140	231	●					
ZD04-35.5-XP32-SP11-02	35.5	142	233	●					
ZD04-35.5-XP32-SP11-02	35.5	142	233	●					

● Stock ○ Non-stock



4D-SP U DRILL

Unit (mm)

Model No.	Size					Insert	Screw	Wrench	Stock
	D	L1	L	L2	d				
ZD04-36.0-XP32-SP11-02	36	144	235	60	32	SP□X110408	ST4010	T15	●
ZD04-36.5-XP32-SP11-02	36.5	146	237						●
ZD04-37.0-XP32-SP11-02	37	148	239						●
ZD04-37.5-XP32-SP11-02	37.5	150	241						●
ZD04-38.0-XP32-SP11-02	38	152	243						●
ZD04-38.5-XP32-SP11-02	38.5	154	245						●
ZD04-39.0-XP32-SP11-02	39	156	247						●
ZD04-39.5-XP32-SP11-02	39.5	158	249						●
ZD04-40.0-XP32-SP11-02	40	160	251						●
ZD04-41.0-XP32-SP14-02	41	164	255						65
ZD04-42.0-XP32-SP14-02	42	168	259	●					
ZD04-43.0-XP40-SP14-02	43	172	272	●					
ZD04-44.0-XP40-SP14-02	44	176	276	●					
ZD04-45.0-XP40-SP14-02	45	180	280	●					
ZD04-46.0-XP40-SP14-02	46	184	284	●					
ZD04-47.0-XP40-SP14-02	47	188	288	●					
ZD04-48.0-XP40-SP14-02	48	192	292	●					
ZD04-49.0-XP40-SP14-02	49	196	296	●					
ZD04-50.0-XP40-SP14-02	50	200	300	●					
ZD04-51.0-XP40-SP14-02	51	204	304	SP□X090408	ST3508	T15	●		
ZD04-52.0-XP40-SP09-04	52	208	308				●		
ZD04-53.0-XP40-SP09-04	53	212	312				●		
ZD04-54.0-XP40-SP09-04	54	216	316				●		
ZD04-55.0-XP40-SP09-04	55	220	320				●		
ZD04-56.0-XP40-SP09-04	56	224	324				●		
ZD04-57.0-XP40-SP09-04	57	228	328				●		
ZD04-58.0-XP40-SP09-04	58	232	332				●		
ZD04-59.0-XP40-SP09-04	59	236	336				●		
ZD04-60.0-XP40-SP09-04	60	240	340				●		

● Stock ○ Non-stock

Carbide Drills

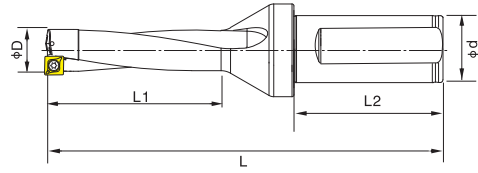
U Drills

Head Exchangable Drills

Deep Hole Drills

CDR 45° Chamfer Cutter

Non-standard Tools



5D-SP U DRILL

Unit (mm)

Model No.	Size					Insert	Screw	Wrench	Stock
	D	L1	L	L2	d				
ZD05-20.0-XP25-SP06-02	20	100	179	56	25	SPOX060204	ST2205	T6	●
ZD05-20.5-XP25-SP06-02	20.5	102.5	181						●
ZD05-21.0-XP25-SP06-02	21	105	184						●
ZD05-21.5-XP25-SP06-02	21.5	107.5	186						●
ZD05-22.0-XP25-SP07-02	22	110	189			SPOX07T308	ST2506	T8	●
ZD05-22.5-XP25-SP07-02	22.5	112.5	193						●
ZD05-23.0-XP25-SP07-02	23	115	194						●
ZD05-23.5-XP25-SP07-02	23.5	117.5	196						●
ZD05-24.0-XP25-SP07-02	24	120	199						●
ZD05-24.5-XP25-SP07-02	24.5	122.5	201						●
ZD05-25.0-XP32-SP07-02	25	125	216	60	32	SPOX090408	ST3508	T15	●
ZD05-25.5-XP32-SP07-02	25.5	127.5	218						●
ZD05-26.0-XP32-SP07-02	26	130	221						●
ZD05-26.5-XP32-SP07-02	26.5	132.5	223						●
ZD05-27.0-XP32-SP07-02	27	135	226			SPOX110408	ST4010	T15	●
ZD05-27.5-XP32-SP09-02	27.5	137.5	228						●
ZD05-28.0-XP32-SP09-02	28	140	231						●
ZD05-28.5-XP32-SP09-02	28.5	142.5	233						●
ZD05-29.0-XP32-SP09-02	29	145	236						●
ZD05-29.5-XP32-SP09-02	29.5	147.5	238						●
ZD05-30.0-XP32-SP09-02	30	150	241	SPOX140512	ST5010	T20	●		
ZD05-30.5-XP32-SP09-02	30.5	152.5	243				●		
ZD05-31.0-XP32-SP09-02	31	155	246				●		
ZD05-31.5-XP32-SP09-02	31.5	157.5	248				●		
ZD05-32.0-XP32-SP09-02	32	160	251				●		
ZD05-32.5-XP32-SP09-02	32.5	162.5	253				●		
ZD05-33.0-XP32-SP09-02	33	165	256				●		
ZD05-33.5-XP32-SP11-02	33.5	167.5	258				●		
ZD05-34.0-XP32-SP11-02	34	170	261				●		
ZD05-34.5-XP32-SP11-02	34.5	172.5	263				●		
ZD05-35.0-XP32-SP11-02	35	175	266	●					
ZD05-35.5-XP32-SP11-02	35.5	177.5	268	●					
ZD05-36.0-XP32-SP11-02	36	180	271	●					
ZD05-36.5-XP32-SP11-02	36.5	182.5	273	●					
ZD05-37.0-XP32-SP11-02	37	185	276	●					
ZD05-37.5-XP32-SP11-02	37.5	187.5	278	●					
ZD05-38.0-XP32-SP11-02	38	190	281	●					
ZD05-38.5-XP32-SP11-02	38.5	192.5	283	●					
ZD05-39.0-XP32-SP11-02	39	195	284	●					
ZD05-39.5-XP32-SP11-02	39.5	197.5	288	●					
ZD05-40.0-XP32-SP11-02	40	200	291	●					
ZD05-41.0-XP32-SP14-02	41	205	296	●					
ZD05-42.0-XP32-SP14-02	42	210	301	●					

● Stock ○ Non-stock

Cutting Conditions

Unit (mm)

ISO	Material	Condition	Tensile strength	Hardness	Cutting speed	Feed (mm/rev) vs. drill diameter Drill length 2,3,4xD						
			Rm(n/mm ²)	HB		Vc(m/min)	SPGX05	SPGX06	SPGX07	SPGX09	SPGX11	SPGX14
P	Non-alloy steel, cast steel,	<0.25%C	Annealed	420	125	200-280	0.04-0.06	0.04-0.06	0.04-0.08	0.04-0.08	0.06-0.10	0.06-0.12
		>=0.25%C	Annealed	650	190	120-190	0.05-0.08	0.06-0.10	0.06-0.12	0.07-0.13	0.08-0.15	0.08-0.16
	free cutting steel	<0.55%C	Quenched and tempered	850	250	110-180	0.06-0.12	0.08-0.15	0.10-0.18	0.12-0.22	0.12-0.24	0.13-0.25
		>=0.55%C	Annealed	750	220	110-180	0.06-0.12	0.08-0.15	0.10-0.18	0.12-0.22	0.12-0.24	0.13-0.25
	Low alloy steel and cast steel (Less than 5% of alloying elements)	0.55-0.80%	Quenched and tempered	1000	300	110-180	0.06-0.12	0.08-0.15	0.10-0.18	0.12-0.22	0.12-0.24	0.13-0.25
			Annealed	600	200	120-190	0.06-0.12	0.08-0.14	0.10-0.18	0.12-0.20	0.12-0.20	0.13-0.20
			Quenched and tempered	930	275	120-160	0.06-0.15	0.06-0.15	0.08-0.18	0.08-0.18	0.08-0.18	0.08-0.18
	1000	300		120-160	0.06-0.15	0.06-0.15	0.08-0.18	0.08-0.18	0.08-0.18	0.08-0.18		
	"High alloy steel, cast steel and tool steel"		Annealed	680	200	120-180	0.06-0.10	0.06-0.10	0.08-0.12	0.08-0.14	0.08-0.14	0.08-0.14
			Quenched and tempered	1100	325	120-180	0.06-0.10	0.06-0.10	0.10-0.15	0.12-0.15	0.12-0.18	0.13-0.18
M	"Stainless steel and cast steel"	Ferritic / martensitic	680	200	170-230	0.05-0.10	0.06-0.12	0.08-0.15	0.09-0.16	0.10-0.17	0.11-0.18	
		Martensitic	820	240	170-230	0.05-0.10	0.06-0.12	0.08-0.15	0.09-0.16	0.10-0.17	0.11-0.18	
		Austenitic	600	180	170-230	0.05-0.10	0.06-0.12	0.08-0.15	0.09-0.16	0.10-0.17	0.11-0.18	
K	Grey cast iron	-	-	250	120-200	0.09-0.3	0.09-0.33	0.1-0.36	0.1-0.37	0.01-0.38	0.12-0.48	
N	Aluminium Alloy	-	-	-	200-320	0.06-0.17	0.06-0.17	0.06-0.18	0.07-0.20	0.07-0.20	0.08-0.22	
	Copper Alloy	-	-	-	200-320	0.06-0.17	0.06-0.17	0.06-0.18	0.07-0.20	0.07-0.20	0.08-0.22	

ISO	Material	Condition	Tensile strength	Hardness	Cutting speed	Feed (mm/rev) vs. drill diameter Drill length 5xD						
			Rm(n/mm ²)	HB		Vc(m/min)	SPGX05	SPGX06	SPGX07	SPGX09	SPGX11	SPGX14
P	Non-alloy steel, cast steel,	<0.25%C	Annealed	420	125	200-280	0.04-0.05	0.04-0.05	0.04-0.06	0.04-0.07	0.06-0.08	0.06-0.10
		>=0.25%C	Annealed	650	190	120-190	0.06-0.08	0.06-0.08	0.06-0.10	0.07-0.12	0.08-0.13	0.08-0.14
	free cutting steel	<0.55%C	Quenched and tempered	850	250	110-180	0.06-0.10	0.08-0.13	0.10-0.16	0.12-0.20	0.12-0.22	0.13-0.23
		>=0.55%C	Annealed	750	220	110-180	0.06-0.10	0.08-0.13	0.10-0.16	0.12-0.20	0.12-0.22	0.13-0.23
	Low alloy steel and cast steel (Less than 5% of alloying elements)	0.55-0.80%	Quenched and tempered	1000	300	110-180	0.06-0.10	0.08-0.13	0.10-0.16	0.12-0.20	0.12-0.22	0.13-0.23
			Annealed	600	200	120-190	0.06-0.10	0.08-0.12	0.10-0.16	0.12-0.18	0.12-0.18	0.13-0.18
			Quenched and tempered	930	275	120-160	0.06-0.12	0.06-0.13	0.08-0.16	0.08-0.16	0.08-0.17	0.08-0.17
	1000	300		120-160	0.06-0.12	0.06-0.13	0.08-0.16	0.08-0.16	0.08-0.17	0.08-0.17		
	"High alloy steel, cast steel and tool steel"		Annealed	680	200	120-180	0.06-0.08	0.06-0.08	0.08-0.10	0.08-0.12	0.08-0.12	0.08-0.12
			Quenched and tempered	1100	325	120-180	0.08-0.09	0.08-0.10	0.10-0.13	0.12-0.13	0.12-0.15	0.12-0.16
M	"Stainless steel and cast steel"	Ferritic / martensitic	680	200	170-230	0.05-0.09	0.06-0.10	0.08-0.13	0.09-0.15	0.10-0.15	0.10-0.17	
		Martensitic	820	240	170-230	0.05-0.09	0.06-0.10	0.08-0.13	0.09-0.15	0.10-0.15	0.10-0.17	
		Austenitic	600	180	170-230	0.05-0.09	0.06-0.10	0.08-0.13	0.09-0.15	0.10-0.15	0.10-0.17	
K	Grey cast iron	-	-	250	120-200	0.09-0.3	0.09-0.33	0.1-0.36	0.1-0.37	0.01-0.38	0.12-0.48	
N	Aluminium Alloy	-	-	-	200-320	0.05-0.15	0.05-0.15	0.06-0.16	0.06-0.16	0.06-0.20	0.08-0.18	
	Copper Alloy	-	-	-	180-280	0.05-0.15	0.05-0.15	0.06-0.16	0.06-0.16	0.07-0.20	0.08-0.18	