C.P.T.
Präzisions Werkzeuge

MSD Drills

SuperCut Solid Carbide

English

SuperCut Solid Carbide MSD Drills

CPT expands the Tiny Tools product line with MSD, SuperCut Solid Carbide High-Performance drills used on all types of CNC lathes, including Swiss, for a wide range of applications and materials.

CPT **MSD** drills feature a reinforced cutting edge geometry for smooth cutting and high edge stability.

Advantages

- High-Performance and Productivity **(HPC)**
- High-Precision
- Excellent Edge Quality and high surface finish provides excellent chip evacuation
- Minimized tool run out and deflection
- To be used with all the CPT standard Tiny Toolholders: SIM, CIM, SEMV, SEM R, SEMK (Economical Clamping Solution)
- The holder's back adjusting screw (stopper) allows a precise control of tool overhang and provides excellent support during cutting operation

Applications

- Drills hole depth up to 5xDC
- Can be used for countersinking and chamfering of an existing hole
- For small part machining as well as general purpose
- Excellent solution for hole preparation before using CPT Tiny Tools and Mill Thread lines

Carbide Grades:

CR3

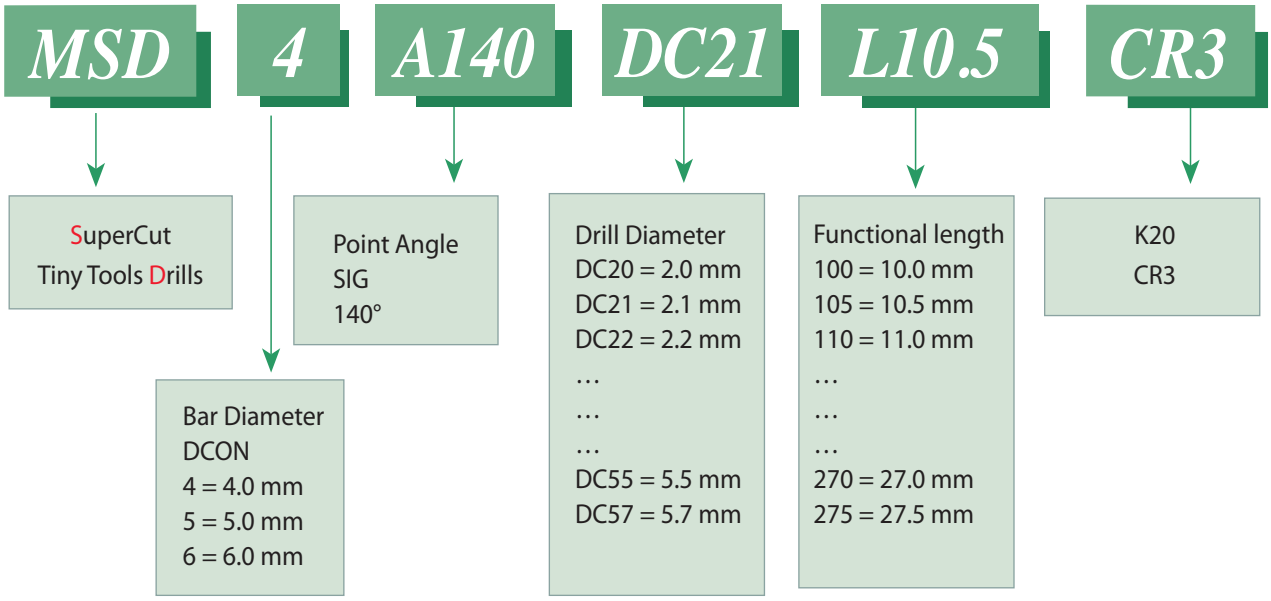
Ultra-Fine carbide grade with high hardness and toughness provides high cutting edge stability and wear resistance.

Features a **New Generation** of PVD Coating for High-Performance Cutting Applications.

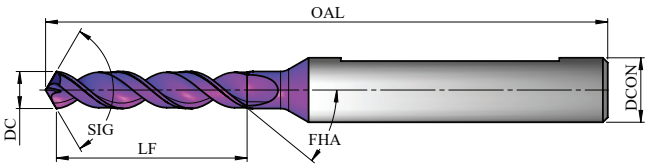
K20

Uncoated Ultra-Fine carbide grade with high hardness and toughness provides high cutting edge stability and wear resistance.

Product Identification - Ordering Codes



SuperCut MSD Drills



Grade	P	M	K	N	S	H
K20		○	○	●	○	
CR3	●	●	●	○	●	●

DCON	Ordering Code	DC	LF	SIG	FHA	OAL	Holder
4.0	**MSD 4 A140 DC20 L10**	2.0	10.0	140	30	55	SIM ... H4
	MSD 4 A140 DC21 L10.5	2.1	10.5	140	30	55	
	MSD 4 A140 DC22 L11	2.2	11.0	140	30	55	
	MSD 4 A140 DC23 L11.5	2.3	11.5	140	30	55	
	MSD 4 A140 DC25 L12.5	2.5	12.5	140	30	55	
	MSD 4 A140 DC26 L13	2.6	13.0	140	30	55	
	MSD 4 A140 DC27 L13.5	2.7	13.5	140	30	55	
	MSD 4 A140 DC29 L14.5	2.9	14.5	140	30	55	
	MSD 4 A140 DC30 L15	3.0	15.0	140	30	55	
	MSD 4 A140 DC32 L16	3.2	16.0	140	30	55	
	MSD 4 A140 DC33 L16.5	3.3	16.5	140	30	55	
	MSD 4 A140 DC34 L17	3.4	17.0	140	30	55	
	MSD 4 A140 DC35 L17.5	3.5	17.5	140	30	55	
	MSD 4 A140 DC38 L19	3.8	19.0	140	30	55	
5.0	**MSD 5 A140 DC40 L20**	4.0	20.0	140	30	66	SIM ... H5
	MSD 5 A140 DC41 L20.5	4.1	20.5	140	30	66	
	MSD 5 A140 DC42 L21	4.2	21.0	140	30	66	
	MSD 5 A140 DC43 L21.5	4.3	21.5	140	30	66	
	MSD 5 A140 DC44 L22	4.4	22.0	140	30	66	
	MSD 5 A140 DC45 L22.5	4.5	22.5	140	30	66	
	MSD 5 A140 DC47 L23.5	4.7	23.5	140	30	66	
	MSD 5 A140 DC48 L24	4.8	24.0	140	30	66	
6.0	**MSD 6 A140 DC50 L25**	5.0	25.0	140	30	70	SIM ... H6
	MSD 6 A140 DC51 L25.5	5.1	25.5	140	30	70	
	MSD 6 A140 DC52 L26	5.2	26.0	140	30	70	
	MSD 6 A140 DC53 L26.5	5.3	26.5	140	30	70	
	MSD 6 A140 DC54 L27	5.4	27.0	140	30	70	
	MSD 6 A140 DC55 L27.5	5.5	27.5	140	30	70	
	MSD 6 A140 DC57 L28.5	5.7	28.5	140	30	70	

Order example: MSD 5 A140 DC44 L22 CR3

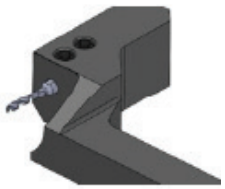
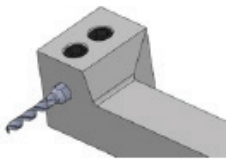
● First choice ○ Alternative

* Cylindrical shank h6 with flat
* Two flutes

Thread Standards Vs. Appropriate drill for the pre-hole

MSD Drills Ordering Code	DC	ISO		UN		UNS
		M coarse	M fine	UNC	UNF/UNEF	
MSD 4 A140 DC20 L10	2.0	M2.5x0.45	M2.2x0.2	3-48UNC		
MSD 4 A140 DC21 L10.5	2.1		M2.5x0.35		3-56UNF	
MSD 4 A140 DC22 L11	2.2		M2.5x0.25 M2.5x0.35	4-40UNC		
MSD 4 A140 DC23 L11.5	2.3				4-48UNF	
MSD 4 A140 DC25 L12.5	2.5	M3x0.5		5-40UNC		
MSD 4 A140 DC26 L13	2.6		M3x0.35		5-44UNF	
MSD 4 A140 DC27 L13.5	2.7		M3x0.25	6-32UNC		
MSD 4 A140 DC29 L14.5	2.9	M3.5x0.6			6-40UNF	
MSD 4 A140 DC30 L15	3.0		M3.5x0.5			
MSD 4 A140 DC32 L16	3.2		M3.5x0.25 M3.5x0.35			
MSD 4 A140 DC33 L16.5	3.3	M4x0.7	M3.5x0.2			
MSD 4 A140 DC34 L17	3.4			8-32UNC		
MSD 4 A140 DC35 L17.5	3.5		M4x0.5		8-36UNF	
MSD 4 A140 DC38 L19	3.8	M4.5x0.75	M4x0.2 M4x0.35	10-24UNC		
MSD 5 A140 DC40 L20	4.0		M4.5x0.5		10-32UNF	
MSD 5 A140 DC41 L20.5	4.1		M4.5x0.35			10-36UNS
MSD 5 A140 DC42 L21	4.2	M5x0.8	M4.5x0.2 M4.5x0.25			10-40UNS
MSD 5 A140 DC43 L21.5	4.3		M5x0.75			10-48UNS
MSD 5 A140 DC44 L22	4.4			12-24UNC		10-56UNS
MSD 5 A140 DC45 L22.5	4.5		M5x0.5			
MSD 5 A140 DC47 L23.5	4.7		M5x0.35		12-32UNEF	
MSD 5 A140 DC48 L24	4.8		M5x0.2 M5x0.25 M5.5x0.75			12-36UNS
MSD 6 A140 DC50 L25	5.0	M6x1.0	M5.5x0.5			12-48UNS 12-56UNS
MSD 6 A140 DC51 L25.5	5.1		M5.5x0.35	1/4-20UNC		
MSD 6 A140 DC52 L26	5.2		M5.5x0.2 M5.5x0.25 M5.5x0.35 M6x0.75			
MSD 6 A140 DC53 L26.5	5.3		M5.5x0.2			1/4-24UNS
MSD 6 A140 DC54 L27	5.4				1/4-28UNF	1/4-27UNS
MSD 6 A140 DC5.5 L27.5	5.5		M6x0.5			
MSD 6 A140 DC5.7 L28.5	5.7		M6x0.35			1/4-40UNS

Standard Tiny Tools holders to clamp the MSD drills

SIM 22S...	CIM...	SIM...	SEMK...	SEM R...
				

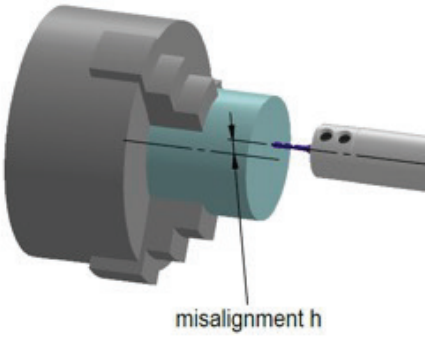
Technical Section
General instructions for use

Using the SIM holders

Insert the MSD SuperCut drill into any of the Tiny Tools holders and tighten the two clamping screw on the tool flat (in case of CIM use the internal tool indexing).
Use the smallest possible tool overhang for maximum tool stability.
Adjusting the rear stopper till the front of the screw touch the tool shank.

Non-rotating drill aligning

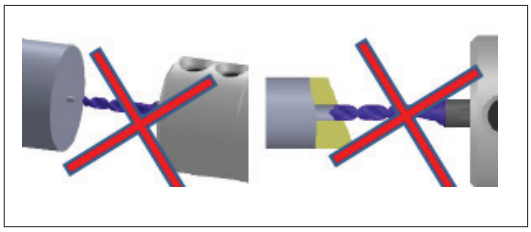
Drilling operation on a lathe is called non-rotating drilling, when the workpiece rotates instead of the drill. It is extremely important to ensure the smallest axis **misalignment h**, as possible, between a tool and lathe spindle prior machining. Large misalignment could cause poor quality of holes or even drill breakage, the solid carbide drills are very sensitive to bending.
To achieve high quality holes and avoid hole shape deviation, a drill axis must be parallel with the spindle axis.



Drill penetration

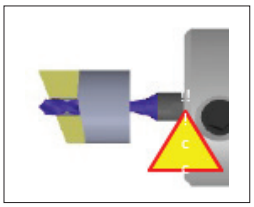
The surface should be cleanly faced (especially from a nib after parting off operation) and normal to the drill axis.

Boring operation (enlarging of existing hole) can cause chip forming and evacuation problems, such operation is not recommended. Pre-hole is not required for short drills up to 5XD, center drilling preparation is not allowed.



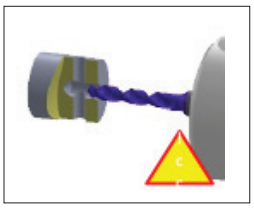
Drill exit

Avoid drill exit on significant slope surfaces because of a breakage danger due to unequal side forces.
In case it can't be avoided, please reduce feed at the exit.



Cross holes

Crossing existing holes is a challenge for the drilling operation. In case you can't avoid that, please reduce feed at the crossing stage.



Pecking cycle

Generally, in case of optimal conditions, pecking cycle is not required, but if a chip evacuation issue occurs, the pecking cycle can be applied. Using of pecking cycle can reduce drill tool life.

General recommendation

Choose a machine with the best stability and high RPM ability for small diameter drills.
Horizontal spindle is preferrable due to better chip evacuation.
Provide suitable coolant supply.

Cutting Data

ISO Standard	Material	Cutting Speed m/min	Drill Diameter=DC/Feed mm/rev	
			2 < DC < 2.9	3 < DC < 6
P	Low and Medium Carbon Steels <0.55%C	80 - 120	0.04 – 0.08	0.10– 0.25
	High Carbon Steels ≥0.55%C	70 - 110	0.03 – 0.07	0.08 – 0.14
	Alloy Steels, Treated Steels	70 - 100	0.03 – 0.07	0.08 – 0.14
M	Stainless Steels - Free Cutting	40 - 80	0.03 – 0.07	0.08 – 0.14
	Stainless Steels - Austenitic	40 - 70	0.03 – 0.07	0.08 – 0.14
	Cast Steels	40 - 70	0.03 – 0.07	0.08 – 0.14
K	Cast Iron	70 - 160	0.06 – 0.10	0.10 – 0.25
N	Aluminum ≤12%Si, Copper	80 - 200	0.06 – 0.10	0.10 – 0.25
	Aluminum >12% Si	70 - 150	0.05 – 0.08	0.08 – 0.20
	Synthetics, Duroplastics, Thermoplastics	90 - 150	0.06 – 0.10	0.10 – 0.25
S	Nickel Alloys, Titanium Alloys	10 - 50	0.02 – 0.04	0.06 – 0.12
H	Hardened Steels	30 - 50	0.01 – 0.04	0.05 – 0.08

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CPT GmbH SuperCut Solid Carbide MSD Drills – 09/2023