

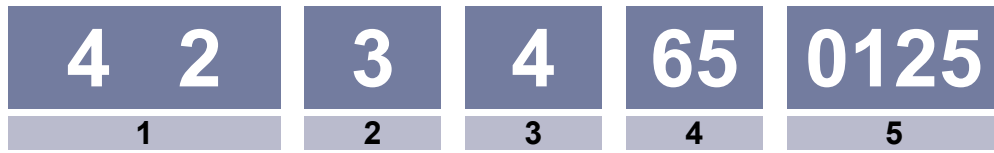


DRILLS

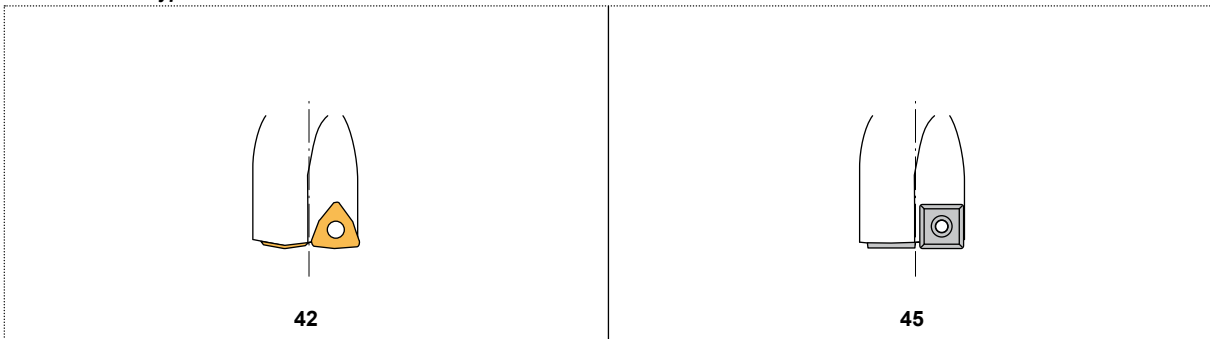
Code system	H02
Inserts for drills	H03
Drills	H04-05
Technical information	H06
Cutting data	H07

**H**










Code system



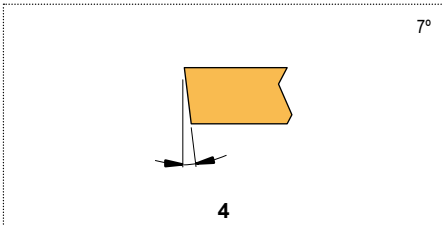
1 Drill type



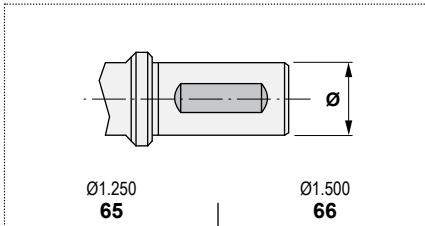
2 Insert size

1	2	3	4	5
 WCMX0302	 WCMX0402	 WCMX0503	 WCMX06T3	 WCMX0804
 SPMT0603	 SPMT0703	 SPMT0903	 SPMT1204	

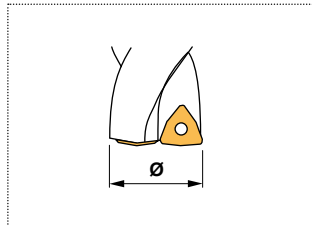
3 Clearance angle of insert



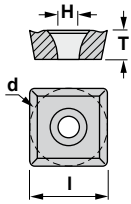
4 Shank size



5 Diameter, inch.



Square inserts / Positive



USE CLASSIFICATION

- Continuous
- ◐ Slight interruption
- ⊕ Interruption

AVAILABILITY

- Standard item
- Check availability

P Steel	●	⊕	●	⊕	●	⊕	●	⊕
M Stainless	●	●	●	●	●	●	●	●
K Cast iron	●	⊕	⊕	⊕	●	⊕	●	⊕
N Non ferrous materials	⊕	●	●	●	●	●	●	⊕
S Heat-resistant alloys								
H Hard materials								



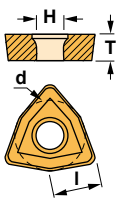
SPMT



Reference	l	T	d	r	H
SPMT060304	0.250	0.125	0.250	0.016	0.105
SPMT070308	0.312	0.125	0.312	0.031	0.105
SPMT090308	0.375	0.125	0.375	0.031	0.133
SPMT120408	0.500	0.187	0.500	0.031	0.220

KM15	PM25	PM40	TIN21	TIN25	TIN28	TL10	TL20	TL40	ZR10
								●	
								●	
								●	
								●	

80° Trigon inserts / Positive



USE CLASSIFICATION

- Continuous
- ◐ Slight interruption
- ⊕ Interruption

AVAILABILITY

- Standard item
- Check availability

P Steel	●	⊕	●	⊕	●	⊕	●	⊕
M Stainless	●	●	●	●	●	●	●	●
K Cast iron	●	⊕	⊕	⊕	●	⊕	●	⊕
N Non ferrous materials	⊕	●	●	●	●	●	●	⊕
S Heat-resistant alloys								
H Hard materials								



WCMX



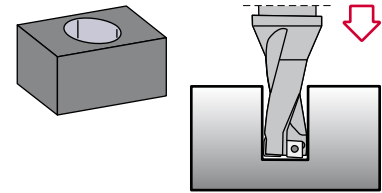
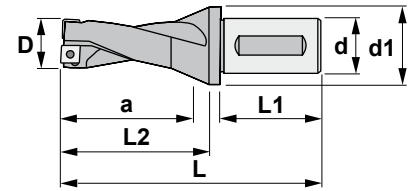
Reference	l	T	d	r	H
WCMX030208	0.136	0.094	0.219	0.031	0.098
WCMX040208	0.157	0.094	0.250	0.031	0.110
WCMX050308	0.200	0.125	0.312	0.031	0.118
WCMX06T308	0.242	0.156	0.375	0.031	0.173
WCMX080412	0.320	0.187	0.500	0.047	0.203

KM15	PM25	PM40	TIN21	TIN25	TIN28	TN30	TL20	TL40	ZR10
						●		●	
						●		●	
						●		●	
						●		●	





Characteristics:
 Helical flute indexable insert drill that provides faster cutting speeds and efficient chip removal for use on conventional and C.N.C. machines. It works well on steels, alloyed steels, stainless steels and refractories.
 Max. hole depth = 3 x Diameter (D)



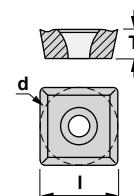
45..

Reference	D	L	L1	L2	a	d	d1			Nm	Insert size	
4514650069	0.687	5.375	2.250	3.125	2.060	1.250	1.500	1225	5507	0.9	SPMT0603..	0.550
4514650072	0.718	5.437	2.250	3.218	2.150	1.250	1.500	1225	5507	0.9	SPMT0603..	0.570
4514650075	0.750	5.500	2.250	3.312	2.250	1.250	1.500	1225	5507	0.9	SPMT0603..	-
4514650078	0.781	5.625	2.250	3.406	2.340	1.250	1.500	1225	5507	0.9	SPMT0603..	0.590
4524650081	0.812	5.750	2.250	3.500	2.430	1.250	1.500	1225	5507	0.9	SPMT0703..	0.605
4524650084	0.844	5.843	2.250	3.609	2.530	1.250	1.500	1225	5507	0.9	SPMT0703..	0.560
4524650087	0.875	5.968	2.250	3.703	2.620	1.250	1.500	1225	5507	0.9	SPMT0703..	0.580
4524650091	0.906	6.062	2.250	3.797	2.710	1.250	1.500	1225	5507	0.9	SPMT0703..	0.590
4524650094	0.937	6.156	2.250	3.891	2.810	1.250	1.500	1225	5507	0.9	SPMT0703..	0.650
4524650097	0.968	6.187	2.250	3.891	2.900	1.250	1.500	1225	5507	0.9	SPMT0703..	0.660
4524650100	1.000	6.187	2.250	3.891	3.000	1.250	1.500	1225	5507	0.9	SPMT0703..	0.670
4534650103	1.031	6.281	2.250	3.891	3.090	1.250	1.500	1230	5508	1.2	SPMT0903..	0.675
4534650106	1.062	6.375	2.250	4.032	3.180	1.250	1.500	1230	5508	1.2	SPMT0903..	0.690
4534650109	1.093	6.468	2.250	4.187	3.270	1.250	1.500	1230	5508	1.2	SPMT0903..	-
4534650112	1.125	6.562	2.250	4.281	3.370	1.250	1.500	1230	5508	1.2	SPMT0903..	0.740
4534650116	1.156	6.656	2.250	4.343	3.460	1.250	1.500	1230	5508	1.2	SPMT0903..	0.755
4534650119	1.187	6.718	2.250	4.437	3.560	1.250	1.500	1230	5508	1.2	SPMT0903..	0.780
4534650122	1.218	6.756	2.250	4.500	3.650	1.250	1.500	1230	5508	1.2	SPMT0903..	-
4534650125	1.250	6.812	2.250	4.562	3.750	1.250	1.500	1230	5508	1.2	SPMT0903..	0.835
4534650131	1.312	7.031	2.250	4.781	3.930	1.250	1.500	1230	5508	1.2	SPMT0903..	0.860
4544660137	1.375	7.468	2.250	5.203	4.120	1.250	1.500	1250	5520	4.0	SPMT1204..	-
4544660144	1.437	8.156	2.750	5.453	4.310	1.500	2.000	1250	5520	4.0	SPMT1204..	1.285
4544660150	1.500	8.468	2.750	5.703	4.500	1.500	2.000	1250	5520	4.0	SPMT1204..	1.470
4544660156	1.562	8.812	2.750	5.891	4.680	1.500	2.000	1250	5520	4.0	SPMT1204..	1.510
4544660162	1.625	9.187	2.750	6.156	4.870	1.500	2.000	1250	5520	4.0	SPMT1204..	1.540

SPMT

Square positive insert with 11° clearance. H03

Reference	l	T	d
SPMT060304	0.250	0.125	0.250
SPMT070308	0.312	0.125	0.312
SPMT090308	0.374	0.125	0.374
SPMT120408	0.500	0.187	0.500

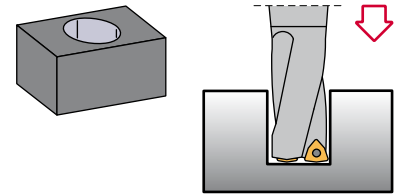
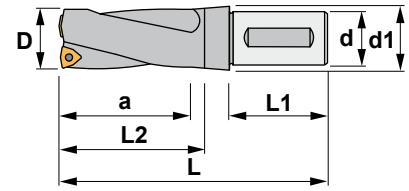


SPMT





Characteristics:
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 Max. hole depth = 3 x Diameter (D)



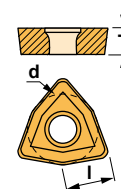
42..

Reference	D	L	L1	L2	a	d	d1		Nm	Insert size	
4214650069	0.687	5.375	2.250	3.125	2.060	1.250	1.500	1622 5507	0.9	WCMX0302..	0.550
4214650072	0.718	5.437	2.250	3.218	2.150	1.250	1.500	1622 5507	0.9	WCMX0302..	0.570
4214650075	0.750	5.500	2.250	3.312	2.250	1.250	1.500	1622 5507	0.9	WCMX0302..	-
4214650078	0.781	5.625	2.250	3.406	2.340	1.250	1.500	1622 5507	0.9	WCMX0302..	0.590
4214650081	0.812	5.750	2.250	3.500	2.430	1.250	1.500	1622 5507	0.9	WCMX0302..	0.605
4224650084	0.844	5.843	2.250	3.609	2.530	1.250	1.500	1225 5507	0.9	WCMX0402..	0.560
4224650087	0.875	5.968	2.250	3.703	2.620	1.250	1.500	1225 5507	0.9	WCMX0402..	0.580
4224650091	0.906	6.062	2.250	3.797	2.710	1.250	1.500	1225 5507	0.9	WCMX0402..	0.590
4224650094	0.937	6.156	2.250	3.891	2.810	1.250	1.500	1225 5507	0.9	WCMX0402..	0.650
4224650097	0.968	6.187	2.250	3.891	2.900	1.250	1.500	1225 5507	0.9	WCMX0402..	0.660
4224650100	1.000	6.187	2.250	3.891	3.000	1.250	1.500	1225 5507	0.9	WCMX0402..	0.670
4224650103	1.031	6.281	2.250	3.891	3.090	1.250	1.500	1225 5507	0.9	WCMX0402..	0.675
4234650106	1.062	6.375	2.250	4.032	3.180	1.250	1.500	1630 5509	1.4	WCMX0503..	0.690
4234650109	1.093	6.468	2.250	4.187	3.270	1.250	1.500	1630 5509	1.4	WCMX0503..	-
4234650112	1.125	6.562	2.250	4.281	3.370	1.250	1.500	1630 5509	1.4	WCMX0503..	0.740
4234650116	1.156	6.656	2.250	4.343	3.460	1.250	1.500	1630 5509	1.4	WCMX0503..	0.755
4234650119	1.187	6.718	2.250	4.437	3.560	1.250	1.500	1630 5509	1.4	WCMX0503..	0.780
4234650122	1.218	6.756	2.250	4.500	3.650	1.250	1.500	1630 5509	1.4	WCMX0503..	-
4234650125	1.250	6.812	2.250	4.562	3.750	1.250	1.500	1630 5509	1.4	WCMX0503..	0.835
4244660131	1.312	7.031	2.250	4.781	3.930	1.250	1.500	1635 5510	2.0	WCMX06T3..	0.860
4244660137	1.375	7.468	2.250	5.203	4.120	1.250	1.500	1635 5510	2.0	WCMX06T3..	-
4244660144	1.437	8.156	2.750	5.453	4.310	1.500	2.000	1635 5510	2.0	WCMX06T3..	1.285
4244660150	1.500	8.468	2.750	5.703	4.500	1.500	2.000	1635 5510	2.0	WCMX06T3..	1.470
4244660156	1.562	8.812	2.750	5.891	4.680	1.500	2.000	1635 5510	2.0	WCMX06T3..	1.510
4254660162	1.625	9.187	2.750	6.156	4.870	1.500	2.000	1640 5515	3.0	WCMX0804..	1.540
4254660169	1.687	9.562	2.750	6.656	5.060	1.500	2.000	1640 5515	3.0	WCMX0804..	1.640
4254660175	1.750	9.937	2.750	7.172	5.250	1.500	2.500	1640 5515	3.0	WCMX0804..	1.850
4254660181	1.812	10.125	2.750	7.359	5.430	1.500	2.500	1640 5515	3.0	WCMX0804..	1.850
4254660187	1.875	10.312	2.750	7.547	5.620	1.500	2.500	1640 5515	3.0	WCMX0804..	1.940
4254660194	1.937	10.500	2.750	7.734	5.810	1.500	2.500	1640 5515	3.0	WCMX0804..	2.100
4254660200	2.000	10.687	2.750	7.922	6.000	1.500	2.500	1640 5515	3.0	WCMX0804..	2.280

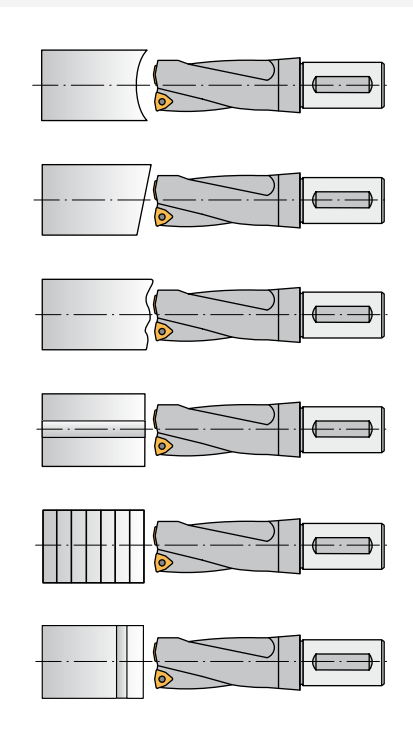
WCMX

80° trigon positive insert with 7° clearance. H03

Reference	l	T	d
WCMX0302..	0.136	0.093	0.219
WCMX0402..	0.157	0.093	0.250
WCMX0503..	0.200	0.125	0.313
WCMX06T3..	0.242	0.156	0.375
WCMX0804..	0.320	0.187	0.500



Drills - Recommendations for the assembly



Drills for indexable inserts

A concave surface is not normally recommended because there is the possibility that the tool turns away from the center. Feed should be reduced to 1/3 of the recommended.

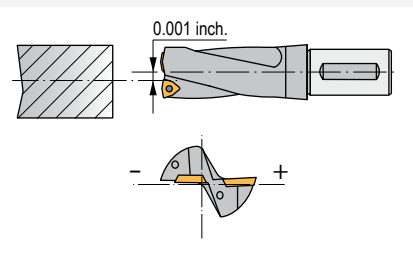
The surface of the tool to be drilled on should be preferably even. If the angles exceed 2°, feed should be reduced to 1/3 of the recommended.

If the starting surface is an uneven surface of the component, feed should be reduced so that the chip of the cutting edges can be avoided. The same can also happen at the way out from the tool.

When working with a hole made beforehand, this should not be bigger than 1/4 of the final size, because the tool could turn away.

There is the possibility to drill sets of more than one piece.

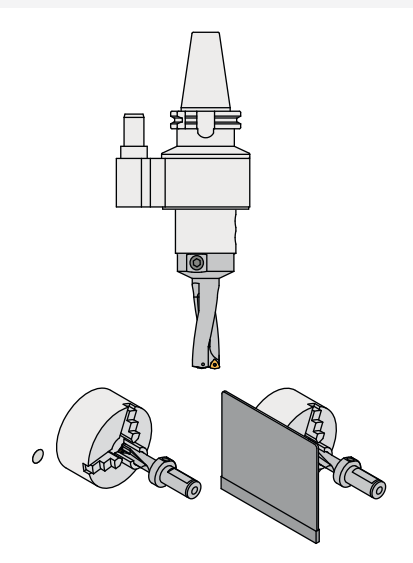
When the tool has a crossed hole, which is 1/4 bigger than the diameter of the drill, feed should be reduced when going through it.



Fixed drills

The axis of the tool should not be deviated from the center of the piece more than 0.0012 inch, so that the pointed tolerances are acquired.

The tool should be assembled in a way that the face of the central insert goes parallel to the cross movement axis of the machine.



Drilling with drill-holders with housing for cutting fluid supply

When a drillholder with a housing supplier of cutting fluid is used, it has to have a fixed top so as to avoid that the housing turns around.

If the cutting fluid has some dirty rests, this could lock the rotary housing and, consequently, the supplier tube would roll up around it, which could cause a serious accident.

If the drillholder has not been used for a long time, check if it turns round in the housing before the spindle starts working.

Drilling of through-holes

When through-holes are drilled, a disk is produced after the drill has finished the hole. This disk is often thrown away at high speed and can cause injuries and accidents.

In order to avoid this accident, a suitable safety system has to be placed around the dish.



Material	HB	Condition	D inch.	Feed inch./Rev.	Cutting speed ft./min.
Unalloyed steel P	90-200	Non-hardened 0.05-0.25%C	0.689-1.000	0.001-0.003	328-820
			1.024-1.181	0.002-0.004	
			1.220-1.626	0.003-0.005	
			1.654-3.150	0.003-0.005	
Unalloyed steel	125-225 150-225 180-225	Non-hardened 0.25-0.55%C Non-hardened 0.55-0.80%C High carbon & carbon tool steel	0.689-1.000	0.001-0.005	328-820
			1.024-1.181	0.003-0.007	
			1.220-1.626	0.004-0.008	
			1.654-3.150	0.006-0.010	
Low alloyed steel	150-260	Non-hardened	0.689-1.000	0.003-0.005	295-820
			1.024-1.181	0.004-0.006	
			1.220-1.626	0.004-0.008	
			1.654-3.150	0.006-0.009	
Low alloyed steel	220-400	Hardened	0.689-1.000	0.002-0.004	262-722
			1.024-1.181	0.003-0.006	
			1.220-1.626	0.003-0.006	
			1.654-3.150	0.004-0.008	
High alloyed steel	150-250 150-250	Annealed Annealed HSS	0.689-1.000	0.003-0.005	328-722
			1.024-1.181	0.004-0.007	
			1.220-1.626	0.004-0.009	
			1.654-3.150	0.006-0.010	
High alloyed steel	250-350 250-400	Hardened tool steel Hardened steel	0.689-1.000	0.003-0.005	295-656
			1.024-1.181	0.004-0.006	
			1.220-1.626	0.004-0.007	
			1.654-3.150	0.005-0.008	
Stainless steel	150-270	Ferritic, Martensitic 13-25%Cr	0.689-1.000	0.001-0.005	295-623
			1.024-1.181	0.004-0.006	
			1.220-1.626	0.004-0.007	
			1.654-3.150	0.004-0.007	
Steel castings	150-270	Unalloyed	0.689-1.000	0.002-0.004	328-754
			1.024-1.181	0.002-0.004	
			1.220-1.626	0.004-0.006	
			1.654-3.150	0.004-0.007	
Steel castings	90-225	Low alloyed (alloying elements < 5%)	0.689-1.000	0.003-0.005	295-656
			1.024-1.181	0.004-0.006	
			1.220-1.626	0.005-0.008	
			1.654-3.150	0.006-0.009	
Stainless steel M	150-250	Austenitic Ni > 8%, 18-25% Cr	0.689-1.000	0.001-0.005	230-492
			1.024-1.181	0.004-0.006	
			1.220-1.626	0.004-0.007	
			1.654-3.150	0.004-0.007	
Malleable cast iron K	110-145	Ferritic (short chipping)	0.689-1.000	0.004-0.007	295-656
			1.024-1.181	0.006-0.009	
			1.220-1.626	0.007-0.010	
			1.654-3.150	0.007-0.012	
Malleable cast iron	150-270	Pearlitic (long chipping)	0.689-1.000	0.004-0.006	262-590
			1.024-1.181	0.004-0.007	
			1.220-1.626	0.005-0.008	
			1.654-3.150	0.006-0.009	
Grey cast iron	150-220	Low tensile strength	0.689-1.000	0.004-0.006	262-590
			1.024-1.181	0.006-0.009	
			1.220-1.626	0.006-0.010	
			1.654-3.150	0.007-0.011	
Grey cast iron	200-330	High tensile strength	0.689-1.000	0.004-0.006	230-492
			1.024-1.181	0.005-0.008	
			1.220-1.626	0.006-0.009	
			1.654-3.150	0.006-0.010	
Nodular cast iron	125-230	Ferritic	0.689-1.000	0.004-0.006	262-590
			1.024-1.181	0.006-0.009	
			1.220-1.626	0.006-0.010	
			1.654-3.150	0.007-0.011	
Nodular cast iron	200-300	Pearlitic	0.689-1.000	0.004-0.006	230-492
			1.024-1.181	0.005-0.008	
			1.220-1.626	0.006-0.009	
			1.654-3.150	0.006-0.012	
Aluminium alloys	75-150 40-100 70-125	Wrought, solution treated & aged Cast Cast, solution treated & aged	0.689-1.000	0.003-0.005	492-1230
			1.024-1.181	0.004-0.007	
			1.220-1.626	0.007-0.011	
			1.654-3.150	0.007-0.011	
Copper and copper alloys	50-160	Free cutting alloys (pb>1%) Brass and leaded bronzes (pb<1%)	0.689-1.000	0.004-0.006	262-525
			1.024-1.181	0.004-0.006	
			1.220-1.626	0.006-0.010	
			1.654-3.150	0.006-0.010	



