

WTO

CoolSpeed[®] MAX

Ultra-high rotation speed up to 60,000 rpm
efficient and process-safe with
wireless spindle speed monitoring.



Ideal for machining and turning centers
High run-out accuracy
Extended tool life

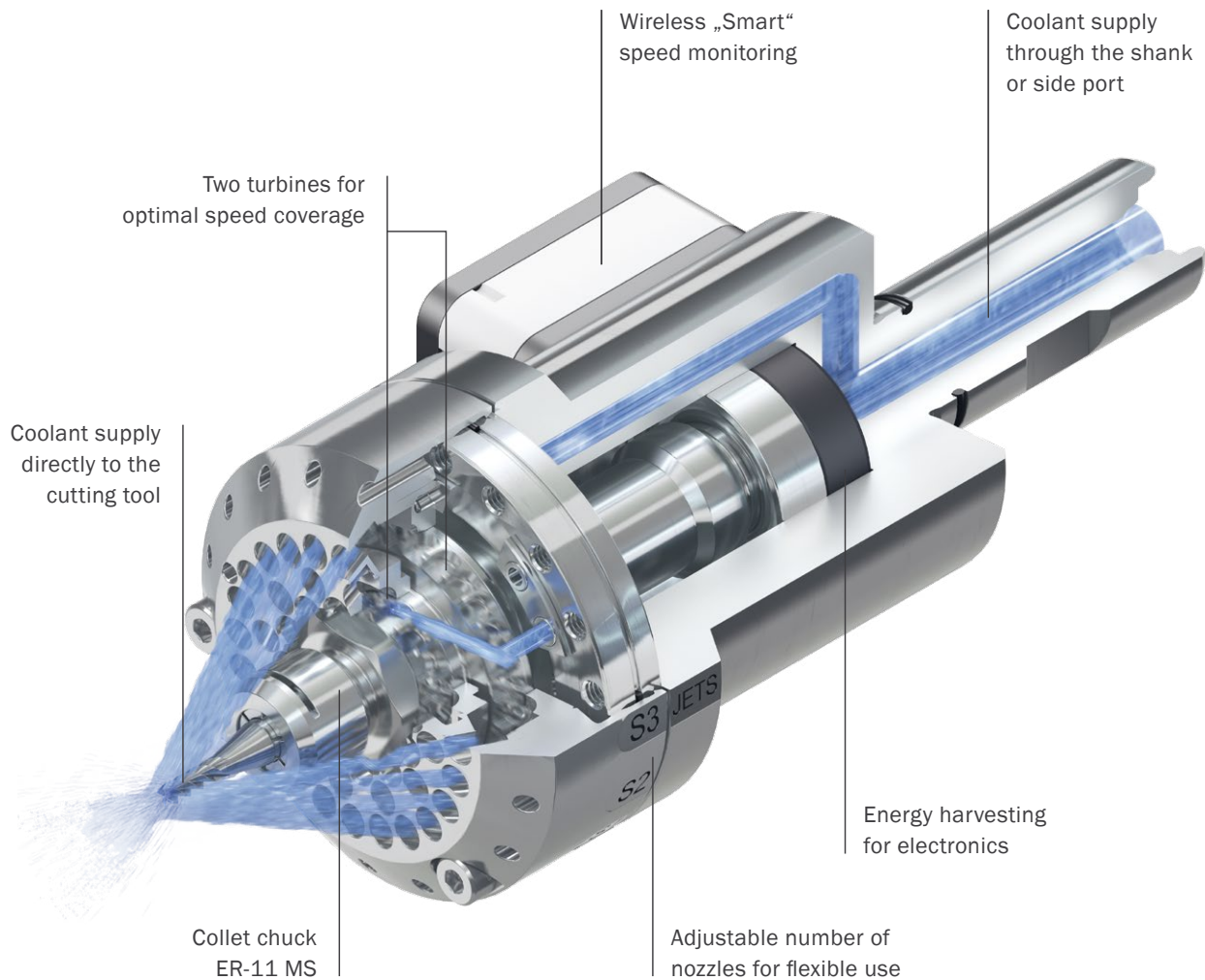
**INDUSTRY
4.0
ready**

CoolSpeed[®] MAX

Ultra-high rotation speed up to 60,000 rpm

Two turbines and adjustable number of jets

Applications: Milling, Drilling, Grinding, Deburring, Engraving



Driven by

Rotation Speed

Number of Jets

Number of Turbines

Operating Pressure

Flow Rate

Maximum Power

Cutting Tool Shank Ø

Coolant or Cutting Oil

20,000-60,000 rpm

1-3 (adjustable)

1 small + 1 large (adjustable)

20-70 bar (290-1015 psi)

12-32 l/min (3-8.5 gal/min)

360-1100 W

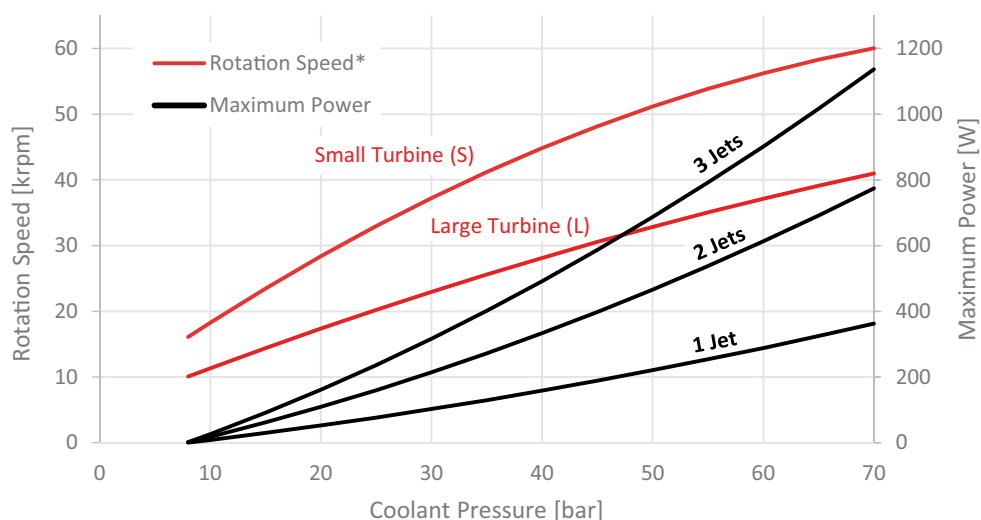
0.5-7.0 mm



CoolSpeed® MAX is a universally applicable ultra-high-speed spindle, driven by two turbines of different sizes and an adjustable number of jets.

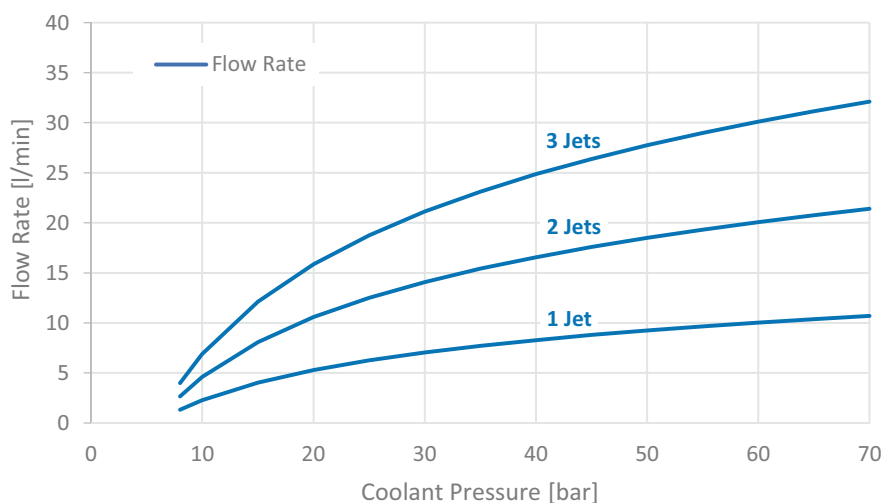
With the small turbine, maximum speeds of up to 60,000 rpm can be achieved; with the large turbine, CoolSpeed® MAX provides higher torque in the lower speed range.

Speed & Output Power/Coolant Pressure



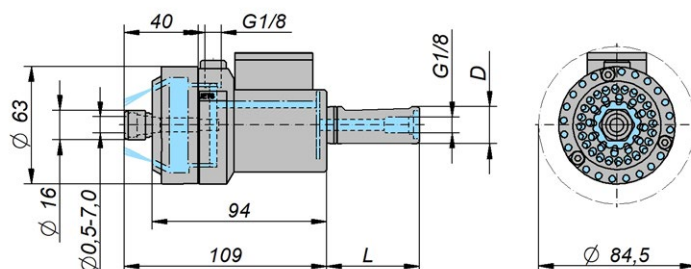
* Idle speed. The operation speed is approx. 10% lower depending on the load

Coolant Flow/Coolant Pressure



Due to the adjustable number of jets, it is possible to adjust the coolant flow (volume flow) and as a result the maximum performance to the application. CoolSpeed® MAX can therefore be used in a very energy-efficient way and can also be operated with coolant pumps as low as 12 l/min (3.2 gal/min).

CoolSpeed® MAX



Item number

CX-CE-F020-109-FL-SB-A

D

20

L

50

Dimensions in mm

Wrenches are not included.

Locking wrench



Item number

CX-SOW-001

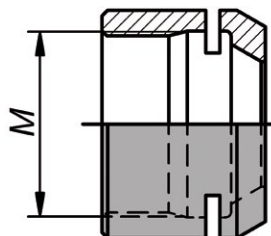
Clamping wrench

Item number

107511205

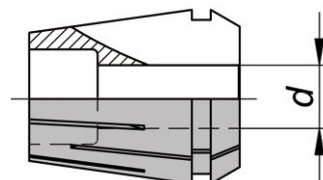


Clamping nut ER-MS



Item number	Size	M
200511002	ER-11	M13x0.75

ER collet ER-11 UP



d	ER-11
1-0.5	190111010
1.5-1	190111015
2-1.5	190111020
2.5-2	190111025
3-2.5	190111030
3.5-3	190111035
4-3.5	190111040
4.5-4	190111045
5-4.5	190111050
5.5-5	190111055
6-5.5	190111060
6.5-6	190111065
7-6.5	190111070

Dimensions in mm.
Run-out max. 0.005 mm.

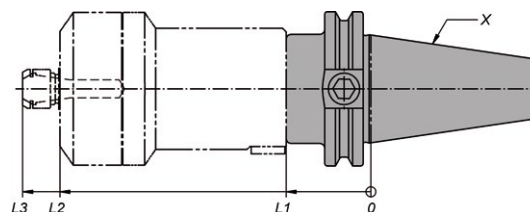
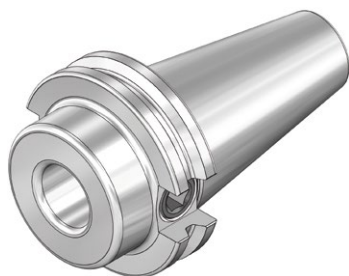


d	ER-11
1/32"	190111010
1/16"	190111020
3/32"	190111025
1/8"	190111035
5/32"	190111040
3/16"	190111050
7/32"	190111060
1/4"	190111065

Dimensions in inch.
Run-out max. 0.005 mm.



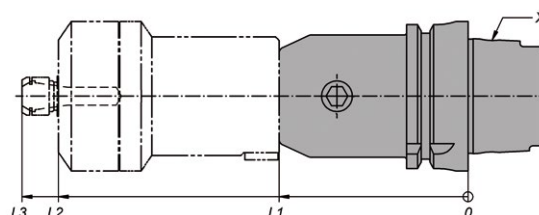
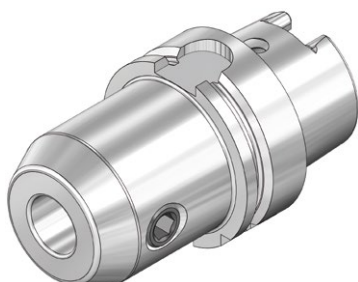
SK-Holder



Item number	Tool Holder X	L1	L2	L3
CX-MA-SK40A-W020-A	DIN ISO 7388-1 SK40	35	128.5	144
CX-MA-SK50A-W020-A	DIN ISO 7388-1 SK50	35	128.5	144
CX-MA-BT40A-W020-A	DIN ISO 7388-2 BT40	35	128.5	144

Dimensions in mm

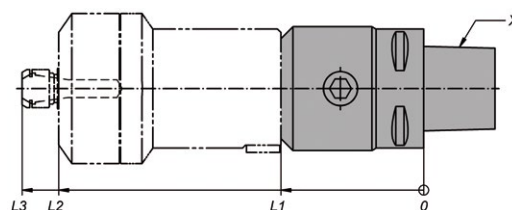
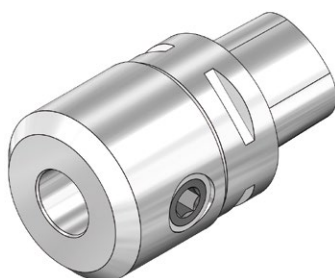
HSK-Holder



Item number	Tool Holder X	L1	L2	L3
CX-MA-HK63A-W020-A	DIN 69893 HSK-A 63	80	173.5	189
CX-MA-HK80A-W020-A	DIN 69893 HSK-A 80	100	193.5	209

Dimensions in mm

Capto-Holder



Item number	Tool Holder X	L1	L2	L3
C6-391.20-20065	C6	65	153.5	174

Dimensions in mm



Starter Set

Contains:

CoolSpeed® MAX

CX-SOW-001 Locking wrench

107511205 Clamping wrench ER-11 MS

Power Off Magnet

Torx Allen key T20

Allen key SW3

Allen key SW5

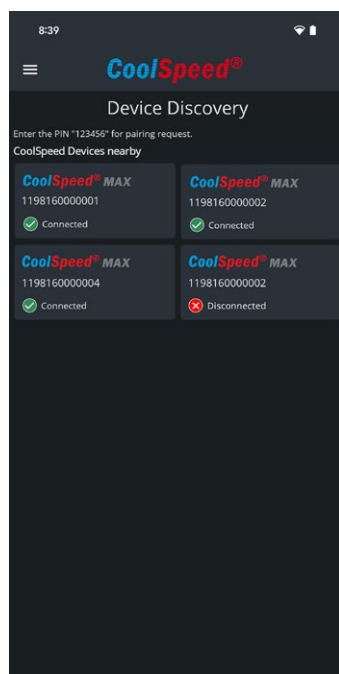
Item number

CX-CE-F020-109-FL-SB-SK-A

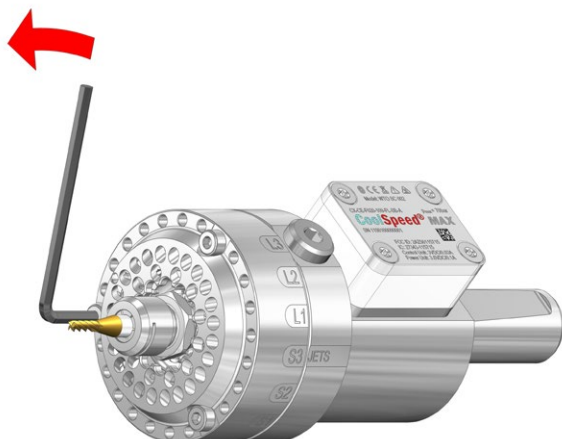
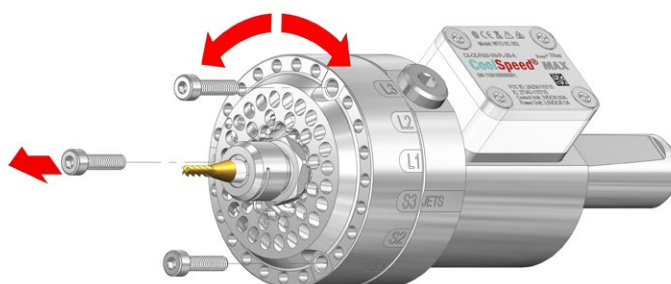
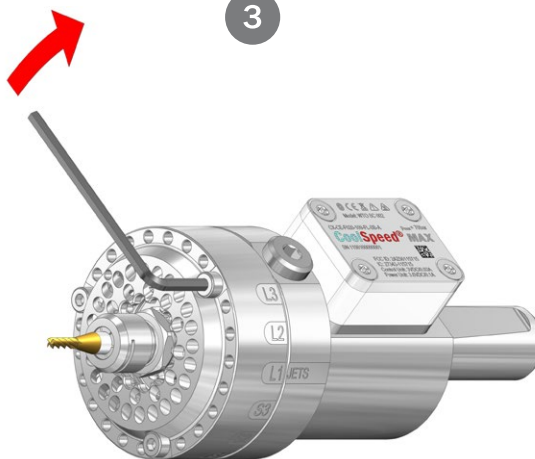


App “CoolSpeed”

The app connects to the electronics via Bluetooth. The app displays the actual speed, vibration, and temperature of the CoolSpeed® MAX spindle in use.



Adjust Turbine Size + Number of Jets

1
Loosen screws

2
Set turbine size + number of jets

3
Tighten screws


Configuration	Turbine size	Number of jets	RPM	Torque	Coolant flow Power
S1	Small	1	●●	●○○○○○	●○○
S2	Small	2	●●	●●○○○○	●●○
S3	Small	3	●●	●●●○○○	●●●
L1	Large	1	●○	●●●●○○	●○○
L2	Large	2	●○	●●●●●○	●●○
L3	Large	3	●○	●●●●●●	●●●

Quick Start Guide

1. Install “CoolSpeed®” App

Download and open the “CoolSpeed” app (see page 7).

2. Connect the App “CoolSpeed®” with CoolSpeed® MAX

Establish a Bluetooth connection to the corresponding CoolSpeed® MAX in the CoolSpeed® app.

3. Set turbine size and number of jets

CoolSpeed® MAX is equipped with two turbines. Set the speed range by selecting turbine S (small turbine) or L (large turbine).

The speed can be adjusted by changing the coolant pressure in the speed range of the selected turbine.

Depending on the machine tool, the coolant pump can only provide limited amounts of coolant depending on the coolant pressure. At a higher coolant flow, the pressure drops and thus the speed drops. The coolant flow can be adjusted by the adjustable number of 1, 2 or 3 jets.

Set turbine size and number of jets (S1 ... L3) according to page 8 and page 3.

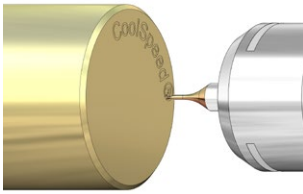
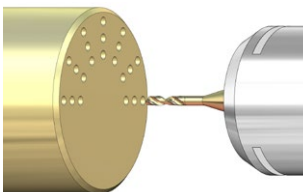
4. Fine set number of jets

1. Switch on the coolant.
2. Read off the speed in the app.
3. Adjust speed via coolant pressure:
higher pressure = higher speed
lower pressure = lower speed
4. If the desired speed cannot not be reached, the coolant pressure within CoolSpeed® MAX is too low: reduce the number of jets (e.g. from L3 to L2) and repeat from point 3.

Note:

The app displays the real speed. The speed graph in the speed diagram refers to a no-load operation. The operation speed is approx. 10 % lower depending on the load.

Application examples

				Tool-Ø	4.0	3.0	2.0	1.0	0.5	4.0	3.0	2.0	1.0	0.5		
				Material	Coolant Pressure [bar]	Cutting Values	Small Turbine					Large Turbine				
						a _p	0.450	0.400	0.300	0.200	0.100	0.450	0.400	0.300	0.200	0.100
				Aluminum	20	f _z	0.027	0.022	0.016	0.011	0.008	0.100	0.080	0.060	0.040	0.030
					40	f _z	0.038	0.030	0.023	0.015	0.011	0.140	0.112	0.084	0.056	0.042
					60	f _z	0.046	0.037	0.027	0.018	0.014	0.170	0.136	0.102	0.068	0.051
				Carbon Steel	20	f _z	0.013	0.011	0.008	0.005	0.004	0.050	0.040	0.030	0.020	0.010
					40	f _z		0.015	0.011	0.008	0.006		0.056	0.042	0.028	0.021
					60	f _z			0.014	0.009	0.007			0.051	0.034	0.026
				Stainless Steel	20	f _z	0.011	0.009	0.007	0.004	0.003	0.042	0.033	0.025	0.017	0.013
					40	f _z		0.013	0.009	0.006	0.005		0.047	0.035	0.023	0.018
60	f _z				0.011	0.008	0.006			0.043	0.028	0.021				
				Aluminum	20	f _z			0.003	0.006	0.013	0.003	0.006	0.012	0.024	0.048
					40	f _z		0.003	0.006	0.013	0.026	0.008	0.012	0.024	0.048	0.096
					60	f _z	0.003	0.006	0.013	0.026	0.051	0.016	0.024	0.048	0.096	0.192
				Carbon Steel	20	f _z				0.003	0.006		0.003	0.006	0.012	0.024
					40	f _z			0.003	0.006	0.013		0.006	0.012	0.024	0.048
					60	f _z			0.006	0.013	0.026			0.024	0.048	0.096
				Stainless Steel	20	f _z				0.003	0.005		0.002	0.005	0.010	0.020
					40	f _z			0.003	0.005	0.013		0.005	0.010	0.020	0.040
					60	f _z			0.005	0.011	0.021			0.020	0.040	0.080

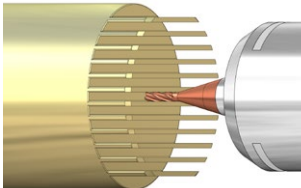
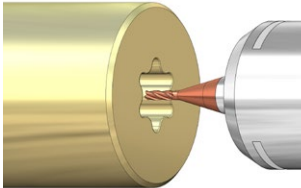
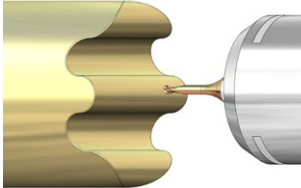
a_p in mm, f_z in mm/tooth.

The cutting values apply to CoolSpeed® MAX using 3 jets. The values are for orientation only and shall be adapted to the specific application by gradually increasing f_z until the optimum cutting result is achieved.

Coolant Pressure [bar]	Power with 3 Jets [W]	Idle Speed [rpm]		Operation Speed [rpm]	
		Small Turbine	Large Turbine	Small Turbine	Large Turbine
20	160	28300	17400	25500	15600
40	490	44800	28100	40300	25300
60	900	56200	37100	50500	33400



Application examples

			Tool-Ø	4.0	3.0	2.0	1.0	0.5	4.0	3.0	2.0	1.0	0.5		
			Material	Coolant Pressure [bar]	Cutting Values	Small Turbine			Large Turbine						
					a _p		0.100	0.250	0.300	0.200	0.200	0.250	0.300	0.500	0.200
			Aluminum	20	f _z		0.003	0.004	0.011	0.009	0.003	0.014	0.021	0.011	0.009
				40	f _z		0.008	0.008	0.011	0.009	0.008	0.022	0.038	0.011	0.009
				60	f _z		0.014	0.017	0.011	0.009	0.014	0.035	0.038	0.011	0.009
			Carbon Steel	20	f _z		0.002	0.003	0.008	0.007	0.002	0.010	0.010	0.008	0.007
				40	f _z		0.006	0.006	0.008	0.007	0.006	0.016	0.018	0.008	0.007
				60	f _z		0.010	0.012	0.008	0.007	0.010	0.025	0.018	0.008	0.007
			Stainless Steel	20	f _z		0.002	0.002	0.006	0.005	0.002	0.008	0.008	0.006	0.005
				40	f _z		0.005	0.005	0.006	0.005	0.005	0.013	0.014	0.006	0.005
60	f _z			0.008	0.010	0.006	0.005	0.008	0.020	0.014	0.006	0.005			
					a _p		0.600	1.000	1.000	0.200	1.400	1.600	2.000	1.000	0.200
					a _e		0.200	0.200	0.100	0.020	0.200	0.300	0.200	0.100	0.020
			Aluminum	20	f _z		0.053	0.029	0.013	0.011		0.057	0.034	0.013	0.011
				40	f _z		0.053	0.029	0.013	0.011	0.050	0.057	0.034	0.013	0.011
				60	f _z		0.053	0.029	0.013	0.011	0.050	0.057	0.034	0.013	0.011
			Carbon Steel	20	f _z		0.025	0.014	0.006	0.005		0.027	0.016	0.006	0.005
				40	f _z		0.025	0.014	0.006	0.005	0.024	0.027	0.016	0.006	0.005
				60	f _z		0.025	0.014	0.006	0.005	0.024	0.027	0.016	0.006	0.005
			Stainless Steel	20	f _z		0.020	0.011	0.005	0.004		0.022	0.014	0.005	0.004
40	f _z			0.020	0.011	0.005	0.004	0.019	0.022	0.014	0.005	0.004			
60	f _z			0.020	0.011	0.005	0.004	0.019	0.022	0.014	0.005	0.004			
					a _p		0.600	1.000	1.000	0.200	1.400	1.600	2.000	1.000	0.200
					a _e		0.200	0.200	0.100	0.020	0.200	0.300	0.200	0.100	0.020
			Aluminum	20	f _z		0.053	0.029	0.013	0.011		0.057	0.034	0.013	0.011
				40	f _z		0.053	0.029	0.013	0.011	0.050	0.057	0.034	0.013	0.011
				60	f _z		0.053	0.029	0.013	0.011	0.050	0.057	0.034	0.013	0.011
			Carbon Steel	20	f _z		0.025	0.014	0.006	0.005		0.027	0.016	0.006	0.005
				40	f _z		0.025	0.014	0.006	0.005	0.024	0.027	0.016	0.006	0.005
				60	f _z		0.025	0.014	0.006	0.005	0.024	0.027	0.016	0.006	0.005
			Stainless Steel	20	f _z		0.020	0.011	0.005	0.004		0.022	0.014	0.005	0.004
40	f _z			0.020	0.011	0.005	0.004	0.019	0.022	0.014	0.005	0.004			
60	f _z			0.020	0.011	0.005	0.004	0.019	0.022	0.014	0.005	0.004			

a_p in mm, f_z in mm/tooth.

The cutting values apply to CoolSpeed® MAX using 3 jets. The values are for orientation only and shall be adapted to the specific application by gradually increasing f_z until the optimum cutting result is achieved.

CoolSpeed®

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WTO worldwide

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