

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

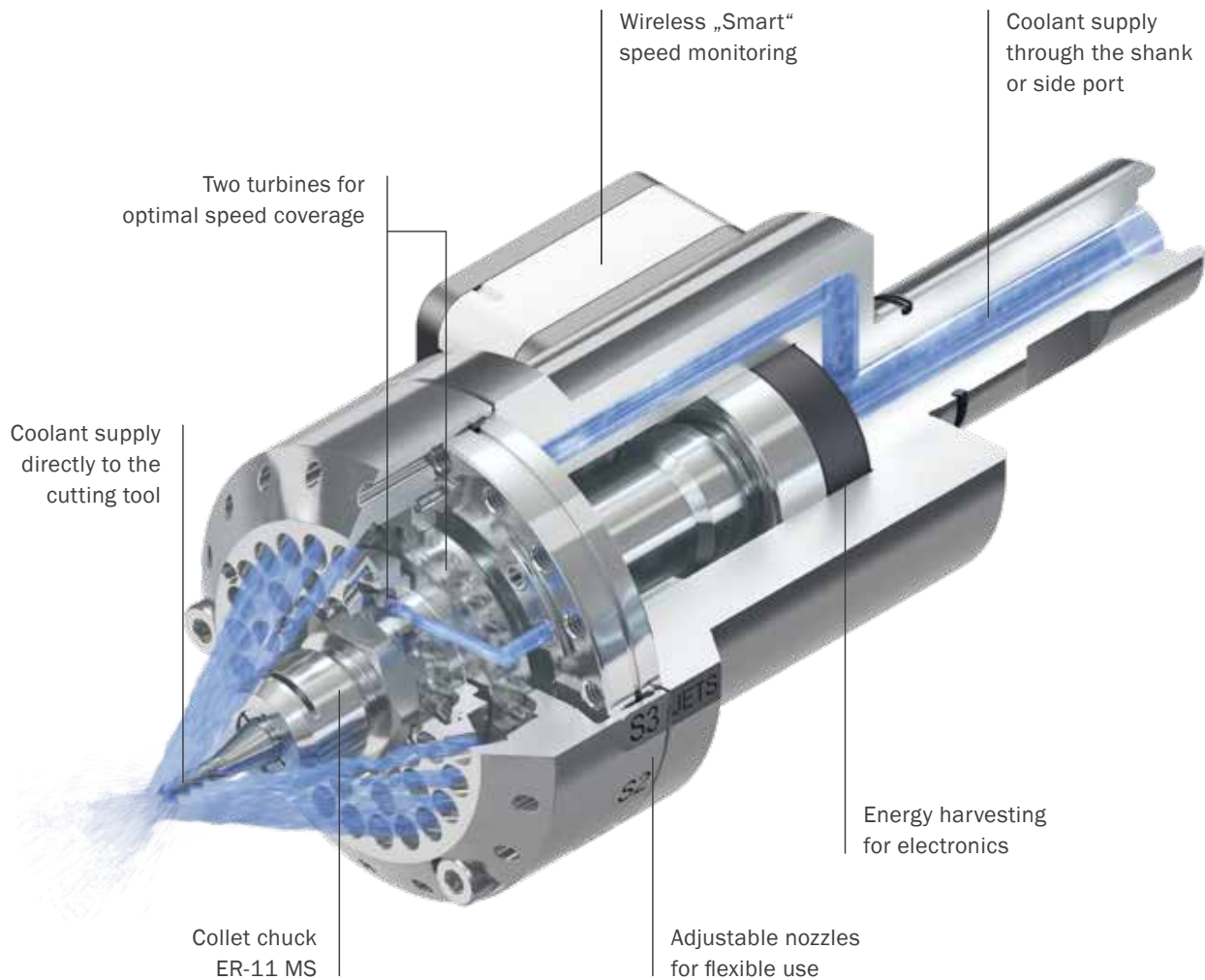
**INDUSTRY
4.0
ready**

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 1/min

1-3 (adjustable)

1 small + 1 large (adjustable)

10-70 bar (145-1015 psi)

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

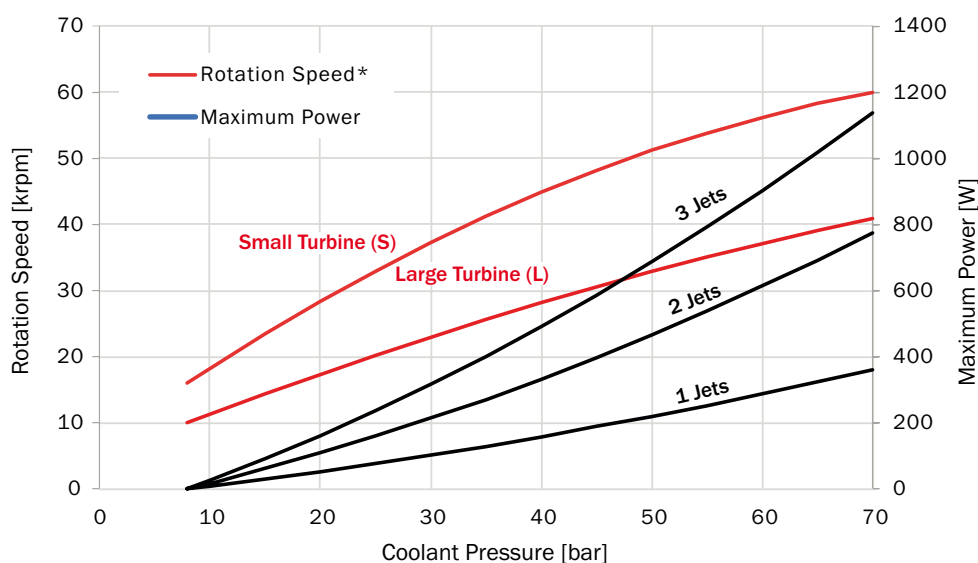
360-1100 W

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.

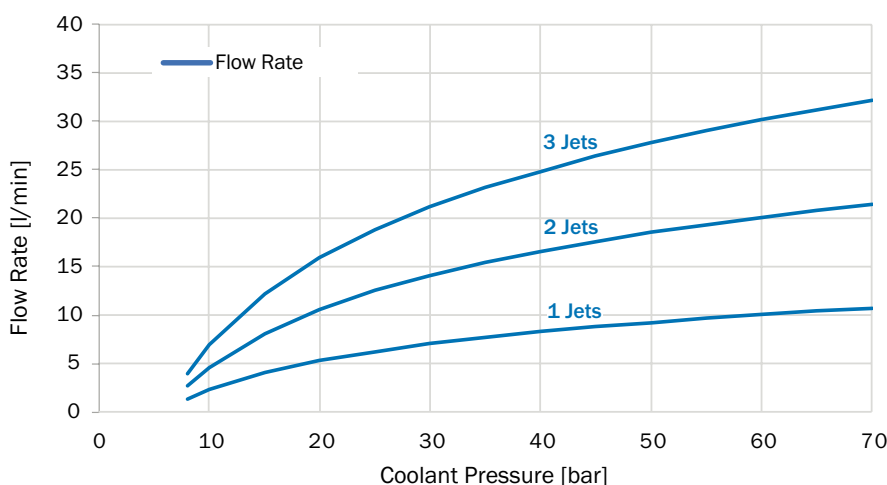
With the small turbine, maximum speeds of up to 60,000 rpm can be achieved; with the large turbine, CoolSpeed® MAX provides higher torque in the lower speed range.

Speed & Output Power / Coolant Pressure



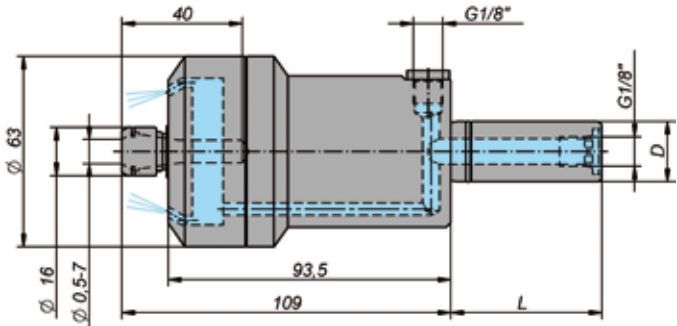
¹⁾ Idle speed. The operation speed is approx. 10% lower depending on the load

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).

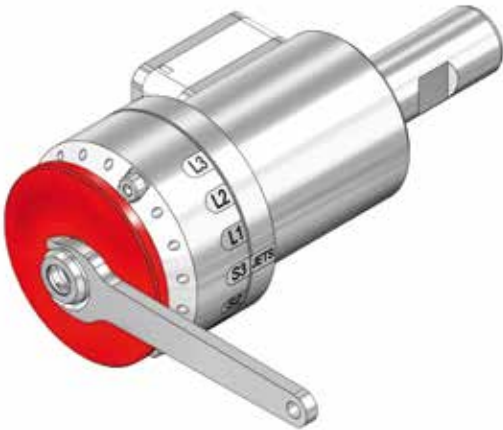
CoolSpeed® MAX



Item number	D	L
CX-CE-F020-109-FL-A	20	50

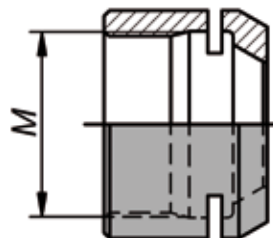
Dimensions in mm

Locking wrench



Item number
CX-SOW-001

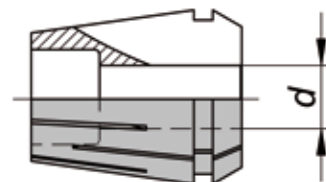
Clamping nut ER-MS



Item number	Size	M	
200511002	ER-11	M13x0.75	107511205



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.

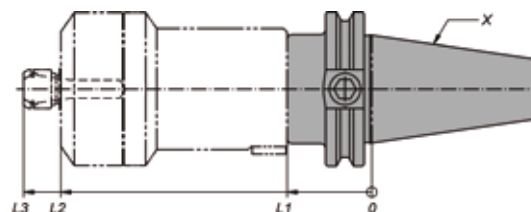


d	ER-11
1/32"	190111010
1/16"	190111020
3/32"	190111025
1/8"	190111035
5/32"	190111040
3/16"	190111050
7/32"	190111060
1/4"	190111065

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



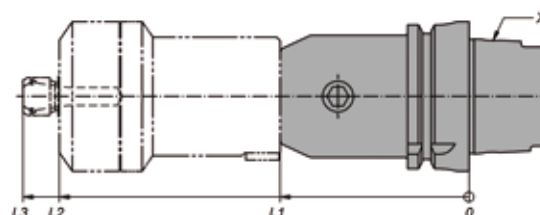
SK-Holder



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

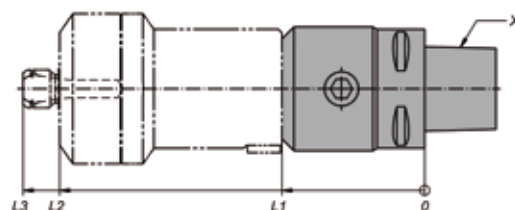
HSK-Holder



Item number	Tool Holder X	L1	L2	L3
CX-MA-HSK63A-W020-A	DIN 69893 HSK-A 63	80	173.5	189
CX-MA-HSK80A-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

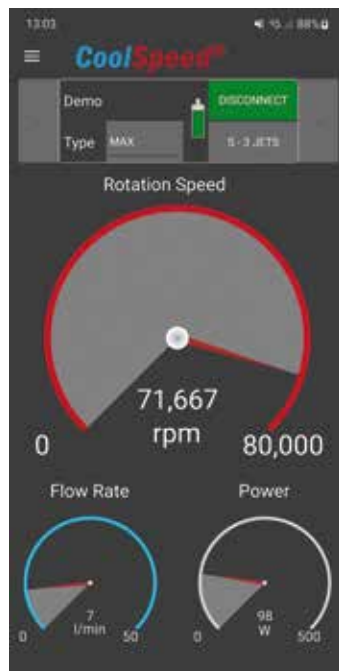
Item number

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



App “CoolSpeed Speedometer”

The app connects to the electronics via Bluetooth and displays spindle speed, coolant pressure, coolant flow and the power of the high-speed spindle used in real time.




Adjust Turbine Size + Number of Jets

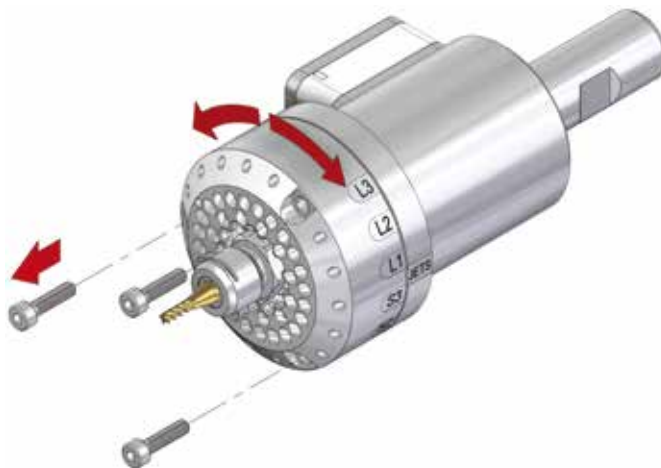
1

Loosen screws



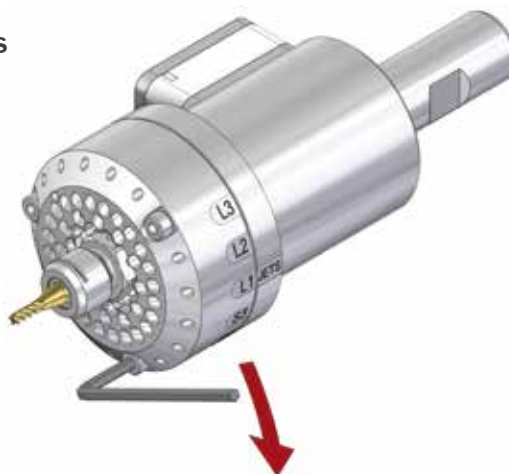
2

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® Speedometer“ App

Download and open the “CoolSpeed Speedometer” app (see page 7) from the App Store or Google Play.

2. Connect the app with CoolSpeed® MAX

3. Adjust Speed and Coolant Flow

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.

Select the number of jets in the Options category of the app to display the calculated coolant flow correctly.

4. Set-up preparation:

1. Define the speed range and thus the turbine size (S or L):
 S = small turbine = higher speed
 L = large turbine = higher torque
2. Check which coolant flow, at which pressure the pump of the machine tool pump can supply. Read in the diagram “Coolant flow/coolant pressure” (see page 3) whether 1, 2 or 3 jets:
 1 = one jet = less coolant flow = lower performance
 2 = two jets = medium coolant flow = medium performance
 3 = three jets = high coolant flow = high performance

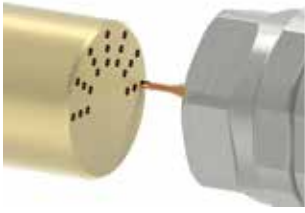
5. Set-up procedure:

1. Set CoolSpeed® MAX to 3 jets (for the small turbine S3 or for the large turbine L3).
2. Adjust the coolant pressure and switch on the coolant.
3. Read off the speed in the CoolSpeed® app.
4. Correct the pressure via the pump control until the desired speed is reached.
5. If the desired speed cannot not be reached, the coolant pressure within CoolSpeed MAX is too low: Switch off the coolant pressure, 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 speed in operation is approx. 10% lower.

Application examples

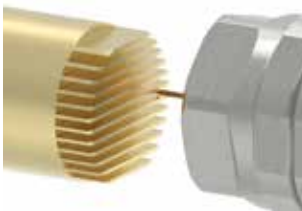
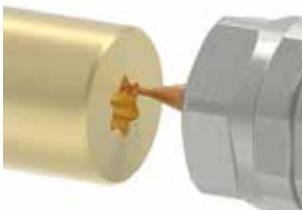
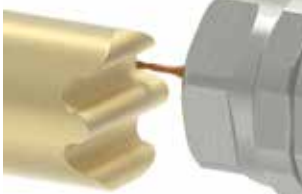
				Tool-Ø	6.0	4.0	2.0	1.0	0.5	6.0	4.0	2.0	1.0	0.5		
				Material	Coolant Pressure [bar]	Cutting Values	Small Turbine					Large Turbine				
						a _p	0.450	0.400	0.300	0.200	0.100	0.450	0.400	0.300	0.200	0.100
	Aluminum	20	f _z	0.027	0.022	0.016	0.011	0.008	0.100	0.100	0.080	0.060	0.040	0.030		
		40	f _z	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	0.015			
		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			0.005	0.010	0.020			
		40	f _z			0.003	0.005	0.011		0.005	0.010	0.020	0.040			
		60	f _z			0.005	0.011	0.021		0.010	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	28,300	17,300	25,200	15,500
40	490	44,800	28,100	40,300	25,290
60	1,130	60,000	40,900	54,000	36,800

Application examples

			Tool-Ø	6.0	4.0	2.0	1.0	0.5	6.0	4.0	2.0	1.0	0.5		
			Material	Coolant Pressure [bar]	Cutting Values	Small Turbine			Large Turbine						
Slot Milling 				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	0.015		
		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		
	Side Milling 				a _p	0.300	0.200	0.100	0.050	0.030	0.300	0.200	0.100	0.050	0.030
					a _e	0.400	0.250	0.120	0.060	0.050	0.400	0.250	0.120	0.060	0.050
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		0.030	0.023	0.015	0.011		0.112	0.084	0.056	0.042		
		60	f _z			0.027	0.018	0.014			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	0.015		
		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		
Profile Milling 					a _p	0.300	0.200	0.100	0.050	0.030	0.300	0.200	0.100	0.050	0.030
				a _e	0.400	0.250	0.120	0.060	0.050	0.400	0.250	0.120	0.060	0.050	
	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	0.015		
		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		

a_p in mm, f_z in mm/tooth.

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North America

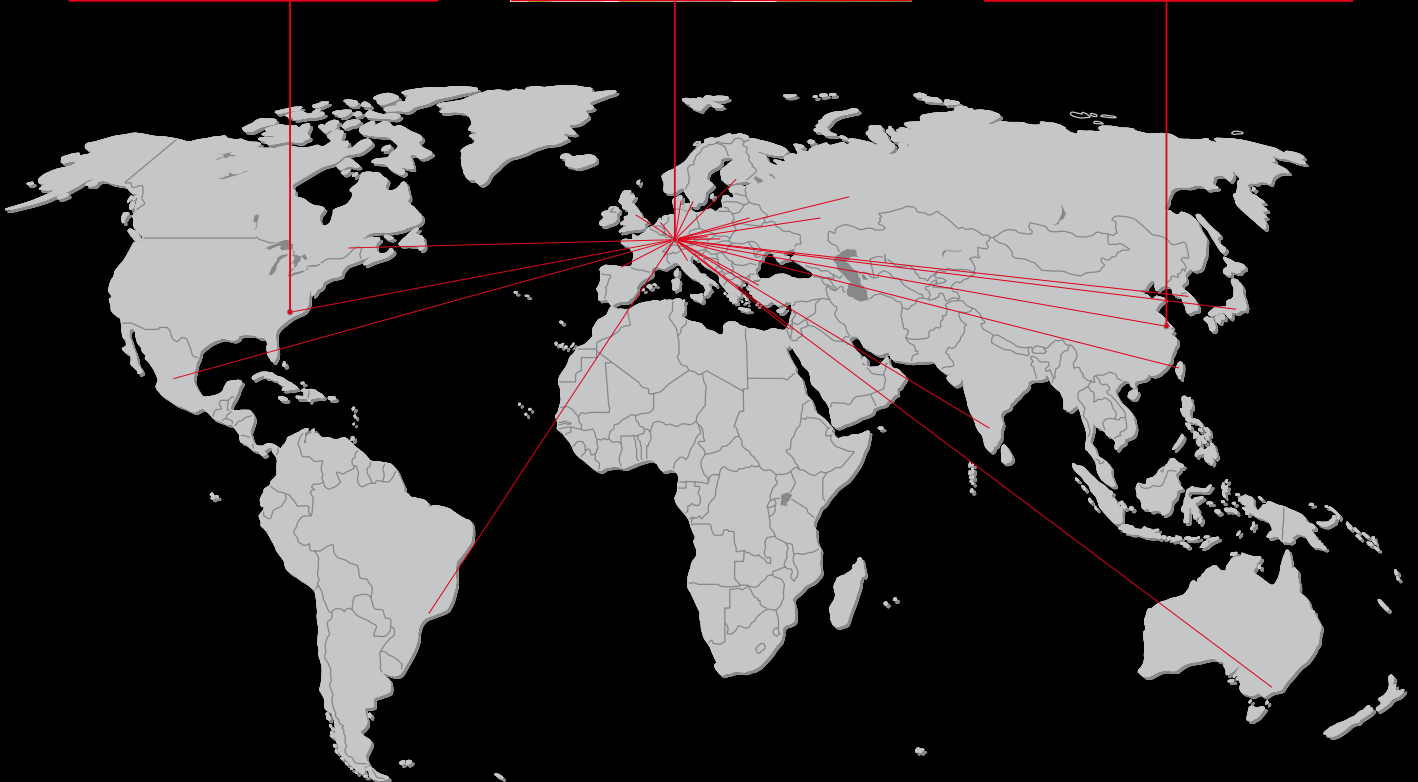
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WTO worldwide

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