

WTO

CoolSpeed® Flex

Ultra-high rotation speed up to 80,000 rpm.
Affordable and flexible in use!



Ideal for Swiss Type lathes and turning centers
Best dynamic runout
Extended tool life

CoolSpeed® Flex

Ultra-high rotation speed up to 80,000 rpm.

Adjustable number of jets.

Applications: Milling, Drilling, Grinding, Deburring, Engraving.



Driven by

Rotation Speed

Number of Jets

Operating Pressure

Flow Rate

Maximum Power

Tool Shank Ø

Coolant or Cutting Oil

30.000-80.000 rpm

1-5

145-870 psi (10-60 bar)

2.0-7.5 gal/min (8-28 l/min)

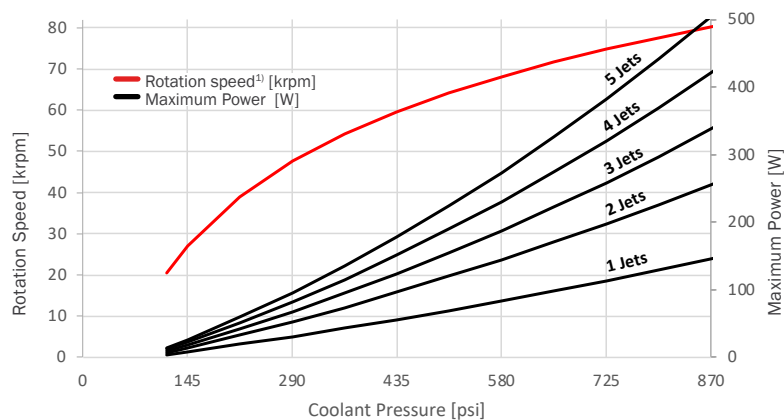
150-500 W

1/8", 3/16", 3 mm, 4 mm, 6 mm



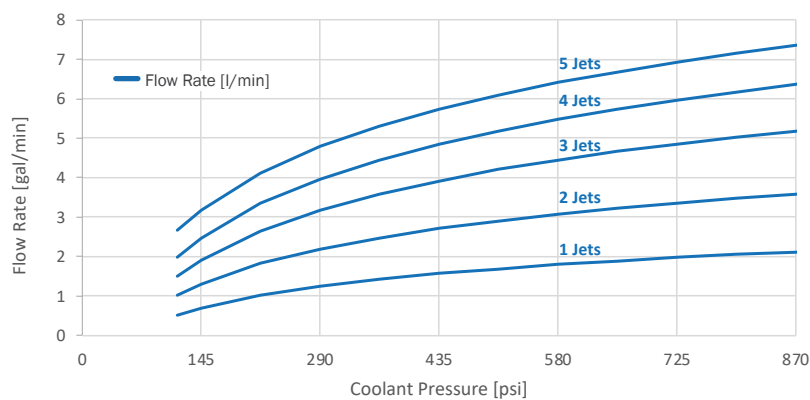
CoolSpeed® Flex is a new state-of-the-art turbine-driven ultra-high-speed spindle. Due to the adjustable number of jets, CoolSpeed® Flex can also be operated by coolant pumps with a flow rate as low as 2 gal/min.

Rotation Speed & Maximum Power/Coolant Pressure

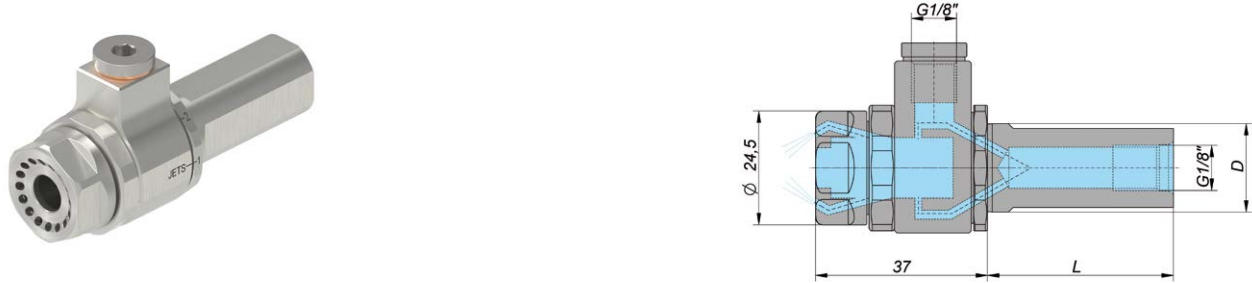


¹⁾ Idle speed. The operation speed is approx. 10% lower depending on the load.

Flow Rate/Coolant Pressure



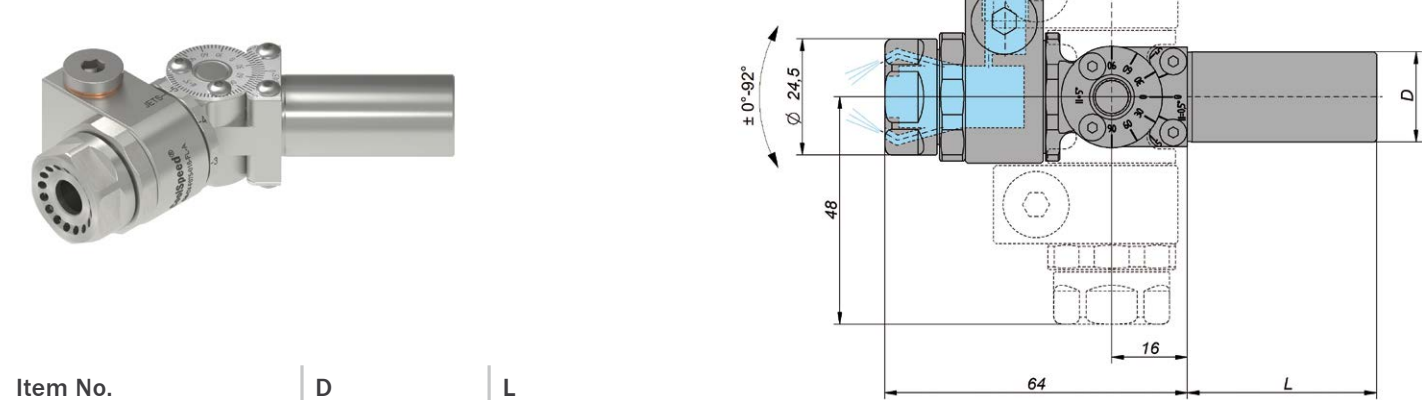
CoolSpeed® Flex



Item No.	D	L
CM-CE-R016-037-FL-A	16	48
CM-CE-F075-037-FL-A	¾" (19.05)	40
CM-CE-F020-037-FL-A	20	50
CM-CE-F022-037-FL-A	22	50
CM-CE-F025-037-FL-A	25	55

Dimensions in mm

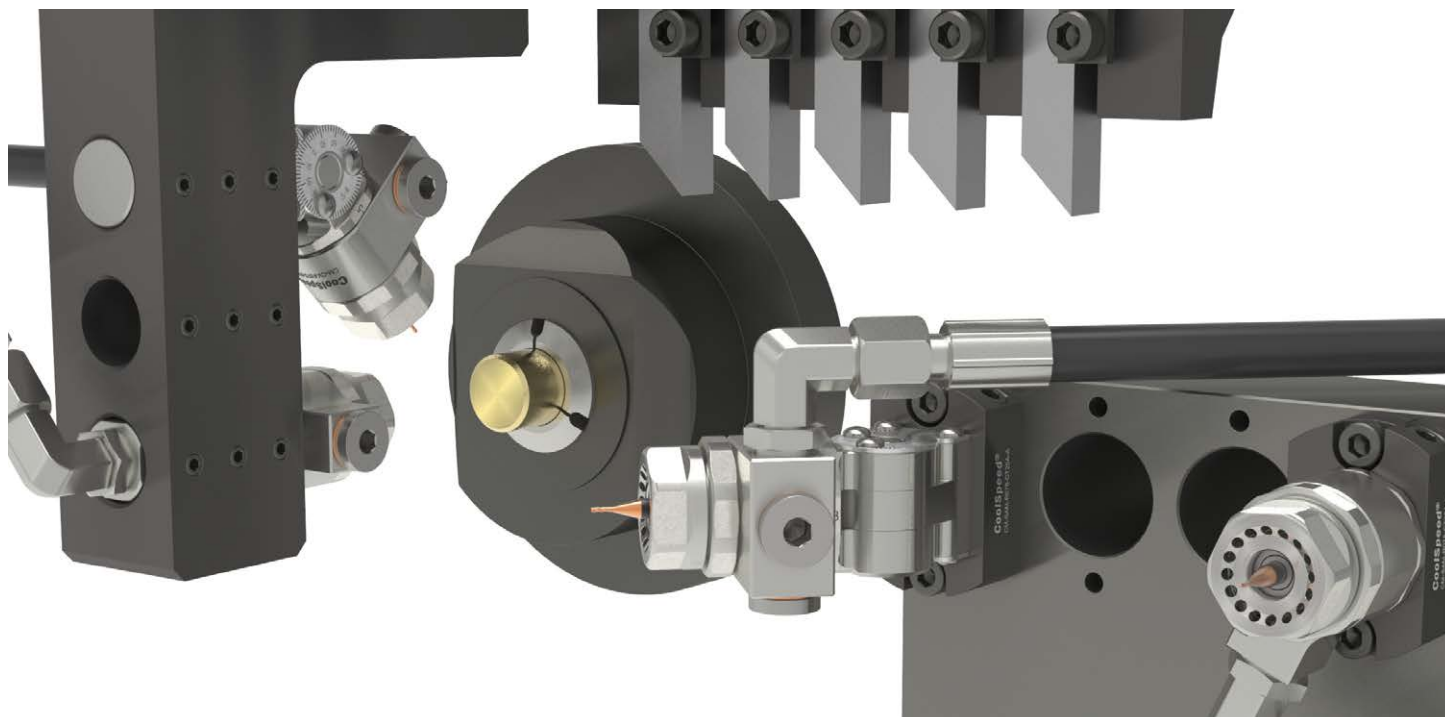
CoolSpeed® Flex V



Item No.	D	L
CM-CV-R075-016-FL-A	¾" (19.05)	40
CM-CV-R020-016-FL-A	20	50
CM-CV-R022-016-FL-A	22	50
CM-CV-R025-016-FL-A	25	55

Dimensions in mm

Application for Citizen



CoolSpeed® Flex

CM-CE-F075-037-FL-A

Shaft Ø ¾" (19.05 mm)



CoolSpeed® Flex V

CM-CV-R075-016-FL-A

Shaft Ø ¾" (19.05 mm)



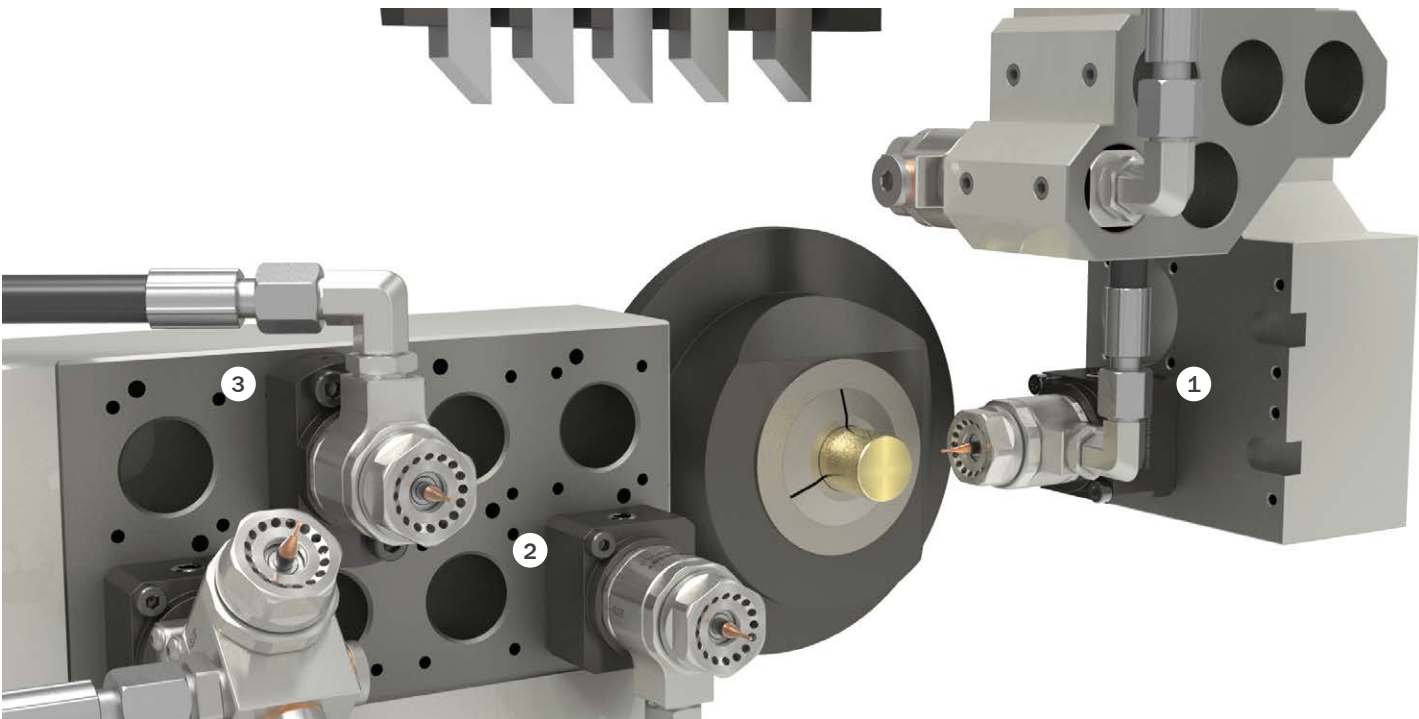
Machine Adapter

CM-MA-CT25A-R075-A

Shaft Ø 25 mm
Bore Ø ¾" (19.05 mm)



Application for Star



CoolSpeed® Flex
CM-CE-F022-037-FL-A

Shaft Ø 22 mm

CoolSpeed® Flex V
CM-CV-R022-016-FL-A

Shaft Ø 22 mm



Machine Adapter
CM-MA-ST34A-R022-A

Shaft Ø 34 mm
Bore Ø 22 mm

Machine Adapter
CM-MA-ST22B-R022-A

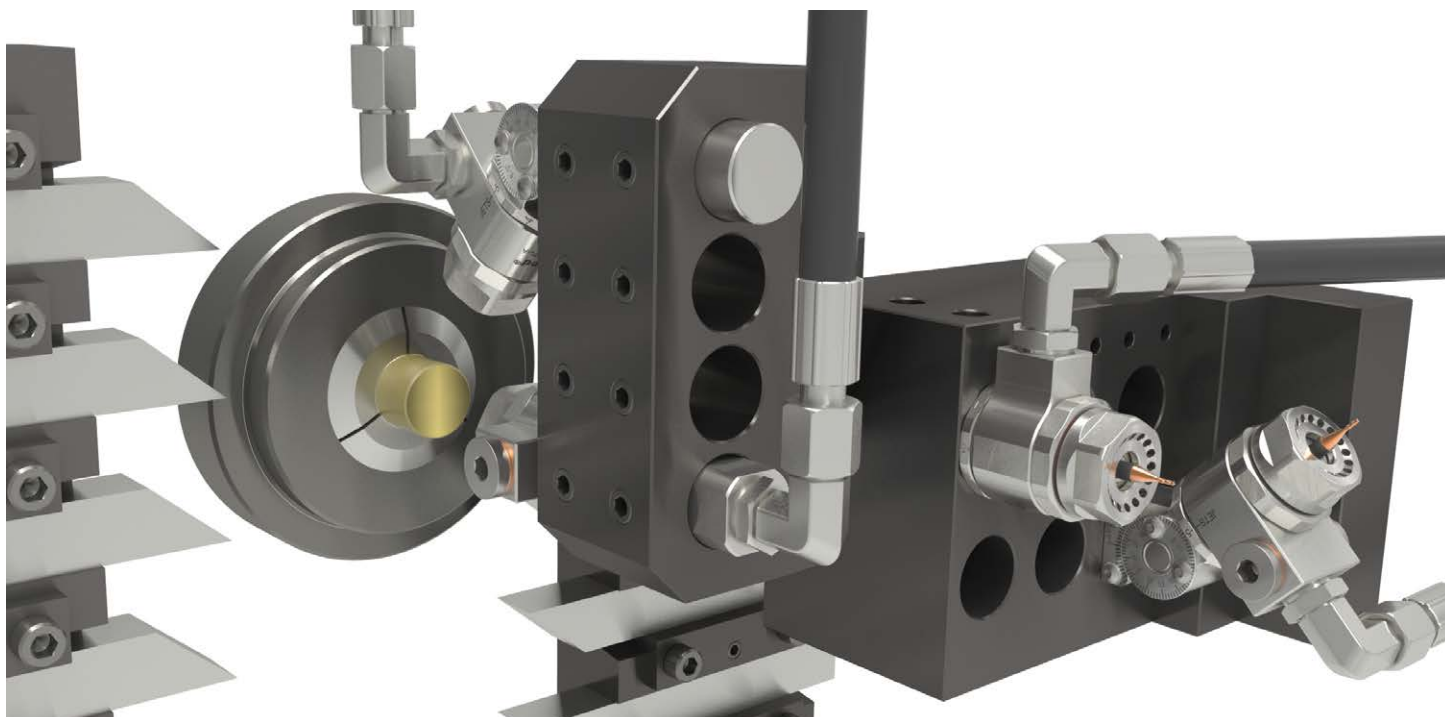
Bore Ø22 mm

Machine Adapter
CM-MA-ST22A-R022-A

Bore Ø 22 mm



Application for Tsugami



CoolSpeed® Flex

CM-CE-F020-037-FL-A

Shaft Ø 20 mm

CoolSpeed® Flex

CM-CE-F025-037-FL-A

Shaft Ø 25 mm



CoolSpeed® Flex V

CM-CV-R020-016-FL-A

Shaft Ø 20 mm

CoolSpeed® Flex V

CM-CV-R025-016-FL-A

Shaft Ø 25 mm



Replacement kit

(2 bearings, 1 turbine)

Ø3 mm CM-SRK-030
 Ø4 mm CM-SRK-040
 Ø6 mm CM-SRK-060

mm
dimensions

Ø¹/₈" CM-SRK-013
 Ø³/₁₆" CM-SRK-019

inch
dimensions



Bearing Puller

To extract the bearings from the CoolSpeed® housing.

CM-SBW-001



Assembly Device 3-in-1

Ø3, 4, 6 mm CM-SMD-346

mm
dimensions

Ø¹/₈", ³/₁₆" CM-SMD-1319

inch
dimensions



Master Gauge

For high accurate angular alignment with CoolSpeed® Flex V

CM-SMG-013-A



Starter Set mm dimensions

- Includes:
- CoolSpeed® Flex
 - CM-SRK-030 Replacement Kit Ø3 mm
 - CM-SRK-040 Replacement Kit Ø4 mm
 - CM-SRK-060 Replacement Kit Ø6 mm
 - CM-SMD-346 Assembly Device
 - CM-SPG-60-SA Bluetooth Pressure Gauge G1¼"
 - CM-SBW-001 Bearing Puller
 - Allen Wrench 5 mm
 - Double open-end Wrench 22x27 mm
 - Single open-end Wrench 27 mm

Starter Set inch dimensions

- Includes:
- CoolSpeed Flex
 - CM-SRK-013 Replacement Kit Ø1/8" (2 pcs)
 - CM-SRK-019 Replacement Kit Ø3/16" (1 pc)
 - CM-SMD-1319 Assembly Device
 - CM-SPG-60-SA Bluetooth Pressure Gauge G1¼"
 - CM-SMD-001 Bearing Puller
 - Allen Wrench 5 mm
 - Double open-end Wrench 22x27 mm
 - Single open-end Wrench 27 mm



Shaft Ø	CoolSpeed® Flex	Starter Set – Metric	Starter Set – Inch
¾" (19.05 mm)	CM-CE-F075-037-FL-A	CM-CE-F075-037-FL-SK-A	CM-CE-F075-037-FL-SKI-A
20	CM-CE-F020-037-FL-A	CM-CE-F020-037-FL-SK-A	CM-CE-F020-037-FL-SKI-A
22	CM-CE-F022-037-FL-A	CM-CE-F022-037-FL-SK-A	CM-CE-F022-037-FL-SKI-A
25	CM-CE-F025-037-FL-A	CM-CE-F025-037-FL-SK-A	CM-CE-F025-037-FL-SKI-A

Dimensions in mm

Pressure Gauge G1¼"

CM-SPG-60-C



Adapter for pressure gauge

1/8" CM-SPA-013-025-A



Bluetooth Pressure Gauge G1/4"

CM-SPG-60-SA

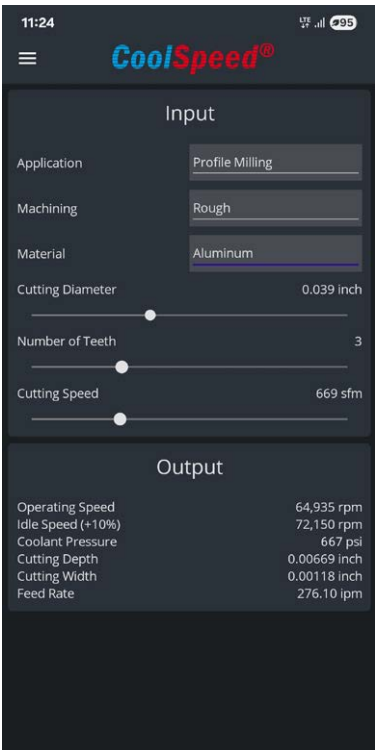
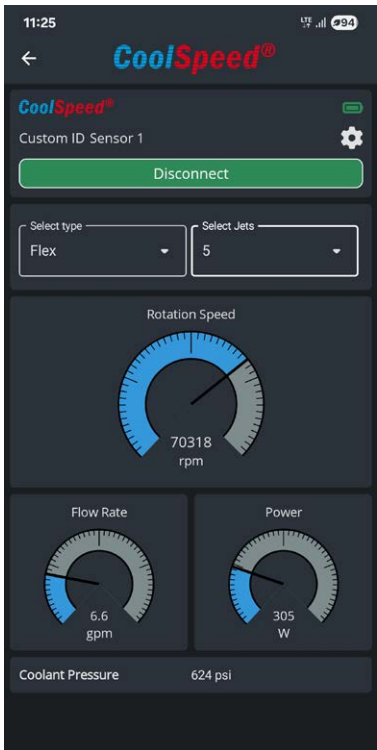
Replacement Battery

CM-SRB-2450-A



App “CoolSpeed”

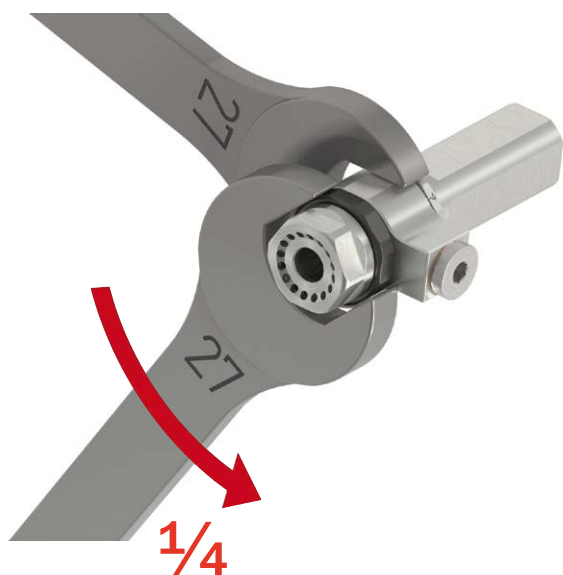
The app connects to the Bluetooth Pressure Gauge and displays the rotation speed, coolant pressure, flow rate and power of the high-speed spindle in real time.



How to Adjust the Number of Jets

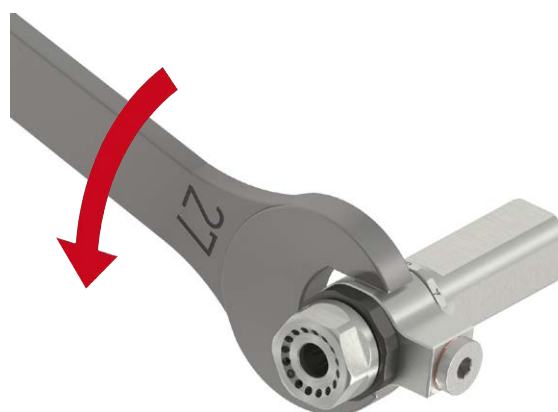
1

Untighten Clamping Nut



2

Adjust the Number of Jets



3

Tighten Clamping Nut



How to Measure the Coolant Pressure

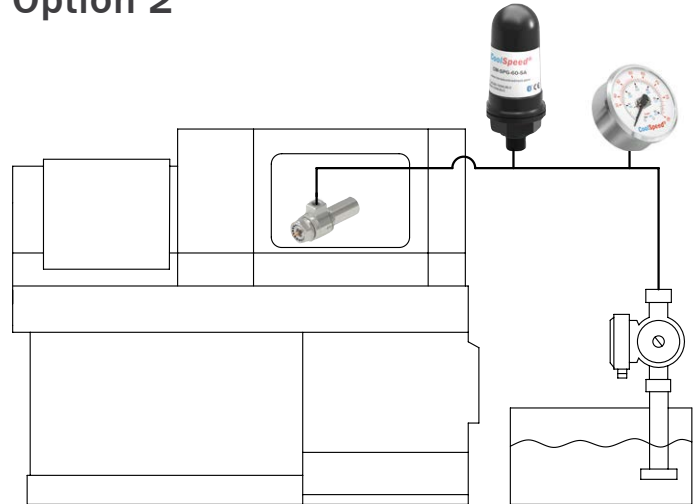
The CoolSpeed® Flex rotation speed depends on the coolant pressure. Therefore, it is important to adjust the coolant pressure as needed for the application. There are two options to measure the coolant pressure.

Option 1



Preferred option, as the measurement of the pressure is close to CoolSpeed® Flex.

Option 2



Alternative, if there is no possibility to place the manometer inside the operation area. With this option, the speed determination is less accurate than option 1.

Adjust the Rotation Speed

1. Adjust CoolSpeed® Flex to 5 Jets
2. Switch the coolant pressure on
3. Read the pressure and rotation speed from the Pressure Gauge or using the CoolSpeed® App
4. Adjust the coolant pressure via the pump control until the desired rotation speed is reached
5. If the desired speed cannot be reached: Switch the coolant pressure off, reduce the number of jets and repeat from point 2

Note: The inner diameter of the coolant supply pipe should be at least 4 mm.

The rotation speed refers to the idle speed.

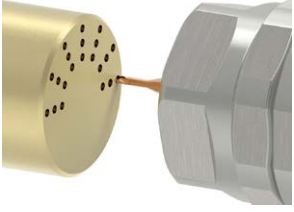
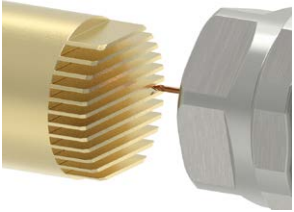
The operation speed is approx. 10% lower depending on the load on CoolSpeed®.

Assembly of Bearings and Turbine onto the Cutting Tool

Note: The tolerance of the tool shank should be h6 or better.



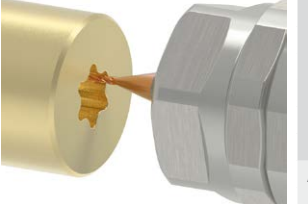
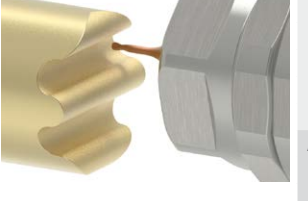
Application Examples

					Tool-Ø	0.0787	0.0394	0.0197
					Cutting Values	Finish Machining	Finish Machining	Finish Machining
Engraving 	Stainless Steel	290	48,000	43,000	a_p	0.0063	0.0031	0.0016
		580	68,000	61,000	V_f	31.5	63.0	126.0
		870	80,000	72,000	a_p	0.0063	0.0031	0.0016
	Aluminum	290	48,000	43,000	V_f	39.4	78.7	157.5
		580	68,000	61,000	a_p	0.0063	0.0031	0.0016
		870	80,000	72,000	V_f	47.2	94.5	189.0
	Carbon Steel	290	48,000	43,000	a_p	0.0105	0.0052	0.0026
		580	68,000	61,000	V_f	52.5	105.0	210.0
		870	80,000	72,000	a_p	0.0105	0.0052	0.0026
	Carbon Steel	290	48,000	43,000	V_f	65.6	131.2	262.5
		580	68,000	61,000	a_p	0.0105	0.0052	0.0026
		870	80,000	72,000	V_f	78.7	157.5	315.0
Drilling 	Stainless Steel	290	48,000	43,000	a_p	0.0072	0.0036	0.0018
		580	68,000	61,000	V_f	40.9	81.9	163.8
		870	80,000	72,000	a_p	0.0072	0.0036	0.0018
	Aluminum	290	48,000	43,000	V_f	51.2	102.4	204.7
		580	68,000	61,000	a_p	0.0072	0.0036	0.0018
		870	80,000	72,000	V_f	61.4	122.8	245.7
	Carbon Steel	290	48,000	43,000	a_p	39.4	59.1	88.6
		580	68,000	61,000	V_f	49.2	73.8	110.7
		870	80,000	72,000	V_f	59.1	88.6	132.9
	Carbon Steel	290	48,000	43,000	a_p	39.4	59.1	88.6
		580	68,000	61,000	V_f	49.2	73.8	110.7
		870	80,000	72,000	V_f	59.1	88.6	132.9
Slot Milling 	Stainless Steel	290	48,000	43,000	a_p	0.0039	0.0020	0.0010
		580	68,000	61,000	V_f	15.7	31.5	63.0
		870	80,000	72,000	a_p	0.0039	0.0020	0.0010
	Aluminum	290	48,000	43,000	V_f	19.7	39.4	78.7
		580	68,000	61,000	a_p	0.0039	0.0020	0.0010
		870	80,000	72,000	V_f	23.6	47.2	94.5
	Aluminum	290	48,000	43,000	a_p	0.0066	0.0033	0.0016
		580	68,000	61,000	V_f	26.2	52.5	105.0
		870	80,000	72,000	a_p	0.0066	0.0033	0.0016
	Carbon Steel	290	48,000	43,000	V_f	32.8	65.6	131.2
		580	68,000	61,000	a_p	0.0066	0.0033	0.0016
		870	80,000	72,000	V_f	39.4	78.7	157.5
	Carbon Steel	290	48,000	43,000	a_p	0.0045	0.0022	0.0011
		580	68,000	61,000	V_f	20.5	40.9	81.9
		870	80,000	72,000	a_p	0.0045	0.0022	0.0011
		290	48,000	43,000	V_f	20.5	51.2	102.4
		580	68,000	61,000	a_p	0.0045	0.0022	0.0011
		870	80,000	72,000	V_f	30.7	61.4	122.8

a_p in inch, V_f in ipm.

The cutting values apply to CoolSpeed® Flex using 4 jets. The values are for orientation only and shall be adapted to the specific application by gradually increasing V_f until the optimum cutting result is achieved.

Application Examples

					Tool-Ø	0.0787		0.0394		0.0197			
	Material	Coolant Pressure [psi]	Idle Speed [rpm]	Operation Speed [rpm]	Cutting Values	Rough Machin- ing	Finish Machin- ing	Rough Machin- ing	Finish Machin- ing	Rough Machin- ing	Finish Machin- ing		
Side Milling		Stainless Steel	290	48,000	43,000	a _p	0.0157	0.0157	0.0079	0.0079	0.0039	0.0039	
						a _e	0.0019	0.0009	0.0014	0.0007	0.0009	0.0005	
						V _f	78.7	39.4	118.1	59.1	177.2	88.6	
			580	68,000	61,000	a _p	0.0157	0.0157	0.0079	0.0079	0.0039	0.0039	
					a _e	0.0019	0.0009	0.0014	0.0007	0.0009	0.0005		
					V _f	98.4	49.2	147.6	73.8	221.5	110.7		
			870	80,000	72,000	a _p	0.0157	0.0157	0.0079	0.0079	0.0039	0.0039	
					a _e	0.0019	0.0009	0.0014	0.0007	0.0009	0.0005		
					V _f	118.1	59.1	177.2	88.6	265.7	132.9		
			Aluminum	290	48,000	43,000	a _p	0.0262	0.0262	0.0131	0.0131	0.0066	0.0066
						a _e	0.0031	0.0016	0.0024	0.0012	0.0016	0.0008	
						V _f	131.2	65.6	196.9	98.4	295.3	147.6	
		580	68,000	61,000	a _p	0.0262	0.0262	0.0131	0.0131	0.0066	0.0066		
					a _e	0.0031	0.0016	0.0024	0.0012	0.0016	0.0008		
					V _f	164.0	82.0	246.1	123.0	369.1	184.5		
		870	80,000	72,000	a _p	0.0262	0.0262	0.0131	0.0131	0.0066	0.0066		
					a _e	0.0031	0.0016	0.0024	0.0012	0.0016	0.0008		
					V _f	196.9	98.4	295.3	147.6	492.1	221.5		
		Carbon Steel	290	48,000	43,000	a _p	0.0180	0.0180	0.0090	0.0090	0.0045	0.0045	
					a _e	0.0032	0.0016	0.0024	0.0012	0.0016	0.0008		
					V _f	102.4	51.2	153.5	76.8	230.3	115.2		
		580	68,000	61,000	a _p	0.0180	0.0180	0.0090	0.0090	0.0045	0.0045		
					a _e	0.0032	0.0016	0.0024	0.0012	0.0016	0.0008		
					V _f	128.0	64.0	191.9	96.0	287.9	143.9		
		870	80,000	72,000	a _p	0.0180	0.0180	0.0090	0.0090	0.0045	0.0045		
					a _e	0.0032	0.0016	0.0024	0.0012	0.0016	0.0008		
					V _f	153.5	76.8	230.3	115.2	345.5	172.7		
Profile Milling		Stainless Steel	290	48,000	43,000	a _p	0.0079	0.0039	0.0039	0.0020	0.0020	0.0010	
						a _e	0.0013	0.0006	0.0006	0.0003	0.0003	0.0004	
						V _f	39.4	19.7	78.7	39.4	157.5	78.7	
			580	68,000	61,000	a _p	0.0079	0.0039	0.0039	0.0020	0.0020	0.0010	
						a _e	0.0013	0.0006	0.0006	0.0003	0.0003	0.0004	
						V _f	49.2	24.6	98.4	49.2	196.9	98.4	
			870	80,000	72,000	a _p	0.0079	0.0039	0.0039	0.0020	0.0020	0.0010	
						a _e	0.0013	0.0006	0.0006	0.0003	0.0003	0.0004	
						V _f	59.1	29.5	118.1	59.1	236.2	118.1	
			Aluminum	290	48,000	43,000	a _p	0.0131	0.0066	0.0066	0.0033	0.0033	0.0016
						a _e	0.0021	0.0010	0.0010	0.0005	0.0005	0.0003	
						V _f	65.6	32.8	131.2	65.6	262.5	131.2	
			580	68,000	61,000	a _p	0.0131	0.0066	0.0066	0.0033	0.0033	0.0016	
						a _e	0.0021	0.0010	0.0010	0.0005	0.0005	0.0003	
						V _f	82.0	41.0	164.0	82.0	328.1	164.0	
			870	80,000	72,000	a _p	0.0131	0.0066	0.0066	0.0033	0.0033	0.0016	
						a _e	0.0021	0.0010	0.0010	0.0005	0.0005	0.0003	
						V _f	98.4	49.2	196.9	98.4	393.7	196.9	
			Carbon Steel	290	48,000	43,000	a _p	0.0090	0.0045	0.0045	0.0022	0.0022	0.0011
						a _e	0.0021	0.0011	0.0011	0.0005	0.0005	0.0003	
						V _f	51.2	25.6	102.4	51.2	204.7	102.4	
			580	68,000	61,000	a _p	0.0090	0.0045	0.0045	0.0022	0.0022	0.0011	
						a _e	0.0021	0.0011	0.0011	0.0005	0.0005	0.0003	
						V _f	64.0	32.0	128.0	64.0	255.9	128.0	
		870	80,000	72,000	a _p	0.0090	0.0045	0.0045	0.0022	0.0022	0.0011		
					a _e	0.0021	0.0011	0.0011	0.0005	0.0005	0.0003		
					V _f	76.8	38.4	153.5	76.8	307.1	153.5		

a_p and a_e in inch, V_f in ipm.

The cutting values apply to CoolSpeed® Flex using 4 jets. The values are for orientation only and shall be adapted to the specific application by gradually increasing V_f until the optimum cutting result is achieved.



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WTO worldwide

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