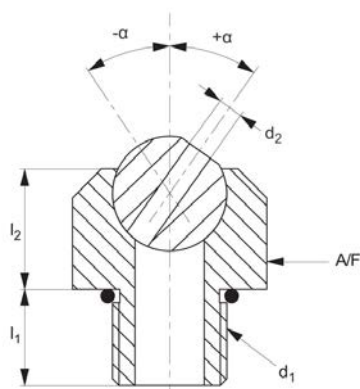




Coolant Nozzles - Jet Bolt - Compact

max. 10 bar

Coolant Nozzles



20010

COOLANT NOZZLES

Material

Body: acetal.

Ball: stainless steel.

Technical Notes

Max. temperature 70°C.

Max. pressure 10 bar.

symbol α / symbol is an angle of adjustment

either side of centre line.

For extension tubes see part nos. 20090 and 20092.

For spray tips see part nos. 20080 and 20082.

Tips

Screws into threaded coolant ports. Large

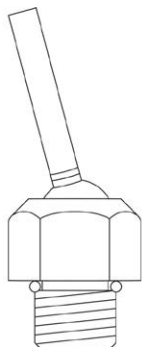
adjustment angle.

Choose large orifice for maximum flow.

Choose smaller orifices when using multiple nozzles.

Choose tapped ends if nozzle will need to be plugged (set screw included).

Order No.	Thread	d ₁	d ₂	Jet bore d ₂	l ₁	l ₂	α	A/F
20010.W0100	Metric Fine	M10x1,25	4.0	Plain	9.1	10.4	±35°	17
20010.W0101	Metric Fine	M10x1,25	2.8	Plain	9.1	10.4	±35°	17
20010.W1101	Metric Coarse	M10x1,50	4.0	Plain	9.1	10.4	±35°	17
20010.W1102	Metric Coarse	M10x1,50	2.8	Plain	9.1	10.4	±35°	17
20010.W1120	Metric Coarse	M12x1,75	4.0	Plain	9.1	10.4	±35°	17
20010.W1121	Metric Coarse	M12x1,75	2.8	Plain	9.9	10.4	±35°	17
20010.W2130	NPT-BSPT	1/8	4.0	Plain	9.9	10.4	±35°	17
20010.W2131	NPT-BSPT	1/8	2.8	Plain	12.7	10.4	±35°	17
20010.W2250	NPT-BSPT	1/4	4.0	Plain	12.7	10.4	±35°	17
20010.W2251	NPT-BSPT	1/4	2.8	Plain	12.7	10.4	±35°	17
20010.W2380	NPT-BSPT	3/8	4.0	Plain	12.7	10.4	±35°	17
20010.W2381	NPT-BSPT	3/8	5.6	Plain	12.7	10.4	±35°	17
20010.W2382	NPT-BSPT	3/8	M 5x0,8	Threaded	9.1	10.4	±35°	17
20010.W6100	Metric Fine	M10x1,25	M 5x0,8	Threaded	9.1	10.4	±35°	17
20010.W7100	Metric Coarse	M10x1,50	M 5x0,8	Threaded	9.1	10.4	±35°	17
20010.W7120	Metric Coarse	M12x1,75	M 5x0,8	Threaded	9.9	10.4	±35°	17
20010.W8130	NPT-BSPT	1/8	M 5x0,8	Threaded	12.7	10.4	±35°	17
20010.W8131	NPT-BSPT	1/4	M 6x1,0	Threaded	12.7	10.4	±35°	17
20010.W8381	NPT-BSPT	3/8	M 6x1,0	Threaded	12.7	10.4	±35°	17





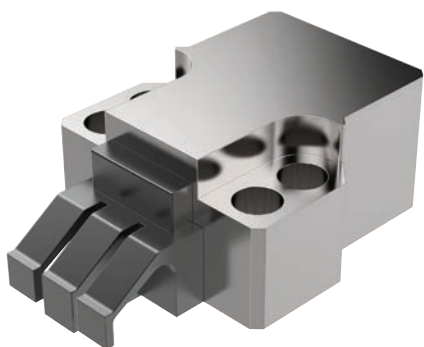
Horizontal Clamping

up to 2.2 tons

Clamping & Height Setting

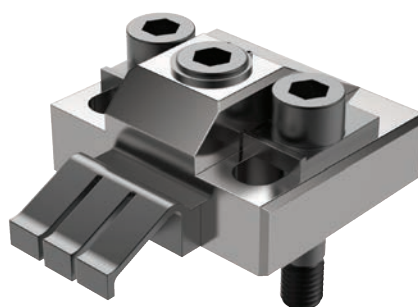
COOLANT NOZZLES

Clamping Torque



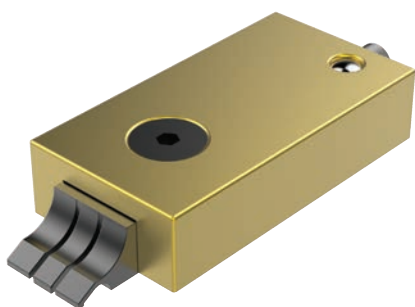
11040/CL2040

Clamping Torque	Clamping Force
N/m	N
50	23000
40	18000
30	12500
25	11500
20	9500



11070/CL2070

Clamping Torque	Clamping Force
N/m	N
60	16500
50	15000
40	12000
30	10000
25	8000
20	7000



11081/CL2081

Clamping Torque	Clamping Force
N/m	N
5	6600
4.5	5500
4	4900



10940/CL0030

Clamping Torque	Clamping Force
N/m	N
8.5	4000
8	3800
7	3400
6	3000
5	2500
4	2000



What Flow Rate of Coolant is Required?

Choose a nozzle with an orifice size that matches your pump's capacity.

Select an orifice size too big and coolant pressure will drop off, an orifice size too small and an inadequate amount of coolant will reach the tool tip and can result in damage.

Note: Flow rates are based on water at 20°. Actual results may vary with fluid type, extension length and aiming angle.

System pressure (bar)	0.35	0.7	1.4	2.0	2.8	4.1	5.5
Orifice diameter (mm)	Flow rate (litres/minute)						
1.02	0.32	0.45	0.64	0.77	0.91	1.18	1.41
1.57	0.86	1.14	1.68	2	2.32	2.82	3.32
2.18	1.64	2.32	3.27	3.86	4.55	5.46	6.82
2.79	2.91	4.09	6.36	7.27	8.18	10	11.37
4.06	6.36	9.09	12.73	15.91	18.18	21.82	25.46
5.59	11.37	16.82	23.64	30.46	35.46	42.28	48.19

System pressure (bar)	6.9	10.3	13.8	20.7	34.5	69.0	103.5
Orifice diameter (mm)	Flow rate (litres/minute)						
1.02	1.59	1.86	2.09	2.77	4	5.46	6.36
1.57	3.64	4.55	5.46	6.82	9.55	13.64	17.28
2.18	7.73	9.09	10.46	12.73	16.82	23.64	28.64
2.79	14.09	16.37	18.64	23.64	29.55	40.46	49.55
4.06	28.19	34.55	41.37	49.1	63.65	90.01	110.47
5.59	53.64	65.46	75.01	89.1	114.56	161.39	197.75

Calculating Coolant Velocity

To calculate the average coolant exit velocity (important in some grinding operations where it is often desirable to match or exceed the peripheral velocity of the wheel) refer to the formula below. Choose an orifice size that produces sufficient back pressure to achieve the desired velocity.

$$V = \frac{(17.11 \times 10^{-5}) \times F}{(d \times 10^{-3})^2}$$

Where;

V = Velocity in m/s

C = Constant of 17.11 x 10⁻⁵

F = Flow rate through orifice in litres/min (see table above)

d = Orifice diameter (mm) from product tables

Nozzle Extensions

Choose a nozzle extension that suits your application. Short projections are more compact and less likely to be knocked out of position by swarf or vibration. Longer extensions are easier to aim, produce a more streamline or laminar flow and shoot further.

A Word About Coolant Pumps

The most common coolant pump on CNC machine tools is a single stage centrifugal pump, normally designed to move high volumes of water at low pressure (typically 0.2 to 1.4 bar). Multi-stage centrifugal pumps are capable of higher pressures (typically 1.4 to 14 bar) while still producing high flow rates. Positive displacement pumps are used for very high pressure applications up to 140 bar and are generally used with small diameter orifices due to their lower flow rates.

