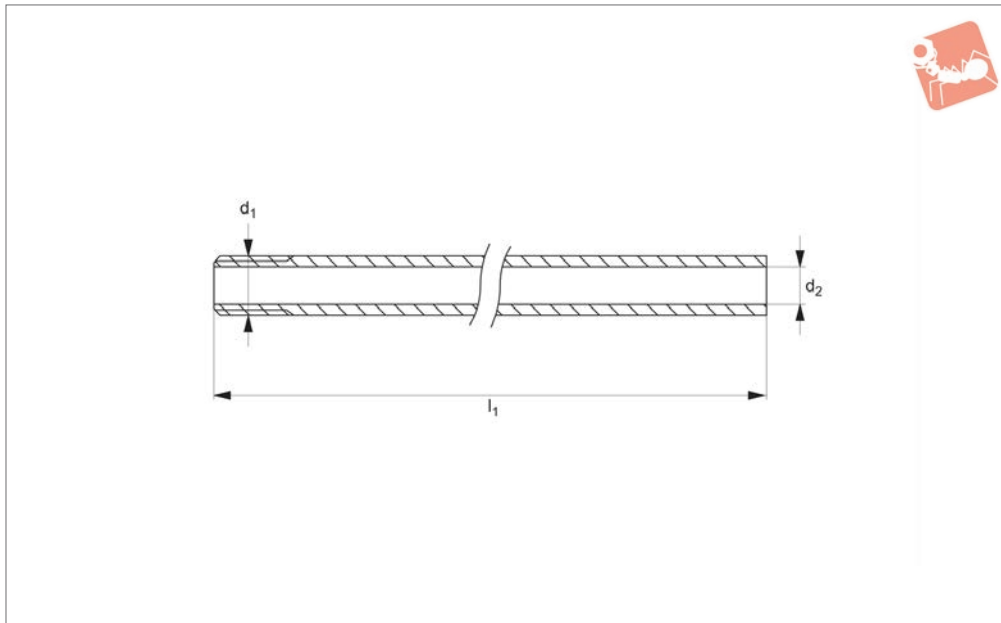




# Extension Tube - For Coolant Nozzles

max. 33 bar

## Coolant Nozzles



**20090**

COOLANT NOZZLES

**Material**

Brass.

Max. pressure: 33 bar.

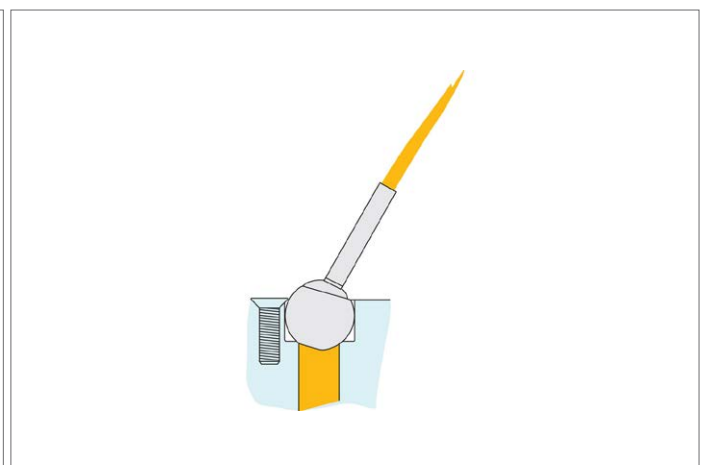
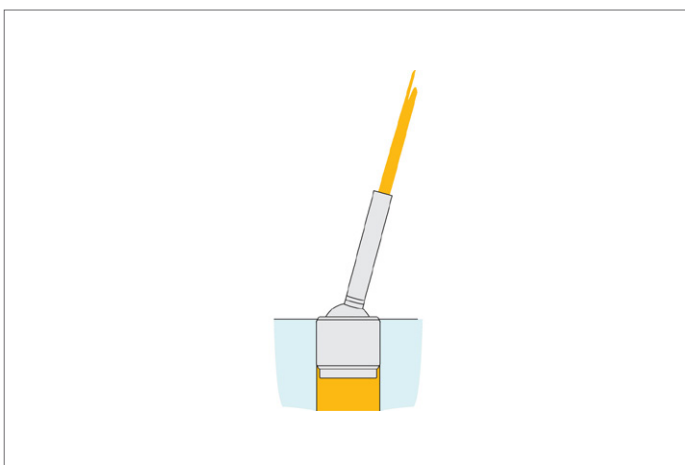
**Technical Notes**

Max. temperature: 150°C.

**Tips**

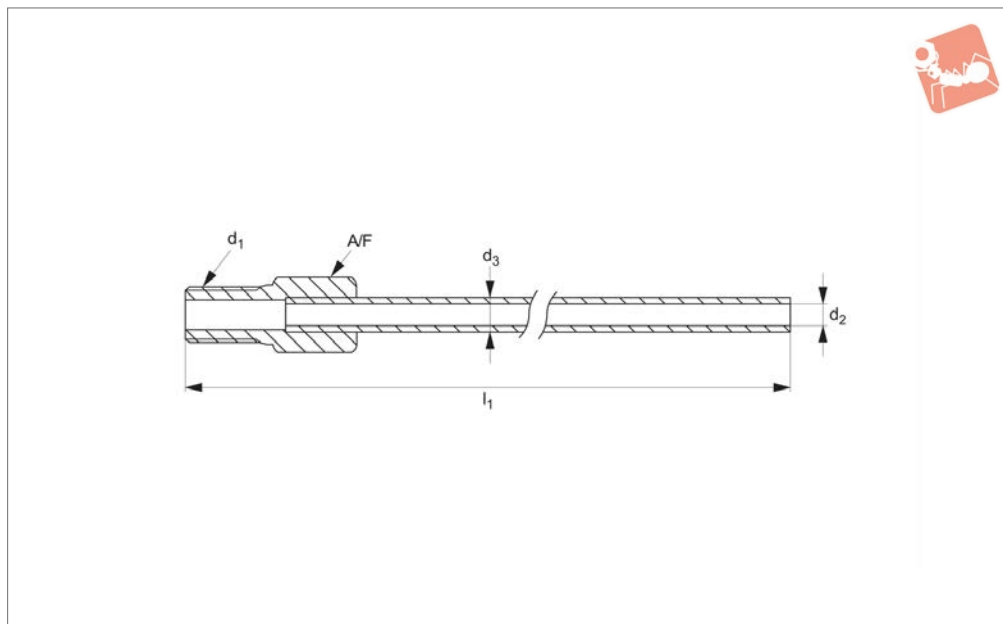
For use with many of our coolant nozzles, or as stand alone units.

Order No.	d <sub>1</sub>	d <sub>2</sub>	l <sub>1</sub>
20090.W0030	M 3,5x0,60	2.0	30
20090.W0040	M 4x0,70	2.0	30
20090.W0050	M 5x0,80	3.0	40
20090.W0060	M 6x1,00	4.0	50
20090.W0070	M 7x1,00	5.0	55
20090.W0080	M 8x1,25	5.5	55





## 20092



### Material

Tube: copper.  
Connector: threaded brass.

Max. pressure: 33 bar.  
Bend and cut to length as required.

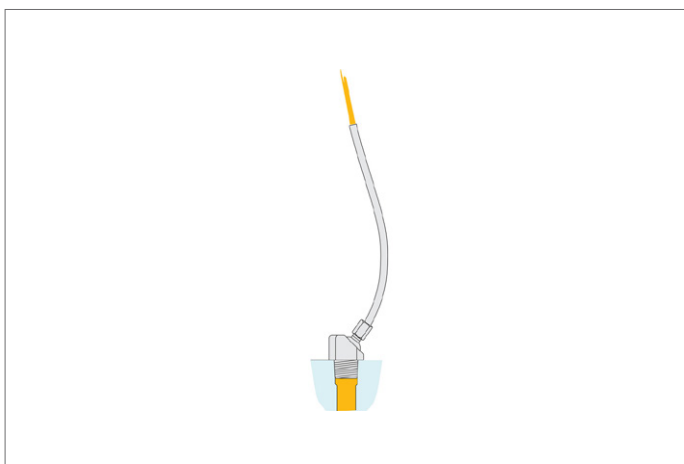
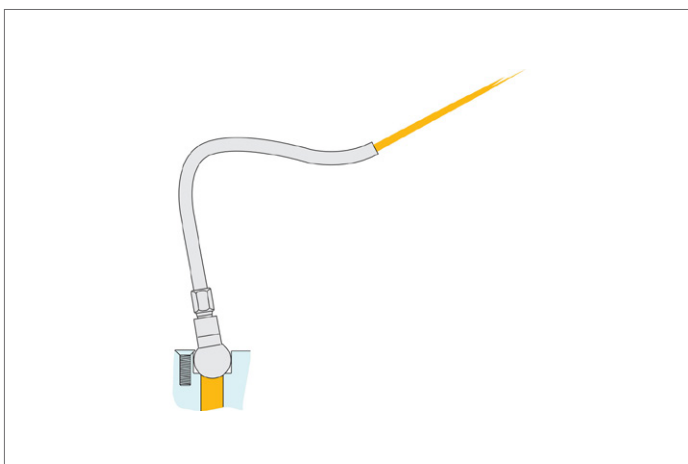
### Technical Notes

Max. temperature: 150°C.

### Tips

For use with many of our coolant nozzles,  
or as stand alone units.

Order No.	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	l <sub>1</sub>	A/F
20092.W0030	M 3,5x0,60	1.8	3.2	155.5	3/16"
20092.W0040	M 4x0,70	1.8	3.2	155.5	3/16"
20092.W0050	M 5x0,80	3.0	4.8	155.5	1/4"
20092.W0060	M 6x1,00	3.0	4.8	155.5	1/4"
20092.W0070	M 7x1,00	4.6	6.4	155.5	5/16"
20092.W0080	M 8x1,25	4.6	6.4	155.5	5/16"
20092.W0081	M 8x0,50	3.0	4.8	155.5	6
20092.W0082	M 8x0,50	4.6	6.4	155.5	7
20092.W0100	M10x0,50	3.0	4.8	155.5	6
20092.W0101	M10x0,50	4.6	6.4	155.5	8
20092.W0120	M12x0,50	3.0	4.8	155.5	6
20092.W0121	M12x0,50	4.6	6.4	155.5	8
20092.W0122	M12x0,50	6.4	7.9	155.5	10

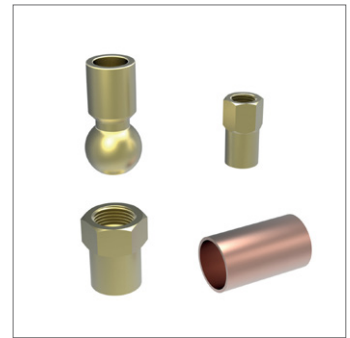
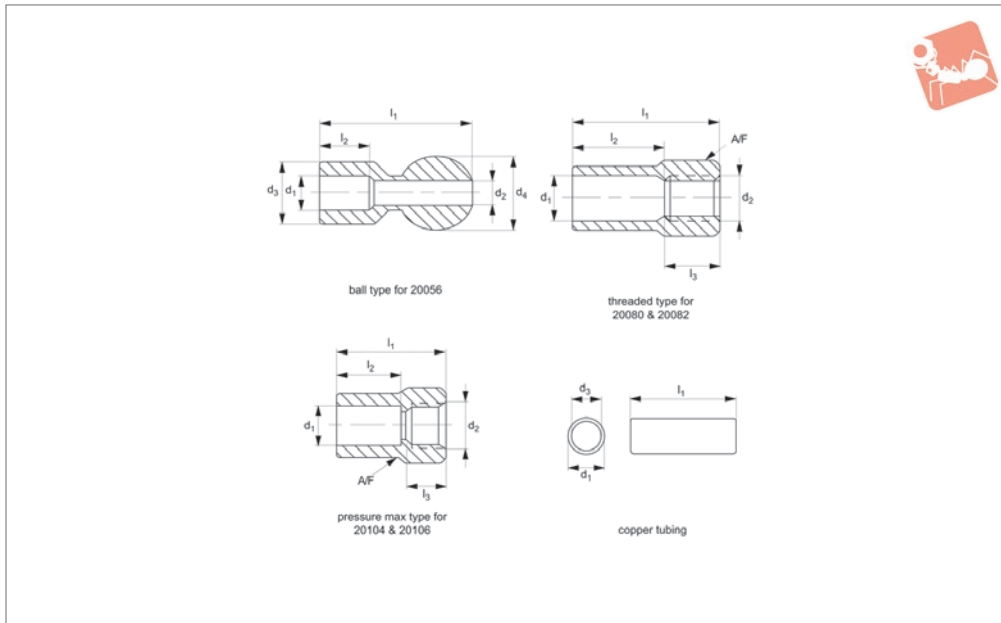




# Sweat Fittings - for Coolant Nozzles

for adapting coolant nozzles to copper tubing

## Coolant Nozzles



## 20093

COOLANT NOZZLES

### Material

Brass.

### Technical Notes

Max. temperature: 70°C.

Max. pressure: 33 bar.

### Tips

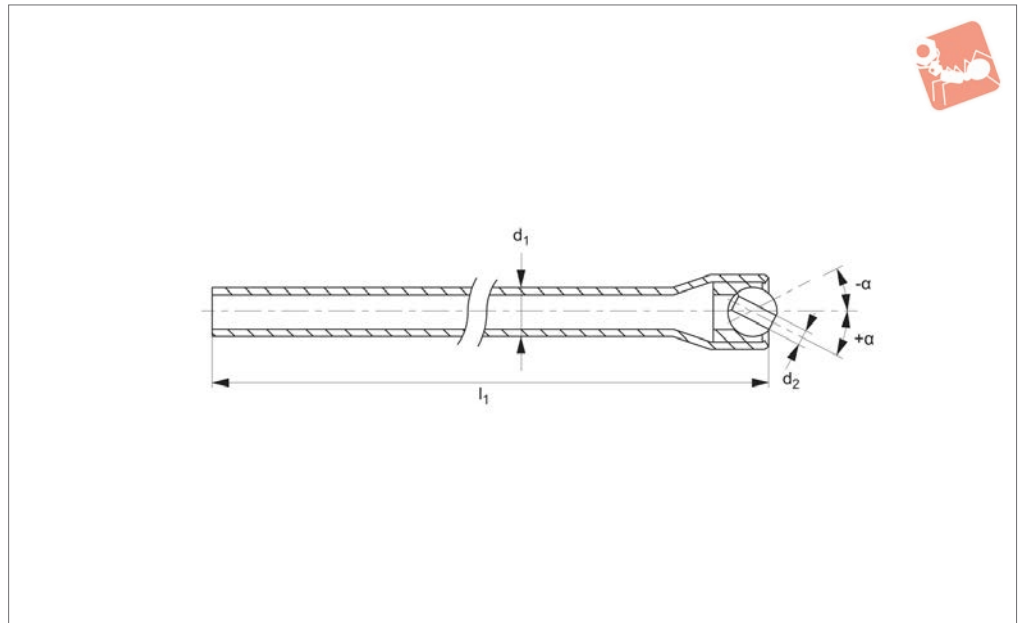
Sweat fittings allow a wide variety of coolant nozzles to be mounted to copper tubing, increasing reliability through use of short rigid hose. For use with coolant

nozzles 20056, 20080, 20082, 20104 and 20106. See table for compatibility. Easy to solder.

Order No.	Type	For use with	d <sub>1</sub>	d <sub>2</sub>	d <sub>3</sub>	d <sub>4</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	A/F
20093.W0250	Ball Type	20056	6.4	5.6	9.6	12	25.1	9.6	-	-
20093.W0310	Ball Type	20056	7.9	5.6	11.2	12	26.7	11.2	-	-
20093.W0370	Ball Type	20056	9.5	5.6	12.4	12	29.2	12.4	-	-
20093.W1190	Threaded Type	20080/20082	4.8	M 5x0,80	-	-	14.2	7.9	6.4	6.4
20093.W1250	Threaded Type	20080/20082	6.4	M 6x1,00	-	-	15.7	9.4	6.4	7.9
20093.W1340	Threaded Type	20080/20082	7.9	M 8x1,25	-	-	20.6	12.7	7.9	9.7
20093.W1370	Threaded Type	20080/20082	9.5	1/8" NPT/BSPT	-	-	23.9	14.2	6.4	12.7
20093.W2250	Pressure Max Type	20104/20106	6.4	5/16"-24 UNJF	-	-	17.3	9.7	5.0	11.2
20093.W2251	Pressure Max Type	20104/20106	6.4	7/16"-20 UNJF	-	-	19.0	10.7	5.0	14.2
20093.W2310	Pressure Max Type	20104/20106	7.9	7/16"-20 UNJF	-	-	19.0	11.2	5.0	14.2
20093.W2311	Pressure Max Type	20104/20106	7.9	1/2"-20 UNJF	-	-	25.4	14.2	6.3	15.7
20093.W2370	Pressure Max Type	20104/20106	9.5	7/16"-20 UNJF	-	-	19.0	11.2	5.0	14.2
20093.W2371	Pressure Max Type	20104/20106	9.5	1/2"-20 UNJF	-	-	25.4	14.2	6.3	15.7
20093.W5190	Copper Tubing	Copper Tube	4.8	-	3.0	-	3000.0	-	-	-
20093.W5250	Copper Tubing	Copper Tube	6.4	-	4.6	-	3000.0	-	-	-
20093.W5310	Copper Tubing	Copper Tube	7.9	-	6.3	-	3000.0	-	-	-
20093.W5370	Copper Tubing	Copper Tube	9.5	-	7.9	-	3000.0	-	-	-



### 20094



#### Material

Tube: copper.  
 Inserts: acetal.  
 Ball: stainless steel.

#### Technical Notes

Max. temperature: 70°C.

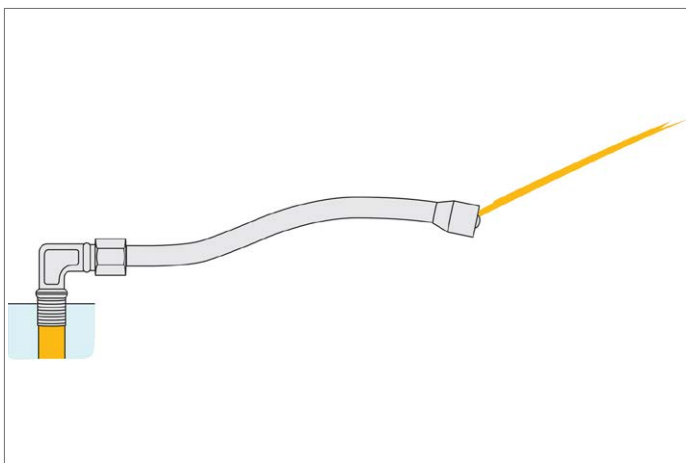
Max. pressure: 33 bar.  
 symbola/symbol is an angle of adjustment  
 either side of centre line.

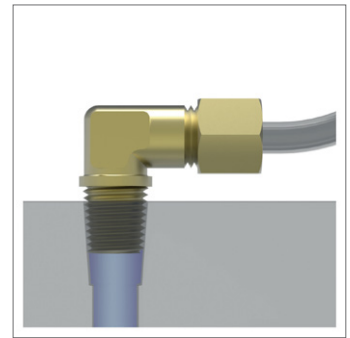
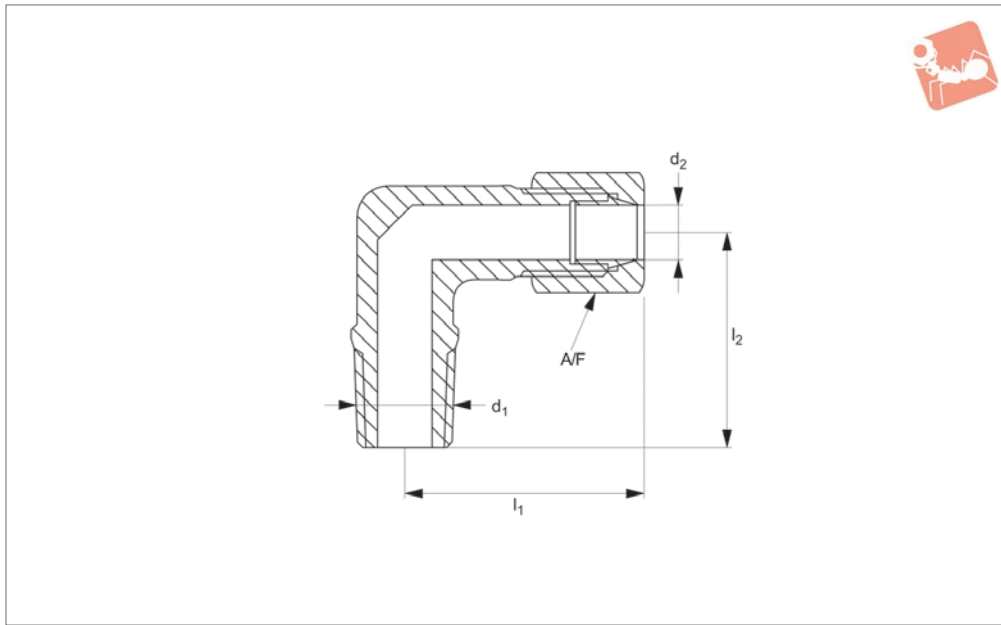
#### Tips

Adjustable direction ball on tip.  
 Can be combined with connectors 20095

(right angle) or 20096 (straight).

Order No.	d <sub>1</sub>	d <sub>2</sub>	Jet bore d <sub>2</sub>	l <sub>1</sub>	α
20094.W0040	4.8	2	Plain	146.0	±35°
20094.W6060	6.4	M 3,5x0,6	Threaded	146.0	±35°
20094.W6070	7.9	M 4x0,7	Threaded	298.5	±35°
20094.W6090	9.5	M 5x0,8	Threaded	298.5	±35°





**20095**

COOLANT NOZZLES

**Material**

Brass connector (supplied with olive).

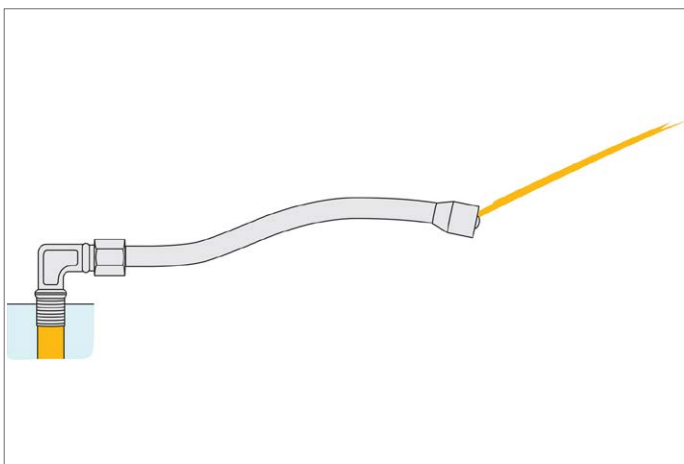
Max. pressure: 33 bar.

For use with adjustable direction spray nozzle tube 20094.

**Technical Notes**

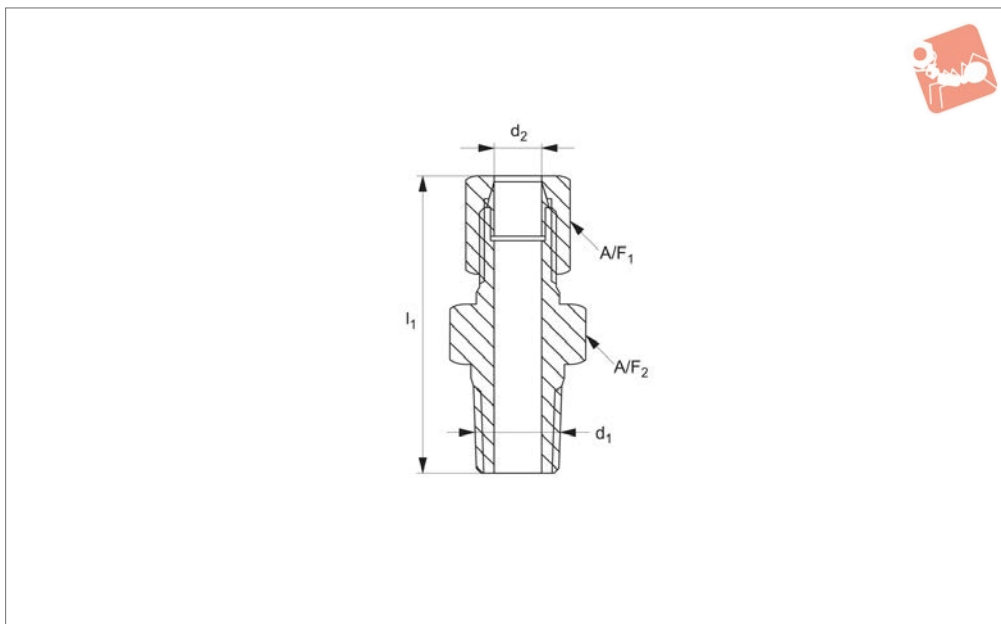
Max. temperature: 150°C.

Order No.	Type	Tube size mm	d <sub>1</sub>	d <sub>2</sub>	l <sub>1</sub>	l <sub>2</sub>	A/F
20095.W1120	1/8" NPT/BSPT	3/16"	1/8"	3/8" - 24 UN	21.3	17.5	7/16"
20095.W1121	1/8" NPT/BSPT	1/4"	1/8"	7/16" - 24 UN	21.8	18.8	1/12"
20095.W1122	1/8" NPT/BSPT	5/16"	1/8"	1/2" - 24 UN	22.4	18.8	9/16"
20095.W1250	1/4" NPT/BSPT	3/16"	1/4"	3/8" - 24 UN	21.8	23.6	7/16"
20095.W1251	1/4" NPT/BSPT	1/4"	1/4"	7/16" - 24 UN	21.8	23.9	1/2"
20095.W1252	1/4" NPT/BSPT	5/16"	1/4"	1/2" - 24 UN	24.1	23.6	9/16"
20095.W1253	1/4" NPT/BSPT	3/8"	1/4"	9/24" - 24 UN	26.2	23.6	5/8"
20095.W1370	3/8" NPT/BSPT	3/8"	3/8"	9/24" - 24 UN	26.2	25.4	5/8"





**20096**



**Material**

Brass connector (supplied with olive).

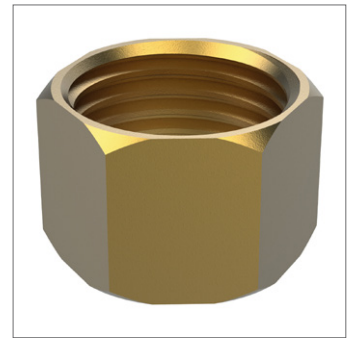
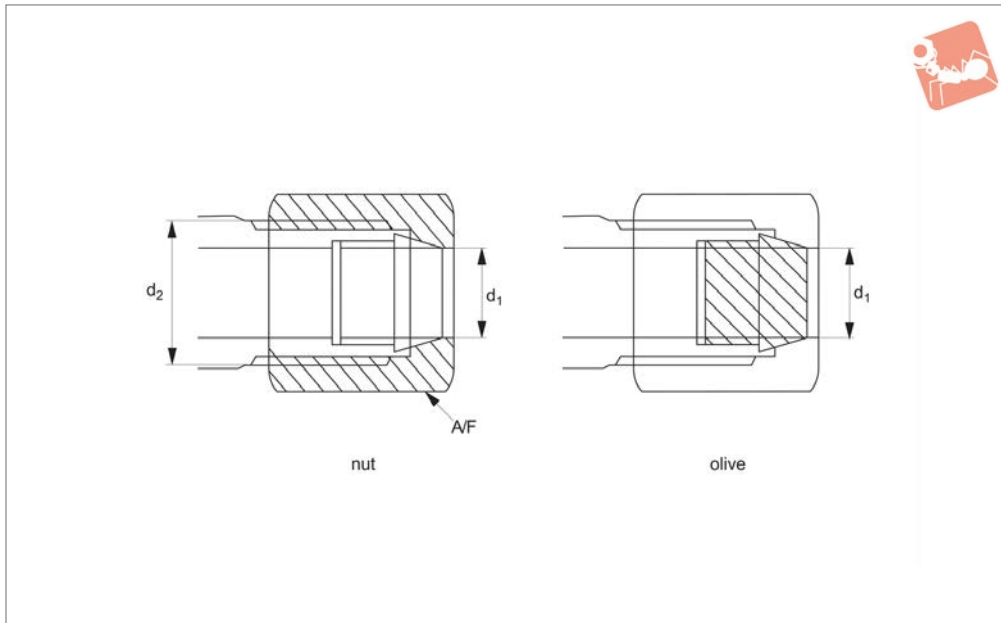
Max. pressure: 33 bar.

For use with adjustable direction spray nozzle tube 20094.

**Technical Notes**

Max. temperature: 70°C.

Order No.	Type	d <sub>1</sub>	d <sub>2</sub>	l <sub>1</sub>	A/F <sub>1</sub>	A/F <sub>2</sub>
20096.W0080	Metric fine	M 8x1,00	4.8	28.0	7/16"	7/16"
20096.W0100	Metric fine	M10x1,25	4.8	28.7	7/16"	7/16"
20096.W1101	Metric fine	M10x1,00	4.8	28.7	7/16"	7/16"
20096.W1080	Metric coarse	M 8x1,25	4.8	28.0	7/16"	7/16"
20096.W1100	Metric coarse	M10x1,50	4.8	28.7	7/16"	7/16"
20096.W1120	Metric coarse	M12x1,75	6.4	30.5	1/2"	1/2"
20096.W2060	NPT/BSPT	1/16"	4.8	27.4	7/16"	7/16"
20096.W1130	NPT/BSPT	1/8"	4.8	27.4	7/16"	7/16"
20096.W1131	NPT/BSPT	1/8"	6.4	28.0	1/2"	7/16"
20096.W1132	NPT/BSPT	1/8"	7.9	29.2	9/16"	1/2"
20096.W1250	NPT/BSPT	1/4"	4.8	32.3	7/16"	9/16"
20096.W1251	NPT/BSPT	1/4"	6.4	33.0	1/2"	9/16"
20096.W1252	NPT/BSPT	1/4"	7.9	33.8	9/16"	9/16"
20096.W1253	NPT/BSPT	1/4"	9.5	36.0	5/8"	9/16"
20096.W1370	NPT/BSPT	3/8"	9.5	36.6	5/8"	5/8"



**20097**

COOLANT NOZZLES

**Material**

Brass.

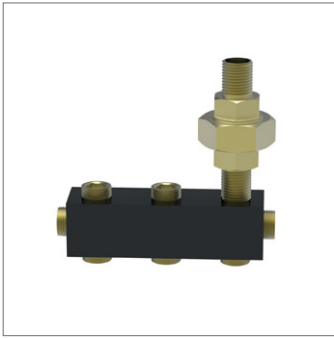
Max. pressure: 33 bar.

For angled or straight connectors 20095 and 20096.

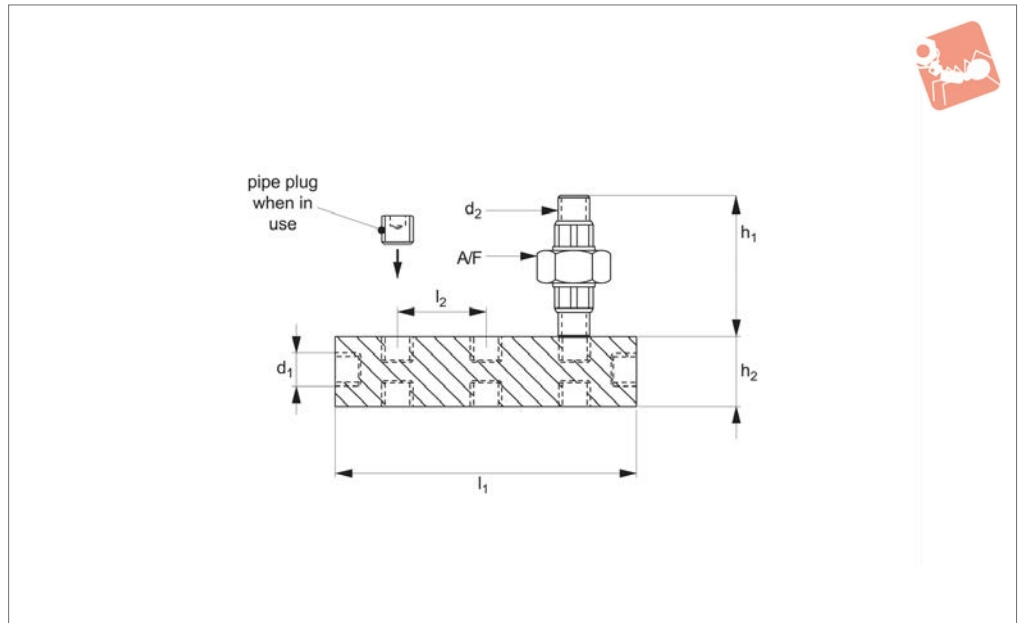
**Technical Notes**

Max. temperature: 150°C.

Order No.	Type	d <sub>1</sub>	Internal thread d <sub>2</sub>	A/F
20097.W1040	Nut	4.8	3/8" - 24 UNF	7/16"
20097.W1060	Nut	6.4	7/16" - 24 UNF	1/2"
20097.W1070	Nut	7.9	1/2" - 24 UNF	9/16"
20097.W1090	Nut	9.5	9/16" - 24 UNF	5/8"
20097.W2040	Olive	4.8	-	-
20097.W2060	Olive	6.4	-	-
20097.W2070	Olive	7.9	-	-
20097.W2090	Olive	9.5	-	-



20114



**Material**

Manifold: anodized aluminium.  
 Thread connectors: brass.  
 Pipe plugs: plated steel.

Thread union: brass.

Max. pressure: 33 bar.

**Technical Notes**

Max. temperature: 70°C.

Order No.	d <sub>1</sub>	d <sub>2</sub>	h <sub>1</sub>	h <sub>2</sub>	l <sub>1</sub>	l <sub>2</sub>	A/F
20114.W2250	1/4" NPT	1/4" NPT/BSPT	76.2	25.4	88.9	31.8	1-3/16"





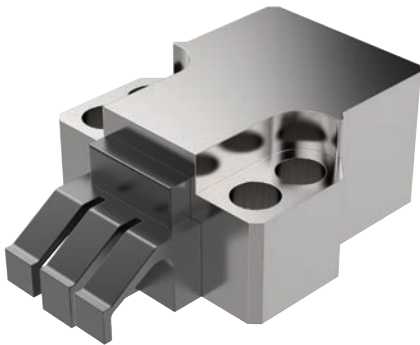
# Horizontal Clamping

up to 2.2 tons

# Clamping & Height Setting

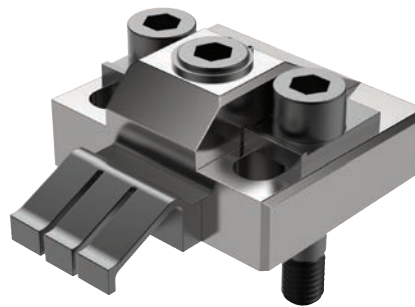


## Clamping Torque



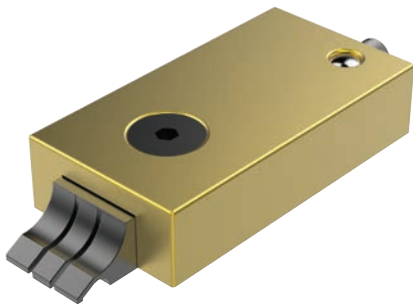
11040/CL2040

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



11070/CL2070

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



11081/CL2081

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



10940/CL0030

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

COOLANT NOZZLES

ov-W11040-A-T-W10940-A-T-horizontal-clamping-rnh - Updated - 13-10-2022



## 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
<b>Orifice diameter (mm)</b>							
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
<b>Orifice diameter (mm)</b>							
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<sup>-5</sup>

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

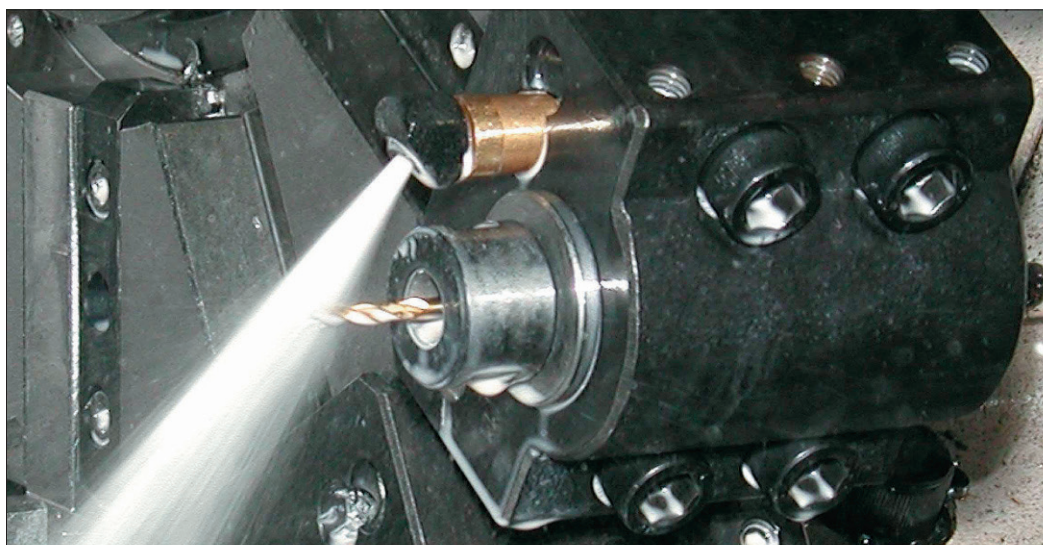
d = Orifice diameter (mm) from product tables

## 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.

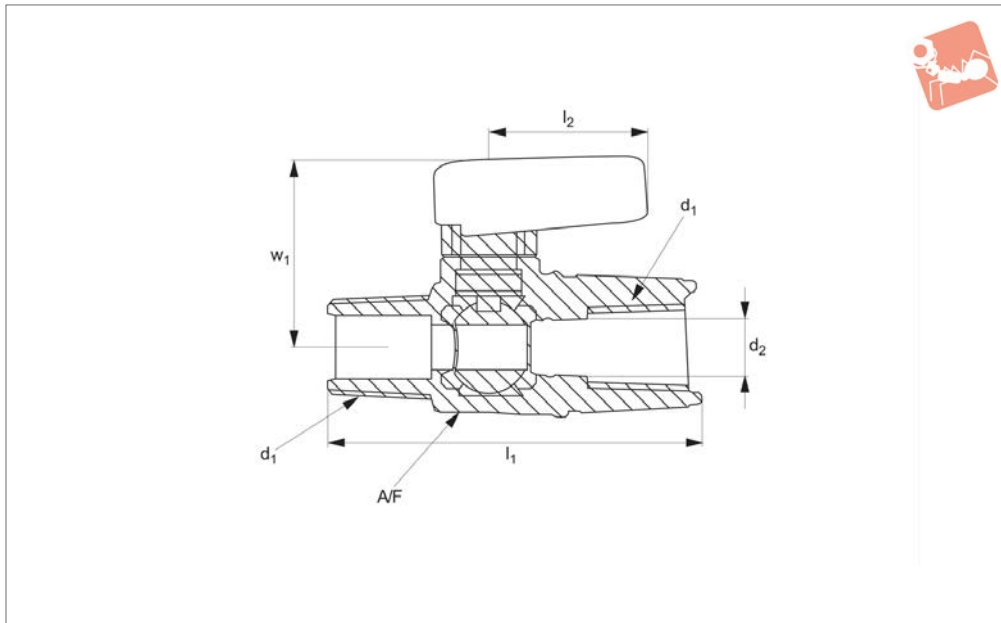




# Ball Valves - for Coolant Systems

max. 16 bar

## Coolant Nozzles



**20118**

COOLANT NOZZLES

### Material

Brass, chrome plated.  
Teflon seals.

### Technical Notes

Max. temperature: 80°C.  
Max. pressure: 16 bar.

Order No.	d <sub>1</sub>	d <sub>2</sub>	l <sub>1</sub>	l <sub>2</sub>	w <sub>1</sub>	A/F	Handle colour
<b>20118.W1120</b>	1/8" BSPT	5.3	36.0	18.8	21.8	14	Red
<b>20118.W1250</b>	1/4" BSPT	5.3	43.2	18.8	21.8	14	Red
<b>20118.W1370</b>	3/8" BSPT	7.9	46.0	18.8	23.4	18	Red
<b>20118.W3120</b>	1/8" NPTF	5.3	36.8	18.8	21.8	14	Blue
<b>20118.W3250</b>	1/4" NPTF	5.3	43.2	18.8	21.8	14	Blue
<b>20118.W3370</b>	3/8" NPTF	7.9	48.0	18.8	23.4	18	Blue