

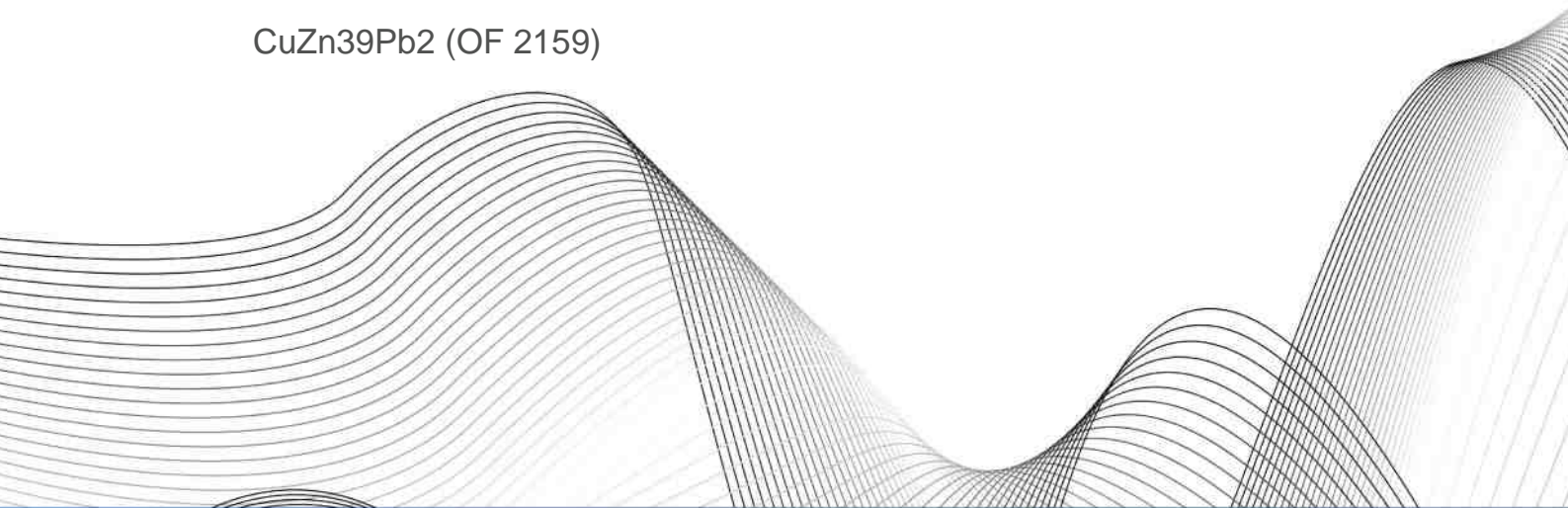


OTTO FUCHS  
Dülken GmbH & Co. KG



Copper and Copper Alloys

CuZn39Pb2 (OF 2159)



	Cu	Zn	Pb	Sn	Fe	Mn	Ni	Al	Si	As	Co	Cr	Others
min.	59.0	Rem.	1.6	-	-	-	-	-	-	-	-	-	-
max.	60.0	-	2.2	0.3	0.3	0.02	0.1	0.05	-	-	-	-	0.2

## Applications

CuZn39Pb2 is highly suitable for hot formed parts. Due to a mixture of  $\alpha$ - and  $\beta$ -phase and the presence of Pb OF 2159 is excellent for drilling parts, e.g. for use in drinking water, automotive or electronic applications.

CuZn39Pb2 is suitable for use in drinking water. The German Federal Office for the Environment enlists CuZn39Pb2 for products which are used in drinking water (category B: fittings and connectors, pumps and other devices; category C: components whose surface is in contact with drinking water at less than 10% of the total surface).

Examples of application:

Fittings and connectors in applications for drinking water  
Wrought and unwrought stock  
Housings  
Brass parts in mechanical clocks for gears and metal blanks

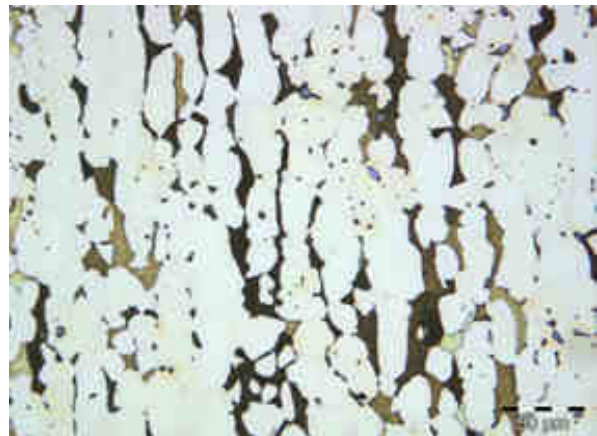
## Physical properties

At room temperature

Density	8.4	g/cm <sup>3</sup>
Electrical conductivity	13.9	MS/m
	24	% I.A.C.S
Heat conductivity	109	W/(m*K)
Heat capacity	377	J/(kg*K)
Coefficient of thermal expansion	21.1	10 <sup>-6</sup> /K
Young's modulus	102	GPa
Melting range	880-895	°C

## Structure

The microstructures of CuZn39Pb2 consist of a heterogeneous mixture of  $\alpha$ - and  $\beta$ -phase. Pb is insoluble, it forms fine precipitations in the brass matrix.



Consignment and measurements

Strength conditions

Spec./ DIN EN	Condition	Yield strength R <sub>p0.2</sub> [MPa]	Tensile strength R <sub>m</sub> [MPa]	Elongation at break A [%]	Brinell- Hardness HB 2.5/62.5
12164/12165/ 12167/12168/ 12420	M	**	**	**	**
12164/12167/ 12168	R360	≤300	≥360	≥20	/
12164	R410	≥230	≥410	≥12	/
12167		≥220	≥410	≥12	/
12168		≥250	≥410	≥12	/
12164/12167/ 12168	R500	≥350	≥500	≥8	/
12164/12167/ 12168	H070	/	/	/	70-100
12165		/	/	/	70-170
12420	H075	(≥110)	(≥340)	(≥20)	≥75
12420	H080	(≥120)	(≥360)	(≥20)	≥80
12164/12167/ 12168	H100	/	/	/	100-145
12164/12167/ 12168	H120	/	/	/	≥120

DIN EN 12164:  
Bars for machining

DIN EN 12165:  
Pre-material for forging

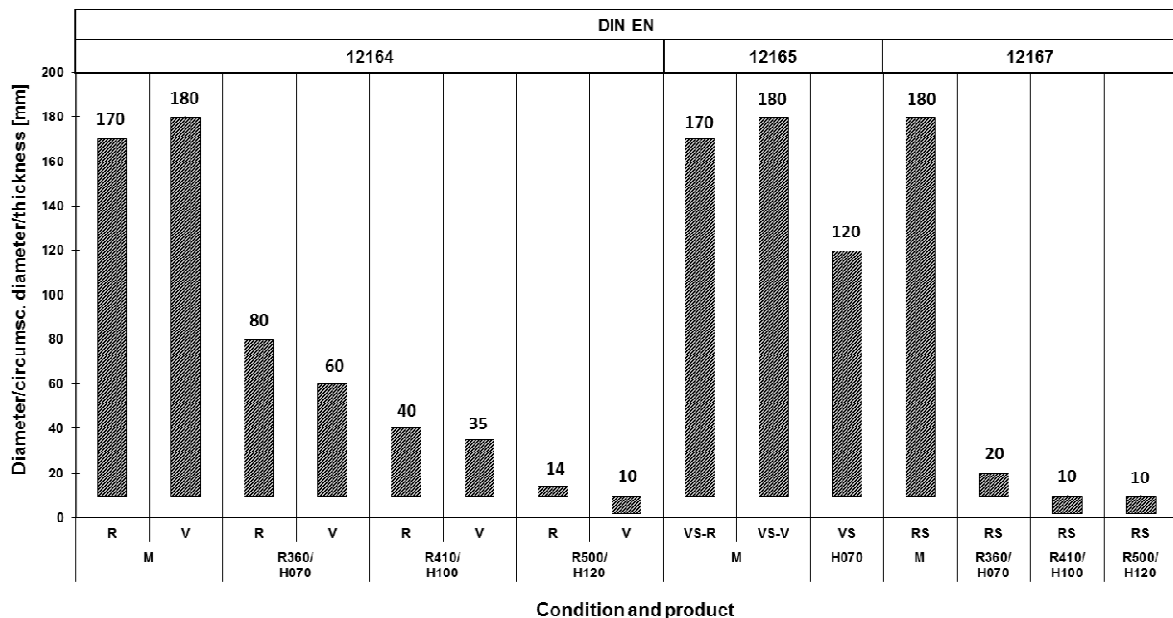
DIN EN 12167:  
Profiles, rectangular bars

DIN EN 12168:  
Hollow bars for machining

DIN EN 12420:  
Forgings

- \*\* Condition M = Without specified mechanical properties - as manufactured
- () The numbers are not requirements of the standard - they are for information only
- / No requirements in specification or not applicable

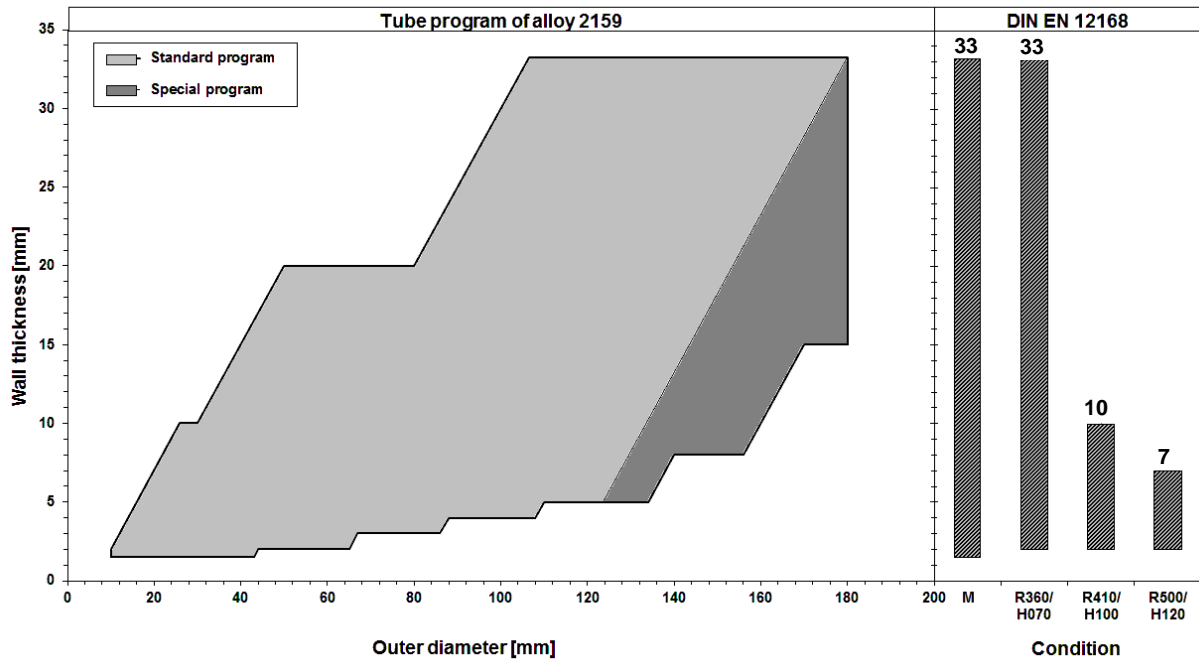
Specified dimensions for bars, pre-material for forging and forgings



- R/V Rod/polygonal bar
- VS-R/V Pre-material for forging round/polygonal
- RS Rectangular bar

Profiles and rectangular bars can be delivered up to 180 mm in extruded condition. Pre-material for forging and forgings is dependent upon each individual case.

### Specified dimensions for hollow bars and round tubes



Further dimensions for hollow bars and round tubes are available on request.

### Other consignments

Rods and tubes in other strength and hardness conditions and dimensions are available on request.

Processing		Heat treatment	
Shaping		Soft annealing	450-600°C
Machinability (CuZn39Pb3=100%)	very good (95)	Stress relieving	200-380°C
Cold working	poor	<b>Special notes and remarks</b>	
Hot working	very good		
Hot working temperature	650-800°C	There is a risk of stress corrosion cracking (SCC) in case of concurrent presence of mechanical stress and corrosive media (in particular ammoniac atmosphere).	
Connecting			
Resistance welding	good		
Shielded welding	poor		
Brazing	average		
Soldering	very good		
Surface treatment			
Mechanical polishing	very good		
Electrolytic polishing	poor		
Galvanisation	very good		
Tin coating	-		

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