

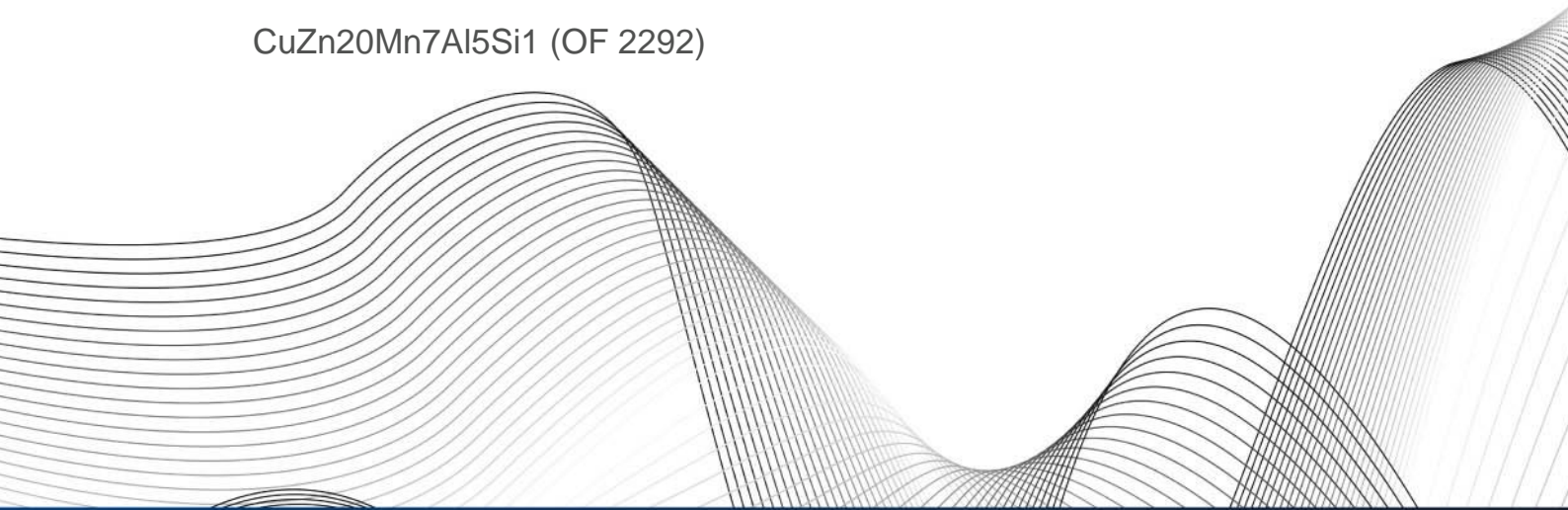


OTTO FUCHS  
Dülken GmbH & Co. KG



Copper and Copper Alloys

CuZn20Mn7Al5Si1 (OF 2292)



	Cu	Zn	Pb	Sn	Fe	Mn	Ni	Al	Si	As	Co	Cr	Others
min.	63	Rem.	-	-	0.5	7.0	-	4.5	1.0	-	-	-	-
max.	66	-	0.1	0.5	1.5	8.5	0.5	6.0	2.0	-	-	-	0.3

## Applications

CuZn20Mn7Al5Si1 provides high strength and good sliding and friction properties. The presence of relatively coarse Mn-silicides in OF 2292 leads to improved emergency running properties. The content of Pb in OF 2292 is confined to a maximum of 0,1 mass-%.

Examples of application:

Bushings  
Thrust bearings  
Distributor plates  
Synchronisers  
Gliding parts

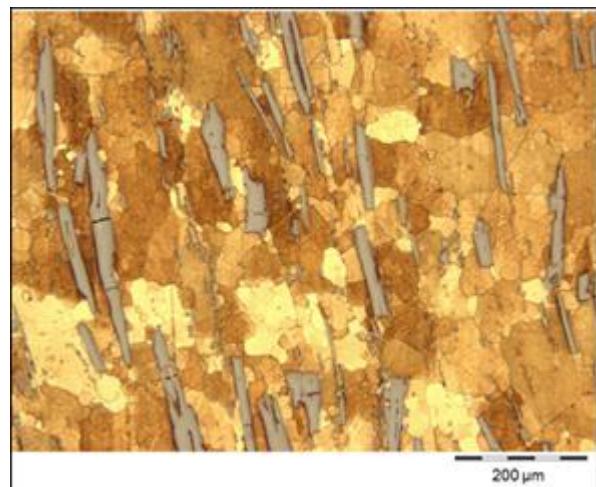
## Physical properties

At room temperature

Density	7.7	g/cm <sup>3</sup>
Electrical conductivity	4.5	MS/m
	7.8	% I.A.C.S
Heat conductivity	30	W/(m*K)
Heat capacity	400	J/(kg*K)
Coefficient of thermal expansion	20	10 <sup>-6</sup> /K
Young's modulus	103	GPa
Melting range	910-1030	°C

## Microstructures

The microstructures of CuZn20Mn7Al5Si1 consist of mainly  $\beta$ -phase with Mn-silicides embedded in the brass matrix for improvement of wear resistance. The content of the Mn-silicides amounts to approx. 10 %.





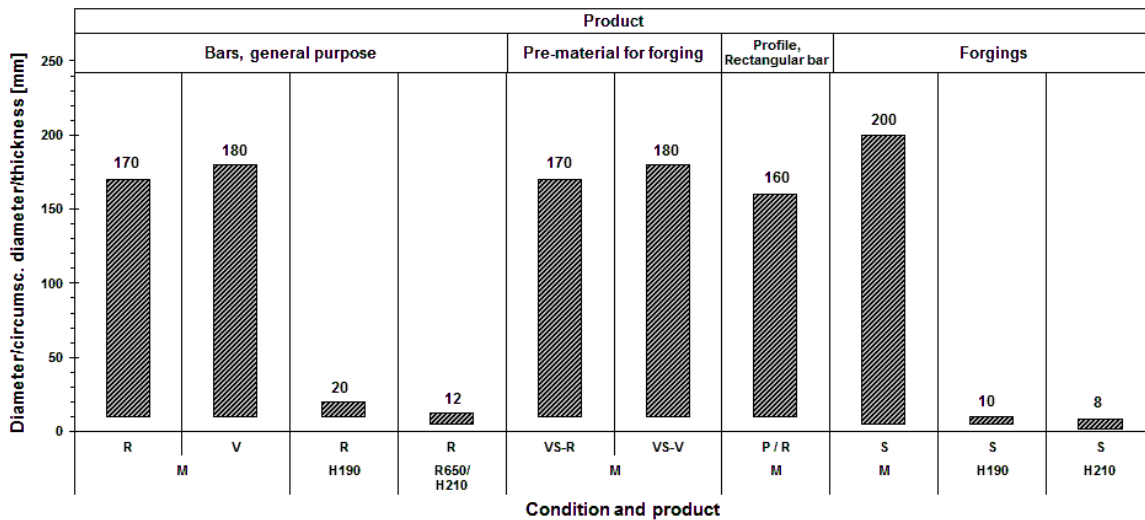
**Consignment and measurements**

**Strength conditions**

Product	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
Bars, general purpose	M	**	**	**	**
Pre-material for forging					
Forgings					
Profile, Rectangular bar					
Seamless tubes	R650	≥450	≥650	≥2	/
Bars, general purpose					
Bars, general purpose	H190	/	/	/	190-240
Forgings					
Seamless tubes					
Bars, general purpose	H210	/	/	/	210-260
Forgings		(≥450)	(≥650)	(≥2)	
Seamless tubes		/	/	/	

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

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

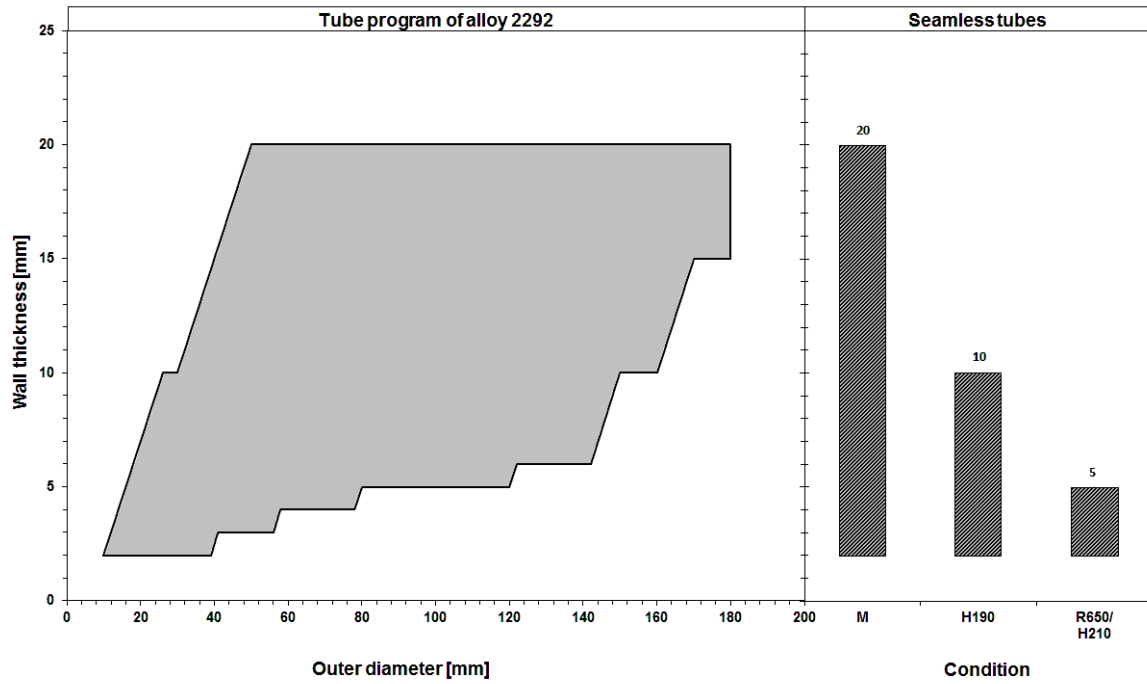


- VS-R Pre-material for forging round
- VS-V Pre-material for forging polygonal
- P/R Profile, rectangular bar
- S Forgings

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 conditions**

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



<b>Processing</b>		<b>Heat treatment</b>	
Shaping		Soft annealing	-
Machinability (CuZn39Pb3=100%)	average	Stress relieving	350-500°C
Cold working	poor	<b>Special notes and remarks</b>	
Hot working	average		
Hot working temperature	650-790°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).	
<b>Connecting</b>			
Resistance welding	-		
Shielded welding	-		
Brazing	poor		
Soldering	poor		
<b>Surface treatment</b>			
Mechanical polishing	good		
Electrolytic polishing	poor		
Galvanisation	poor		
Tin coating	-		

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