

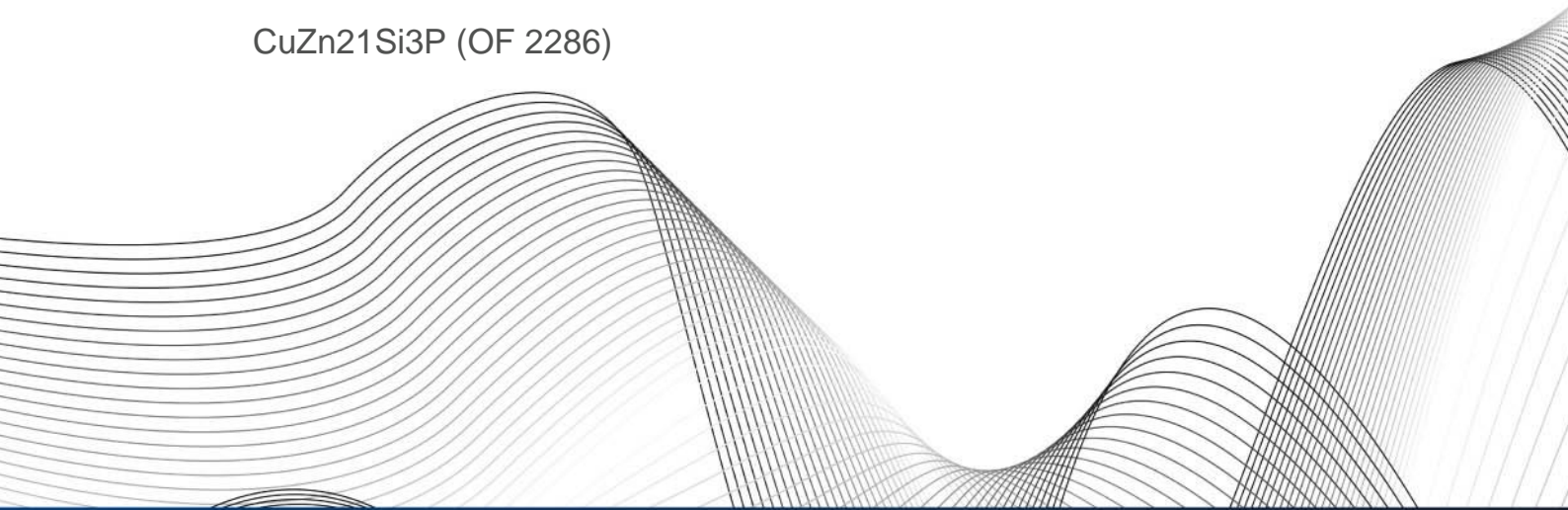


OTTO FUCHS
Dülken GmbH & Co. KG



Copper and Copper Alloys

CuZn21Si3P (OF 2286)



	Cu	Zn	Pb	Sn	Fe	Mn	Ni	Al	Si	As	Cr	P	Others
min.	75.0	Rem.	-	-	-	-	-	-	2.7	-	-	0.02	-
max.	77.0	-	0.10	0.3	0.3	0.05	0.2	0.05	3.5	-	-	0.10	max. 0.2

Applications

CuZn21Si3P is a special brass alloy with silicon providing good corrosion resistance. The addition of silicon in CuZn21Si3P improves the resistance against dezincification and stress corrosion cracking. Due to its good machinability the alloy is used for machined parts.

CuZn31Si3P is suitable for use in drinking water. The German Federal Office for the Environment enlists CuZn31Si3P 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).

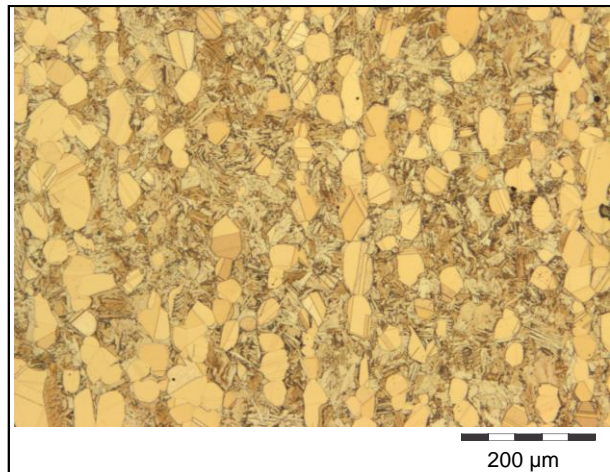
Physical properties

At room temperature

Density	8.3	g/cm ³
Electrical conductivity	4.5	MS/m
	7.8	% I.A.C.S
Heat conductivity	33	W/(m*K)
Heat capacity	377	J/(kg*K)
Coefficient of thermal expansion	19.7	10 ⁻⁶ /K
Young's modulus	85	GPa
Melting range	860-925	°C

Microstructures

The microstructures consist of α -Phase with κ - und γ -phase. The amount of the κ -phase exceeds the amount of the γ -phase. Depending on the heat treatment condition of the alloy the phase composition of CuZn21Si3P can show variations.





Consignment and measurements

Strength conditions

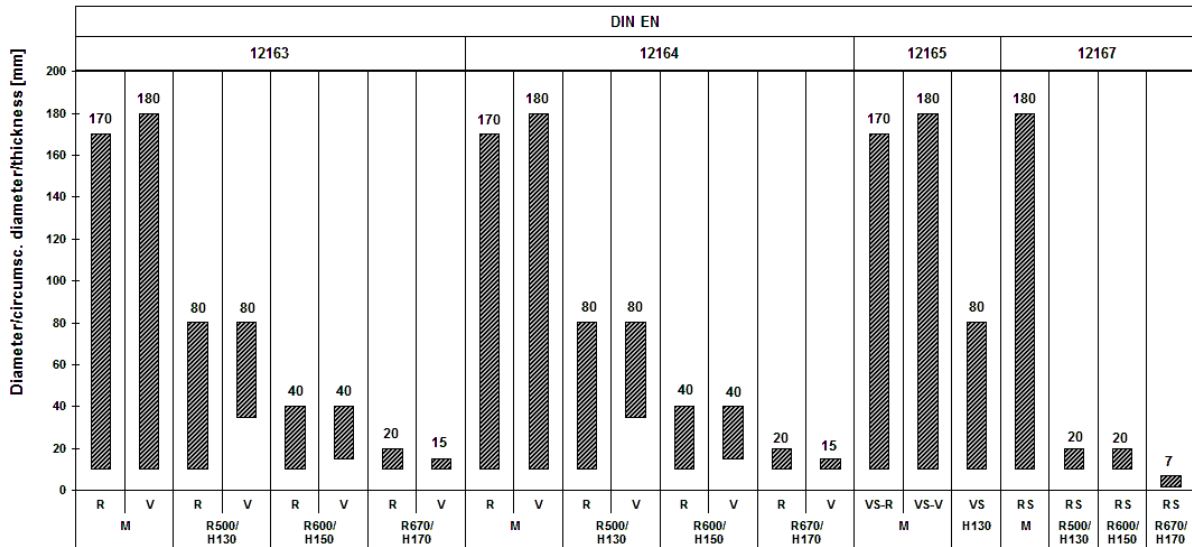
Spec./ DIN EN	Condition	Yield strength R _{p0.2} [MPa]	Tensile strength R _m [MPa]	Elongation at break A [%]	Brinell- Hardness HBW 2.5/62.5	
12163	M	**	**	**	**	DIN EN 12163: Bars, general purpose
12164						DIN EN 12164: Bars for machining
12165						DIN EN 12165: Pre-material for forging
12167						DIN EN 12167: Profiles, rectangular bars
12168						DIN EN 12168: Hollow bars for machining
Forgings						DIN EN 12449: Seamless tubes
12449						
12163	R500	≤450	≥500	≥15	/	
12164						
12167						
12168						
12449						
12163	R600	≥300	≥600	≥12	/	
12164						
12167		≥350	≥600	≥12	/	
12168						
12449						
12168	R650	≥400	≥650	≥10	/	
12449						
12163	R670	≥400	≥670	≥10	/	
12164						
12167						
12449	H110	/	/	/	110-170	
12163	H130	/	/	/	130-180	
12164						
12167						
12168						
12165						/
12449	/	/	/	130-190		
12163	H150	/	/	/	150-220	
12164						
12167						
12168						
12449	/	/	/	/	150-210	
12163	H170	/	/	/	≥170	
12164						
12167						
12168						

** Condition M = without specified properties-as manufactured

/ No requirements in specification or not applicable

Special strength conditions are available on request.

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

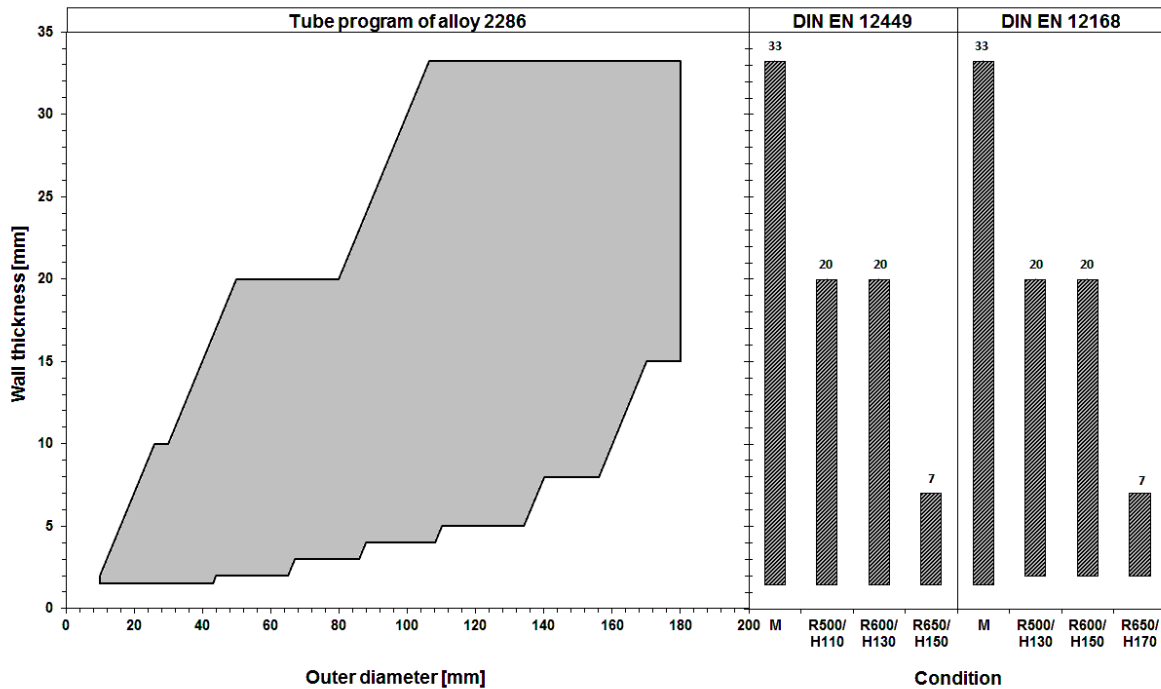


Condition and product

R/V Round/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 and up to 130 mm in cold drawn 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	530-700°C
Machinability (CuZn39Pb3=100%)	good (80)	Stress relieving	250-300°C
Cold working	good	Special notes and remarks	
Hot working	very good		
Hot working temperature	700-750°C	CuZn31Si3P corresponds to ECOBRASS® (brass for drilling) and is suitable for use in drinking water (CUPHIN®).	
Connecting			
Resistance welding	good		
Shielded welding	good		
Brazing	very good		
Soldering	very good		
Surface treatment			
Mechanical polishing	good		
Electrolytic polishing	poor		
Galvanisation	good		
Tin coating	average		

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