

eco SW1

CuZn21Si3P | Lead-free special brass

Material designation

EN CuZn21Si3P
CW724R

UNS C69300

Chemical composition*

Cu 76 %
Si 3 %
P 0.05 %
Zn balance
Pb max. 0.09 %

*Reference values in % by weight

Physical properties*

Electrical conductivity MS/m 4.5
%IACS 7.8
Thermal conductivity W/(m·K) 35
Density g/cm³ 8.25
Modulus of elasticity GPa approx. 100

*Reference values at room temperature

Corrosion resistance

Special brass generally exhibits good corrosion resistance due to alloying additions. The addition of silicon improves resistance to tarnishing and reduces the risk to stress corrosion cracking and dezincification. For operations at temperatures >600 °C we recommend a heat treatment at 550–580 °C for 2–3 hours to optimise corrosion resistance.

Product standards

Rod EN 12163
EN 12164
Wire EN 12166
Section EN 12167

Material properties and typical applications

Eco SW1 is according to ELV and RoHS a lead-free special brass resisting high load and exhibiting good corrosion resistance as well as excellent machinability. This alloy is suited to the production of machined and drop forged parts. ECOBRASS is available as machining brass as well as in hot stamping quality. This material is also marketed under the designation CUPHIN for sanitary applications. The material meets the requirements of ISO 6509 regarding the dezincification resistance.

Material accepted for products in contact with drinking water as per 4 MS positive list.

The material is lead free according to RoHS and ELV.

Types of delivery

The BU Extruded Products supplies bars, wire, sections and tubes. Please get in touch with your contact person regarding the available delivery forms, dimensions and tempers.

Fabrication properties

Forming

Machinability 80 %
(CuZn39Pb3 = 100 %)
Capacity for being cold worked good
Capacity for being hot worked excellent*

Joining

Resistance welding (butt weld) good*
Inert gas shielded arc welding good*
Gas welding good*
Hard soldering good*
Soft soldering good

*see section „Corrosion resistance“

Surface treatment

Polishing
mechanical good
electrolytic poor
Electroplating good*

*for further fabrication properties, please contact our Technical Marketing

Heat treatment

Melting range 860–925 °C
Hot working 680–750 °C
Soft annealing 550–580 °C
1–3 h

Trademarks

wieland ecoline

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Mechanical properties according to EN

Round rods/polygonal rods												acc. to EN 12163	
Temper	Diameter		Width across flats		Tensile strength R _m	Yield strength R _{p0.2}		Elongation %			Hardness		
	mm		mm		MPa	MPa		A100	A11.3	A	HB		
	from	to	from	to	min.	min.	max.	min.	min.	min.	min.	max.	
M	all		all		as manufactured – without specified mechanical properties								
R500	6	80	35	80	500	–	450	–	13	15	–	–	
H130	6	80	35	80	–	–	–	–	–	–	130	180	
R600	10	40	15	40	600	300	–	–	–	12	–	–	
H150	10	40	15	40	–	–	–	–	–	–	150	220	
R670	2	20	2	15	670	400	–	8	9	10	–	–	
H170	2	20	2	15	–	–	–	–	–	–	170	–	

Round rods/polygonal rods												acc. to EN 12164	
Temper	Diameter		Width across flats		Tensile strength R _m	Yield strength R _{p0.2}		Elongation %			Hardness		
	mm		mm		MPa	MPa		A100	A11.3	A	HB		
	from	to	from	to	min.	min.	max.	min.	min.	min.	min.	max.	
M	all		all		as manufactured – without specified mechanical properties								
R500	6	80	35	80	500	–	450	–	–	15	–	–	
H130	6	80	35	80	–	–	–	–	–	–	130	180	
R600	10	40	15	40	600	300	–	–	–	12	–	–	
H150	10	40	15	40	–	–	–	–	–	–	150	220	
R670	2	20	2	15	670	400	–	8	9	10	–	–	
H170	2	20	2	15	–	–	–	–	–	–	170	–	

Rectangular rods											acc. to EN 12167		
Temper	Thickness		Tensile strength R _m		Yield strength R _{p0.2}		Elongation %			Hardness			
	mm		MPa		MPa		A100	A11.3	A	HB			
	from	to	min.	min.	max.	min.	min.	min.	min.	max.			
M	all		as manufactured – without specified mechanical properties										
R500	2	20	500	–	450	12	13	15	–	–	–	–	
H130	2	20	–	–	–	–	–	–	–	–	130	170	
R600	2	20	600	300	–	–	11	12	–	–	–	–	
H150	2	20	–	–	–	–	–	–	–	–	150	190	
R670	2	7	670	400	–	8	9	10	–	–	–	–	
H170	2	7	–	–	–	–	–	–	–	–	170	220	

Round wires											acc. to EN 12166		
Temper	Diameter		Tensile strength R _m		Yield strength R _{p0.2}		Elongation %			Hardness			
	mm		MPa		MPa		A100	A11.3	A	HB			
	from	to	min.	min.	max.	min.	min.	min.	min.	max.			
M	all		as manufactured – without specified mechanical properties										
R500	0.5	20	500	–	450	12	13	15	–	–	–	–	
H110	1.5	20	–	–	–	–	–	–	–	–	110	170	
R600	0.5	8	600	300	–	10	11	12	–	–	–	–	
H130	1.5	8	–	–	–	–	–	–	–	–	130	190	
R670	0.5	8	670	400	–	8	9	10	–	–	–	–	
H160	1.5	8	–	–	–	–	–	–	–	–	160	220	
R750	0.5	8	750	450	–	2	3	–	–	–	–	–	
H200	1.5	8	–	–	–	–	–	–	–	–	200	–	