

eco SW1

CuZn21Si3P | Lead-free special brass

Material designation

EN	CW724R CuZn21Si3P
UNS	C69300

Chemical composition¹

Cu	76 %
Si	3.3 %
P	0.05 %
Zn	balance
Pb	max. 0.09 %

¹Reference values in % by weight

Physical properties²

Electrical conductivity	MS/m %IACS	4.5 7.8
Thermal conductivity	W/(m·K)	35
Density	g/cm ³	8.25
Modulus of elasticity	GPa	~ 100

²Reference values at room temperature

Corrosion resistance³

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 subsequent heat treatment at 550–580 °C for 2–3 hours to improve dezincification resistance.

³Reference values

Product standards

Rod	EN 12163 EN 12164 EN 12165
Wire	EN 12166
Section	EN 12167

Material properties and typical applications

eco SW1 is 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. eco SW1 is available as machining rod as well as in hot stamping quality and is designed for applications where high strength is needed. 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 ⁴

Joining

Resistance welding (butt weld)	good ⁴
Inert gas shielded arc welding	good ⁴
Gas welding	good ⁴
Hard soldering	good ⁴
Soft soldering	good

⁴see section „Corrosion resistance“

Surface treatment⁵

Polishing	
mechanical	good
electrolytic	poor
Electroplating	good

⁵for further fabrication properties, please call your contact person.

Heat treatment

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

Trademarks

wieland ecoline

eco SW1

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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	–	