wieland

eco SW1

CuZn21Si3P | Lead-free special brass

Material designation

EN	CW724R CuZn21Si3P
UNS	C69300

Chemical composition[1]

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

[1]Reference values in % by weight

Physical properties[2]

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

[2]Reference values at room temperature

Corrosion resistance[3]

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 dezincfication resistance.

[3]Reference 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 (CuZn39Pb3 = 100 %)	90 %
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

[4]see section „Corrosion resistance“

Surface treatment[5]

Polishing	
mechanical electrolytic	good poor
Electroplating	good

[5]for 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

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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	–

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