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U33

CW307G | CuAl10Ni5Fe4 | Nickel-Aluminum bronze

Material designation

EN	CuAl10Ni5Fe4, CW307G
UNS	C63000

**Former national standards*

Chemical composition*

Cu	balance
Al	10 %
Fe	4 %
Ni	5 %
Mn	max. 1.0 %
Pb	max. 0.05 %

**Reference values in % by weight*

Physical properties*

Thermal conductivity	W/m . K	50
Density	g/cm^3	7.45
Moduls of elasticity	kN/mm^2	117–120
Coefficient of expansion	10^{-6}/K	17

**Reference values at room temperature*

Corrosion resistance[3]

Aluminum bronzes have generally good corrosion resistance to neutral and acidic aqueous solutions as well as seawater. There is increased resistance to scaling, erosion and cavitation. In contact with strongly acidic media with increased oxidising capacity or in alkaline media the passivated surface layer can be damaged or its formation can be prevented. The suitability of the material must be checked bevore application.

[3]Standard value

Product standards

Rod	EN 12163 EN 12165
Tread	EN 12167

Material properties and typical applications

U33 is a heterogeneous aluminum multi-material bronze. Nickel and iron are added to the aluminum content of 8.5% - 11%. The resulting optimisation of the corrosion resistance in aggressive media with above-average mechanical and physical properties explains the particular importance of this alloy within the fields of mechanical engineering, shipbuilding and apparatus engineering, as well as in Aerospace applications.

Types of delivery

The BU Global Extruded & Cast Products supplies rods, wires, profiles and tubes. Please ask your contact person about the available shapes, dimensions and conditions.

Fabrication properties

Forming

Machinability (CuZn39Pb3 = 100 %)	30 %
Capacity for being cold worked	poor
Capacity for being hot worked	good

Joining

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

Surface treatment[5]

Polishing mechanical	good
Polishing electrolytic	poor
Electroplating	good

[5]for further processing instructions, please get in touch with your contact person.

Heat treatment

Melting range	1050 – 1080 °C
Hot working	940 – 980 °C
Soft annealing	680 °C, 1 – 3 h
Thermal stress-relieving	350 °C, 1 h

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Dimensions and mechanical properties according to standards

Round rods / polygonal rods — EN 12163

Temper	Diameter mm from	Diameter mm to	Width across flat mm from	Width across flat mm to	Tensile strength R_m MPa min.	Yield strength $R_{p0,2}$ MPa min.	Yield strength $R_{p0,2}$ MPa max.	Elongation % A100 min.	Elongation % A11.3 min.	Elongation % A min.	Hardness HB min.	Hardness HB max.
M	all		all		as manufactured							
R680	10	120	10	120	680	320	–	–	–	10	–	–
H170	10	120	10	120	–	–	–	–	–	–	170	210
R740	10	80	10	80	740	400	–	–	–	8	–	–
H200	10	80	10	80	–	–	–	–	–	–	200	–

Rectangular rods — EN 12167

Temper	Thickness mm from	Thickness mm to	Tensile strength R_m MPa min.	Yield strength $R_{p0,2}$ MPa min.	Yield strength $R_{p0,2}$ MPa max.	Elongation % A100 min.	Elongation % A11.3 min.	Elongation % A min.	Hardness HB min.	Hardness HB max.
M	all		as manufactured							
R680	all		680	320	–	–	8	10	–	–
H170	all		–	–	–	–	–	–	170	210
R740	all		740	400	–	–	6	8	–	–
H200	all		–	–	–	–	–	–	200	–

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