

ZOLLERN

Solid metals. Fine solutions.

Sand Casting and Forging

Maritime and
Offshore



Individual casting solutions. For maritime and offshore.

ZOLLERN offers individual component solutions for maritime applications. At ZOLLERN we melt and cast over 500 steel and bronze alloys. Depending on requirements, we are able to provide customer-specific processing of components from either casting or forging ready for installation.

ZOLLERN steel and bronze alloys for marine and offshore applications

- Blade hubs and propeller blades for propulsion systems
- Wear blocks and guides
- Fittings and valve housings
- Round bar, flat bar, rings

Custom design

- High-strength copper aluminium alloys cast, forged or rolled
- Various copper alloys: sand or centrifugally cast
- Mechanical pre-finishing and finish machining
- Quality management





Images, top: castings for submarine applications
Image, below: semi-finished forged products



Modern processes. 300 years of experience.

- Highest component quality
- Significant pattern cost savings with in house mould milling
- Technical support from the first design concept

Workmanship in forging. For shipbuilding.

Forged ZOLLERN marine bronzes such as AMB2, MEBZ, NB10 and NB30 are established in submarine and standard shipbuilding.

- MEBZ - CuAl9Ni7
Advantage: non-magnetic, corrosion resistant, good strength properties
Application: high pressure valves, fittings, components in measuring and control devices
- AMB2 - CuAl8Mn
Advantage: non-magnetic, corrosion resistant
Application: bolts, nuts, components for valves such as shut-off cones, spindles and flanges
- NB10 - CuNi10
Advantage: very tough at low temperatures, largely resistant to the growth of marine organisms
Application: pipes and pipe connections, screws, bolts, nuts, oil and water cooler parts
- NB30 - CuNi30
Advantage: excellent resistance to corrosion, cavitation, erosion
Application: tube sheet plates, parts for seawater desalination plants, cryoengineering parts

Offshore applications of ZOLLERN forged and cast bronzes

- High strength and sea water resistant bushes and discs for jack-up systems
- Propellers for rig-positioning drives in deep sea oil drilling
- High degree of wear resistance

Copper-aluminium casting alloys

ZOLLERN Brand	Standards			Minimum values of tensile test			Min. Hardness HB 10/1000
				R _{p0.2} N/mm ²	R _m N/mm ²	A ₅ %	
EBG 9	EN 1982 CC332G DIN 1714 2.0970	CuAl10Ni3Fe2-C G-CuAl9Ni	GS	180	500	18	100
			GZ	220	550	20	120
EBG	EN 1982 CC333G DIN 1714 2.0975 USA ~ C95500, ~ C95800 UK ~ AB2 F U-A10N	CuAl10Fe5Ni5-C G-CuAl10Ni	GS	250	600	13	140
			GZ	280	650	13	150
VBG	EN 1982 CC334G DIN 1714 2.0980 USA ~ C95500	CuAl11Fe6Ni6-C G-CuAl11Ni	GS	320	680	5	170
			GZ	380	750	5	185
MEBG	WL 2.0968	G-CuAl9Ni7	GS	230	490	10	125
			GZ	290	490	7	130
AMB3	DIN 1714 2.0962	G-CuAl8Mn	GS	180	440	18	105
			GZ	200	500	18	105

GS = sand casting (values also for shell-mould casting) GZ = centrifugal casting

- Young's modulus ~ 90 - 125 kN/mm²
- Electric conductivity ~ 2-9 MS/m
- Density ~7.5-7.6 kg/dm³
- Thermal conductivity ~0.34-1.13 W/cm.K
- Thermal expansion coefficient ~ 14-18 · 10⁻⁶/K
- Permeability < 1.01 to < 1.9 μ,

Stainless and acid-resistant steels, ferritic/austenitic

Designation	Material no.	Standard	Typical heat treatment state	Mechanical and technological properties			Notch bar impact work (ISO-V) (J)	Thermal expansion between 20 and 300° C α (10 ⁻⁶ K ⁻¹)
				0.2 proof stress Rp0.2	Tensile strength Rm (MPa)	Elongation at fracture A ₅ (%)		
G X 4 CrNi 26-7	1.4347	EN 10283	solution annealed & quenched	≥ 420	≥ 590	≥ 20	≥ 30	14.5
G X 2 CrNiMoN 26-7-4	1.4469 J93404	EN 10213 EN 10283 ASTM A 995	solution annealed & quenched	≥ 480	≥ 650	≥ 22	≥ 50	
G X 2 CrNiMoN 22-5-3	1.4470 J92205	SEW 400 EN 10283 ASTM A 995	solution annealed & quenched	≥ 420	≥ 600	≥ 20	≥ 30	13
G X 2 CrNiMoCuN 25-6-3-3	1.4517	EN 10283	solution annealed & quenched	≥ 480	≥ 650	≥ 22	≥ 50	14.9
G X 2 CrNiMoN 25-6-3	1.4468							



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