

10.13 Carbon steel, zinc alloys, aluminium, brass characteristics

Carbon steel, zinc alloys, aluminium and brass							
Description		Steel for threaded studs	Steel for threaded studs	Zinc alloy for pressure diecasting	Aluminium for handles tubes	Brass for bosses with threaded or plain hole	Brass for reinforcing square holes
Material description	Symbol Number	11SMnPb37 1.0737	C10C 1.0214	ZnAl4Cu1 ZL0410 (ZL5)	AlMgSi EN AW-6060	CuZn39Pb3 CW614N	CuZn37 CW508L
UNI standard		UNI EN 10277-4	UNI EN 10263-2	UNI EN 1774	UNI EN 573-3	UNI EN 12164	UNI EN 12449
% components of alloy		C <= 0.14 Pb ≤ 0.20-0.35 Si ≤ 0.05 Mn 1.00 ÷ 1.50 P ≤ 0.11 S 0.340.40 Fe rest	C 0.08-0.12 Si ≤ 0.10 Mn 0.30-0.50 P ≤ 0.025 S ≤ 0.025 Al 0.02-0.06 Fe rest	Cu 0.7-1.1 Pb ≤ 0.003 Fe ≤ 0.020 Al 3.8-4.2 Sn ≤ 0.001 Si ≤ 0.02 Ni ≤ 0.001 Mg 0.035-0.06 Cd ≤ 0.003 Zn rest	Si 0.03-0.6 Fe 0.1-0.3 Cu ≤ 0.10 Mn ≤ 0.10 Mg 0.035-0.06 Cr ≤ 0.05 Zn ≤ 0.15 Ti ≤ 0.10 Total impurities ≤ 0.15	Cu 57-59 Pb 2.5-3.5 Fe ≤ 0.30 Al ≤ 0.05 Sn ≤ 0.30 Si ≤ 0.90 Ni ≤ 0.30 Total impurities ≤ 0.20 Zn rest	Cu 62-64 Pb ≤ 0.10 Fe ≤ 0.10 Al ≤ 0.05 Sn ≤ 0.10 Ni ≤ 0.30 Total impurities ≤ 0.10 Zn rest
Tensile breaking load Rm [MPa]		400 – 650	510 – 520	280 – 350	120 – 190	490 – 530	340 – 360
Yield point Rp 0.2 [MPa]		≤ 305	–	220 – 250	60 – 150	–	–
Modulus of elasticity E [MPa]		–	–	100000	67000	100000	103400
Ultimate elongation %		9	58	2 – 5	16	12 – 16	45
Special features		Steel for high-speed machining. Used for parts obtained by turning.	Steel for moulding.	–	–	Brass for high-speed machining. Used for parts obtained by turning.	Brass for machining with good plastic deformability.

Duroplasts – Resistance to chemical agents at 23 °C temperature		
Chemical agent resistance	Duroplast (PF)	Painted Duroplast
Alcohol (methanol, ethanol, isopropanol...)	●	●
Boiling water	□	□
Edible oils	●	●
Esters (methyl acetate, ethyl acetate, ...)	●	
Ether (ethyl eter, oil ether, ...)	●	
Fat	●	
Ketons (acetone)	●	●
Mineral oils	●	●
Petrol, gas oil, benzene	●	●
Strong acids (hydrochloric, nitric, sulphuric, ...)	▲	▲
Strong alkali	▲	▲
Toluene	●	□ (milk effect)
Water	●	●
Weak acids (butyric, oleic, lactic, ...)	□	
Weak alkali	□	
Xylene	●	□ (milk effect)

● = good resistance □ = fair resistance (limited use according to working conditions) ▲ = poor resistance (should not be used)
Blank stand for data not available

The characteristics described should be treated as guidelines only. No guarantee is made.
The user is responsible for checking the exact operating conditions.

