DIEHL
Metall Messing

MATERIAL DATASHEET

ALLOY 474 HT (TEC.PURE)

Designation	
Diehl Metall	474 HT (TEC.PURE)
DIN EN symbol	CuZn14Mn8Al5Si2Fe1
DIN EN No.	Special alloy
UNS	-

Composition
(mass as %, reference values)

Cu	70.5	Mn	8.0
Fe	1.1	Si	1.8
Al	5.2	Pb	< 0.1
Zn	remain-der		

TEC.PURE

Application

Intake and exhaust valve guides. Wear-resistant gear parts, synchronizer rings, sliding blocks, plain bearings.

Products and relevant standards

Rods	Dimensions on request
Rods, extruded	Dimensions on request
Profiles	Dimensions on request
Hollow rods	Dimensions on request

Physical properties

Density	g/cm³	7.7
Coefficient of linear thermal expansion: 20 – 200 °C	• 10^{-6}/K	18.79
Thermal conductivity RT 200 °C	 W/(m · K) W/(m · K)	 40.0 56.1
Specific thermal capacity RT 200 °C	 J/(g · K) J/(g · K)	 0.45 0.475
Electrical conductivity	m/(Ω · mm²)	5.4
Specific electrical resistance	(Ω · mm²)/m	0.185
Young's modulus	GPa	126.0
Shear modulus	GPa	47.8
Poisson`s ratio		0.32

Mechanical properties
(reference values: standard production for information, drawn and annealed condition)

Rod diameter ≤ 15 mm (valve guides)

Tensile strength R_m	MPa	≥ 590
0.2 yield strength $Rp_{0.2}$	MPa	≥ 390
Hardness	HB (2.5/62.5)	160 – 200

Rod diameter > 15 mm (general purposes)

Tensile strength R_m	MPa	≥ 560
0.2 yield strength $Rp_{0.2}$	MPa	≥ 360
Hardness	HB (2.5/62.5)	≥ 160

Tube wall thickness ≤ 4 mm

Tensile strength R_m	MPa	≥ 590
0.2 yield strength $Rp_{0.2}$	MPa	≥ 410
Hardness (surface)	HB (2.5/62.5)	≥ 160

Other

Bending fatigue strength	MPa	200
High-temperature strength (200 °C)	MPa	550
Notched bar impact work acc. to EN 10045 U notch V notch	 J J	 8.0 12.0

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Processing properties

Machinability (CuZn39Pb3 = 100%)	moderate (Index 50)
Hot formability	good
Cold formability	adequate
Polishing	good
Electroplating	good

Heat treatment

Soft annealing	550 – 700 °C
Stress relief annealing	200 – 400 °C

Microstructure

The microstructure consists of an alpha and beta solid solution matrix with up to 80% of alpha phase and hard intermetallic compounds (Fe-Mn-silicides).

Corrosion resistance

Generally good resistance to neutral, alkaline and organic aqueous solutions.

Diehl Metall Stiftung & Co. KG
Diehl Metall Messing

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