Elmedur HA
Technical Datasheet

Short Name	CW103C
Code	CuCoNiBe
Material-Nr.(old)	~2.1285

Chemical Composition (Reference values in %)	Co	Ni	Be	Cu
	1.0	1.0	0.5	balance

Classification	DIN ISO 5782 Class A 3/1 R.W.M.A. Class 3
Material-Properties	Precipitation hardened copper alloy with very high hardness and good electrical and thermal conductivity.

Applications

- Electrodes for spot welding, especially for stainless steel
- Electrodes for projection welding
- Butt welding jaws
- Contact tips for submerged-arc-welding

Mechanical Properties (Reference values)	Conditions		solution annealed, cold drawn and aged		Extruded, sol. annealed and aged	Castings prec. hardened
	Cross section		<25 mm Ø	<35 mm Ø	<60 mm Ø	-
	Hardness	HB	220 – 260	210 – 260	195 – 235	min. 210
	Tensile strength	N/mm²	800 – 950	750 – 900	680 – 800	min. 650
	Yield strength	N/mm²	min. 730	min. 680	min. 500	min. 500
	Elongation L = 5 D	%	min. 5	min. 5	min. 6	-
	Modulus of elasticity	kN/mm²	118	118	118	-
	Modulus of torsion	kN/mm²	-			
	Compressive yield point	%	95 – 100 % of yield strength			

Physical Properties (Reference values)		
Electrical conductivity 293 K (20 °C)	MS/m	min. 25 Castings ~28 (min. 40 % I.A.C.S.)
Electrical resistance 293 K (20 °C)	$\frac{\Omega \cdot mm^2}{m}$	0.033 – 0,05
Coefficient of electrical resistance 273-373 K (0-100°C)	$\frac{1}{K}$	0.0019
Coefficient of thermal expansion 273-593 K (0-320°C)	$\frac{1}{K}$	$17{,}0 \cdot 10^{-6}$
Specific heat	$\frac{J}{g \cdot K}$	0.42
Thermal conductivity 293 K (20 °C) 473 K (200 °C) 573 K (300 °C)	$\frac{W}{m \cdot K}$	 c. 209 c. 280 c. 320
Density	$\frac{g}{cm^3}$	8.8

Available sizes	Rods drawn or extruded in round, square and flat; discs and rings, forgings, electrodes for spot-, seam-, projection- and butt welding, castings on request (Available sizes can be found in our current stock list).

THYSSEN DURO METALL

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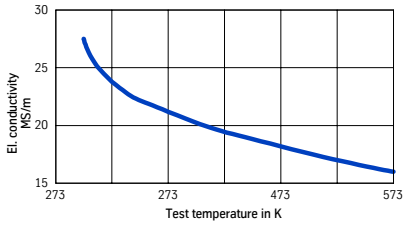
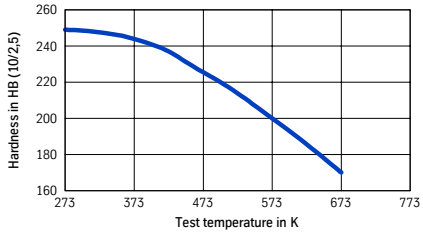
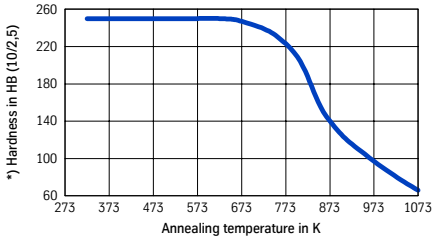
Electrical Conductivity of Elmedur HA



Hardness of Elmedur HA at elevated temperatures



Effect of annealing temperature on hardness of Elmedur HA



*) Brinell hardness at r. t. after 5-hrs heating, cooling with air

Machining (Reference values) Condition: precipitation hardened

Turning	Tungsten Carbide K 20	HSS THYRAPID 3207
Cutting speed m/min.	up to 250	up to 80
Rake angle	6 – 18	15 –25
Feed and depth of cut	as to required surface finish	as to required surface finish
Chip breaker	recommended	recommended

Milling	Tungsten Carbide K20	HSS THYRAPID 3207
Cutting speed m/min.	up to 250	up to 80
Rake angle	positive	positive
Feed mm/min.	200 – 300	80 – 150

Drilling	
Twist drills in acc. with DIN 338	
Cutting speed m/min.	max. 20
Chip flow	For a better chip flow, drills with an enlarged twist angle should advantageously be used. We recommend contacting the respective manufacturers.

Standards / Tolerances	
DIN EN 12 163	Round bars for general purpose
DIN EN 12 167	Profiles and rectangular bars for general purpose.

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