



Langley Alloys

Copper
Alloys

Hiduron® 130

Specifications:

DIN 2.1504, Hidurax Special, DTD 900/4805

Hiduron® 130 is a high-strength cupronickel supplied in the hot worked condition. Aluminium is the alloy's key strengthening element through the formation of finely dispersed γ' nickel aluminium precipitate, strengthening the alloy in a similar way to Alloy K-500. As these precipitates are formed through a carefully controlled forging process, naturally aged during cooling, no further heat treatment is necessary, making it one of the highest strength copper alloys commercially available. Being a cupronickel, it has excellent resistance to corrosion by seawater and in marine and industrial atmospheres and it is highly resistant to crevice corrosion. It has a very low magnetic permeability - it is virtually non-magnetic - and has a higher modulus of elasticity than is normally associated with copper alloys. All these properties are achieved without heat treatment and are combined with good machinability and the ability to take an excellent finish.

The major use of Hiduron® 130 is in subsea hydraulic and electrical connectors such as flying lead connectors for stab plates. It is also used in naval winches, seawater valves and marine engineering generally. Additionally, it is applied in the aerospace industry for heavily stressed airframe components. Other applications include a variety of mechanical engineering and hydraulics systems amongst which are valve seat inserts and thrust washers for high performance internal combustion engines. It is covered by the specifications DIN 2.1504 and DTD 900/4805 to which it can be supplied when required.

Key features:

- Superior strength, general corrosion resistance and erosion/corrosion resistance compared to conventional copper nickels
- High wear resistance
- Excellent anti-galling properties, particularly when operating against stainless steels
- High corrosion resistance in marine environments
- No loss of impact strength down to -196°C facilitating cryogenic and ultra-deep subsea applications
- Good anti-fouling properties
- Freedom from hydrogen embrittlement
- Low magnetic permeability
- Good machinability

Typical applications:

- Naval applications such as submarine control elements, sonar equipment, tow and winch fittings
- Marine pump shafts, mechanical seals, gears, hose couplings, propeller shafts, drive bushes
- Oil & Gas industry shafts for pumps & valves, valve spindles, hydraulic pistons, cylinders, wireline tooling, tooling bits, stems and clamps
- Aerospace landing bearings, flight refuelling connectors
- Process industry valve components, process control equipment
- Electrical industry stress rings, current-carrying bolting
- Automotive valve seat inserts and thrust washers in high performance engines

Physical Properties:

Density (Kg/m^3)	8500
Magnetic Permeability (20°C)	< 1.01
Young's Modulus (kN/mm^2)	141
Modulus of Rigidity (kN/mm^2)	52
Electrical Conductivity, 20°C ($\text{m}\Omega/\text{mm}^2$)	1.71/ (10% IACS)
Mean coefficient of thermal expansion, $20 - 300^{\circ}\text{C}$ ($\text{m/m}^{\circ}\text{C}$)	16.4×10^{-6}
Specific Heat, 20°C (J/kg.K)	435
Thermal conductivity, 20°C (W/m.K)	46

Product Forms Available:

Bar	✓
Plate	Enquiry
Tube	Enquiry
Fittings	Enquiry
Forgings	To order
Castings	To order

Chemical Composition:

	Cr	Ni	Mo	Co	Nb (+Ta)	Ti	V	W	Cu	C	Mn	N	Si	P	S	Fe	Al
Min		13.00									0.10					0.60	2.00
Max	0.50	16.00							Bal		1.00		0.10			1.50	3.00

Note:

1. Pb $< 0.05\%$, Sn $< 0.20\%$, Zn $< 0.30\%$

Mechanical Properties:

	Bars up to and including 65mm (2½") diameter or section		Bars greater than 65mm (2½") but less than 110mm (4¾") diameter or section		Bars greater than 110mm (4¾") but less than 203mm (8") diameter or section	
0.2% Proof Stress	630 N/mm ²	91.4ksi	580 N/mm ²	84.1ksi	555 N/mm ²	80.5ksi
Tensile Strength	850 N/mm ²	123.3ksi	770 N/mm ²	111.7ksi	770 N/mm ²	111.7ksi
Elongation, 5.65√S0	10%		10%		10%	
Hardness (Brinell)	>240		>229		>229	
Impact Strength (Room Temp)	>14J		>14J		>14J	

Notes:

1. Testing shall be carried out in accordance with ASTM A370 or EN ISO 6892-1 (tensile), EN ISO 6506-1 (hardness)
2. Minimum properties quoted (tested at room temperature in a longitudinal direction)
3. Testing performed on each melt of material per heat treatment batch

Product Comparison:

Alloy Comparisons	Hiduron® 130	Alloy K-500	Ferrallium® 255-SD50	Hiduron® 191
0.2% Proof Strength (N/mm ²)	630	690	586	430
Corrosion resistance in seawater (mm/year)	0.02	0.018	< 0.01	0.02
Anti-Galling properties	Good	Poor	Good	Good

Machining Advice:

Operation	Cutting Speed m/min (ft/min)	Feed Rate mm/rev (in/rev)	Depth of cut mm (in)
Milling	45 - 60 (150 - 200)	0.05 - 0.13 mm/tooth (0.02 - 0.005 in/tooth)	0.5 - 6.0 (0.02 - 0.25)
Drilling	25 - 75 (80 - 250)	0.075 - 0.50 (0.003 - 0.020)	
Turning - Roughing	120 - 180 (400 - 600)	0.40 - 0.750 (0.01 - 0.03)	3.0 (0.125)
Turning - Finishing	150 - 300 (500 - 100)	0.15 - 0.40 (0.006 - 0.0015)	0.5 (0.02)
Tooling	Carbide tipped using water-soluble lubricant A chip breaker may be found necessary for efficient operation		

Production Route:

Hiduron® 130 is produced through high-quality melting processes to ensure cleanliness and consistency.

- a) The minimum forging ratio utilised is at least 4:1
- b) Bars are supplied peeled and polished to a surface finish of 125CLA or better
- c) Each bar is ultrasonically tested and visually inspected

Further Processing:

- Order processing and stock control is facilitated by a fully-integrated computer system which links to item production and inspection.
- Automated band saws are available for accurate stock cutting up to a section size of 650mm (25")
- First-stage processing, including water jet cutting, turning, boring and grinding can be undertaken to help manage your overall supply chain.
- Additional documentation and certification can be supplied as required.

Unique metals for your demanding applications

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