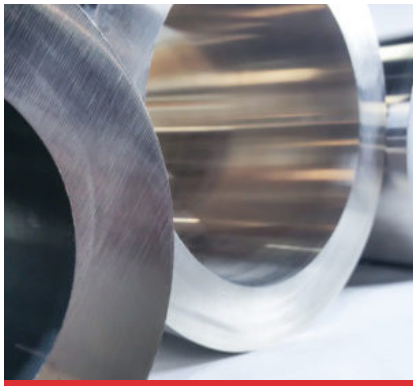
Hardiall® Industrial Applications

Hard High Strength Spinodal Copper Nickel Tin Alloys

lebronze alloys



HARDIALL® KEY FEATURES & BENEFITS

- High strength & hardness
- Low friction
- Excellent lubricity
- Corrosion & erosion resistant
- Excellent wear resistance
- Excellent machinability
- Excellent galling resistance
- Pitting & spalling resistance
- No hydrogen embrittlement
- Non-magnetic
- High performance at both elevated and sub-zero temperatures -193°F up to 572°F
- Dimensional stability

Hardiall® is a wrought, spinodally hardened copper alloy CuNi15Sn8 (C72900) designed for high strength applications where toughness is required. It is non-magnetic and resists mechanical wear, galling, stress relaxation, corrosion and erosion.

It is easily machined into complex components and is environmentally friendly being both lead and beryllium free.

Hardiall® is used within industrial applications thanks to its outstanding physical and mechanical properties in many varied components. Lebronze alloys has developed a full range of Hardiall® products to match the variety of requirements for demanding industrial applications.

Lebronze alloys' manufacturing process for Hardiall® is fully integrated: *internal processes include casting, hot and cold working stage, heat treatment and non-destructive testing. Being fully integrated ensures reactivity and complete traceability.*

Hardiall® Properties and Benefits

HARDIALL® PHYSICAL PROPERTIES		
Electrical Conductivity at 20°C (68°F)	7.5	% IACS
Thermal Conductivity at 20°C to 200°C (68°F to 392°F)	38 (22)	W/m/°C (Btu/ft/hr/°F)
Coefficient of Thermal Expansion at 20°C to 200°C (68°F to 392°F)	16.4 x10^{-6} (9.1 x 10^{-6})	Per °C (Per °F)
Density	8.95 (0.323)	g/cm^3 (lb/in^3)

Hardiall® Key Industrial Applications

Escalator & lift bushings, bearings, gear drives, worm wheels and wheel shafts

Hardiall® is used in bushings, bearings, worm & worm wheels and wheel shafts. For such applications, Hardiall® demonstrates outstanding mechanical strength and wear, corrosion and temperature resistance. Hardiall® contributes to longer service life and a better total cost of ownership (TCO) compared to Steels, Aluminium and Phosphor Bronzes.

Bushings and bearings for heavy metallurgical equipment

Hardiall® is suitable for wear related parts like bushings and bearings in heavy metallurgical equipment like extrusion presses, rolling and drawing mills. In such applications where hardening steels, carbon steels or phosphor bronzes are generally used, Hardiall® demonstrates excellent resistance to metal-to-metal wear, thus providing fewer failures and hence reducing costly maintenance downtime.

For these applications Lebronze alloys' integrated supply chain can propose ready-to-use products.

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Hardiall® Products Portfolio

Hardiall® is available in various tempers and grades offering different mechanical properties.
The following table indicates Hardiall® products available for industrial applications.

MECHANICAL PROPERTIES OF HARDIALL® ALLOYS*						
LBA Designation	**Minimal Yield Strength 0.2% Offset (MPa)**	**Minimal UTS (MPa)**	**Minimal Elongation 4D (%)**	**Typical Hardness (HRC)**	**Available Forms**	**Available Sizes**
Wrought and spinodally hardened Hardiall® rods						
Hardiall TX 90	620	760	15	26	Rods	60 ≤ Ø < 101.6mm
Hardiall TX 105	724	758	4	30	Rods	19 ≤ Ø < 101.6mm
	652	683	4	30	Rods	Ø ≥ 101.6mm
Hardiall TX 110	760	910	10	30	Rods	19 ≤ Ø < 101.6 mm
	760	875	6	30	Rods	Ø ≥ 101.6mm
Solution annealed, cold finished and spinodally hardened Hardiall® rods						
Hardiall TS 95	655	730	18	93 HRB	Rods	40 ≤ Ø < 82mm
	655	725	18	93 HRB	Rods	82 ≤ Ø < 90mm
Hardiall TS 120U	755	825	15	24	Rods	40 ≤ Ø < 82mm
	755	825	15	22	Rods	82 ≤ Ø < 90mm
Hardiall TS 130	895	965	10	24	Rods	40 ≤ Ø < 90mm
Hardiall TS 160U	1035	1105	3	34	Rods	40 ≤ Ø < 82mm
	1020	1100	3	32	Rods	82 ≤ Ø < 90mm
Wrought and spinodally hardened Hardiall® hollow bars/tubes (length limited to 1000mm) Wall thickness: 10 to 20% of Ø						
Hardiall TX 105	724	758	4	30	Tubes	60 ≤ Ø < 101.6mm
	652	683	4	30	Tubes	Ø ≥ 101.6mm
Hardiall TX 110	760	895	10	30	Tubes	60 ≤ Ø <101.6mm
	760	895	6	30	Tubes	101.6 ≤ Ø < 203mm
	760	895	5	30	Tubes	Ø ≥ 203mm

* Measurements made in laboratory conditions. Non contractual. TS 120U & TS 160U refer to UTS, other tempers refer to YS.
All products can be ultrasonically tested at LBA upon customer request.

Your trusted supply partner for premium quality metals and specialist plastics

Righton Blackburns Service Centres

Operating a reliable and efficient delivery service from our 11 Service Centres nationwide, we offer in-house processing facilities. In addition to next day delivery from locally-held stock, we also provide non-standard or customer specific material.

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