LION 1 ALLOY

TECHNICAL DATA

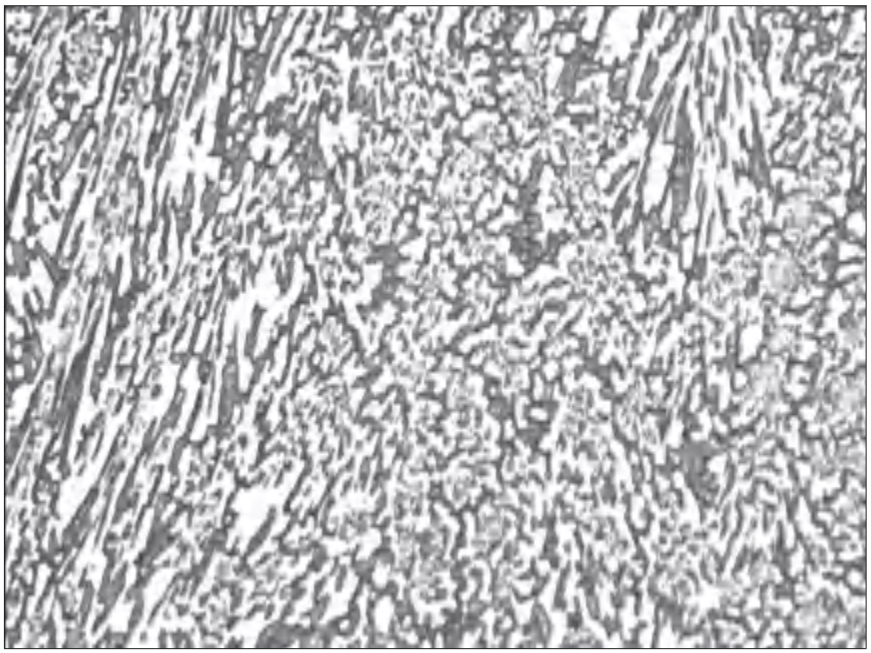
TIG WELD DEPOSITION | MMA WELD DEPOSITION | MIG WELD DEPOSITION | PTA & LASER WELD DEPOSITION

Nominal Composition (mass %) and Physical Properties

Co	Cr	W	C	Others	Hardness	Density	Melting Range
Base	28 - 32	11- 13	2.0-3.0	Ni, Fe, Si, Mn, Mo	50-58 HRC 550-720 HV	8.69 g/cm^3 0.314 lb/in^3	2175-2450 °F 1190- 1345 °C

LION® 1 is a hardfacing alloy possessing excellent abrasion and corrosion resistance for applications such as pump sleeves, rotary seal rings, wear pads, expeller screws and bearing sleeves. It retains its hardness at temperatures in excess of 760°C (1400°F).

LION® 1 contains a high propor- tion of hard, wear resistant primary carbides. These render the alloy well suited to applications involv- ing extreme low-angle erosion and severe abrasion, with some sacrifice in toughness. Compared to other LION® alloys it is more crack- sen- sitive, and care should be taken to minimize the cooling stresses experienced during casting and hardfacing processes. Due to its high hardness and wear resistance, **LION® 1** should only be finished by grinding.



Optical micrograph of a LION ® 1 weld overlay

Corrosion Resistance

LION® 1 has good general corrosion resistance. The typical electrode potential in sea water at room temperature is approx. -0.4 V (SCE). LION® **1** corrodes primarily by a pitting mechanism and not by general mass loss in seawater and chloride solutions. More detailed information regard- ing corrosion resistance can be provided on request.

Nominal Thermal Expansion Coefficient (from 20°C/68°F to stated temperature)

	100°C (212°F)	200°C (392°F)	300°C (572°F)	400°C (752°F)	500°C (932°F)	600°C (1112°F)	700°C (1292°F)	800°C (1472°F)	900°C (1652°F)
µm/m. K	10.5	11.3	11.8	12.1	12.5	12.8	13.5	13.9	14.4
µ-inch/inch. °F	5.8	6.3	6.5	6.7	6.9	7.1	7.5	7.7	8.0

Nominal Tensile Properties at Room Temperature

	Ultimate Tensile Strength Rm		Yield Stress Rp(0.2%)		Elongation	Elastic Modulus	
	ksi	MPa	ksi	MPa	A(%)	psi	GPa
Castings	79	550	-	-	<1	$36.0x10^6$	248
LION® HS- 1 (*)	173	1195	152	1050	<1	$33.4x10^6$	230

(*) "HS" = HIP-consolidated from the powder form.

Nominal Hot Hardness (DPH) as-cast

20°C (68°F)	100°C (212°F)	200°C (392°F)	300°C (572°F)	400°C (752°F)	500°C (932°F)	600°C (1112°F)	700°C (1292°F)	800°C (1472°F)	900°C (1652°F)
606	573	540	508	485	453	406	330	217	140

Thermal and Electrical Properties

	Approximate value at Room Temperature	
Thermal conductivity	14.5 W/m.K	100.5 Btu-in/hr/ft^2/°F
Electrical resistivity	94.0 µ-ohm.cm	37.0 µ-ohm.inch

Product Forms and Cross Reference Specifications

LION® 1 is available as welding wire, rod, powder, and electrodes, fnished castings and HIP consolidated blands or parts.

LION® 1 can be supplied to the following specifcations:

SPECIFICATION	PRODUCT FORM	SPECIFICATION	PRODUCT FORM
UNS R30001	LION® **1** Rod, castings, powder for PTA or laser processing	AWS A5.21 / ASME BPVC IIC SFA 5.21 ERCoCr-C	LION® 1 Rod
UNS R30001	LION® **HS- 1** (HIP-consolidated from powder)	AWS A5.21 / ASME BPVC IIC SFA 5.21 ERCCoCr-C	LION® 1 Wire
UNS W73031	LION® **1** Wire	AWS A5. 13 / ASME BPVC IIC SFA 5.13 ECoCr-C	LION® 1 Electrode