

# ALLOY DATA SHEET

## HI

HEAT RESISTANT ALLOY

REVISION: 03/91

### DESCRIPTION

HI is an iron-chromium-nickel alloy for moderately high temperatures and loading.

### COMPOSITION

	<u>C</u>	<u>Mn</u>	<u>Si</u>	<u>Cr</u>	<u>Ni</u>	<u>Mo</u>	<u>P</u>	<u>S</u>
Min %	0.35			26	14		-	-
Max %	0.45	2.0	2.0	30	18	0.5	0.04	0.04

### APPLICATIONS

Furnace skids and rails, conveyor roll assemblies, lead pots, retorts

### PRODUCT FORMS

Horizontal and vertical centrifugal castings; static castings.

### PHYSICAL PROPERTIES

Density (lbs/in <sup>3</sup> )	0.279
Melting Point(°F)	2550
Thermal Conductivity (Btu/h/ft <sup>2</sup> /ft/°F)	8.2 @ 212°F
	12.0 @ 1000°F
	13.0 @ 1200°F
	14.1 @ 1400°F
	15.3 @ 1600°F
	16.3 @ 1800°F
Thermal Expansion (10 <sup>-6</sup> in/in °F)	17.5 @ 2000°F
	9.9 @ 70-1000°F
	10.1 @ 70-1400°F
	10.3 @ 70-1600°F
	10.5 @ 70-1800°F
	10.8 @ 70-2000°F
Magnetic Permeability	11.4 @ 1200-1800°F
	11.5 @ 1200-2000°F
	1.0-1.7

### CARBURIZATION

#### RESISTANCE

(Gas-1064 hours @ 1760°F)

ALLOY	WEIGHT GAIN
GRADE	mg/mm <sup>2</sup>
H E	0.54
H F	0.81
H H	0.58
<b>H I</b>	<b>0.63</b>
H K	0.56
H L	0.46

### MECHANICAL PROPERTIES (Typical Values)

		Static Castings			°F	ASTM Spec A297	
U.T.S.	K.S.I.	70	1400	1600		70	Min.
Y.S.	K.S.I.	80	38	26	35	Min.	
El.	%	12	6	12	10	Min.	

**SERVICE TEMPERATURE**

The alloy is suitable for long term service at temperatures up to 2025°F.

COMPARATIVE OXIDATION RATES (mm / year)  
(500 hour cyclic tests)

GRADE	1832	1922	2012	2102°F
H F	0.86	1.8	3.6	6.7
H H	<0.1	0.22	0.92	3.9
<b>H I</b>		<b>0.24</b>		<b>3.5</b>

**WELDABILITY**

HI alloy has good weldability by the SMAW, GTAW and GMAW processes

**CREEP-RUPTURE PROPERTIES**

Long term creep-rupture properties were extrapolated from Larson-Miller Parameter versus stress plots.

		<u>RUPTURE-STRESS-KSI</u>									
<u>HOURS</u>		<u>1400</u>	<u>1500</u>	<u>1600</u>	<u>1700</u>	<u>1800</u>	<u>1900</u>	<u>2000</u>	<u>2100</u>	<u>2100</u> °F	
100	AVG.	12.5	9.5	7.0	5.3	3.9	2.9	2.2	1.6		
1,000	AVG.	8.3	6.0	4.4	3.15	2.3	1.67	1.2			
10,000	AVG.	5.3	3.8	2.7	1.87	1.35	0.94				
100,000	AVG.	3.45	2.4	1.65	1.15	0.75					
		<u>CREEP-STRESS-KSI</u>									
<u>%/HOUR</u>		<u>1400</u>	<u>1500</u>	<u>1600</u>	<u>1700</u>	<u>1800</u>	<u>1900</u>	<u>2000</u>	<u>2100</u>	<u>2150</u>	<u>°F</u>
0.0001	AVG.	6.6	4.8	3.6	2.6	1.9	1.2	0.80	0.26	0.15	

Note: Creep and rupture stresses are subject to periodic revisions as the results from long term tests become available.

**RELATED SPECIFICATIONS**

ASTM: A 297 (HI); A 608 (HI 35)

Nearest wrought grade: None

**HEAD OFFICE, FOUNDRY & INTERNATIONAL SALES**

**Kubota Metal Corporation, Fahramet Division**

25 Commerce Road, P.O. Box 1700,

Orillia, Ontario, Canada, L3V 6L6.

Phone (705) 325-2781

Fax (705) 325 5887