Kubota METAL CORPORATION
25 Commerce Road, Orillia, Ontario, Canada L3V 6L6
Phone (705) 325-2781 Fax (705) 325-5887

ISO 9001:2000 SGS

ALLOY DATA SHEET
KHR35C-HiSi

HEAT RESISTANT ALLOY

REVISION: 06/99

DESCRIPTION
KHR35C Hi Si is a modification of KHR35C alloy which is compositionally balanced to increase carburization resistance. The alloy is commonly used for ethylene furnace tubes and fittings where it may be complimented by load bearing components outside the feedstock stream which utilize the higher strength KHR35C alloy

COMPOSITION

	C	Mn	Si	Cr	Ni	Nb	P	S
Min %	0.4		1.5	24	34	0.6	-	-
Max %	0.5	1.5	2.0	28	37	1.5	<.03	<.03

APPLICATIONS
Ethylene pyrolysis coils and fittings.

PRODUCT FORMS
Horizontal and vertical centrifugal castings; static castings; formed fittings and sweeps.

PHYSICAL PROPERTIES

Density (lbs/in^3)	0.291	
Melting Solidus	2372 ^oF	
Thermal Conductivity	6.6	@ 212 ^oF
(Btu ft/ft^2 hr ^oF)	14.6	@ 1600 ^oF
	16.7	@ 1800 ^oF
Thermal Expansion	10.0	@ 70-1600 ^oF
(X 10^{-6} in/in ^oF)	10.3	@ 70-1800 ^oF
	10.6	@ 70-2000 ^oF

CARBURIZATION RESISTANCE
(Pack-cylic tests @ 1560-2100 ^oF)

Alloy Grade	Wt Gain %
KHR45A	7.5
KHR35CW	20.4
KHR35C Hi-Si	**22.6**
KHR35CL	23.8

MECHANICAL PROPERTIES

		Typical Values Centrifugal Castings					Minimum Values
		70	1400	1600	1800	2000 ^oF	70 ^oF
U.T.S.	K.S.I.	78	44	28	17	10	63.8
Y.S.	K.S.I.	41	21	14	9	6	32.6
El.	%	13	20	29	34	40	8 (c.c.) 6 (Static)

SERVICE TEMPERATURE
The alloy is suitable for long term service at temperatures up to 1975 ^oF, but because of the detrimental effect of niobium on oxidation resistance, it should be used with caution above this temperature.

WELDABILITY
Good with all conventional processes; bare wire and flux coated electrodes of matching composition are commercially available

CREEP-RUPTURE PROPERTIES

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

RUPTURE-STRESS-KSI

HOURS		1400	1500	1600	1700	1800	1900	2000	2050°F
1,000	AVG.	14.25	10.83	8.00	5.71	3.90	2.52	1.53	1.16
	MIN.	13.13	9.95	7.34	5.22	3.57	2.31	1.41	1.08
10,000	AVG	11.44	8.38	5.92	4.00	2.55	1.51	0.84	0.61
	MIN	10.52	7.69	5.42	3.66	2.33	1.39	0.78	0.58
100,000	AVG.	9.02	6.33	4.24	2.67	1.56	0.84	0.45	0.36
	MIN.	8.28	5.80	3.88	2.45	1.44	0.79	0.43	0.34

CREEP-STRESS-KSI

%/HOUR		1742	1800	1832	1900	1922	2012	°F
0.0001	AVG.	3.34	2.57	2.25	1.59	1.44	0.83	

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

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