Kubota METAL CORPORATION
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ALLOY DATA SHEET
KHR35H

HEAT RESISTANT ALLOY

REVISION: 12/95

DESCRIPTION

KHR35H is a 25Cr-35Ni-Fe base alloy modified by an addition of molybdenum to increase creep and rupture strength. Rupture strength is intermediate between that of HP alloy and the niobium or tungsten modified grades KHR35C and KHR35W. The alloy has better oxidation resistance than KHR35C at temperaures above 1922 ^{o}F. The alloy is also produced in a high silicon grade, KHR35H HiSi, for service in carburizing atmospheres.

COMPOSITION

	C	Mn	Si	Cr	Ni	Mo	P	S
Min %	0.37			24	34	1.0	-	-
Max %	0.47	1.5	1.5	28	37	1.5	<.03	<.03

APPLICATIONS

Radiant heaters and heat treatment furnace hardware.

PRODUCT FORMS

Horizontal and vertical centrifugal castings; static castings.

PHYSICAL PROPERTIES

Density (lbs/in$^{3)}$	0.291	
Melting Solidus	2372 ^{o}F	
Thermal Conductivity	6.6	@ 212 ^{o}F
(Btu ft/ft^{2} hr °F)	14.6	@ 1600 ^{o}F
	16.7	@ 1800 ^{o}F
Thermal Expansion	8.8	@ 70-1472 ^{o}F
(10^{-6}in/in ^{o}F)	9.2	@ 70-1832 ^{o}F

OXIDATION RESISTANCE

(100 Hours @ 2192 ^{o}F)

Alloy Grade	Wt Loss mg/cm^{2}
HP	10.0
KHR35C	9.5
KHR35H	**8.0**

MECHANICAL PROPERTIES (Typical Values)

		Centrifugal Castings				Minimum Values
		1700	1800	1900	2000 ^{o}F	70 ^{o}F
U.T.S.	K.S.I.	26	22	17	12	63.8
Y.S.	K.S.I.	18	15	11	8	35.5
El.	%	44	60	66	70	8 (c.c.) 6 (Static)

SERVICE TEMPERATURE

The alloy is suitable for long term service at temperatures up to 2000 ^{o}F.

WELDABILITY

Procedures for welding KHR35H are available from Kubota Metal Corporation.

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	°F
100.	AVG.	-	-	10.03	7.46	5.38	3.75	2.50	
	MIN.	-	-	8.66	6.45	4.66	3.24	2.16	
1,000.	AVG.	-	10.35	7.61	5.42	3.71	2.42	1.50	
	MIN.	-	8.92	6.58	4.32	3.21	2.09	1.28	
10,000.	AVG	10.94	7.98	5.62	3.80	2.44	1.48	0.84	
	MIN	9.43	6.90	4.87	3.29	2.10	1.26	0.71	
100,000	AVG.	8.59	6.01	4.03	2.56	1.52	0.85	0.46	
	MIN.	7.42	5.20	3.49	2.21	1.30	0.72	0.39	

CREEP-STRESS-KSI

%/HOUR		1400	1500	1600	1700	1800	1900	2000	°F
0.0001	AVG.					3.12	1.74	1.07	

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

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