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ALLOY DATA SHEET
KHR35W

HEAT RESISTANT ALLOY

REVISION: 11/96

DESCRIPTION

Additions of tungsten to 25Cr-35Ni base alloy are used to further increase carburization resistance in service at temperatures up to 2000 °F.

COMPOSITION

	C	Mn	Si	Cr	Ni	P	S	W
Min %	0.4			24	34	-	-	3.0
Max %	0.5	2.0	2.0	28	37	<.03	<.03	4.5

APPLICATIONS

Ethylene pyrolysis coils and fittings.

PRODUCT FORMS

Horizontal and vertical centrifugal castings; static castings.

PHYSICAL PROPERTIES

Density (lbs/in^3)	0.296	
Melting Solidus	2390 °F	
Thermal Conductivity	6.6	@ 212 °F
(Btu ft/ft^2 hr °F)	14.6	@ 1600 °F
	16.7	@ 1800 °F
Thermal Expansion	8.2	@ 68-1112 °F
(x 10^{-6} in/in °F)	8.8	@ 68-1472 °F
	9.1	@ 68-1652 °F
	9.4	@ 68-1832 °F

CARBURIZATION RESISTANCE

(Pack-cylic tests @ 1560-2100 °F)

Alloy Grade	Wt Gain %
KHR35H Hi-Si	22.6
KHR35C Hi-Si	22.7
KHR35CW	20.35
KHR35W	**21.2**
KHR45A	7.5

MECHANICAL PROPERTIES

		Typical Tensile Values for Centrifugal Castings							Minimum Values
		68	932	1292	1472	1652	1832	2012 °F	70 °F
U.T.S.	ksi	83	63	56	48	34	22	14	64
Y.S.	ksi	46	34	30	25	17	11	6	34
El.	%	10	12	15	18	23	32	44	5 (c.c.), 3 (Static)
R.A.	%	11	12	16	20	28	37	44	

SERVICE TEMPERATURE

The alloy is suitable for long term service at temperatures up to 2000°F.

WELDABILITY

Procedures for welding KHR35W 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	2100	°F
1,000	AVG.	12.87	10.09	7.70	5.67	4.00	2.67	1.66	0.97	
	MIN.	11.49	8.92	6.74	4.92	3.45	2.30	1.43	0.83	
10,000	AVG.	10.59	8.03	5.87	4.09	2.69	1.64	0.93	0.55	
	MIN.	9.38	7.03	5.10	3.53	2.32	1.42	0.80	0.44	
100,000	AVG.	8.57	6.23	4.32	2.81	1.69	0.94	0.54	0.47	
	MIN.	7.53	5.42	3.73	2.42	1.46	0.81	0.44	0.31	

CREEP-STRESS-KSI

%/HOUR		1742	1832	1922	2012	°F
0.0001	AVG.	3.92	2.47	1.55	0.99	

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

MODULUS OF ELASTICITY

R.T.	932	1292	1472	1652	1832	2012	°F
24.9	24.2	22.8	21.3	18.1	13.7	12.1	(x 10^3 ksi)

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