

ALLOY DATA SHEET

KHR48NCo

HEAT RESISTANT ALLOY

REVISION: 05/99

DESCRIPTION

KHR48NCo is a nickel-chromium-iron alloy strengthened by additions of 5% tungsten and 3% cobalt for use in the 1800 to 2200 °F temperature range.

COMPOSITION

	<u>C</u>	<u>Mn</u>	<u>Si</u>	<u>Cr</u>	<u>Ni</u>	<u>W</u>	<u>P</u>	<u>S</u>	<u>Co</u>
Min %	0.35	-	-	25	46	4	-	-	2.5
Max %	0.65	1.5	1.75	28	50	6	0.03	0.03	4.5

APPLICATIONS

Heat treatment furnace roll conveyors and furnace hardware; reformer tubes; radiant heaters; tube hangers.

PRODUCT FORMS

Horizontal and vertical centrifugal castings; static castings.

PHYSICAL PROPERTIES

Density (lbs/in ³)	0.292
Melting Solidus	2390 °F
Thermal Conductivity (Btu/h/ft ² /ft/°F)	16.8 @ 2012 °F
Thermal Expansion (10 ⁻⁶ in/in °F)	7.92 @ 100-800 °F 8.61 @ 100-1600 °F 8.75 @ 100-1800 °F

CARBURIZATION

RESISTANCE

(Gas-100 hours @ 1922°F)	
ALLOY	WEIGHT GAIN
GRADE	mg/mm ²
H K	0.33
H P	0.23
KHR48NCo	0.21
KHR48N-HiSi	0.18

MECHANICAL PROPERTIES (Typical Values - Centrifugal Castings)

		<u>70</u>	<u>1600</u>	<u>1800</u>	°F
U.T.S.	K.S.I.	77	30	18	
Y.S.	K.S.I.	44			
El.	%	10	26	32	

SERVICE TEMPERATURE

The alloy is suitable for long term service at temperatures up to 2125 °F, Oxidation rates derived from 100 hour tests in air are shown in the table below.

OXIDATION RATE

	1832	1922	2012	2102	2192	°F
F27-37W	0.24	0.42	0.66	0.96	1.25	mm/yr
KHR48NCo	0.29	0.57	0.77	0.93	1.13	mm/yr

WELDABILITY

Procedures for welding KHR48NCo alloy 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		1600	1700	1800	1900	2000	2100	2200	°F
100.	AVG.	11.48	8.75	6.49	4.66	3.21	2.10	1.28	
	MIN.	10.99	8.33	6.13	4.36	2.97	1.91	1.15	
1,000.	AVG.	8.91	6.53	4.62	3.12	1.98	1.17	0.63	
	MIN.	8.48	6.17	4.32	2.88	1.81	1.05	0.55	
10,000.	AVG.	6.76	4.72	3.14	1.96	1.12	0.58	0.27	
	MIN.	6.39	4.42	2.90	1.78	1.01	0.51	0.24	
100,000	AVG.	4.98	3.28	2.02	1.14	0.57	0.25	-	
	MIN.	4.67	3.03	1.84	1.02	0.50	0.23	-	

CREEP-STRESS-KSI

%/HOUR		1600	1700	1800	1900	2000	2100	2200	°F
0.0001	AVG.			3.2	2.25	1.6	0.75	0.35	

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