

PARALLOY CR39W

25/35 Cr/Ni 0.1%C

Low Carbon Microalloy

Steam Cracker

APPLICATION

Because of the attractive combination of creep strength, carburisation resistance and ductility, **PARALLOY CR39W** is widely used in many applications in high temperature pyrolysis plants including ethylene furnaces up to 1050°C.

The alloy is used for cast fittings including “wyees”, “elbow bends”, “return bends” and “tees”. **CR39W** centrifugal cast tubes are also an excellent choice for pyrolysis coils and transfer lines subjected to thermal stresses. Some coil designs may also require tubes to be supplied and formed into “swept bends” or “cranked” tube sections for specific furnace designs. **Paralloy CR39W** is also recommended for heat treatment furnace fixtures or any equipment subjected to temperature cycling.

DESCRIPTION

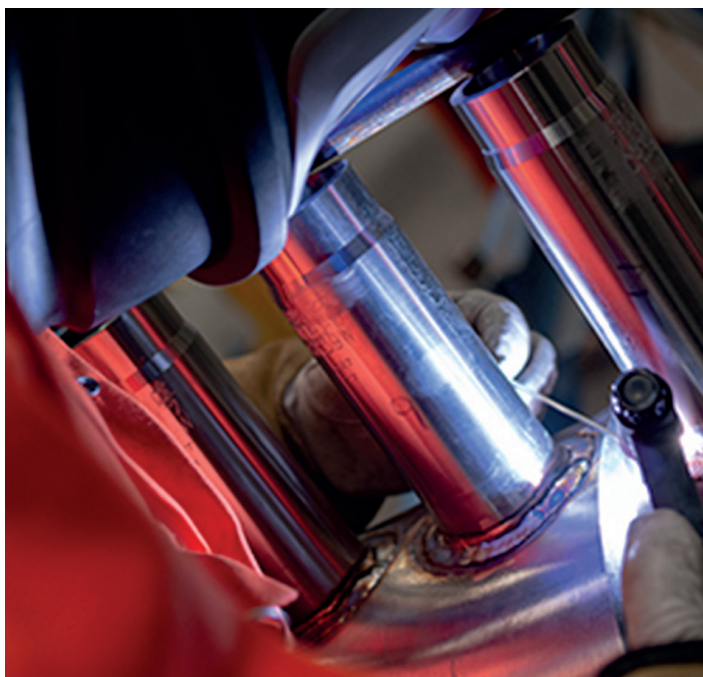
PARALLOY CR39W is a low carbon, weldable chromium nickel, niobium-bearing heat resisting steel developed from **PARALLOY H39W** (25/35-Cr/Ni + Nb: 0.4% C)

The high chromium and nickel content means that **CR39W** combines the superior strength and carburisation resistance with the added attraction of increased ductility due to the low carbon content. This imported ductility minimises the effects of high temperature carburisation and thermal stresses. The alloy is readily welded by metal arc (SMAW) or inert gas shielded arc (GTAW, GMAW) welding processes using matching filler material.



NOMINAL COMPOSITION%

C	Si	Mn	Cr	Ni	Nb
0.1	1.3	1	25	35	1.2



PHYSICAL PROPERTIES

COEFFICIENT OF THERMAL EXPANSION (mm/mm°C)	THERMAL CONDUCTIVITY (W/m²K)	DENSITY (kg/m³)	YOUNG MODULUS (N/mm² x 10³)	SPECIFIC HEAT (J/kgK)
20 - 100°C - 14.5 x 10 ⁻⁶	100°C - 13.4	7.97 x 10³	20°C - 158.5	502
20 - 750°C - 17.5 x 10 ⁻⁶	750°C - 26.0		800°C - 108.2	
20 - 1000°C - 18.5 x 10 ⁻⁶	1000°C - 31.5		1000°C - 95.1	

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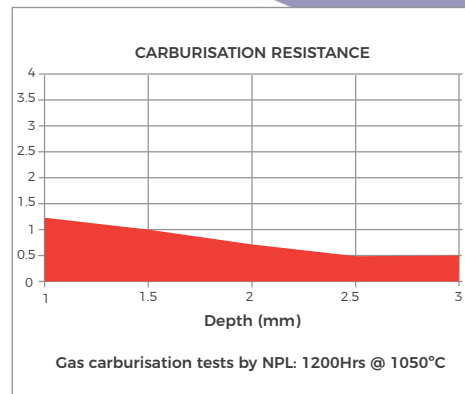
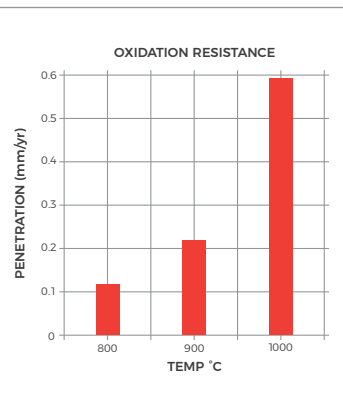
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MECHANICAL PROPERTIES

ROOM TEMPERATURE TENSILE PROPERTIES (Minimum Values)

UTS (N/mm ²)	448
Proof Stress 0.2% (N/mm ²)	186
Elongation (%)	25



ELEVATED TEMPERATURE TENSILE PROPERTIES (Typical Values)

TEMPERATURE (°C)	UTS (N/mm ²)	PROOF STRESS 0.2% (N/mm ²)	ELONGATION (%)
700	296	125	39
800	196	106	49
900	102	76	67
1000	68	56	75

CREEP RUPTURE STRESS (N/mm²)

TEMP	10,000 HOUR LIFE		50,000 HOUR LIFE		100,000 HOUR LIFE	
	MEAN	Minimum	MEAN	Minimum	MEAN	Minimum
850	42,12	34,26	33,75	27,45	30,6	24,89
875	34,19	27,81	27,04	21,99	24,37	19,82
900	27,54	22,40	21,49	17,48	19,26	15,66
925	22,03	17,92	16,95	13,79	15,10	12,28
950	17,48	14,22	13,26	10,79	11,74	9,55
975	13,77	11,20	10,30	8,38	9,06	7,37
1000	10,77	8,76	7,93	6,45	6,93	5,64