

PARALLOY CR32W

20/32 Cr/Ni Nb 0.1% C

Cast Heat Resisting Alloy

Steam Reforming / Steam Cracking

APPLICATIONS

PARALLOY **CR32W** was developed primarily for applications up to 1000°C that are subjected to high stresses, thermal fatigue or even thermal shock.

For many years, **CR32W** has been widely used for outlet headers or “manifolds” in reformer furnaces, and for collectors and transfer lines in pyrolysis plants such as ethylene furnaces. The low carbon content helps maintain tensile ductility after service ageing, and careful composition control provides the high creep ductility to assist relaxation of weld-zone residual stresses in thick sections.

CR32W is also recommended for heat treatment furnace fixtures or any equipment that is subjected to rapid thermal cycling.

DESCRIPTION

PARALLOY **CR32W** is a low carbon, weldable chromium nickel, niobium-bearing heat and corrosion resistant steel, which is a cast alternative to wrought 20/32 Cr/Ni grades and equivalent of CT15C / ASTM A351. Niobium is a major strengthening addition and the composition is carefully ‘balanced’ to ensure that the alloy offers an excellent combination of creep and thermal fatigue strength, ductility, weldability and corrosion resistance.

CR32W is readily welded by metal arc (SMAW) or inert gas shielded arc (GTAW, GMAW) welding process using matching filler material.



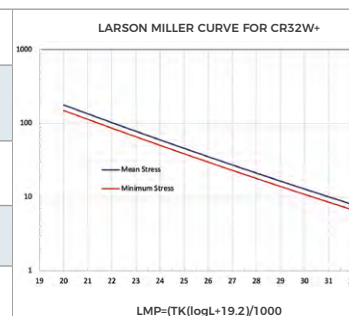
NOMINAL COMPOSITION%

C	Si	Mn	Cr	Ni	Nb
0.1	0.8	1	20	32	1.0



PHYSICAL PROPERTIES

COEFFICIENT OF THERMAL EXPANSION (mm/mm°C)	THERMAL CONDUCTIVITY (W/m°K)	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	7.94 x 103	20°C - 155	502
20 - 750°C - 17.5 x 10-6	750°C - 25.9		800°C - 105.5	
20 - 1000°C - 18.5 x 10-6	1000°C - 30.5		1000°C - 95.8	



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MECHANICAL PROPERTIES

ROOM TEMPERATURE TENSILE PROPERTIES (Minimum Values)

UTS (N/mm ²)	448
Proof Stress 0.2% (N/mm ²)	175
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 °C	10,000 HOUR LIFE		50,000 HOUR LIFE		100,000 HOUR LIFE	
	MEAN	Minimum	MEAN	Minimum	MEAN	Minimum
750	64.02	54.12	52.94	44.75	48.45	41.26
775	54.87	46.38	45.23	38.23	41.64	35.20
800	47.08	39.79	38.68	32.70	35.57	30.07
825	40.44	34.18	33.13	28.00	30.42	25.71
850	34.77	29.40	28.40	24.01	26.05	22.02
875	29.94	25.31	24.38	20.61	22.33	18.88
900	25.80	21.81	20.95	17.71	19.17	16.21
925	22.27	18.82	18.03	15.24	16.48	13.39
950	19.23	16.26	15.53	13.13	14.18	11.99
975	16.63	14.06	13.40	11.33	12.22	10.33
1,000	14.40	12.17	11.57	9.78	10.54	8.91