

PARALLOY CR32W

20/32 Cr/Ni 0.1%C
ASTM A351 CT15C
Steam Reforming

APPLICATIONS

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

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 corresponds to CT15C of 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.



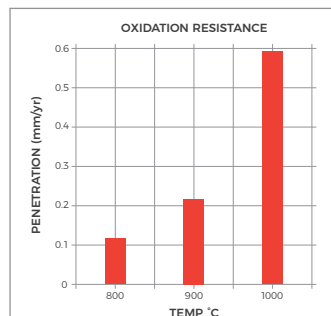
NOMINAL COMPOSITION%

C	Si	Mn	Cr	Ni	Nb
0.1	0.8	1	20	32	1.2



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 10 ³	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	79,73	73,53	68,66	63,32	64,12	59,13
775	70,70	65,20	59,99	55,32	55,65	51,32
800	62,15	57,31	51,93	47,89	47,85	44,13
825	54,16	49,94	44,54	41,07	40,75	37,58
850	46,78	43,14	37,85	34,90	34,37	31,70
875	40,06	36,94	31,86	29,38	28,72	26,49
900	34,01	31,36	26,58	24,51	23,77	21,92
925	28,62	26,39	21,96	20,26	19,49	17,97
950	23,87	22,01	17,99	16,59	15,83	14,60
975	19,74	18,20	14,59	13,46	12,73	11,74
1000	16,18	14,92	11,73	10,82	10,15	9,36