

PARALLOY H39WM

25/35 Cr/Ni 0.4%C

Microalloy Steam Reformer & Cracker

APPLICATION

PARALLOY H39WM is the reference alloy, developed in 1990s for the “heavy-duty” passes of Pyrolysis Cracker Coils where high carburisation resistance is required, and “peak” temperatures can exceed 1125°C, the alloy is widely used today.

The very high creep rupture strength also makes it ideal for steam reformer furnaces where high tube temperatures or thinner tube walls are required.

Because of the combination of exceptional creep strength and carburisation resistance, microalloyed H39WM boasts a proven track record of success within the petrochemical industry over many years.

DESCRIPTION

PARALLOY H39WM (HP Nb mod) is a weldable chromium nickel heat resistant steel which is the microalloyed version of **PARALLOY H39W** (HP Nb Mod)

In addition to the controlled niobium content, further creep strengthening is introduced by making microalloy additions.

The important elements interact by the process of “synergism” to increase the high temperature strength.



NOMINAL COMPOSITION%

C	Si	Mn	Cr	Ni	Nb
0.4	1.5	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 - 15.5 x 10 ⁻⁶	100°C - 13	7.97 x 10 ³	20°C - 158.5	455
20 - 800°C - 18.9 x 10 ⁻⁶	750°C - 24.3		800°C - 108.2	
20 - 1000°C - 19.4 x 10 ⁻⁶	1000°C - 27.7		1000°C - 95.1	
20 - 1100°C - 19.7 x 10 ⁻⁶	1000°C - 29.7			

PARALLOY H39WM

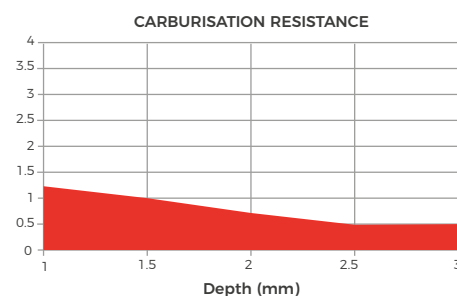
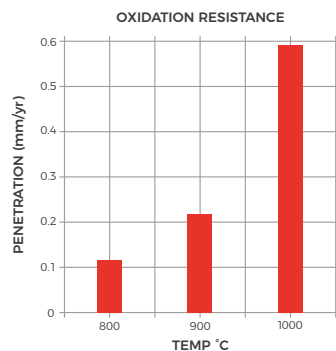
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MECHANICAL PROPERTIES

ROOM TEMPERATURE TENSILE PROPERTIES (Minimum Values)

UTS (N/mm ²)	450
Proof Stress 0.2% (N/mm ²)	250
Elongation (%)	8 (tube) 6 (static)



Gas carburisation tests by NPL: 1200Hrs @ 1050°C

ELEVATED TEMPERATURE TENSILE PROPERTIES (Typical Values)

TEMPERATURE (°C)	UTS (N/mm ²)	PROOF STRESS 0.2% (N/mm ²)	ELONGATION (%)
800	265	136	31
900	172	94	38
1000	117	66	43
1100	82	50	45

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
900	40,2	35,28	33,04	28,99	30,18	26,48
925	34,26	30,06	27,58	24,2	24,96	21,9
950	28,81	25,28	22,7	19,92	20,36	17,86
975	23,92	20,99	18,43	16,18	16,37	14,36
1000	19,59	17,19	14,76	12,95	12,98	11,39
1025	15,84	13,9	11,66	10,23	10,14	8,9
1050	12,64	11,1	9,08	7,97	7,82	6,86
1075	9,96	8,74	6,98	6,13	5,94	5,22
1100	7,74	6,79	5,29	4,64	4,45	3,91
1125	5,94	5,21	3,95	3,47	3,29	2,89
1150	4,5	3,95	2,92	2,56	2,4	2,1