



35/45 Cr/Ni 0.4%C
Chromium Corrosion Strengthening
Ammonia Cracking

Ammorite 45 is a specifically adapted version of the 35/45 Cr/Ni for ammonia cracking application. This variation allows Ammorite 45 to have a slower nitrogen diffusion within it than the standard 35/45 alloys.

C	Si	Mn	Ni	Cr	Nb	Fe	Plus Additions
0.4	1.6	1	45	35	1	Balance	



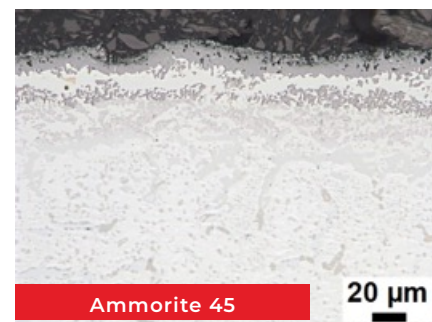
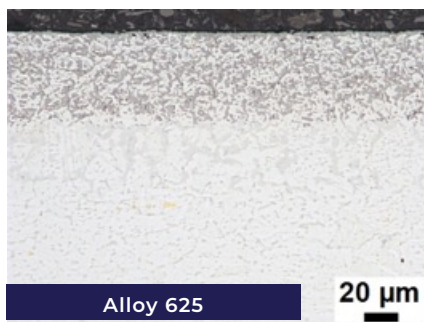
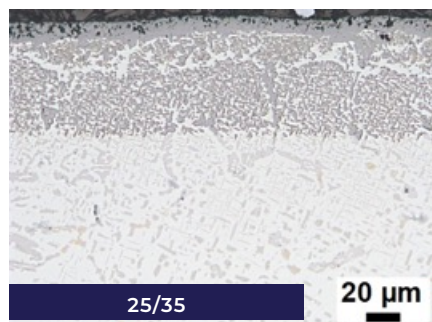
APPLICATION

Ammonia cracking produces a highly reactive nitrogen environment. Ammonia dissociates on hot metallic surfaces into hydrogen and atomic nitrogen; giving the possibility to this nitrogen to diffuse into the alloys, destabilising protective oxide layers and forming nitrides.

AMMONIA CRACKING TESTING

Test temperature: 850°C
Pressure: 20 bar
Gas atmosphere: NH₃
Test duration: 1000h

Ammorite 45 shows clearly much less nitridation and nitrogen diffusion than the base alloy 25/35 and shows a much thinner layer of nitridation than the benchmark Alloy 625.



PHYSICAL PROPERTIES

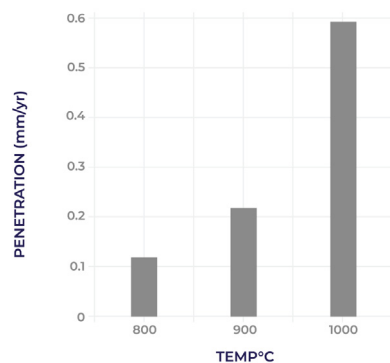
COEFFICIENT OF THERMAL EXPANSION (mm/mm°C)	THERMAL CONDUCTIVITY (W/m°K)	DENSITY (kg/m ³)	YOUNG MODULUS (N/mm ² x10 ³)	SPECIFIC HEAT (J/KgK)
20 - 100°C - 15.6 x 10 ⁻⁶	100°C - 13.8	7.97 x 10 ³	20°C - 176.5	480
20 - 800°C - 18.8 x 10 ⁻⁶	800°C - 25.9		800°C - 127.2	
20 - 1000°C - 19.2 x 10 ⁻⁶	1000°C - 28.3		1000°C - 109.1	

MECHANICAL PROPERTIES

ROOM TEMPERATURE TENSILE PROPERTIES (Minimum Values)

COEFFICIENT OF THERMAL EXPANSION (mm/mm°C)	THERMAL CONDUCTIVITY (W/m°K)
UTS (N/mm ²)	450
Proof Stress 0.2% (N/mm ²)	250
Elongation (%)	4

OXIDATION RESISTANCE



ELEVATED TEMPERATURE TENSILE PROPERTIES (Typical Values)

TEMPERATURE (°C)	UTS (N/mm ²)	PROOF STRESS 0.2% (N/mm ²)	ELONGATION (%)
650	435	188	23.5
700	425	191	25
750	312	163	27
800	292	134	28
850	226	106	30

CREEP RUPTURE STRESS (N/mm²)

TEMP	10,000 HOUR LIFE		50,000 HOUR LIFE		100,000 HOUR LIFE	
°C	MEAN	MINIMUM	MEAN	MINIMUM	MEAN	MINIMUM
800	53.90	45.66	48.71	41.27	46.37	39.28
850	44.73	37.89	38.87	32.93	36.36	30.8
950	26.07	22.08	20.76	17.59	18.68	15.83
975	21.99	18.63	17.1	14.49	15.23	12.9
1000	18.29	15.5	13.88	11.76	12.23	10.36
1025	15.01	12.71	11.11	9.41	9.67	8.19
1050	12.14	10.28	8.75	7.41	7.54	6.38