

Classifications

EN ISO 26304-A	EN ISO 26304-B	AWS A5.23	AWS A5.23M
S 55 6 FB S3Ni1Mo	-	F9A8-EF3-F3-N F9P8-EF3-F3-N	-

Characteristics and typical fields of application

Union S 3 NiMo 1 - UV 420 TTR is a wire flux combination for submerged arc welding of unalloyed and low alloyed steel grades.

UV 420 TTR is an agglomerated fluoride-basic flux with high basicity with a neutral metallurgical behavior and is characterised by a high degree of purity.

The wire / flux combination Union S 3 NiMo 1 – UV 420 TTR is extensively used for the manufacturing of nuclear pressure vessels and also used in oil and gas industry for the welding of high strength low alloy steel grades where good strength and toughness properties are required with controlled hardness levels.

Excellent weldability, good slag detachability and side wall fusion and a nice bead appearance. It is mostly applied in single wire technique on DC+ polarity.

Base materials

Reactor structural steels such as 22 NiMoCr 37, 20 MnMo 44, 20 MnMoNi 55, 15NiCuMoNb5-6-4, WB 36, Welmonil 35, Welmonil 43, GS-18 NiMoCr 37, tested acc. to KTA 1408.

Quenched and tempered fine-grained steels S460N, S460M, S460NL, S460ML, S460Q-S555Q, S460QL-S550QL, S460QL1-S550QL1, P460N, P460NH, P460NL1, P460NL2, L415NB, L415MB-L555MB, L415QB-L555QB, alform 500 M, aldur 500 Q, 500 QL, 500 QL1, aldur 550 Q, 550 QL, 550 QL1, ASTM A572 Gr. 65; A633 Gr. E; A738 Gr. A; A852; API 5 L X60 - X80, X60Q, X65Q, X70Q, X80Q

Typical analysis of the wire and of all-weld metal (wt.-%)

	C	Si	Mn	Ni	Mo	P	S
Wire %	0.12	0.20	1.70	0.95	0.60	≤ 0.010	≤ 0.010
Weld metal	0.08	0.25	1.70	0.90	0.55	≤ 0.014	≤ 0.010

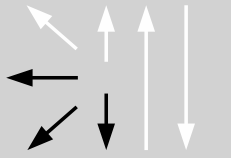
Mechanical properties of all-weld metal

Heat-treatment	Tensile test				Impact work ISO-V CVN J (Average value from 3 test results)				
	Tensile test Temperature	Yield strength R _{p0,2}	Tensile strength R _m	Elongation A (L ₀ =5d ₀)					
	°C	MPa	MPa	%	+20°C	0°C	-20°C	-40°C	-60°C
U	+20°C (68°F)	≥ 560	≥680	≥ 22	≥140	≥120	≥100	≥70	≥47
A1	+20°C (68°F)	≥ 560	≥660	≥ 22	≥140			≥70	≥47
A1	+350°C (662 °F)	≥ 420	≥590	≥ 24					
A1	+550°C (1022 °F)	≥ 290	≥410	≥ 25					
A2	+20°C (68°F)	≥ 560	≥630	≥ 22	≥140			≥80	≥47
A3	+20°C (68°F)	≥ 500	≥620	≥ 24	≥140				
A3	+350°C (662 °F)	≥ 420	≥580	≥ 24					
A3	+550°C (1022 °F)	≥ 190	≥330	≥ 32					

U = untreated , as welded ; A1 = 600 °C / 2 hrs (1076 - 1148 °F)

A2 = 620°C / 20 hrs ; A3 = 550 °C / 60 hrs (1022 °F) + 620 °C / 40 hrs (1148 °F) / air

Operating data



Polarity:
DC + / AC

SAW – single wire process DC+ or AC
Preheating and Interpass temp.: 180 – 240 °C
Heat Input \leq 2.3 kJ/mm

Approvals

TÜV (03021 and 08015)