

UV 420 TTR / UV 420 TTR-W

Fluoride basic type

Classifications	EN 760 SA FB 1 65 DC / SA FB 1 65 AC
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Characteristics and field of use UV 420 TTR is an agglomerated welding flux of the fluoride basic type, mainly for joining and surfacing applications on creep resistant steel qualities. It displays neutral metallurgical behaviour and is characterised by a high degree of purity. It is particularly suitable for welding hydrocrackers because of the low P pick-up of 0.004 % max. When used in combination with wire electrodes Union S 2 CrMo and Union S 1 CrMo 2 it is possible to meet the most stringent toughness requirements at subzero temperatures even after step-cooling treatment.

The UV 420 TTR-W variety permits sound welding on AC, by this achieving a higher level of toughness when welding with CrMo-alloyed sub arc wires.

Grain size EN 760: 3 - 20 (0.3 - 2.0 mm); 3 - 16 (0.3 - 1.6 mm)

Packaging 25 kg plastic bag (200 kg steel drum)

Advice It is advisable to redry the welding flux for around 2 h at 300-350 °C (572-662 °F) prior to use.

Main constituents in %	SiO ₂ +TiO ₂	CaO+MgO	Al ₂ O ₃ +MnO	CaF ₂
	15	35	21	26

Basicity (Boniszewski)	Mol.-%	Weight %
	3.4	2.5

Typical analysis for wire and weld metal in wt. %:

Designation	C	Si	Mn	Cr	Mo	Ni	Weld metal classification acc. to EN 756 AWS A 5.23 - SFA-5.23
Union S 2 Mo Weld metal	0.10 0.07	0.10 0.25	1.00 1.05	- -	0.50 0.45	- -	S 46 4 FB S2Mo F8A4-EA2-A2
Union S 4 Mo Weld metal	0.12 0.08	0.10 0.25	2.00 1.85	- -	0.50 0.45	- -	S 50 3 FB S4Mo F8P4-EA3-A3
Union S 2 CrMo Weld metal	0.12 0.08	0.10 0.25	0.80 1.00	1.20 1.10	0.50 0.45	- -	- F8P2-EB2R-B2
Union S 1 CrMo 2 Weld metal	0.10 0.07	0.10 0.25	0.50 0.75	2.40 2.25	1.00 0.95	- -	- F9P2-EB3R-B3R
Union S 3 NiMo Weld metal	0.08 0.05	0.10 0.25	1.50 1.50	- -	0.45 0.40	1.50 1.40	S 50 6 FB S3Ni1,5Mo F9A8-EG-F1
Union S 3 NiMo 1 Weld metal	0.12 0.08	0.10 0.25	1.60 1.55	- -	0.60 0.55	0.95 0.90	S 50 4 FB S3Ni1Mo F9A8-EG-F3-N

Mechanical properties of the weld metal, as welded:

Wire electrodes used	0.2% Yield strength ≥N/mm ²	Tensile strength ≥N/mm ²	Elongation l ₀ =5d ₀ ≥%	Impact values* ≥ J (CVN)				
				+20 °C	±0 °C	-20 °C	-40 °C	-60 °C
Union S 2 Mo	470	550	25	140	120	100	47	-
Union S 4 Mo	550	630	18	120	100	80	47	-
Union S 3 NiMo	560	660	22	140	120	100	47	47
Union S 3 NiMo 1	560	680	22	140	120	100	47	27

* Average values from 3 tests

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Mechanical properties of the weld metal at different heat treatments and test temperatures:

Wire electrodes used	Heat treatment	Test temperature 20 °C (68 °F)*			
		0.2% Yield strength ≥ N/mm ²	Tensile strength ≥ N/mm ²	Elongation l ₀ =5d ₀ ≥ %	Impact values ≥ J (CVN)
Union S 2 Mo	SR	470	550	24	165
	N + A	290	440	26	120
Union S 4 Mo	SR	500	600	24	140
	N + A	355	510	26	110
Union S 2 CrMo	A*	470	550	24	140
	N + A*	330	480	26	120
Union S 1 CrMo 2	A*	460	560	22	140
Union S 3 NiMo	SR	560	660	22	150
	N + A	420	540	24	120
Union S 3 NiMo 1	SR	560	660	22	140
	SO	500	620	24	140

A = tempered, 580 - 620 °C (1076 - 1148 °F) / air
 A* = tempered, 670 - 720 °C (1238 - 1328 °F)
 A** = Special heat treatment, please ask for report

SR = stress relieved, 580 - 620 °C (1076 - 1148 °F)
 SO = 60 h 550 °C (1022 °F) + 40 h 620 °C (1148 °F) / air
 N = normalized, 920 °C (1688 °F) / air

* = Average values from 3 tests

Mechanical properties of the weld metal of different heat treatments and test temperatures:

Wire electrodes used	Heat treatment	Test temperature 350 °C (662 °F)*			Test temp. 550 °C (1022 °F)*		
		0.2% Yield strength ≥ N/mm ²	Tensile strength ≥ N/mm ²	Elongation l ₀ =5d ₀ ≥ %	0.2% Yield strength ≥ N/mm ²	Tensile strength ≥ N/mm ²	Elongation l ₀ =5d ₀ ≥ %
Union S 2 Mo	SR	370	570	24	280	380	26
	N + A	220	420	25	170	310	30
Union S 4 Mo	SR	400	590	23	290	410	24
	N + A	280	470	20	190	330	30
Union S 2 CrMo	A*	380	540	22	280	420	26
	N + A*	200	440	19	180	340	24
Union S 1 CrMo 2	A*	380*	500*	20*	270	360	26
Union S 3 NiMo	SR	450	600	20	320	410	24
	N + A	320	510	25	220	350	28
Union S 3 NiMo 1	SR	420**	590**	24**	290	410	25
	SO	420**	580**	24**	190	330	32

A = tempered, 580 - 620 °C (1076 - 1148 °F) / air
 A* = tempered, 670 - 720 °C (1238 - 1328 °F)
 A** = Special heat treatment, please ask for report

SR = stress relieved, 580 - 620 °C (1076 - 1148 °F)
 SO = 60 h 550 °C (1022 °F) + 40 h 620 °C (1148 °F) / air
 N = normalized, 920 °C (1688 °F) / air

* = Average values from 3 tests
 + = Values at test temperature 450 °C (842 °F)
 ++ = Values at test temperature 400 °C (752 °F)

Approvals:*	TÜV	Controlas
Union S 2	x	
Union S 3	x	
Union S 2 Mo	x	
Union S 3 Mo	x	
Union S 2 CrMo	x	x
Union S 1 CrMo 2 **	x, TÜV, Wien	x
Union S 3 NiMo	x	
Union S 3 NiMo 1	x, also KTA 1408	
Union S 3 NiMoCr	x	

* only with UV 420 TTR ** also with UV 420 TTR-W