

# Welding flux for unalloyed, low-alloyed and medium-alloyed steels

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**Classifications****EN ISO 14174**

S A AR 1 76 AC H5

**Characteristics and typical fields of application**

**UV 305** is an aluminate-rutile agglomerated flux with medium Si and Mn pick-up for joining un- alloyed and low alloyed steel grades,

The flux finds its most important applications in high speed fillet welding, especially fin-to-tube in water-wall construction for thermal power generation (boiler), with Union S 2 Mo, S 2 CrMo, S 1 CrMo 2 and S P24.

Also very good performance in two-run technique (longitudinal and circular seams), especially for very thin wall thickness.

Wall thickness is recommended up to 10 mm sheet thickness in other general purpose applications. It has outstanding good slag detachability (even in narrow grooves) and allows high welding speed. Best welding performance is with DC+ current with single wire and Twin-arc process.

**Flux properties**

Polarity	DC / AC
Basicity index (Boniszewski)	0.6
Grain size (EN ISO 14174)	4 – 14 (0.4 – 1.4 mm)
Flux consumption	1 kg flux per kg wire
Redrying	300 – 350°C. min 2 hrs
Diffusible hydrogen (ISO 3690)	< 5 ml / 100gr (as produced / re-dried)

**Composition of sub-arc welding flux**

	SiO <sub>2</sub> +TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub> +MnO	CaF <sub>2</sub> +CaO+MgO
wt. %	30	55	8

**Typical wires to combine**

Name	EN ISO	Class	AWS / SFA	Class
Union S 2	14171-A	S2		
Union S 2 Si	14171-A	S2Si	A5.17 / -5.17	EM12K
Union S 2 Mo	14171-A	S2Mo	A5.23 / -5.23	EA2
Union MV Mo S	14171-A	T2Mo	A5.23 / -5.23	ECA2
Union MV Mo S	24598-A	S T Mo	A5.23 / -5.23	ECA2
Union S 2 CrMo	24598-A	S S CrMo1	A5.23 / -5.23	EB2R
Union MV CrMo S	24598-A	S T CrMo1	A5.23 / -5.23	ECB2
Union S 1 CrMo 2	24598-A	S S CrMo2	A5.23 / -5.23	EB3R
Union MV CrMo 910 S	24598-A	S T CrMo2	A5.23 / -5.23	ECB3
Union S P23	24598-A	S S ZCrWV 2 1,5	A5.23 / -5.23	EB23
Union S P24	24598-A	S S ZCrMo2VNb	A5.23 / -5.23	EB24

**Packaging**

<b>Type</b>	<b>Weight</b>
DRY SYSTEM	25 kg
PE-bag	25 kg

# UV 306



aluminate-rutile type

## Classifications

**EN ISO 14174**

S A AR 1 77 AC H5

## Characteristics and typical fields of application

**UV 306** is an agglomerated aluminate-rutile flux submerged arc welding of unalloyed steel grades.

It is recommended for general-purpose applications and light steel constructions.

It is suited for direct and alternating current. It can be used for single- and multi-wire welding with high welding speed using the two-run technique as well as for fillet welding. Mainly for single pass welds on thin plates (or a few subsequent passes). Very good slag removability and nice bead appearance.

This flux has also been available on the market as "BÖHLER BB 306".

## Flux properties

Polarity	DC / AC
Basicity index (Boniszewski)	0.6
Grain size (EN ISO 14174)	3 - 16 (0.3 - 1.6 mm)
Flux consumption	0.7 - 1.6 kg flux per kg wire
Redrying	300 - 350°C, min 2 hrs
Diffusible hydrogen (ISO 3690)	≤ 5 ml / 100gr (as produced / re-dried)

## Composition of sub-arc welding flux

wt. %	SiO <sub>2</sub> +TiO <sub>2</sub> 24	Al <sub>2</sub> O <sub>3</sub> +MnO 50	CaF <sub>2</sub> +CaO+MgO 14
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## Typical wires to combine

Name	EN ISO	Class	AWS / SFA	Class
Union S 2	14171-A	S2		
Union S 2 Si	14171-A	S2Si	A5.17 / -5.17	EM12K
BÖHLER SUBARC T55 HP	14171-A	T3	A5.17 / -5.17	EC1
Union S 2 Mo	14171-A	S2Mo	A5.23 / -5.23	EA2
BÖHLER SUBARC TNiCu1	14171-A	T2Ni1Cu	A5.23 / -5.23	ECG

## Packaging

Type	Weight
PE-bag	25 kg

**Classifications****EN ISO 14174**

S A AB 1 65 AC H5

**Characteristics and typical fields of application**

**UV 309 P** is an agglomerated aluminate-basic flux for submerged arc welding for the manufacture of pipes, using the two-run technique, in unalloyed and low alloyed steel grades.

The flux has been designed to achieve best operative characteristics in multi-wire DSAW applications (2-5 wires). The flux generates a low amount of diffusible hydrogen content  $HD < 5 \text{ ml}/100\text{gr}$  acc to ISO 3690.

The basic flux has a neutral metallurgical behaviour regarding to Mn and Si and is suitable for sour service applications.

Suitable for longitudinal and spiral pipe welding. Nice flat bead appearance with very good slag detachability. High current carrying capacity.

Depending on wire selection and welding conditions the flux can be used for pipe steel grades acc. to API: Grade X 42 to X 80.

**Flux properties**

Polarity	DC / AC
Basicity index (Boniszewski)	1.3
Grain size (EN ISO 14174)	3 – 20 (0.3 – 2.0 mm)
Apparent density	1.15-1.30 kg/dm <sup>3</sup>
Flux consumption	0.9 - 1.1 kg flux per kg wire
Redrying	300 – 350°C. min 2 hrs
Diffusible hydrogen (ISO 3690)	≤ 5 ml / 100gr (as produced / re-dried)
Moisture content (AWS A4.4M: 2001; 1050 °C)	≤ 0.05 % (as produced / re-dried)

**Composition of sub-arc welding flux**

	SiO <sub>2</sub> +TiO <sub>2</sub>	CaO+MgO	Al <sub>2</sub> O <sub>3</sub> +MnO	CaF <sub>2</sub>
wt. %	22	27	32	14

**Typical wires to combine**

Name	EN ISO	Class	AWS / SFA	Class
Union S 2	14171-A	S2		
Union S 3 Si	14171-A	S3Si	A5.17 / -5.17	EH12K
Union S 3 TiB	14171-A	SZ	A5.23 / -5.23	EG
Union S 2 Mo	14171-A	S2Mo	A5.23 / -5.23	EA2
Union S 4 Mo	14171-A	S4Mo	A5.23 / -5.23	EA3
Union S 3 MoTiB	14171-A	S2MoTiB	A5.23 / -5.23	EA2TiB

**Packaging**

Type	Weight
BIGBAG DRY SYSTEM	500 kg / 1000 kg
DRY SYSTEM	25 kg
PE-bag	25 kg

# UV 310 P

aluminate-basic type

## Classifications

EN ISO 14174

S A AB 1 55 AC H5

## Characteristics and typical fields of application

**UV 310 P** is an agglomerated aluminate-basic flux for submerged arc welding of unalloyed and low alloyed steel grades. The basic flux has a neutral metallurgical behaviour regarding to Mn and Si and is suitable for sour service applications. The flux has been optimised for the manufacture of pipes using the two-run technique and has a high current carrying capacity. Suitable for longitudinal pipe welding and spiral pipe welding with single wire, and especially multi-wire applications with 2-5 wires (DC+ / AC). Nice flat bead appearance with very good slag detachability.

The flux generates a very low amount of diffusible hydrogen content  $HD < 4 \text{ ml}/100\text{gr}$  acc to ISO 3690 in the weld metal. During welding activities the flux shows a very low tendency concerning moisture pick-up and consequently a rapid increase of diffusible hydrogen in the weld metal is avoided.

The slag composition of UV 310 P has been adapted to reduce possible negative effects of the eventual presence of copper particles.

UV 310 P has been designed to achieve best CTOD- and charpy toughness properties in two-run applications with wires like Union S 3 MoTiB, Union S 3 TiB (and Union S 2 Mo). Depending on wire selection and welding conditions the flux can be used for pipe steel grades acc. to API: Grade X 42 to X 80.

## Flux properties

Polarity	DC / AC
Basicity index (Boniszewski)	1.5
Grain size (EN ISO 14174)	3 – 20 (0.3 – 2.0 mm)
Apparent density	1.15-1.30 kg/dm <sup>3</sup>
Flux consumption	0.9 - 1.1 kg flux per kg wire
Redrying	300 – 350°C. min 2 hrs ; max 3 cycles
Diffusible hydrogen (ISO 3690)	≤ 4 ml / 100gr (as produced / re-dried).
Moisture content (AWS A4.4M: 2001; 1050 °C)	≤ 0.05 % (as produced / re-dried).

## Composition of sub-arc welding flux

wt. %	SiO <sub>2</sub> +TiO <sub>2</sub>	CaO+MgO	Al <sub>2</sub> O <sub>3</sub> +MnO	CaF <sub>2</sub>
	18 %	25 %	35 %	17 %

## Typical wires to combine

Name	EN ISO	Class	AWS / SFA	Class
Union S 2	14171-A	S2		
Union S 2 Si	14171-A	S2Si	A5.17 / -5.17	EM12K
Union S 3 Si	14171-A	S3Si	A5.17 / -5.17	EH12K
Union S 3 TiB	14171-A	SZ	A5.23 / -5.23	EG
Union S 2 Mo	14171-A	S2Mo	A5.23 / -5.23	EA2
Union S 4 Mo	14171-A	S4Mo	A5.23 / -5.23	EA3
Union S 3 MoTiB	14171-A	S2MoTiB	A5.23 / -5.23	EA2TiB

## Packaging

Type	Weight
BIGBAG DRY SYSTEM	500kg / 1000 kg
DRY SYSTEM	25 kg
PE-bag	25 kg

**Classifications****EN ISO 14174**

S A AB 1 67 AC H5

**Characteristics and typical fields of application**

**UV 400** is an agglomerated flux of aluminate basic type designed for joining and surfacing applications with general-purpose structural steels, fine grained structural steels, boiler and pipe steels. The flux is characterized by its low silicon and moderate manganese pickup. It can be used on DC and AC. Its good welding characteristics and the technological properties of the weld metal produced with different wires permit universal use.

This flux has also been available on the market as "BÖHLER BB 400".

**Flux properties**

Polarity	DC / AC
Basicity index (Boniszewski)	2.0
Grain size (EN ISO 14174)	3 – 20 (0.3 – 2.0 mm)
Flux consumption	1.0 kg flux per kg wire
Redrying	300 – 350 °C. 2 hrs min.
Diffusible hydrogen (ISO 3690)	≤ 5 ml / 100gr (as produced / re-dried)

**Composition of sub-arc welding flux**

wt. %	SiO <sub>2</sub> +TiO <sub>2</sub>	CaO+MgO	Al <sub>2</sub> O <sub>3</sub> +MnO	CaF <sub>2</sub>
	20	30	26	16

**Typical wires to combine**

Name	EN ISO	Class	AWS / SFA	Class
Union S 2	14171-A	S2		
Union S 2 Si	14171-A	S2Si	A5.17 / -5.17	EM12K
Union S 2 Mo	14171-A	S2Mo	A5.23 / -5.23	EA2
BÖHLER SUBARC TNiCu1	14171-A	T2Ni1Cu	A5.23 / -5.23	ECG

**Packaging**

Type	Weight
DRY SYSTEM	25 kg
PE-bag	25 kg

# UV 418 TT

fluoride-basic type

## Classifications

EN ISO 14174

S A FB 1 55 AC H5

## Characteristics and typical fields of application

**UV 418 TT** is an agglomerated fluoride basic flux for submerged arc welding of a very wide scope of unalloyed and low alloyed steel grades. It has a high basicity and neutral metallurgical behaviour and is designed for medium and high strength fine grained structural steels.

Delivers very good toughness properties at -60°C and CTOD values at -30°C in as welded and PWHT-condition.

The flux has, due to its great current carrying capacity, also a great capability for 2 run procedures with unalloyed and low alloyed wire grades (e.g. Union S 2 Mo and Union S 3 MoTiB), with very good toughness properties. In general the flux gives a very nice bead appearance with very good slag release, even in narrow gap preparations.

## Flux properties

Polarity	DC / AC
Basicity index (Boniszewski)	2.7
Grain size (EN ISO 14174)	3 – 20 (0.3 – 2.0 mm)
Flux consumption	1.0 kg flux per kg wire
Redrying	300 – 350 °C. 2 hrs min.
Diffusible hydrogen (ISO 3690)	≤ 5 ml / 100gr (as produced / re-dried)

## Composition of sub-arc welding flux

wt. %	SiO <sub>2</sub> +TiO <sub>2</sub>	CaO+MgO	Al <sub>2</sub> O <sub>3</sub> +MnO	CaF <sub>2</sub>	CaF <sub>2</sub> +CaO+MgO
	15	38	20	25	-

## Typical wires to combine

Name	EN ISO	Class	AWS / SFA	Class
Union S 2	14171-A	S2		
Union S 2 Si	14171-A	S2Si	A5.17 / -5.17	EM12K
Union S 3 Si	14171-A	S3Si	A5.17 / -5.17	EH12K
Union S 2 Mo	14171-A	S2Mo	A5.23 / -5.23	EA2
Union S 3 Mo	14171-A	S3Mo	A5.23 / -5.23	EA4
Union S 3 Mo	24598-A	S S MnMo	A5.23 / -5.23	EA4
Union S 4 Mo	14171-A	S4Mo	A5.23 / -5.23	EA3
Union S 2 Ni 2,5	14171-A	S2Ni2	A5.23 / -5.23	ENi2
Union S 2 Ni 3,5	14171-A	S2Ni3	A5.23 / -5.23	ENi3
Union S 2 NiMo 1	14171-A	S2Ni1Mo	A5.23 / -5.23	ENi1
Union S 3 NiMo 1	26304-A	S3Ni1Mo	A5.23 / -5.23	EF3
Union S 3 NiMo	14171-A	S3Ni1,5Mo	A5.23 / -5.23	EG

## Packaging

Type	Weight
BIGBAG DRY SYSTEM	500 kg / 1000 kg
DRY SYSTEM	25 kg
Metal bucket	30 kg
PE-bag	25 kg



**Classifications****EN ISO 14174**

S A FB 1 55 AC H5

**Characteristics and typical fields of application**

**UV 421 TT** is an agglomerated fluoride basic flux for submerged arc welding of unalloyed and low alloyed steel grades. It has a high basicity and neutral metallurgical behaviour and is designed for medium and high strength fine grained structural steels.

This flux finds its main application in welding shops as the multi-purpose flux to cover the widest range of applications in as welded and PWHT applications. It can be combined with many wire-grades types (solid and cored), supported by the widest collection of approvals.

Suited for very good toughness properties and CTOD values in as welded condition and PWHT-condition. In general the flux gives a very nice bead appearance with very good slag release, even in narrow weld preparations.

**Flux properties**

Polarity	DC / AC
Basicity Index (Boniszewski)	2.7
Grain size (EN ISO 14174)	3 – 20 (0.3 – 2.0 mm)
Apparent density	1 kg/dm <sup>3</sup>
Flux consumption	1.0 kg flux per kg wire
Redrying	300 – 350 °C. 2 hrs min.
Diffusible hydrogen (ISO 3690)	≤ 5 ml / 100gr (as produced / re-dried)

**Composition of sub-arc welding flux**

	SiO <sub>2</sub> +TiO <sub>2</sub>	CaO+MgO	Al <sub>2</sub> O <sub>3</sub> +MnO	CaF <sub>2</sub>
wt. %	15	38	20	25

**Typical wires to combine**

Name	EN ISO	Class	AWS / SFA	Class
Union S 2	14171-A	S2		
Union S 2 Si	14171-A	S2Si	A5.17 / -5.17	EM12K
Union S 3 Si	14171-A	S3Si	A5.17 / -5.17	EH12K
BÖHLER SUBARC T55 HP	14171-A	T3	A5.17 / -5.17	EC1
Union S 2 Mo	14171-A	S2Mo	A5.23 / -5.23	EA2
Union S 3 Mo	14171-A	S3Mo	A5.23 / -5.23	EA4
Union S 3 Mo	24598-A	S S MnMo	A5.23 / -5.23	EA4
Union S 4 Mo	14171-A	S4Mo	A5.23 / -5.23	EA3
Union S 2 Ni 2,5	14171-A	S2Ni2	A5.23 / -5.23	ENi2
Union S 2 Ni 3,5	14171-A	S2Ni3	A5.23 / -5.23	ENi3
BÖHLER SUBARC TNiCu1	14171-A	T2Ni1Cu	A5.23 / -5.23	ECG
Union S 2 NiMo 1	14171-A	S2Ni1Mo	A5.23 / -5.23	ENi1
BÖHLER SUBARC T60	14171-A	TZ3Ni1	A5.23 / -5.23	ECNi1
Union S 3 NiMo 1	26304-A	S3Ni1Mo	A5.23 / -5.23	EF3
Union S 3 NiMo	14171-A	S3Ni1,5Mo	A5.23 / -5.23	EG
Union S 3 NiMoCr	26304-A	SZ3Ni2,5CrMo	A5.23 / -5.23	EG

**Packaging**

Type	Weight
DRY SYSTEM	25 kg
Metal bucket	30 kg
PE-bag	25 kg

# UV 419 TT-W

fluoride-basic type

## Classifications

**EN ISO 14174**  
S A FB 1 55 AC

**EN ISO 14174**  
S A FB 1 55 DC H5

## Characteristics and typical fields of application

**UV 419 TT-W** is an agglomerated fluoride-basic flux for submerged arc welding of unalloyed and low alloyed steel grades. The basic flux has a neutral metallurgical behaviour regarding to Mn and Si, and is mainly recommended for multi-run procedures for relative great wall thickness. Nice flat bead appearance with very good slag detachability, especially in narrow gap applications.

Metallurgically, the flux has been optimised to provide excellent mechanical properties as well after PWHT-duration as also in as welded condition.

The flux generates a low amount of diffusible hydrogen content  $HD < 5 \text{ ml}/100\text{gr}$  according to ISO 3690 in the weld metal.

## Flux properties

Polarity	DC / AC
Basicity Index (Boniszewski)	2.6
Grain size (EN ISO 14174)	3-20 (0.3 bis 2.0 mm)
Apparent density	1 kg/dm <sup>3</sup>
Flux consumption	0.9 - 1.1 kg flux per kg wire
Redrying	300 – 350°C. min 2 hrs
Diffusible hydrogen (ISO 3690)	≤ 5 ml / 100gr (as produced / re-dried. DC+)

## Composition of sub-arc welding flux

	SiO <sub>2</sub> +TiO <sub>2</sub>	CaO+MgO	Al <sub>2</sub> O <sub>3</sub> +MnO	CaF <sub>2</sub>
wt. %	15 %	35 %	21 %	26 %

## Typical wires to combine

Name	EN ISO	Class	AWS / SFA	Class
Union S 3 Si	14171-A	S3Si	A5.17 / -5.17	EH12K
BÖHLER SUBARC T55 HP	14171-A	T3	A5.17 / -5.17	EC1
Union S 2 Mo	14171-A	S2Mo	A5.23 / -5.23	EA2
Union S 3 MoTiB	14171-A	S2MoTiB	A5.23 / -5.23	EA2TiB
Union S 2 CrMo	24598-A	S S CrMo1	A5.23 / -5.23	EB2R
BÖHLER SUBARC T60	14171-A	TZ3Ni1	A5.23 / -5.23	ECNi1
Union S 2 NiMo 1	14171-A	SZ2Ni1Mo	A5.23 / -5.23	ENi1
Union S 3 NiMo 1	26304-A	S3Ni1Mo	A5.23 / -5.23	EF3

## Packaging

<b>Type</b>	<b>Weight</b>
DRY SYSTEM	25 kg

**Classifications**
**EN ISO 14174**  
S A FB 1 65 AC H5

**EN ISO 14174**  
S A FB 1 65 DC H4
**Characteristics and typical fields of application**

UV 422 TT-LH is an agglomerated fluoride-basic flux for submerged arc welding of non-alloyed and low alloyed steel grades. The flux has good welding behaviour and can be used in single and multi-wire applications with solid and flux-cored SA-wires. Nice flat bead appearance with very good slag detachability.

The flux has been optimised for the highest strength levels (700 till 1100 MPa) with high toughness requirements. The flux generates a very low amount of diffusible hydrogen content HD < 4ml/100gr acc to ISO 3690 in the weld metal. Also during welding activities the flux shows a very low tendency concerning moisture pick-up and consequently a rapid increase of diffusible hydrogen in the weld metal is avoided.

Applications in high tensile strength constructions (S460-S1100) in off-shore industry and heavy lifting equipment and hydro-power.

**Flux properties**

Polarity	DC / AC
Basicity index (Boniszewski)	2.5
Grain size (EN ISO 14174)	3-20 (0.3 bis 2.0 mm)
Flux consumption	0.9 - 1.1 kg flux per kg wire
Redrying	300 – 350°C. min 2 hrs
Diffusible hydrogen (ISO 3690)	≤ 4 ml / 100gr (as produced / re-dried. DC+)
Moisture content (AWS A4.4M: 2001; 1050 °C)	≤ 0.1 % (as produced / re-dried)

**Composition of sub-arc welding flux**

wt. %	SiO <sub>2</sub> +TiO <sub>2</sub>	CaO+MgO	Al <sub>2</sub> O <sub>3</sub> +MnO	CaF <sub>2</sub>
	18 %	42 %	19 %	19 %

**Typical wires to combine**

Name	EN ISO	Class	AWS / SFA	Class
Union S 3 Si	14171-A	S3Si	A5.17 / -5.17	EH12K
BÖHLER SUBARC T55 HP	14171-A	T3	A5.17 / -5.17	EC1
Union S 3 NiMo 1	26304-A	S3Ni1Mo	A5.23 / -5.23	EF3
BÖHLER NiCrMo 1-UP	26304-A	SZ2Ni0,9MoCr	A5.23 / -5.23	EG
Union S 3 NiMoCr	26304-A	SZ3Ni2,5CrMo	A5.23 / -5.23	EG
BÖHLER Subarc S 700 HP	26304-A	TZ	A5.23 / -5.23	ECF5
BÖHLER SUBARC T85	26304-A	TZ	A5.23 / -5.23	ECF5
BÖHLER Subarc S 900 HP	26304-A	TZ	A5.23 / -5.23	ECG

**Packaging**

Type	Weight
DRY SYSTEM	25 kg
Metal bucket	30 kg

# UV 420 TT-LH

fluoride-basic type

## Classifications

EN ISO 14174

SA FB 1 65 DC H5

## Characteristics and typical fields of application

UV 420 TT-LH is an agglomerated flux of fluoride basic type characterised by the neutral metallurgical behaviour. In combination with suitable wire electrodes, the weld metal exhibits good toughness properties at low temperatures. For joining and surfacing applications with general purpose structural steels, fine grained structural steels and creep resistant steels. It is suited for single wire and tandem welding.

This flux has also been available on the market as "BÖHLER BB 24".

## Flux properties

Polarity	DC
Basicity index (Boniszewski)	2.5
Grain size (EN ISO 14174)	3 – 25 (0.3 – 2.5 mm)
Flux consumption	1.0 kg flux per kg wire
Redrying	300 – 350 °C. 2 hrs min.
Diffusible hydrogen (ISO 3690)	≤ 5 ml / 100gr (as produced / re-dried)

## Composition of sub-arc welding flux

wt. %	SiO <sub>2</sub> +TiO <sub>2</sub>	CaO+MgO	Al <sub>2</sub> O <sub>3</sub> +MnO	CaF <sub>2</sub>
	15	35	21	28

## Typical wires to combine

Name	EN ISO	Class	AWS / SFA	Class
Union S 2	14171-A	S2		
Union S 3	14171-A	S3	A5.17 / -5.17	EH10
Union S 2 Mo	14171-A	S2Mo	A5.23 / -5.23	EA2
Union S 3 Mo	14171-A	S3Mo	A5.23 / -5.23	EA4
Union S 3 Mo	24598-A	S S MnMo	A5.23 / -5.23	EA4
Union S 4 Mo	14171-A	S4Mo	A5.23 / -5.23	EA3
Union S 2 Ni 2,5	14171-A	S2Ni2	A5.23 / -5.23	ENi2
Union S 3 NiMo 1	26304-A	S3Ni1Mo	A5.23 / -5.23	EF3
Union S 3 NiMo	14171-A	S3Ni1,5Mo	A5.23 / -5.23	EG
Union S 2 CrMo	24598-A	S S CrMo1	A5.23 / -5.23	EB2R
Union S 1 CrMo 2	24598-A	S S CrMo2	A5.23 / -5.23	EB3R
Union S 1 CrMo 5	24598-A	S S CrMo5	A5.23 / -5.23	EB6
Thermanit MTS 4	24598-A	S S CrMoWV12	A5.23 / -5.23	EG

## Packaging

Type	Weight
DRY SYSTEM	25 kg
PE-bag	25 kg

**Classifications**

**EN ISO 14174**  
 SA FB 1 65 DC

**Characteristics and typical fields of application**

UV 420 TT is an agglomerated flux of fluoride basic type characterised by the neutral metallurgical behaviour. In combination with suitable wire electrodes, the weld metal exhibits good toughness properties at low temperatures. For joining and surfacing applications with general purpose structural steels, fine grained structural steels and creep resistant steels. It is suited for single wire and tandem welding.

**Flux properties**

Polarity	DC
Basicity index (Boniszewski)	2.5
Grain size (EN ISO 14174)	Standard 3 – 20 (0.3 – 2.0 mm) ; on request 3 – 25 (0.3 – 2.5 mm)
Flux consumption	1.0 kg flux per kg wire
Redrying	300 – 350 °C. 2 hrs min.

**Composition of sub-arc welding flux**

	SiO <sub>2</sub> +TiO <sub>2</sub>	CaO+MgO	Al <sub>2</sub> O <sub>3</sub> +MnO	CaF <sub>2</sub>
wt. %	15	35	21	26

**Typical wires to combine**

Name	EN ISO	Class	AWS / SFA	Class
Union S 2	14171-A	S2		
Union S 3	14171-A	S3	A5.17 / -5.17	EH10
Union S 2 Mo	14171-A	S2Mo	A5.23 / -5.23	EA2
Union S 3 Mo	14171-A	S3Mo	A5.23 / -5.23	EA4
Union S 3 Mo	24598-A	S S MnMo	A5.23 / -5.23	EA4
Union S 4 Mo	14171-A	S4Mo	A5.23 / -5.23	EA3
Union S 2 Ni 2,5	14171-A	S2Ni2	A5.23 / -5.23	ENi2
Union S 3 NiMo 1	26304-A	S3Ni1Mo	A5.23 / -5.23	EF3
Union S 3 NiMo	14171-A	S3Ni1,5Mo	A5.23 / -5.23	EG
Union S 2 CrMo	24598-A	S S CrMo1	A5.23 / -5.23	EB2R
Union S 1 CrMo 2	24598-A	S S CrMo2	A5.23 / -5.23	EB3R
Union S 1 CrMo 5	24598-A	S S CrMo5	A5.23 / -5.23	EB6
Thermanit MTS 4	24598-A	S S CrMoWW12	A5.23 / -5.23	EG

**Packaging**

<b>Type</b>	<b>Weight</b>
Metal bucket	30 kg
PE-bag	25 kg

# UV 420 TTR

fluoride-basic type

## Classifications

EN ISO 14174

SA FB 1 65 DC

## Characteristics and typical fields of application

UV 420 TTR is an agglomerated fluoride-basic flux for Submerged Arc Welding of un- and low-alloyed steel grades. It is characterized by its neutral metallurgical behaviour and has been designed mainly for multi-pass welding. Very good slag detachability in narrow gap weld preparations.

UV 420 TTR has been optimised for welding operations in combination with wire electrodes Union S 1 CrMo 2 and Union S 2 CrMo to maintain high strength levels after long PWHT-durations with good toughness. The pick-up of Phosphorus is limited to +0.004 % and makes the flux suited for step-cooling requirements.

## Flux properties

Polarity	DC
Basicity index (Boniszewski)	2.9
Grain size (EN ISO 14174)	3 – 20 (0.3 – 2.0 mm)
Apparent density	1.0 kg/dm <sup>3</sup>
Flux consumption	0.9 - 1.1 kg flux per kg wire
Redrying	300 – 350 °C. 2 hrs min.

## Composition of sub-arc welding flux

	SiO <sub>2</sub> +TiO <sub>2</sub>	CaO+MgO	Al <sub>2</sub> O <sub>3</sub> +MnO	CaF <sub>2</sub>
wt. %	14	34	19	26

## Typical wires to combine

Name	EN ISO	Class	AWS / SFA	Class
Union S 3 Mo	14171-A	S3Mo	A5.23 / -5.23	EA4
Union S 3 Mo	24598-A	S S MnMo	A5.23 / -5.23	EA4
Union S 4 Mo	14171-A	S4Mo	A5.23 / -5.23	EA3
Union S 3 NiMo 1	26304-A	S3Ni1Mo	A5.23 / -5.23	EF3
Union S 3 NiMo	14171-A	S3Ni1,5Mo	A5.23 / -5.23	EG
Union S 2 CrMo	24598-A	S S CrMo1	A5.23 / -5.23	EB2R
Union S 1 CrMo 2	24598-A	S S CrMo2	A5.23 / -5.23	EB3R
Union S 1 CrMo 5	24598-A	S S CrMo5	A5.23 / -5.23	EB6

## Packaging

Type	Weight
DRY SYSTEM	25 kg
Metal bucket	30 kg

## Classifications

**EN ISO 14174**  
SA FB 1 65 AC

## Characteristics and typical fields of application

**UV 420 TTR-W** is an agglomerated fluoride-basic flux for Submerged Arc Welding of un- and low-alloyed steel grades. It is characterized by its neutral metallurgical behaviour and has been designed mainly for multi-pass welding. During welding the flux shows very nice operative characteristics on both AC and DC+, and is suitable for Tandem process. Also very good slag detachability in narrow gap weld is especially recommended for welding operations with AC-polarity in combination with wire electrodes Union S 1 CrMo 2 and Union S 2 CrMo, to maintain highest strength levels after long PWHT-durations and meet the most stringent toughness requirements at sub-zero temperatures even after step-cooling treatment. The pick-up of Phosphorus is limited to +0.004 %.

UV 420 TTR-W is particularly suitable for welding hydrocrackers with Union S 1 CrMo 2 on AC-polarity for the highest mechanical properties, however the flux can also be applied in DC+ polarity, and also with other wires grades.

## Flux properties

Polarity	DC / AC
Basicity index (Boniszewski)	2.6
Grain size (EN ISO 14174)	3 – 20 (0.3 – 2.0 mm)
Apparent density	1.0 kg/dm <sup>3</sup>
Flux consumption	0.9 - 1.1 kg flux per kg wire
Redrying	300 – 350 °C. 2 hrs min.

## Composition of sub-arc welding flux

	SiO <sub>2</sub> +TiO <sub>2</sub>	CaO+MgO	Al <sub>2</sub> O <sub>3</sub> +MnO	CaF <sub>2</sub>
wt. %	14	34	22	27

## Typical wires to combine

Name	EN ISO	Class	AWS / SFA	Class
Union S 2 CrMo	24598-A	S S CrMo1	A5.23 / -5.23	EB2R
Union S 1 CrMo 2	24598-A	S S CrMo2	A5.23 / -5.23	EB3R

## Packaging

Type	Weight
PE-bag	25 kg
DRY SYSTEM	25 kg
Metal bucket	30 kg

# UV 420 TTR-C

fluoride-basic type

## Classifications

**EN ISO 14174**  
SA FB 1 65 DC

## Characteristics and typical fields of application

**UV 420 TTR-C** is an agglomerated fluoride-basic welding flux with high basicity. It is characterized by its neutral metallurgical behaviour and has been designed mainly for multi-pass welding.

UV 420 TTR-C is applied in high strength and creep resistant applications that need PWHT at relative high temperatures (e.g. 632 – 660°C) for long duration (e.g. 6-26 hrs). Also suited for weldments that will be exposed to a normalising heat treatment (N+A / Q +A).

The flux has Carbon support as special feature. Depending on the Carbon content in the wire, it results in either a reduced loss or a small increase of Carbon. Compared to UV 420 TTR the Carbon content in the weld metal is about 0.02 – 0.04% higher.

## Flux properties

Polarity	DC
Basicity Index (Boniszewski)	2.6
Grain size (EN ISO 14174)	3 – 20 (0.3 – 2.0 mm)
Apparent density	1.0 kg/dm <sup>3</sup>
Flux consumption	0.9 - 1.1 kg flux per kg wire
Redrying	300 – 350°C. min 2 hrs

## Composition of sub-arc welding flux

	SiO <sub>2</sub> +TiO <sub>2</sub>	CaO+MgO	Al <sub>2</sub> O <sub>3</sub> +MnO	CaF <sub>2</sub>
wt. %	15	35	21	26

## Typical wires to combine

Name	EN ISO	Class	AWS / SFA	Class
Union S 2 NiMo 1	14171-A	SZ2Ni1Mo	A5.23 / -5.23	ENi1
Union S 3 NiMo 1	26304-A	S3Ni1Mo	A5.23 / -5.23	EF3
Union S Ni1MoCr	26304-A	SZ3Ni0,9MoCr	A5.23 / -5.23	EG
Union S 2 CrMo	24598-A	S S CrMo1	A5.23 / -5.23	EB2R
Union S 1 CrMo 2	24598-A	S S CrMo2	A5.23 / -5.23	EB3R

## Packaging

Type	Weight
PE-bag	25 kg
DRY SYSTEM	25 kg
Metal bucket	30 kg



## Classifications

**EN ISO 14174**  
 S A FB 1 55 AC

## Characteristics and typical fields of application

**UV 430 TTR-W** is a basic agglomerated welding flux with high basicity, for welding high temperature creep resistant steel grade 2,25%Cr – 1%Mo – 0,25%V.

It is characterised by its neutral metallurgical behaviour and is optimised for AC current to give highest toughness at low/sub-zero temperatures, even after step-cooling heat treatment.

Also suitable to use in tandem configuration (AC/AC and DC+/AC).

## Flux properties

Polarity	AC or AC/DC+ or AC/AC
Basicity index (Boniszewski)	2.6
Grain size (EN ISO 14174)	3 – 16 (0.3 – 1.6 mm)
Apparent density	1.0 kg/dm <sup>3</sup>
Redrying	300 – 350 °C / 2 hrs min.

## Composition of sub-arc welding flux

wt. %	SiO <sub>2</sub> +TiO <sub>2</sub>	CaO+MgO	Al <sub>2</sub> O <sub>3</sub> +MnO	CaF <sub>2</sub>
	15	35	21	26

## Typical wires to combine

<b>Name</b>	<b>EN ISO</b>	<b>Class</b>	<b>AWS / SFA</b>	<b>Class</b>
Union S 1 CrMo 2 V	24598-A	S S ZCrMoV2	A5.23 / -5.23	EG

## Packaging

<b>Type</b>	<b>Weight</b>
DRY SYSTEM	25 kg

# Marathon 543



fluoride-basic type

## Classifications

EN ISO 14174

S A FB 1 55 DC H5

## Characteristics and typical fields of application

**Marathon 543** is an agglomerated fluoride-basic special welding flux with high basicity suitable for multi-run welding high creep resistant 9%Cr-steels like grade P91/T91, 1.4903 - X10CrMoVNb9-1, grade P92/T92, NF616 and 1.4905 - X11CrMoWVNb9-1-1.

The metallurgical behaviour concerning Si and Mn is neutral. The flux produces well contoured and smooth welding beads with good slag release as well as appropriate weld metal ductility and impact behaviour after tempering. Marathon 543 is a hydrogen-controlled welding flux with hydrogen contents of maximum 5 ml / 100 gr weld deposit.

This flux has also been available on the market as "BÖHLER BB 910".

## Flux properties

Polarity	DC
Basicity Index (Boniszewski)	2.9
Grain size (EN ISO 14174)	3-20 (0.3–2.0 mm)
Apparent density	1.0 kg/dm <sup>3</sup>
Redrying	300 – 350 °C / 2 hrs min.

## Composition of sub-arc welding flux

wt. %	SiO <sub>2</sub> +Al <sub>2</sub> O <sub>3</sub>	CaF <sub>2</sub> +CaO+MgO
	35	60

## Typical wires to combine

Name	EN ISO	Class	AWS / SFA	Class
Union S 1 CrMo 5	24598-A	S S CrMo5	A5.23 / -5.23	EB6
BÖHLER CM 9-UP	24598-A	S S CrMo9	A5.23 / -5.23	EB8
Thermanit MTS 3	24598-A	S S CrMo91	A5.23 / -5.23	EB91
Thermanit MTS 3 LNI	24598-A	S S ZCrMo91	A5.23 / -5.23	EB91
Thermanit MTS 616	24598-A	S S ZCrMoWVNb 9 0,5 1,5	A5.23 / -5.23	EG (EB91(mod.))
Thermanit MTS 911	24598-A	S S ZCrMoWVNb 9 1 1	A5.23 / -5.23	EG (EB91(mod.))
Thermanit MTS 4	24598-A	S S CrMoWV12	A5.23 / -5.23	EG

## Packaging

Type	Weight
Metal bucket	30 kg
DRY SYSTEM	25 kg