



**elektrode jesenice** d.o.o.

## AGGLOMERATED WELDING FLUXES

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# AR 18.5

## Classification:

EN ISO 14174 SA AR 1 88 AC  
 EN ISO 14171-A S 42 0 AR S2  
 EN ISO 14171-A S 46 0 AR S2Mo  
 EN ISO 14171-A S 3T 0 AR S2  
 EN ISO 14171-A S 4T 0 AR S2Mo

ASME/AWS A5.17  
 A5.23

F7A0-EM12K  
 F7A0-EA2-A2

## Description and application:

It's an aluminate-rutil type flux for welding general structural steels, pressure vessel steels and pipe steels as well as fine grain steels with a yield strength of up to 355 N/mm<sup>2</sup>. It's suited for high-speed welding with the twin-wire process, as well as to tandem and multi-wire welding. It can be used also for welding with the two-run technique. It's also particularly useful for welding tube-web-tube joints of finned tubes. Because of its good slag detachability there's a common application for the welding of fillets. The weld metal isn't susceptible to porosity when welding surface contaminated by rust, scale...

Grain size: 0.2 – 1.6 mm, Density: 1.5 kg/dm<sup>3</sup>

BASE MATERIALS	DIN	W.Nr.
General structural steel	St37-2 to RSt37-2	1.0037 to 1.0038
	St44-2, St44-3	1.0044, 1.0144
	St52-3	1.0570
Pipe steel	StE210.7 to StE290.7,	1.0307 to 1.0484
	StE320.7, StE360.7	1.0409, 1.0582
	St35 to St45.8	1.0308 to 1.0405
Boiler steel	St52, St52-4	1.0580, 1.0581
	H1, H11,	1.0345, 1.0426
	17Mn4, 19Mn5	1.0481, 1.0482
Shipbuilding steel	15Mo3	1.5415
	A, B, D	1.0440, 1.0472,
Fine-grain steel	StE255 to StE355	1.0461, 1.0562,

## Chemical composition of flux

Basicity index (Boniszewski): 0.50

SiO <sub>2</sub> + TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub> + MnO	CaF <sub>2</sub>
30 %	55 %	5%

## Typical all weld metal properties:

### Chemical analysis (wt%)

Wire	C	Si	Mn	Mo
EPP 2	0.06	0.60	1.45	/
EPP 2 Mo	0.06	0.60	1.45	0.50

### Mechanical properties

Wire	R <sub>eL</sub> / R <sub>p 0.2</sub> MPa (N/mm <sup>2</sup> )	R <sub>m</sub> MPa (N/mm <sup>2</sup> )	A5 (%)	KV (J) 0°
EPP 2	>420	530 - 630	>24	> 47
EPP 2 Mo	>440	580 - 680	>22	> 47

**Welding current:** AC, DC+ ; up to 1000 A

**Redrying temperature:** 350°C / 2 h

**Packing:** three-layer paper bag with plastic inserted piece; contents 25 kg



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# AR D1

## Classification:

EN ISO 14174 SA AR 1 97 AC  
 EN ISO 14171-A S 42 0 AR S2  
 EN ISO 14171-A S 46 0 AR S2Mo  
 EN ISO 14171-A S 3T 0 AR S2  
 EN ISO 14171-A S 4T 0 AR S2Mo

ASME/AWS A5.17 7FA0-EM12K  
 A5.23 7FA0-EA2-A2

## Description and application:

It's an aluminate-rutil type flux for welding general structural steels, pressure vessel steels and pipe steels as well as fine grain-steels with a yield strength of up to 355 N/mm<sup>2</sup>. It's suited for twin-wire, tandem and multi-wire welding at high-speeds. It can be used also with the two-run technique, especially when welding thin-walled spiral tubes. Wires containing Mo increase the weld-metal toughness. It may equally well be used for welding tube-web-tube joints or finned tubes. Because of its good slag removal it's very commonly used when welding fillets. The weld metal isn't susceptible to porosity when welding on surface contaminated by rust, scale...

Grain size: 0.2 – 1.6 mm, Density: 1.6 kg/dm<sup>3</sup>

BASE MATERIALS	DIN	W.Nr.
General structural steel	St37-2 to RSt37-2	1.0037 to 1.0038
	St44-2, St44-3, St52-3	1.0044, 1.0144 1.0570
Pipe steel	StE210.7, to StE290.7,	1.0307 to 1.0484
	StE320.7, StE360.7	1.0409, 1.0582
	St35 to St45.8	1.0308 to 1.0405
Boiler steel	St52, St52-4	1.0580, 1.0581
	H1, H11,	1.0345, 1.0426
	17Mn4, 19Mn5	1.0481, 1.0482
Shipbuilding steel	15Mo3	1.5415
	A,B,D	1.0440, 1.0472,
Fine-grain steel	StE255 to StE355	1.0461, 1.0562,

## Chemical composition of flux

Basicity index (Boniszewski): 0.50

SiO <sub>2</sub> + TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub> + MnO	CaF <sub>2</sub>
30 %	55 %	5%

## Typical all weld metal properties:

### Chemical analysis (wt%)

Wire	C	Si	Mn	Mo
EPP 2	0.06	0.60	1.35	/
EPP 2 Mo	0.06	0.60	1.35	0.50

### Mechanical properties

Wire	R <sub>eL</sub> / R <sub>p 0.2</sub> MPa(N/mm <sup>2</sup> )	R <sub>m</sub> MPa(N/mm <sup>2</sup> )	A5 (%)	KV (J) 0°
EPP 2	>400	500 - 600	>22	>47
EPP 2 Mo	>450	580 - 680	>18	>47

**Welding current:** AC, DC+ ; up to 1000 A

**Redrying temperature:** 350°C / 2 h

**Packing:** three-layer paper bag with plastic inserted piece; contents 25 kg

### Approvals:

Wire	CRS	ABS	BV	GL	LR	DNV	SZ	TUV	DB
EPP 2	1YTM	2YTM	A2YTM	1YTM	1YTM	I1YTM	*	*	*



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# AR 18.1

## Classification:

EN ISO 14174 SA AR 188 AC H5  
 EN ISO 14171-A S 42 0 AR S2  
 EN ISO 14171-A S 46 0 AR S2Mo  
 EN ISO 14171-A S 3T 0 AR S2  
 EN ISO 14171-A S 4T 0 AR S2Mo

ASME/AWS A5.17 F7A2-EM12K  
 A5.23 F8A2-EA2-A2

## Description and application:

It's an aluminate-rutil type flux for welding general structural steels, pressure vessel steels and pipe steels as well as fine grain-steels with a yield strength of up to 355 N/mm<sup>2</sup>. It's suited for twin-wire, tandem and multi-wire welding at high-speeds. It's especially well used for two-run technique and fillets, for example for production of large pipes and thin-walled spiral tubes. Because of its good slag-detachability it's very commonly used when welding fillets.

Grain size: 0.2 – 1.6 mm, Density: 1.6 kg/dm<sup>3</sup>

BASE MATERIALS	DIN	W.Nr.
General structural steel	St37-2 to RSt37-2	1.0037 to 1.0038
	St44-2, St44-3, St52-3	1.0044, 1.0144 1.0570
Pipe steel	StE210.7 to StE290.7,	1.0307 to 1.0484
	StE320.7, StE360.7	1.0409, 1.0582
	St35 to St45.8	1.0308 to 1.0405
	St52, St52-4	1.0580, 1.0581
Boiler steel	HI, HII,	1.0345, 1.0426
	17Mn4, 19Mn5	1.0481, 1.0482
	15Mo3	1.5415
Shipbuilding steel	A,B,D	1.0440, 1.0472,
Fine-grain steel	StE255 to StE355	1.0461, 1.0562,

## Chemical composition of flux

Basicity index (Boniszewski): 0.40

SiO <sub>2</sub> + TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub> + MnO	CaF <sub>2</sub>
30 %	55 %	5%

## Typical all weld metal properties:

### Chemical analysis (wt%)

Wire	C	Si	Mn	Mo
EPP 2	0.06	0.70	1.40	/
EPP 2 Mo	0.06	0.70	1.40	0.50

### Mechanical properties

Wire	R <sub>eL</sub> / R <sub>p 0.2</sub> MPa(N/mm <sup>2</sup> )	R <sub>m</sub> MPa(N/mm <sup>2</sup> )	A5 (%)	KV (J) 0°
EPP 2	>450	530 – 630	>22	>47
EPP 2 Mo	>490	610 - 710	>18	>47

**Welding current:** AC, DC+ ; up to 1000 A

**Redrying temperature:** 350°C / 2 h

**Packing:** three-layer paper bag with plastic inserted piece; contents 25 kg

### Approvals:

Wire	CRS	ABS	BV	GL	LR	DNV	SZ
EPP 2	2YTM	2YTM	A2YTM	2YTM	2TM,2YTM	IYTM	*



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# AB 100

## Classification:

EN ISO 14174 SA AB 1 76 AC  
 EN ISO 14171-A S 42 0 AB S2  
 EN ISO 14171-A S 46 0 AB S3  
 EN ISO 14171-A S 46 0 AB S2Mo  
 EN ISO 14171-A S 2T 0 AB S2  
 EN ISO 14171-A S 3T 0 AB S3

ASME/AWS A5.17 F6A2-EM12K  
 A5.17 F7A4-EM13K  
 A5.23 F7A4-EA2-A2

## Description and application:

It's an aluminate-basic type flux for welding general structural steels, pressure vessel steels, pipe steels as well as fine-grain steels with a yield strength of up to 430 N/mm<sup>2</sup>. It can be used for single-wire and multi-wire welding as well as when welding with the two-run technique. The slag removes easily.  
 Grain size: 0.2 – 1,8 mm Density: 1.3 kg/dm<sup>3</sup>

BASE MATERIALS	DIN	W.Nr.
General structural steel	St37-2, USt37-2	1.0037, 1.0036
	RSt37-2, St37-3	1.0038, 1.0116
	St44-2, St44-3, St52-3	1.0044, 1.0144
Pipe steel	StE210.7, StE240.7,	1.0307 to 1.0457
	StE320.7 to StE360.7	1.0409 to 1.0582
	St35 to St35.8	1.0308, 1.0309
	St45 to St52-4	1.0408 to 1.0581
Boiler steel	HI, HII,	1.0345, 1.0426,
	17Mn4, 19Mn5, 15Mo3	1.0481, 1.0482, 1.5415
Shipbuilding steel	A to E	1.0440 to 1.0476
Fine-grain steel	StE255, WStE255,	1.0461, 1.0462,
	StE285, WStE285	1.0486, 1.0487,
	StE315, WStE315	1.0505, 1.0506,
	StE355, WStE355	1.0562, 1.0565
	StE380, WStE380,	1.8900, 1.8930,
	StE420, WStE420	1.8902, 1.8932

## Chemical composition of flux

Basicity index (Boniszewski): 0.80

SiO <sub>2</sub> + TiO <sub>2</sub>	CaO + MgO	Al <sub>2</sub> O <sub>3</sub> + MnO	CaF <sub>2</sub>
25 %	20 %	45 %	10%

## Typical all weld metal properties:

### Chemical analysis (wt%)

Wire	C	Si	Mn	Mo
EPP 2	0.06	0.40	1.20	/
EPP 2 Mo	0.06	0.40	1.20	0.50
EPP 3	0.06	0.45	1.50	/

### Mechanical properties

Wire	R <sub>eL</sub> / R <sub>p 0.2</sub> MPa(N/mm <sup>2</sup> )	R <sub>m</sub> MPa(N/mm <sup>2</sup> )	A <sub>5</sub> (%)	KV (J) 0°
EPP 2	>380	500-600	>24	> 47
EPP 2 Mo	>430	540-640	>22	> 47
EPP 3	>400	520-620	>20	> 47

**Welding current:** AC, DC+ ; up to 1000 A

**Redrying temperature:** 350°C / 2 h

**Packing:** three-layer paper bag with plastic inserted piece; contents 25 kg

### Approvals:

Wire	CRS	ABS	BV	GL	LR	DNV	SZ
EPP 2	2TM	2TM	A2TM	2TM	2TM	IITM	*
EPP 3	2YTM	2YTM	A2YTM	2YTM	2M, 2YM	IYTM	*



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**FB TT**

**Classification:**

EN ISO 14174 SA FB 1 55 AC H5  
 EN ISO 14171-A S 35 4 FB S2  
 EN ISO 14171-A S 42 5 FB S3  
 EN ISO 14171-A S 50 4 FB S2Mo  
 ASME/AWS A5.17 F6A4-EM12K  
 A5.17 F7A6-EM13K  
 A5.23 F8A6-EA2-A2

**Description and application:**

It's a fluorid-basic type flux most suited to welded joints on high-tensile, fine-grain steels as well as steels are tough at sub-zero temperatures and resistant to ageing. It's particularly well-suited for welding with tandem and multi-wire processes, but not for two-run technik. It's also suitable for production welding offshore components. The resulting slag is short allowing circumferential welding. Regularly shaped welds are deposited without of area or interface notches.  
 Grain size: 0.2 – 1,8 mm, Density: 1.2 kg/dm<sup>3</sup>

BASE MATERIALS	DIN	W.Nr.
Shipbuilding steel	A,B,D,E,	1.0440 to 1.0476
	StE255 to StE420	1.0461 to 1.8902
	WStE255 to WstE420	1.0462 to 1.8932
	StE460, WStE420	1.8905, 1.8935
	StE500, WStE500	1.8907, 1.8937
Boiler steel	TStE255 to TStE420	1.0463 to 1.8912
	TStE460, TStE500	1.8915, 1.8917
	15Mo3	1.5415
	13CrMo44	1.7335
	10CrMo910	1.7380
Low temperature steel	12CrMo195	1.7362
	10Ni14	1.5637
Ageing resistant steel	TTSt35N, TTSt35V	
	TTSt41N, TTSt41V	
	ASi35, ASi41	1.0346, 1.0426
	ASi45, ASi52	1.0436, 1.057

It's suitable for welding in combination with flux-cored wires (f. e. fine-grain steels....)

**Chemical composition of flux**

**Basicity index (Boniszewski): 3.1**

SiO <sub>2</sub> + TiO <sub>2</sub>	CaO + MgO	Al <sub>2</sub> O <sub>3</sub> + MnO	CaF <sub>2</sub>
15 %	40 %	20 %	25%

**Typical all weld metal properties:**

**Chemical analysis (wt%)**

WIRE	C	Si	Mn	Mo	Ni
EPP 2	0,06	0.20	0,9		
EPP 3	0,06	0.25	1,2		
EPP 2 Mo	0,06	0.20	0,9	0.50	

**Mechanical properties**

WIRE	R <sub>el</sub> / Rp <sub>0.2</sub> MPa(N/mm <sup>2</sup> )	MPa(N/mm <sup>2</sup> )	A5 (%)	KV (J)				
				20°	0°	-20°	-40°	-60°
EPP 2	>330	450 - 550	>28	>160	>140	>80	>30	
EPP 3	>430	530 – 630	>22	>160	>140	>80	>70	>30
EPP 2 Mo	>500	580 – 680	>20	>120	>100	>80	>50	>30

**Welding current:** AC, DC+ up to 1000 A

**Redrying temperature:** 350°C / 2 h

**Packing:** three-layer paper bag with plastic inserted piece; contents 25 kg

**Approvals:**

WIRE	CRS	ABS	BV	GL	LR	DNV	SZ	DB	TUV
EPP 2	3M	3M	A3M	3M	3M	IIIM	*	*	*
EPP 3	3YM	3YM	A3YM	3YM	3M,3YM	IIIM	*	*	*
EPP2Mo	3YM	3YM	A3YM	3YM		IIIM	*	*	*



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# FB 12.2

## Classification:

EN ISO 14174 SA FB 1 65 AC H5  
 EN ISO 14171-A S 35 2 FB S2  
 EN ISO 14171-A S 42 4 FB S3  
 EN ISO 14171-A S 46 2 FB S2Mo  
 EN ISO 14171-A S 3 T 0 FB S3

ASME/AWS A5.17 F6A4-EM12K  
 A5.17 F7A6-EM13K  
 A5.23 F7A4-EA2-A2

### Description and application:

It's an aluminate-basic type flux for welding general structural steels, pressure vessel steels, pipe steels and fine-grain steels with a yield strength of up to 430 N/mm<sup>2</sup>. It can be used for single-, twin-, or multi-wire welding as well as when welding with the two-run technique. It's suitable for production of large pipes. The slag removes easily.

Grain size: 0.2 – 1,8 mm, Density: 1.2 kg/dm<sup>3</sup>

BASE MATERIALS	DIN	W.Nr.
General structural steel	St37-2, RSt37-3	1.0037,
	RSt37-3, St44-3	1.0144
	St52-3	1.0570
Pipe steel	StE210.7 to StE290.7	1.0307 to 1.0484
	StE320.7 to StE385.7	1.0409 to 1.8970
	StE415.7 to StE480.7	1.8972 to 1.8977
	St35 to St45.8	1.0308 to 1.0405
	St52, St52-4	1.0580, 1.0581,
Boiler steel	API X42 to X70	
	HI, HII,	1.0345, 1.0425
	19Mn5	1.0482
	15Mo3	1.5415
Fine-grain steel	StE255 to StE315	1.0461 to 1.0505
	WStE255 to WStE315	1.0462 to 1.0506
	StE355, WStE355	1.0562, 1.0565
	StE380, WStE380,	1.8900, 1.8930
	StE420, WStE420	1.8902, 1.8932

It's suitable for welding and surfacing in combination with flux-cored wires (f. e. fine-grain steels....)

### Chemical composition of flux

Basicity index (Boniszewski): 1.70

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 %	25 %	20%

### Typical all weld metal properties:

#### Chemical analysis (wt%)

WIRE	C	Si	Mn	Mo
EPP 2	0,06	0.25	1,10	/
EPP 2 Mo	0,06	0.25	1,10	0.50
EPP 3	0,06	0.25	1,50	/

#### Mechanical properties

WIRE	R <sub>eL</sub> / Rp <sub>0.2</sub> MPa(N/mm <sup>2</sup> )	Rm MPa(N/mm <sup>2</sup> )	A5 (%)	KV (J)				
				20°	0°	-20°	-40°	-60°
EPP 2	>360	510 – 600	>24	>150	>110	>90		
EPP2Mo	>430	550 – 650	>20	>90	>90	>70	>40	
EPP 3	>400	530 – 630	>24	>160	>130	>100	>70	>30

**Welding current:** AC, DC+, up to 1000 A

**Redrying temperature:** 350°C / 2 h

**Packing:** three-layer paper bag with plastic inserted piece; contents 25 kg

#### Approvals:

WIRE	ABS	BV	GL	LR	DNV	SZ	TÜV
EPP2							*
EPP 3	2YT,3YM	A3YM	3YM	3M,3YM	IIYT,IIIM	*	



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**Classification:**  
EN ISO 14174 SA FB 2 5635 DC

## FB CrNi

### Description and application:

It's a special fluorid-basic type flux for welding stainless and heat-resistant steels, also ELC quality. In conjunction with wire electrodes to EN ISO 14343 it's used for welding of stainless and heat resistant steels. Grain size: 0.2 – 1,8 mm, Density: 1.4 kg / dm<sup>3</sup>.

BASE MATERIAL	W.n.	WELDING WIRE	W.Nr.
X 2 Cr Ni 19 11	1.4306	EPP 19/9 NC	1.4316
X 5 CrNi 18 10	1.4301	EPP 19/9 NC	1.4316
X 6 Cr NiTi 18 10	1.4541	EPP 19/9 Nb	1.4551
X 5 Cr Ni Nb 18 9	1.4543	EPP 19/9 Nb	1.4551
X 6 Cr Ni Nb 18 10	1.4550	EPP 19/9 Nb	1.4551
X 12 Cr Ni Ti 18 9	1.4878	EPP 19/9 Nb	1.4551
X 2 Cr Ni Mo 17 13 2	1.4404	EPP 19/12/3 NC	1.4430
X 2 Cr Ni Mo 18 14 3	1.4435	EPP 19/12/3 NC	1.4430
X 5 Cr Ni Mo 17 12 2	1.4401	EPP 19/12/3 NC	1.4430
X 6 Cr Ni Mo Ti 17 12 2	1.4571	EPP 19/12/3 Nb	1.4576
X 10 Cr Ni Mo Ti 18 12	1.4573	EPP 19/12/3 Nb	1.4576
X 6 CrNiMoNb 17 12 2	1.4580	EPP 19/12/3 Nb	1.4576
X 10 CrNiMoNb 18 12	1.4583	EPP 19/12/3 Nb	1.4576

### Chemical composition of flux

**Basicity index (Boniszewski): 1.60**

SiO <sub>2</sub> + TiO <sub>2</sub>	CaO + MgO	Al <sub>2</sub> O <sub>3</sub> + MnO	CaF <sub>2</sub>
30 %	30 %	10 %	25%

### Typical all weld metal properties:

#### Chemical analysis (wt%)

WIRE	C	Cr	Ni	Mo	Nb
EPP 19/9 NC	< 0.03	18	9		
EPP 19/9 Nb	0.07	18	9		> 8 xC
EPP 19/12/3 NC	< 0.03	18	10	2.5	
EPP 19/12/3 Nb	0.07	18	10	2.5	> 8 xC

#### Mechanical properties

WIRE	R <sub>eL</sub> / R <sub>p 0.2</sub> MPa(N/mm <sup>2</sup> )	MPa(N/mm <sup>2</sup> )	A5 (%)	KV (J) 20° C
EPP 19/9 NC	> 320	> 550	> 35	> 75
EPP 19/9 Nb	> 350	> 575	> 30	> 65
EPP 19/12/3 NC	> 320	> 550	> 30	> 75
EPP 19/12/3 Nb	> 350	> 600	> 30	> 65

**Welding current:** DC+, up to 800 A

**Redrying temperature:** 350°C / 2 h

**Packing:** three-layer paper bag with plastic inserted piece; contents 25 kg





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Classification:  
EN ISO 14174 SA CS 1 96 AC

## CS Cr 6

### Description and application:

It's a calcium-silicate flux for hardsurfacing with wires and flux-cored wires or strips. It's suitable for high current, up to 1200 A. Slag detachability is good also from hot plates.  
Grain size: 0.2 – 1.6 mm, Density: 1.4 kg / dm<sup>3</sup>

### Chemical composition of flux

Basicity index (Boniszewski): 1.00

SiO <sub>2</sub> + TiO <sub>2</sub>	CaO + MgO	Al <sub>2</sub> O <sub>3</sub> + MnO	CaF <sub>2</sub>
35 %	30 %	25 %	10%

### Chemical analysis and hardness (acc. to DIN 8555)

Wire	C	Si	Mn	Cr	Mo	HARDNESS HB
FILTUB DUR 212	0.08	0.70	1.0	5.0	0.9	350 - 400

**Welding current:** AC, DC+ DC-; up to 1200 A

**Redrying temperature:** 350°C / 2 h

**Packing:** three-layer paper bag with plastic inserted piece; contents 25 kg



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Classification:  
EN ISO 14174 SA CS 2 4994 AC

# CS CrNi

## Description and application:

It's an agglomerated flux for joint welding or cladding with Cr CrNi and CrNiMo wires or strips. It's suitable for cladding in chemical and petrochemical industry. The flux for cladding can be also used on DC-current. Grain size: 0.2 – 1,8 mm, Density: 1.4 kg / dm<sup>3</sup>.

BASE MATERIAL	W.n.	WELDING WIRE	W.Nr.
X 2 Cr Ni 19 11	1.4306	EPP 19/9 NC	1.4316
X 5 CrNi 18 10	1.4301	EPP 19/9 NC	1.4316
X 6 Cr NiTi 18 10	1.4541	EPP 19/9 Nb	1.4551
X 5 Cr Ni Nb 18 9	1.4543	EPP 19/9 Nb	1.4551
X 6 Cr Ni Nb 18 10	1.4550	EPP 19/9 Nb	1.4551
X 12 Cr Ni Ti 18 9	1.4878	EPP 19/9 Nb	1.4551
X 2 Cr Ni Mo 17 13 2	1.4404	EPP 19/12/3 NC	1.4430
X 2 Cr Ni Mo 18 14 3	1.4435	EPP 19/12/3 NC	1.4430
X 5 Cr Ni Mo 17 12 2	1.4401	EPP 19/12/3 NC	1.4430
X 6 Cr Ni Mo Ti 17 12 2	1.4571	EPP 19/12/3 Nb	1.4576
X 10 Cr Ni Mo Ti 18 12	1.4573	EPP 19/12/3 Nb	1.4576
X 6 CrNiMoNb 17 12 2	1.4580	EPP 19/12/3 Nb	1.4576
X 10 CrNiMoNb 18 12	1.4583	EPP 19/12/3 Nb	1.4576

## Chemical composition of flux

Basicity index (Boniszewski): 1.00

SiO <sub>2</sub> + TiO <sub>2</sub>	CaO + MgO	Al <sub>2</sub> O <sub>3</sub> + MnO	CaF <sub>2</sub>
35 %	25 %	25 %	10%

## Typical all weld metal properties:

### Chemical analysis (wt%)

WIRE	C	Cr	Ni	Mo	Nb
EPP 19/9 NC	< 0.03	18	9		
EPP 19/9 Nb	0.07	18	9		> 8 xC
EPP 19/12/3 NC	< 0.03	18	10	2.5	
EPP 19/12/3 Nb	0.07	18	10	2.5	> 8 xC

### Mechanical properties

WIRE	R <sub>el</sub> / R <sub>p 0.2</sub> % MPa(N/mm <sup>2</sup> )	R <sub>m</sub> MPa(N/mm <sup>2</sup> )	A <sub>5</sub> (%)	KV (J) 20° C
EPP 19/9 NC	> 320	> 550	> 35	> 55
EPP 19/9 Nb	> 350	> 575	> 30	> 45
EPP 19/12/3 NC	> 320	> 550	> 30	> 55
EPP 19/12/3 Nb	> 350	> 600	> 30	> 45

**Welding current:** AC, DC+, DC-, up to 1000 A

**Redrying temperature:** 350°C / 2 h

**Packing:** three-layer paper bag with plastic inserted piece; contents 25 kg



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Classification:

EN ISO 14174

SA AB 2B 5654 AC

# AB Cr

## Description and application:

It's an aluminate-basic type flux for submerged-arc cladding with Cr, CrNi and CrNiMo strips and unalloyed SA-wires. It's suitable for corrosion and wear resistant parts. Surface is smooth and flat.  
Grain size: 0.2 – 1,8 mm, Density: 1.3 kg / dm<sup>3</sup>.

## Chemical composition of flux

Basicity index (Boniszewski): 0.70

SiO <sub>2</sub> + TiO <sub>2</sub>	CaO + MgO	Al <sub>2</sub> O <sub>3</sub> + MnO	CaF <sub>2</sub>
30 %	20 %	30 %	5%

## Chemical analysis (wt%) and hardness

Strip / wire	C	Si	Mn	Cr	Ni	Hardness
INOX TR 19/9	0.08	0.70	1.10	17.5	6.0	180 - 220 HB
INOX TR Cr 17	0.07	0.90	0.70	16.5	-	160 - 200 HB
EPP 2	0.05	0.50	0.90	-	-	200 - 250 HB

With strips: two layers; with EPP 2 according to DIN 8555.

**Welding current:** AC, DC+ ; up to 1000 A

**Redrying temperature:** 350°C / 2 h

**Packing:** three-layer paper bag with plastic inserted piece; contents 25 kg



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**Classification:**

EN ISO 14174

SA CS 3 C 0,2 Cr3 AC

# CS 350

## Description and application:

It's an agglomerated alloy-fortified surfacing flux intended for use with low-alloyed SA-wires. The alloying effect is greatly depended on welding parameters. The optimum parameters with wire  $\phi$  4 mm are: 600 A, 32 V, 50 cm/min. It's suitable for wear- and strike- resistant parts (for example for welding of coupling parts, piston rod ends and excavator parts). The greater hardness is reached with Mn, Cr and Mo alloyed wires.

Grain size: 0.2 – 2 mm, Density: 1.2 kg / dm<sup>3</sup>.

## Chemical composition of flux

**Basicity index (Boniszewski): 1.1**

SiO <sub>2</sub> + TiO <sub>2</sub>	CaO + MgO	Al <sub>2</sub> O <sub>3</sub> + MnO	CaF <sub>2</sub>
35 %	25 %	15 %	10%

## Chemical analysis (wt%) and hardness (according to DIN 8555)

Wire	C	Si	Mn	Cr	Mo	Hardness
EPP 1	0.25	0.50	1.70	3.0	0.40	350 - 400 HB
EPP 2	0.25	0.90	2.00	3.0	0.40	400 - 500 HB

**Welding current:** AC, DC+ ; up to 800 A

**Redrying temperature:** 350°C / 2 h

**Packing:** three-layer paper bag with plastic inserted piece; contents 25 kg



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# FB 33

**Classification:**  
EN ISO 14174 SA FB 2 5635 DC

## Description and application:

It's a fluorid-basic flux for welding stainless, heat-resistant and nc-steels in conjunction with wires to EN ISO 14343. Welds are clean and have smooth surface. There's good slag detachability so it's suitable for welding fillets.

Grain size: 0.2 – 1.6 mm, Density: 1.4 kg / dm<sup>3</sup>

Base materials	W.n.	Welded with wire	W.n.
X 2 Cr Ni 19 11	1.4306	EPP 19/9 NC	1.4316
X 5 CrNi 18 10	1.4301	EPP 19/9 NC	1.4316
X 6 Cr NiTi 18 10	1.4541	EPP 19/9 Nb	1.4551
X 5 Cr Ni Nb 18 9	1.4543	EPP 19/9 Nb	1.4551
X 6 Cr Ni Nb 18 10	1.4550	EPP 19/9 Nb	1.4551
X 12 Cr Ni Ti 18 9	1.4878	EPP 19/9 Nb	1.4551
X 2 Cr Ni Mo 17 13 2	1.4404	EPP 19/12/3 NC	1.4430
X 2 Cr Ni Mo 18 14 3	1.4435	EPP 19/12/3 NC	1.4430
X 5 Cr Ni Mo 17 12 2	1.4401	EPP 19/12/3 NC	1.4430
X 6 Cr Ni Mo Ti 17 12 2	1.4571	EPP 19/12/3 Nb	1.4576
X 10 Cr Ni Mo Ti 18 12	1.4573	EPP 19/12/3 Nb	1.4576
X 6 CrNiMoNb 17 12 2	1.4580	EPP 19/12/3 Nb	1.4576
X 10 CrNiMoNb 18 12	1.4583	EPP 19/12/3 Nb	1.4576

## Chemical composition of flux

**Basicity index (Boniszewski): 1.80**

SiO <sub>2</sub> + TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub> + MnO	CaF <sub>2</sub>
10 %	35 %	50%

## Typical all weld metal properties:

### Chemical analysis (%):

Zica	C	Cr	Ni	Mo	Nb
EPP 19/9 NC	< 0.03	18	9		
EPP 19/9 Nb	0.07	18	9		> 8 xC
EPP 19/12/3 NC	< 0.03	18	10	2.5	
EPP 19/12/3 Nb	0.07	18	10	2.5	> 8 xC

## Mechanical properties:

Wire	R <sub>0.1</sub> / R <sub>p 0.2</sub> MPa(N/mm <sup>2</sup> )	R <sub>m</sub> MPa(N/mm <sup>2</sup> )	A5 (%)	KV (J) +20° C
EPP 19/9 NC	> 320	> 550	> 35	> 75
EPP 19/9 Nb	> 350	> 575	> 30	> 65
EPP 19/12/3 NC	> 320	> 550	> 30	> 75
EPP 19/12/3 Nb	> 350	> 600	> 30	> 65

**Welding current:** DC+, do 800 A

**Redrying temperature:** 350°C / 2 h

**Packing:** three-layer paper bag with plastic inserted piece; contents 25 kg

## Approvals:

Wire	TÜV
EPP 19/9 NC	*



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# AB 123

## Classification:

EN ISO 14174 SA AB 1 67 AC H5  
 EN ISO 14171-A S 38 4 AB S2  
 EN ISO 14171-A S 42 4 AB S3  
 EN ISO 14171-A S 42 4 AB S2Mo  
 EN ISO 14171-A S 3T 2 AB S2  
 EN ISO 14171-A S 3T 2 AB S3

ASME/AWS A5.17 F6A4-EM12K  
 A5.17 F7A4-EM13K  
 A5.23 F7A4-EA2-A2

## Description and application:

It's an aluminate-basic type flux for welding general structural steels, pressure vessel steels, pipe steels as well as fine-grain steels. It can be used for single-wire and multi-wire welding as well as when welding with the two-run technique. The slag removes easily.  
 Grain size: 0.2 – 1,8 mm Density: 1.3 kg/dm<sup>3</sup>

BASE MATERIALS	DIN	W.Nr.
Shipbuilding steel	A, B, D, E,	1.0440 to 1.0476
Fine-grain steel	StE255 to StE420	1.0461 to 1.8902
	WStE255 to WStE420	1.0462 to 1.8932
	StE460, WStE420	1.8905, 1.8935
	StE500, WStE500	1.8907, 1.8937
	TStE255 to TStE420	1.0463 to 1.8912
	TStE460, TStE500	1.8915, 1.8917
Boiler steel	15Mo3	1.5415
	13CrMo44	1.7335
	10CrMo910	1.7380
	12CrMo195	1.7362
	Ageing resistant steel	TTSt41N, TTSt41V
ASi35, Ast41		1.0346, 1.0426
ASi45, ASi52		1.0436, 1.057

## Chemical composition of flux

## Basicity index (Boniszewski): 2.3

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 %	30 %	15%

## Typical all weld metal properties:

### Chemical analysis (wt%)

Wire	C	Si	Mn	Cr	Ni	Mo
EPP 2	0,06	0,20	1,30	/		/
EPP 3	0,06	0,20	1,60			
EPP 2 Mo	0,06	0,20	1,30			0,50

## Mechanical properties

Wire	R <sub>eL</sub> / R <sub>p 0.2</sub> MPa(N/mm2)	R <sub>m</sub> MPa(N/mm2)	A5(%)	Av (-40°C)
EPP 2	> 380	510- 610	> 22	> 47
EPP 3	> 430	530- 630	> 22	> 47
EPP 2 Mo	> 430	550- 650	> 20	> 47

## Hardsurfacing properties

Wire	C	Si	Mn	Cr	Ni	Mo	HARDNESS
FILTUB DUR 212	0,10	0,40	1,40	5,0		0,90	40 HRC
FILTUB DUR Cr12Ni2Mo	0,08	0,40	1,50	9,0	1,50	0,90	40 HRC
FILTUB DUR 205	0,18	0,50	1,50	2,6		0,50	350 HB

**Welding current:** AC, DC+ ; up to 1000 A

**Redrying temperature:** 350°C / 2 h

**Packing:** three-layer paper bag with plastic inserted piece; contents 25 kg

## Approvals:

WIRE	TUV
EPP 2	*
EPP 3	*
EPP2Mo	*



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# MS 200

## Classification:

EN ISO 14174 SA MS 1 88 AC  
EN ISO 14171-A S 38 2 MS S2

ASME/AWS A5.17 F7A2-EM12K

### Description and application:

It's a Manganese-silicate type flux with high current capacity designed for welding general structural steels, pressure vessel steels, pipe steels so as ship plates. It is active flux that can be used for single and multi-pass welding of mild and medium alloyed steels. It has high current capacity and high resistance towards cracks. The slag removes easily.

Grain size: 0.2 – 1,8 mm Density: 1.3 kg/dm<sup>3</sup>

BASE MATERIALS	DIN	W.Nr.
General structural steel	St37-2 do RSt37-2	1.0037 do 1.0038
	St44-2, St44-3, St52-3	1.0044, 1.0144 1.0570
Pipe steel	StE210.7 do StE290.7,	1.0307 do 1.0484
	StE320.7, StE360.7	1.0409, 1.0582
	St35 do St45.8	1.0308 do 1.0405
	St52, St52-4	1.0580, 1.0581
Boiler steel	HI, HI1,	1.0345, 1.0426
	17Mn4, 19Mn5	1.0481, 1.0482
	15Mo3	1.5415
	A, B, D	1.0440, 1.0472,
Shipbuilding steel	StE255 do StE355	1.0461, 1.0562,
Fine-grain steel		

### Chemical composition of flux

Basicity index (Boniszewski) 0,9

CaO + MgO+SiO <sub>2</sub>	MnO + SiO <sub>2</sub>	CaO
65 %	60%	10%

### Typical all weld metal properties:

#### Chemical analysis (wt%)

Wire	C	Si	Mn	P	S
EPP 2	0,06	0,60	1,4	< 0,03	< 0,025

### Mechanical properties

Wire	R <sub>eL</sub> / R <sub>p 0.2</sub> MPa(N/mm <sup>2</sup> )	R <sub>m</sub> MPa(N/mm <sup>2</sup> )	A <sub>5</sub> (%)	Av (-40°C)
EPP 2	> 380	> 500	> 22	> 47

**Welding current:** AC, DC+ ; up to 900 A

**Redrying temperature:** 350°C / 2 h

**Packing:** paper bags with PVC inserted sack, content 25 kg