

BÖHLER FOX OHV

Stick electrode, mild steel, rutile coated

SMAW

Classifications

EN ISO 2560-A
E 38 0 RC 1 1

AWS A5.1 / SFA-5.1
E6013

Characteristics and typical fields of application

Rutile-cellulosic coated electrode with good weldability in all positions including vertical-down. Most popular E 6013 type.

For small welding machines, very good operating characteristics, flexible coating, good for tack welding. Versatile applications in structural welding, vehicle construction, boiler and tank welding, and in shipbuilding, also suitable for galvanised components.

Base materials

Steels up to a yield strength of 380 MPa (52 Ksi)

S235JR-S355JR, S235JO-S355JO, P195TR1-P265TR1, P195GH-P265GH, L245NB-L360NB, L245MB-L360MB, ship building steels: A, B, D
ASTM A 106, Gr. A, B; A 283 Gr. A, C; A 285 Gr. A, B, C; A 501, Gr. B; A 573, Gr. 58, 65; A 633, Gr. A, C; A 711 Gr. 1013; API 5 L Gr. B, X42, X52

Typical analysis of all-weld metal

wt.-%	C	Si	Mn
	0.06	0.4	0.45

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength R _e	Tensile strength R _m	Elongation A (L ₀ =5d ₀)	Impact values ISO-V KV J		
	MPa	MPa	%	20°C	0°C	-10°C
u	460 (≥ 380)	540 (470 – 600)	25 (≥ 20)	75	60 (≥ 47)	47
u untreated, as welded						

Operating data



Polarity	DC – / AC
Electrode identification	FOX OHV 6013 E 38 0 RC
Redrying	not necessary

Dimension mm	Current A
2.0 × 250	45 – 80
2.5 × 250	60 – 100
2.5 × 350	60 – 100
3.2 × 350	90 – 130
3.2 × 450	90 – 130
4.0 × 350	110 – 170
4.0 × 450	110 – 170
5.0 × 450	170 – 240

Approvals

TÜV (05687), DB (10.014.12), ABS, DNV GL, LR, CE

Classifications

EN ISO 2560-A
E 42 0 RC 1 1

AWS A5.1 / SFA-5.1
E6013

Characteristics and typical fields of application

Rutile cellulose coated electrode. General purpose; useable in all positions; excellent gap-bridging and arc-striking ability; for tack-welding and bad fit-ups. Well suited for welding rusty and primed plates (roughly 40 µm); excellent vertical down characteristics. Useable on small transformers (42 V, open circuit).

Base materials

S235JRG2 - S355J2; GS-38; GS-45; St35; St45; St35.8; boiler steels P235GH, P265GH, P295GH; shipbuilding steels corresp. to app.-grade 2; fine grained structural steels up to P355N; weldable ribbed reinforcing steel bars. ASTM A36 and A53 Gr. all; A106 Gr. A, B, C; A135 Gr. A, B; A283 Gr. A, B, C, D; A366; A285 Gr. A, B, C; A500 Gr. A, B, C; A570 Gr. 30, 33, 36, 40, 45; A607 Gr. 45; A668 Gr. A, B; A907 Gr. 30, 33, 36, 40; A935 Gr. 45; A936 Gr. 50; API 5 L Gr. B, X42-X52

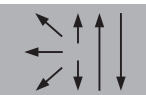
Typical analysis of all-weld metal

wt.-%	C	Si	Mn
	0.09	0.35	0.50

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength R _{p0.2}	Tensile strength R _m	Elongation A (L ₀ =5d ₀)	Impact values ISO-V KV J	
	MPa	MPa	%	20°C	0°C
u	440 (≥ 420)	540 (≥ 500 – 640)	22 (≥ 20)	80	55 (≥ 47)

Operating data



Polarity DC (-) AC
Electrode identification Phoenix Blau / E 42 0 RC / E 6013

Dimension mm	Current A
2.0 × 250	50 – 60
2.5 × 250	60 – 90
2.5 × 350	60 – 90
3.2 × 350	90 – 140
4.0 × 350	150 – 190
4.0 × 450	150 – 190
5.0 × 350	190 – 240
5.0 × 450	190 – 240

Approvals

TÜV (00425), DB (10.014.86), ABS, BV, LR, DNV GL, CE

Classifications

EN ISO 2560-A
E 38 4 B 4 2 H5

AWS A5.1 / SFA-5.1
E7016-1 H4 R

Characteristics and typical fields of application

Basic coated electrode for high-quality welds. Good weldability in all positions except vertical-down. Metal recovery about 110%. Very low hydrogen content (according AWS condition HD < 4 ml/100g weld metal). Weld metal extremely ductile, crack resistant and ageing resistant thus especially suited for rigid welds with heavy seam cross sections.

Base materials

Steels up to a yield strength of 380 MPa (52 ksi)

S235JR-S355JR, S235JO-S355JO, S235J2-S355J2, S275N-S355N, S275M-S355M, P235GH-P355GH, P355N, P275NL1-P355NL1, P215NL, P265NL, P285NH-P355NH, P195TR1-P265TR1, P195TR2-P265TR2, P195GH-P265GH, L245NB-L360NB, L245MB-L360MB, GE200-GE240

Ship-building steels: A, B, D, E, A 32-E 36

ASTM A 106 Gr. A, B, C; A 181 Gr. 60, 70; A 283 Gr. A, C; A 285 Gr. A, B, C; A 350 Gr. LF1, LF2; A 414 Gr. A, B, C, D, E, F, G; A 501 Gr. B; A 513 Gr. 1018; A 516 Gr. 55, 60, 65, 70; A 573 Gr. 58, 65, 70; A 588 Gr. A, B; A 633 Gr. A, C, D; A 662 Gr. A, B, C; A 678 Gr. A, B; A 711 Gr. 1013; API 5 L Gr. B, X42, X52, X56

Typical analysis of all-weld metal

wt.-%	C	Si	Mn
	0.06	0.3	0.9

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength R _e MPa	Tensile strength R _m MPa	Elongation A (L ₀ =5d ₀) %	Impact values ISO-V KV J			
				20°C	-20°C	-40°C	-45°C
u	440 (≥ 380)	530 (≥ 470 – 600)	27 (≥ 20)	200	130	100 (≥ 47)	≥ 27
s	390 (≥ 380)	490 (≥ 470 – 600)	29 (≥ 20)	200	150	100 (≥ 47)	

u untreated, as welded

s stress relieved 600 °C/2h / furnace down to 300 °C / air

Operating data



Polarity	DC (+)
Electrode identification	FOX EV 47 7016-1 E 38 4 B
Redrying	if necessary 300 – 350°C, min. 2h

Dimension mm	Current A
2.5 × 250	80 – 110
2.5 × 350	80 – 110
3.2 × 350	100 – 140
3.2 × 450	100 – 140
4.0 × 350	130 – 180
4.0 × 450	130 – 180
5.0 × 450	180 – 230
6.0 × 450	240 – 280

Approvals

TÜV (01098), DB (10.014.09), ABS, BV, DNV GL, LR, RMR, RINA, CE

Phoenix Spezial D

Stick electrode, mild steel, basic coated

Classifications

EN ISO 2560-A
 E 42 3 B 1 2 H10

AWS A5.1 / SFA-5.1
 E7016

Characteristics and typical fields of application

Basic double coated electrode with excellent weldability in all positions except vertical-down.

Especially suited for out-of-position welding thanks to the well controlled arc. Excellent root penetration. Good suitability for welding on AC. Minimum spatter loss, very easy slag removal with uniform beads. well-suited for small transformers. Low hydrogen content in the weld deposit (HD < 10 ml/100 g deposit).

Base materials

Steels up to a yield strength of 420 MPa (60 ksi)

S235JR-S355JR, S235JO-S355JO, S235J2-S355J2, S275N-S420N, S275M-S420M, P235GH-P355GH, P355N, P285NH-P420NH, P195TR1-P265TR1, P195TR2-P265TR2, P195GH-P265GH, L245NB-L415NB, L245MB-L415MB, GE200-GE240

ASTM A 106 Gr. A, B, C; A 181 Gr. 60, 70; A 283 Gr. A, C; A 285 Gr. A, B, C; A 414 Gr. A, B, C, D, E, F, G; A 501 Gr. B; A 516 Gr. 55, 60, 65, 70; A 573 Gr. 58, 65, 70; A 588 Gr. A, B; A 633 Gr. A, C, D; A 662 Gr. A, B, C; A 678 Gr. A, B; A 711 Gr. 1013; API 5 L Gr. B, X42, X52, X56, X60

Typical analysis of all-weld metal

wt.-%	C	Si	Mn
	0.06	0.65	1.05

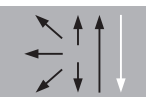
Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength R _{p0.2} MPa	Tensile strength R _m MPa	Elongation A (L ₀ =5d ₀) %	Impact values ISO-V KV J	
				20°C	-30°C
u	440 (≥ 420)	550 (500 - 640)	28 (≥ 20)	170	50 (≥ 47)
s	400	520	28	170	50

u untreated, as welded

s stress relieved 580 °C/2h / furnace down to 300 °C / air

Operating data



Polarity	DC+ / AC
Electrode identification	7016 E 42 3 B
Redrying	300 °C/2 h

Dimension mm	Current A
2.5 × 350	60 – 90
3.2 × 350	100 – 150
3.2 × 450	100 – 150
4.0 × 450	140 - 190
5.0 × 450	190 – 250

Approvals

TÜV (10572), DB (10.138.12), CE

BÖHLER FOX EV 50

Stick electrode, mild steel, basic coated

SMAW

Classifications

EN ISO 2560-A
E 42 5 B 4 2 H5

AWS A5.1 / SFA-5.1
E7018-1 H4 R

Characteristics and typical fields of application

Basic coated electrode engineered for high-quality welds. Excellent strength and toughness properties down to -50°C. Metal recovery approximately 110%. Good weldability in all position except for vertical-down. Very low hydrogen content (acc. AWS condition HD < 4 ml/100g weld metal). Suitable for welding steels with low purity and high carbon content. Welding in steel construction, boiler and tank manufacture, vehicle construction, shipbuilding, and machine construction as well as for buffer layers on build ups on high carbon steels. Especially suitable for off-shore construction, CTOD tested at -10 °C. BÖHLER FOX EV 50 can be used in sour gas applications (HIC-Test acc. NACE TM-02-84). Test values for SSC-test are available too.

Base materials

Steels up to a yield strength of 420 MPa (60 ksi)

S235JR-S355JR, S235JO-S355JO, S235J2-S355J2, S275N-S420N, S275M-S420M, S275NLS420NL,
S275ML-S420ML, P235GH-P355GH, P275NL1-P355NL1, P275NL2-P355NL2, P215NL,
P265NL, P355N, P285NH-P420NH, P195TR1-P265TR1, P195TR2-P265TR2, P195GH-P265GH,
L245NB-L415NB, L245MB-L415MB, GE200-GE240, GE300

Ship building steels: A, B, D, E, A 32-F 36, A 40-F 40

ASTM A 106 Gr. A, B, C; A 181 Gr. 60, 70; A 283 Gr. A, C; A 285 Gr. A, B, C; A 350 Gr. LF1, LF2;
A 414 Gr. A, B, C, D, E, F, G; A 501 Gr. B; A 513 Gr. 1018; A 516 Gr. 55, 60, 65, 70; A 573 Gr 58,
65, 70; A 588 Gr. A, B; A 633 Gr. A, C, D, E; A 662 Gr. A, B, C; A 707 Gr. L1, L2, L3; A 711 Gr.
1013; A 841 Gr. A, B, C; API 5 L Gr. B, X42, X52, X56, X60

Typical analysis of all-weld metal

wt.-%	C	Si	Mn
	0.08	0.4	1.2


Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength R _e MPa	Tensile strength R _m MPa	Elongation A (L ₀ =5d ₀) %	Impact values ISO-V KV J		
				20°C	-20°C	-50°C
u	460 (≥ 420)	570 (500 – 640)	30 (≥ 20)	190	160	70 (≥ 47)
s	430	520	32	200		90

u untreated, as welded

s stress relieved 600°C/2h / furnace down to 300°C / air

Operating data

	Polarity	DC+	Dimension mm	Current A
	Electrode identification	FOX EV 50 7018-1 E 42 5 B	2.5 × 250	80 – 110
	Redrying	300-350°C/2h	2.5 × 350	80 – 110
			3.2 × 350	100 – 140
			3.2 × 450	100 – 140
			4.0 × 350	130 – 180
		4.0 × 450	130 – 180	
		5.0 × 450	180 – 230	

Approvals

TÜV (00426), DB (10.014.02), ABS, BV, DNV GL, LR, RMR, RINA, CWB (Ø3,2-6,0 mm), CE

BÖHLER FOX CEL

Stick electrode, mild steel, cellulose coated, pipeline welding

Classifications

EN ISO 2560-A
E 38 3 C 2 1

AWS A5.1 / SFA-5.1
E6010

Characteristics and typical fields of application

Cellulose electrode for vertical-down welding of large diameter pipelines; suitable for root runs (vertical down and vertical up), hot passes, filler and cover layers. Especially recommended for root run welding. Highly economical compared with vertical-up welding. Apart from its excellent welding and gap bridging characteristics FOX CEL offers a weld deposit with outstanding impact strength values and thus offers the benefit of still more safety in field welding of pipelines. BÖHLER FOX CEL can be used in sour gas applications (HIC-Test acc. NACE TM-02-84). Test values for SSC-test are available too.

Base materials

S235JR, S275JR, S235J2G3, S275J2G3, S355J2G3, P235GH, P265GH, P355T1, P235T2-P355T2, L210NB - L415NB, L290MB - L415MB, P235G1TH, P255G1TH

Root pass up to L555NB, L555MB

API Spec. 5 L: A, B, X 42, X 46, X 52, X 56, Root pass up to X 80

Typical analysis of all-weld metal

	C	Si	Mn
wt.-%	0.12	0.14	0.5

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength R _e MPa	Tensile strength R _m MPa	Elongation A (L ₀ =5d ₀) %	Impact values ISO-V KV J			
				20°C	0°C	-20°C	-30°C
u	450 (≥ 380)	550 (470 – 600)	26 (≥ 22)	100	90	70	55 (≥ 47)
u untreated, as welded							

Operating data



Polarity	DC +/-, Minuspol für Wurzel
Electrode identification	FOX CEL 6010 E 38 2 C
Redrying	not allowed

Dimension mm	Current A
2.5 × 250	50 – 90
2.5 × 300	50 – 90
3.2 × 350	80 – 130
4.0 × 350	120 – 180
5.0 × 350	160 – 210

Approvals

TÜV (01281), DNV GL, CE

Classifications

EN ISO 2560-A
E 38 2 C 2 1

AWS A5.1 / SFA-5.1
E6010

Characteristics and typical fields of application

Cellulose electrode for vertical-down welding of large diameter pipelines.

Especially recommended for root pass welding on D.C. positive polarity in the vertical down and vertical up welding positions.

Apart from its good welding and gap bridging characteristics Böhler FOX CEL+ provides a powerful arc that deposits well penetrated, smooth root passes with high travel speeds as well as high safety against the formation of piping or hollow bead and undercut. BÖHLER FOX CEL+ can be used in sour gas applications (HIC-Test acc. to NACE TM-02-84). Test values for SSC-test are available too.

Base materials

S235JR, S275JR, S235J2G3, S275J2G3, S355J2G3, P235GH, P265GH, P355T1, P235T2-P355T2, L210NB - L415NB, L290MB - L415MB, P235G1TH, P255G1TH

Root pass up to L555NB, L555MB

API Spec. 5 L: A, B, X 42, X 46, X 52, X 56, Root pass up to X 80

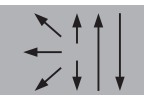
Typical analysis of all-weld metal

wt.-%	C	Si	Mn
	0.17	0.15	0.6

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength R _e MPa	Tensile strength R _m MPa	Elongation A (L ₀ =5d ₀) %	Impact values ISO-V KV J			
				20°C	0°C	-20°C	-30°C
u	430 (≥ 380)	520 (470 - 600)	26 (≥ 22)	105	95	60 (≥ 47)	50 (≥ 27)
u untreated, as welded							

Operating data



Polarity	DC (+/-)
Electrode identification	FOX CEL+ 6010 E 38 2 C
Redrying	not allowed

Dimension mm	Current A
2.5 × 300	50 – 90
3.2 × 350	80 – 130
4.0 × 350	120 – 180

Approvals

TÜV (19380.), CE

Classifications

EN ISO 2560-A
E 42 3 C 2 5

AWS A5.5 / SFA-5.5
E7010-P1

Characteristics and typical fields of application

Cellulose electrode for vertical-down welding of large diameter pipelines.

Especially recommended for hot passes, filler and cover layers. Highly economical compared with conventional vertical-up welding.

The penetrating arc characteristics and the low slag formation allow good bead control and ensure best performance even with the larger diameter electrodes and high amperages.

The weld metal has excellent impact values and welding is easy also under difficult weather conditions.

BÖHLER FOX CEL 75 can be used in sour gas applications (HIC-Test acc. NACE TM-02-84). Test values for SSC-test are available too.

Base materials

S235JR, S275JR, S235J2G3, S275J2G3, S355J2G3, P235GH, P265GH, L210-L415NB,
L290MB – L415MB, P355T1, P235T2 - P355T2, P235G1TH, P255G1TH root pass up to L480MB
API Spec. 5 L: Grade A, B, X42, X 46, X 52, X 56, X 60, Root pass up to X 70

Typical analysis of all-weld metal

wt.-%	C	Si	Mn
	0.14	0.14	0.7

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength R _e MPa	Tensile strength R _m MPa	Elongation A (L ₀ =5d ₀) %	Impact values ISO-V KV J			
				20°C	0°C	-20°C	-30°C
u u untreated, as welded	460 (≥ 420)	550 (500 – 640)	23 (≥ 22)	100	95	65	60 (≥ 47)

Operating data



Polarity	DC+/-, Minuspol für Wurzel
Electrode identification	FOX CEL 75 7010-P1 E 42 3 C
Redrying	not allowed

Dimension mm	Current A
3.2 × 350	80 – 130
4.0 × 350	120 – 180
5.0 × 350	160 – 210

Approvals

CE

BÖHLER FOX CEL Mo

Stick electrode, low-alloyed, cellulose coated, pipeline welding

Classifications

EN ISO 2560-A
E 42 3 Mo C 2 5

AWS A5.5 / SFA-5.5
E7010-A1

Characteristics and typical fields of application

Mo-alloyed cellulose coated electrode for vertical-down welding of high strength large diameter pipelines. Highly economical compared with conventional vertical-up welding. Especially recommended for hot passes, filler and cover layers.

Excellent weld-metal toughness, easy welding, with an intensive arc and a deep penetration in order to ensure sound joint welds with good X-ray quality.

BÖHLER FOX CEL Mo can be used in sour gas applications (HIC-Test acc. NACE TM-02-84). Test values for SSC-test are available too.

Base materials

S235JR, S275JR, S235J2G3, S275J2G3, S355J2G3, P235GH, P265GH, L210 - L415NB, L290MB-L415MB, P355T1, P235T2 - P355T2, P235G1TH, P255G1TH

Root pass up to L555MB

API Spec. 5 L: Grade A, B, X 42, X 46, X 52, X 56, X 60

Root pass up to X 80

Typical analysis of all-weld metal

	C	Si	Mn	Mo
wt.-%	0.1	0.14	0.4	0.5

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength R _e MPa	Tensile strength R _m MPa	Elongation A (L ₀ =5d ₀) %	Impact values ISO-V KV J				
				20°C	0°C	-20°C	-30°C	-40°C
u	480 (≥ 420)	550 (500-640)	23 (≥ 20)	100	95	85	50 (≥ 47)	42
u untreated, as welded								

Operating data



Polarity	DC +/-, Minuspol für Wurzel
Electrode identification	FOX CEL Mo 7010-A1 E 42 3 Mo C
Redrying	not allowed

Dimension mm	Current A
3.2 × 350	80 – 130
4.0 × 350	120 – 180
5.0 × 350	160 – 210

Approvals

TÜV (01325.), ABS, CE

BÖHLER FOX CEL 85

Stick electrode, low-alloyed, cellulose coated, pipeline welding

Classifications

EN ISO 2560-A
E 46 4 1Ni C 2 5

AWS A5.5 / SFA-5.5
E8010-P1

Characteristics and typical fields of application

Cellulose electrode for vertical-down welding of high strength large diameter pipelines. Highly economical compared with conventional vertical-up welding.

Especially recommended for hot passes, filler and cover layers.

BÖHLER FOX CEL 85 is one of the most popular cellulosic electrode which meets all the exacting demands of the field welding of cross country pipelines extremely well. Welding is easy also at difficult weather conditions. It ensures highest joint weld quality down to temperatures of -40°C .

BÖHLER FOX CEL 85 can be used in sour gas applications (HIC-Test acc. NACE TM-02-84). Test values for SSC-test are available too.

Base materials

L415NB - L485NB, L415MB - L485MB

API Spec. 5 L: X 56, X 60, X 65, X 70

Typical analysis of all-weld metal

wt.-%	C	Si	Mn	Ni
	0.14	0.15	0.75	0.7

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength R_e MPa	Tensile strength R_m MPa	Elongation A ($L_0=5d_0$) %	Impact values ISO-V KV J			
				20°C	0°C	-20°C	-40°C
u	490 (≥ 460)	580 (550 – 680)	23 (≥ 20)	110	105	100	70 (≥ 47)
u untreated, as welded							

Operating data



Polarity	DC+
Electrode identification	FOX CEL 85 8010-P1 E 46 4 1Ni C
Redrying	not allowed

Dimension mm	Current A
3.2 × 350	80 – 130
4.0 × 350	120 – 180
5.0 × 350	160 – 210
5.5 × 350	200 – 260

Approvals

TÜV (01361.), ABS, CE

Classifications

EN ISO 2560-A
E 50 3 1Ni C 2 5

AWS A5.5 / SFA-5.5
E9010-P1
E9010-G

Characteristics and typical fields of application

Cellulose-coated electrode for vertical-down welding of high strength large diameter pipelines. Highly economical compared with conventional vertical-up welding. Especially recommended for hot passes, filler and cover layers. The special design of the coating and the core wire guarantees the highest metallurgical quality and soundness of the weld metal deposit with excellent mechanical properties. The electrode allows good weld pool visibility, and easy manipulation, as well as high safety margins against porosity and slag inclusions. BÖHLER FOX CEL 90 can be used in sour gas applications (HIC-Test acc. to NACE TM-02-84). Test values for SSC-test are available too.

Base materials

L450MB, L485MB

API Spec. 5 L: X 65, X 70, X 80

Typical analysis of all-weld metal

wt.-%	C	Si	Mn	Ni
	0.17	0.15	0.9	0.8

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength R _e MPa	Tensile strength R _m MPa	Elongation A (L ₀ =5d ₀) %	Impact values ISO-V KV J				
				20°C	0°C	-20°C	-30°C	-40°C
u	560 (≥ 530)	650 (620 – 720)	21 (≥ 18)	100	90	75	65 (≥ 47)	40
u untreated, as welded								

Operating data



Polarity	DC (+)
Electrode identification	FOX CEL 90 9010-P1 E 50 3 1Ni C
Redrying	not allowed

Dimension mm	Current A
4.0 × 350	120 – 180
5.0 × 350	160 – 210

Approvals

TÜV (01324.), CE



BÖHLER FOX EV PIPE

Stick electrode, mild steel, basic coated, pipeline welding

SMAW

Classifications

EN ISO 2560-A
E 42 4 B 1 2

AWS A5.1 / SFA-5.1
E7016-1

Characteristics and typical fields of application

Basic coated electrode, excellent suited for positional welding of root passes using D.C. negative polarity as well as for filler and cover passes of pipes, tubes and plates on D.C. positive polarity, or even AC. It is user friendly and provides a good gap bridging ability together with easy slag removal to ensure minimum grinding. Weld metal toughness is available down to -46°C. BÖHLER FOX EV PIPE offers considerable time savings against AWS E7018 type electrodes when welding root passes due to increased travel speeds. Also the use of dia. 3.2 mm is possible for root passes in case of wall thicknesses of 8 mm and more. BÖHLER FOX EV PIPE can be used in sour gas applications (HIC-Test acc. to NACE TM-02-84). Test values for SSC-test are available too.

Base materials

P235GH, P265GH, P295GH, P235T1, P275T1, P235G2TH, P255G1TH, (S255N-S420N *1)

S255NL1-S420NL1, L290NB-L360NB, L290MB-L415MB, (L450MB-L555MB *2)

API Spec. 5L: A, B, X 42, X46, X52, X56, X60, (X65-X80 *2)

ASTM: A53 Gr. A-B, A106 Gr. A-C, A179, A192, A210 Gr. A-1

*1) stress relieved up to S380N / S380NL1

*2) only for root pass

Typical analysis of all-weld metal

wt.-%	C	Si	Mn
	0.06	0.60	0.9

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength R _e MPa	Tensile strength R _m MPa	Elongation A (L ₀ =5d ₀) %	Impact values ISO-V KV J			
				20°C	-20°C	-40°C	-45°C
u	470 (≥ 420)	560 (500 – 640)	29 (≥ 20)	170	120	100 (≥ 47)	65 (≥ 27)
u untreated, as welded							

Operating data

	Polarity	DC +/-, Minuspol für Wurzel	Dimension mm	Current A
	Electrode identification	FOX EV PIPE 7016-1 E 42 4 B	2.0 × 300	30 – 60
	Redrying	if necessary: 300 – 350°C, min. 2 h	2.5 × 300	40 – 90
			3.2 × 350	60 – 130
			4.0 × 350	110 – 180

Preheated and interpass temperatures as required by the base material. The optimum gap width for root passes is 2 – 3 mm, the root face should be in the range 2 – 2.5 mm. The electrodes are ready for use straight from the hermetically sealed tins.

Approvals

TÜV (07620.), DB (10.014.77), CE, NAKS, GAZPROM

BÖHLER FOX BVD 85

Basic vertical down stick electrode, low-alloyed, pipeline welding

Classifications

EN ISO 2560-A
E 46 5 1Ni B 4 5 H5

AWS A5.5 / SFA-5.5
E8045-P2 H4 R
E8018-G H4 R

Characteristics and typical fields of application

Basic coated electrodes for vertical-down welds of large diameter pipelines and for structural work. Suitable for filler and cover pass welding in pipeline construction. Deposit is extremely crack resistant, and features high toughness and a very low hydrogen content. Deposition rate is 80-100% higher than for vertical up welding. The weld deposit of BÖHLER FOX BVD 85 shows an ideal combination between high strength and cryogenic toughness down to -50°C . Special design and development work has enabled this electrode to provide exceptional striking characteristics and the avoidance of start porosity. Due to this and the good welding characteristics this special basic electrode offers easy handling even under field conditions.

Böhler FOX BVD 85 can be used in sour gas applications (HIC-Test acc. to NACE TM-02-84). Test values for SSC-test are available too.

Base materials

S235J2G3 - S355J2G3, L290NB - L450NB, L290MB - L450MB, P235GH - P295GH

API Spec. 5 L: A, B, X 42, X46, X 52, X 56, X 60, X 65, (X70)

Typical analysis of all-weld metal

wt.-%	C	Si	Mn	Ni
	0.05	0.4	1.1	0.9

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength R_e MPa	Tensile strength R_m MPa	Elongation A ($L_0=5d_0$) %	Impact values ISO-V KV J				
				20°C	-20°C	-30°C	-40°C	-50°C
u	500 (≥ 460)	560 (550 – 680)	27 (≥ 20)	170	140	120	100	65 (≥ 47)
u untreated, as welded								

Operating data



Polarity	DC (+)
Electrode identification	FOX BVD 85 8045-P2 E 46 5 1Ni B
Redrying	if necessary: 300 – 350 °C / min. 2 h

Dimension mm	Current A
3.2 × 350	110 – 160
4.0 × 350	180 – 210
4.5 × 350	200 – 240

Recommended interpass temperature $> 80^{\circ}\text{C}$

Approvals

TÜV (03531.), CE

Classifications

EN ISO 18275-A

E 55 5 Z2Ni B 4 5 H5

AWS A5.5 / SFA-5.5

E9018-G H4 R

E9045-P2 H4 R (mod.)

Characteristics and typical fields of application

Basic coated electrode for vertical-down welds of large diameter pipelines and for structural work. Suitable for filler and cover pass welding in pipeline construction. Deposit is extremely crack resistant, and features high toughness and a very low hydrogen content. Special design and development work has enabled this electrode to provide exceptional striking characteristics and the avoidance of start porosity. Due to this and the good welding characteristics this special basic electrode offers easy handling even under field conditions. Deposition rate is 80 – 100% higher than for vertical up welding.

Base materials

L485MB, L555MB

API Spec. 5 L: X70, X80

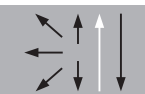
Typical analysis of all-weld metal

wt.-%	C	Si	Mn	Ni
	0.05	0.3	1.2	2.2

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength R _e MPa	Tensile strength R _m MPa	Elongation A (L ₀ =5d ₀) %	Impact values ISO-V KV J				
				20°C	-20°C	-30°C	-40°C	-50°C
u	580 (≥ 550)	650 (620 – 780)	27 (≥ 18)	170	130	110	90	70 (≥ 47)
u untreated, as welded								

Operating data



Polarity	DC (+)
Electrode identification	FOX BVD 90 9018-G E 55 5 Z 2Ni B
Redrying	if necessary: 300 – 350 °C / min. 2 h

Dimension mm	Current A
2.5 x 350	80 - 110
3.2 x 350	110 – 160
4.0 x 350	180 – 210
4.5 x 350	200 – 240

Recommended interpass temperature > 90°C

Approvals

TÜV (03402.), GAZPROM, CE

BÖHLER FOX BVD 100

Basic vertical down stick electrode, low-alloyed, pipeline welding

Classifications

EN ISO 18275-A
E 62 5 Z2Ni B 4 5

AWS A5.5 / SFA-5.5
E10018-G
E10045-P2 (mod.)

Characteristics and typical fields of application

Basic coated electrodes for vertical-down welds of large diameter pipelines and for structural work. Suitable for filler and cover pass welding in pipeline construction. Deposit is extremely crack resistant, and features high toughness and a very low hydrogen content. Special design and development work has enabled this electrode to provide exceptional striking characteristics and the avoidance of start. Due to this and the good welding characteristics this special basic electrode offers easy handling even under field conditions. Deposition rate is 80 – 100% higher than for vertical up welding.

Base materials

L555MB
API Spec. 5 L: X80

Typical analysis of all-weld metal

wt.-%	C	Si	Mn	Ni
	0.07	0.4	1.2	2.3

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength R _e	Tensile strength R _m	Elongation A (L ₀ =5d ₀)	Impact values ISO-V KV J			
	MPa	MPa	%	20°C	-20°C	-30°C	-50°C
u	640 (≥ 620)	720 (690 – 890)	24 (≥ 18)	150	120	105	60 (≥ 47)
u untreated, as welded							

Operating data



Polarity	DC (+)
Electrode identification	FOX BVD 100 10018-G E 62 5 Z2Ni B
Redrying	if necessary: 300 – 350 °C / min. 2 h

Dimension mm	Current A
3.2 × 350	100 – 160
4.0 × 350	180 – 210
4.5 × 350	200 – 240

Recommended interpass temperature > 100°C

Approvals

TÜV (06333.), CE

BÖHLER FOX EV 60

Stick electrode, low-alloyed, basic coated, high-strength

Classifications

EN ISO 2560-A

E 46 6 1Ni B 4 2 H5

AWS A5.5 / SFA-5.5

E8018-C3 H4 R

Characteristics and typical fields of application

Basic coated, Ni- alloyed electrode with excellent mechanical properties, particularly high toughness and crack resistance. For higher strength fine- grained constructional steels.

Suitable for service temperatures at -60°C to $+350^{\circ}\text{C}$. Very good impact strength in aged condition. Metal recovery about 115%. Easy weldability in all positions except vertical-down.

Very low hydrogen content (acc. AWS condition HD < 4 ml/100 g weld metal).

Base materials

Constructional steels, pipe- and vessel steels, cryogenic fine-grained steels and special grades

S275N-S460N, S275NL-S460NL, S275M-S460M, S275ML-S460ML, P355N, P355NH, P460N, P460NH, P275NL1-P460NL1, P275NL2-P460NL2, L360NB, L415NB, L360MB-L450MB, L360QB-L450QB

alform plate 460M; durostat 400, 450, 500, durostat B2

ASTM A 203 Gr. D, E; A 350 Gr. LF1, LF2, LF3; A 420 Gr. WPL3, WPL6; A 516 Gr. 60, 65, 70; A 572 Gr. 42, 50, 55, 60, 65; A 633 Gr. A, D, E; A 662 Gr. A, B, C; A 707 Gr. L1, L2, L3; A 738 Gr. A; A 841 A, B, C; API 5 L X52, X60, X65, X52Q, X60Q, X65Q

Typical analysis of all-weld metal

wt.-%	C	Si	Mn	Ni
	0.07	0.4	1.15	0.9

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength $R_{p0.2}$ MPa	Tensile strength R_m MPa	Elongation A ($L_0=5d_0$) %	Impact values ISO-V KV J	
				20°C	-60°C
u	510 (≥ 460)	600 (550 – 740)	29 (≥ 20)	200	120 (≥ 47)
s	470	580	27	180	

u untreated, as welded

s stress relieved 580°C/2h / furnace down to 300°C / air

Operating data



Polarity	DC+
Electrode identification	FOX EV 60 8018-C3 E 46 6 1Ni B
Redrying	if necessary 300 – 350°C, min. 2h

Dimension mm	Current A
2.5 × 350	80 – 100
3.2 × 350	110 – 140
4.0 × 350	140 – 180
4.0 × 450	140 – 180
5.0 × 450	190 – 230

Approvals

TÜV (01524), DNV GL, RMR, CRS, VG 95132, ABS, CE

Phoenix SH Schwarz 3 K Ni

Stick electrode, low-alloyed, basic coated, high-strength

Classifications

EN ISO 2560-A

E 50 4 Z1NiMo B 4 2 H5

AWS A5.5 / SFA-5.5

E9018-G

Characteristics and typical fields of application

Basic coated NiMo alloyed electrode with a weld metal of special metallurgical purity for nuclear reactor construction. Very low hydrogen content < 5 ml/100 g; NDT-tested. Used preferably for the welding of steels in the construction of nuclear reactors, boiler and pressure vessels; for fine grained structural steels up to S500Q.

Base materials

20MnMoNi55, 22NiMoCr37, ASTM A 508 Cl 2, ASTM A 533 Cl 1 Gr. B, 15NiCuMoNb5 S 1 (WB 36), GS-18NiMoCr37, 11NiMoV53, 12MnNiMo55, S420N - S500Q, P460NH; ASTM A302 Gr. A-D; A517 Gr. A, B, C, E, F, H, J, K, M, P; A225 Gr. C; A572 Gr. 65

Typical analysis of all-weld metal

wt.-%	C	Si	Mn	Ni	Mo	S	P	Cu
	0.06	0.3	1.4	0.95	0.5	≤ 0.01	≤ 0.01	≤ 0.08

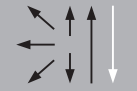
Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength R _{p0.2} MPa	Tensile strength R _m MPa	Elongation A (L ₀ =5d ₀) %	Impact values ISO-V KV J	
				20°C	-40°C
u	540 (≥ 530)	620	20 (≥ 18)	140	60 (≥ 47)
s	500	590	21	140	47

u untreated, as welded

s stress released 620°C / 1h

Operating data

	Polarity	DC+ / AC	Dimension mm	Current A
	Electrode identification	E 9018-G/SH Schwarz 3 K Ni	2.5 × 350	70 – 110
			3.2 × 350	100 – 150
	Redrying	300-350°C/2h	4.0 × 350	140 – 200
			5.0 × 450	170 – 250

Approvals

TÜV (00512 / 08100), CE

BÖHLER FOX EV 65

Stick electrode, low-alloyed, basic coated, high-strength

SMAW

Classifications

EN ISO 18275-M
E6218-G A H5

EN ISO 18275-A
E 55 6 1NiMo B 4 2 H5

AWS A5.5 / SFA-5.5
E8018-G H4 R
E8018-D1 H4 R (mod.)

Characteristics and typical fields of application

Basic coated electrode with high ductility and crack resistance, for high-strength fine-grained steels.

Ductile down to -60°C. Resistant to ageing. Easy to handle in all positions, except vertical-down.

Very low hydrogen content (acc. to AWS condition HD <4 ml/100 g weld metal).

BÖHLER FOX EV 65 can be used in sour gas applications (HIC-Test acc. NACE TM-02-84). Test values for SSC-test are available too.

Base materials

Constructional steels, pipe- and vessel steels, cryogenic fine-grained steels and special grades

S460N, S460M, S460NL, S460ML, S460Q-S550Q, S460QL-S550QL, S460QL1-S550QL1, P460N, P460NH, P460NL1, P460NL2, L415NB, L415MB-L555MB, L415QB-L555QB, alform 500 M, 550 M, aldur 500 Q, 500 QL, 500 QL1, aldur 550 Q, 550 QL, 550 QL1, GE300, 20MnMoNi4-5, 15NiCuMoNb5-6-4

ASTM A 572 Gr. 65; A 633 Gr. E; A 738 Gr. A; A 852; API 5 L X60, X65, X70, X80, X60Q, X65Q, X70Q, X80Q

Typical analysis of all-weld metal

wt.-%	C	Si	Mn	Ni	Mo
	0.06	0.3	1.2	0.8	0.35

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength $R_{p0.2}$ MPa	Tensile strength R_m MPa	Elongation A ($L_0=5d_0$) %	Impact values ISO-V KV J	
				20°C	-60°C
u	590 (≥ 550)	650 (610 – 780)	25 (≥ 18)	190	90 (≥ 47)
s	580	630	25	160	

u untreated, as welded

s stress relieved 580 °C/2h / furnace down to 300 °C / air

Operating data



Polarity	DC+
Electrode identification	FOX EV 65 8018-G E 55 6 1NiMo B
Redrying	if necessary 300 – 350°C, min. 2h

Dimension mm	Current A
2.5 × 350	80 – 100
3.2 × 350	100 – 140
4.0 × 350	140 – 180
4.0 × 450	140 – 180
4.8 × 450	180 – 220
5.0 × 450	190 – 230

Preheating and interpass temperature, as well as post-welds heat treatment as required by the base metal.

Approvals

TÜV (01802), NAKS, VG 95132, BV, RMR, ABS, CE



BÖHLER FOX EV 85

Stick electrode, low-alloyed, basic coated, high-strength

SMAW

Classifications

EN ISO 18275-A

E 69 6 Mn2NiCrMo B 4 2 H5

AWS A5.5 / SFA-5.5

E11018-G H4 R

E11018M H4 R (mod.)

Characteristics and typical fields of application

Basic coated, Mn-Ni-Mo-alloyed electrode with high ductility and crack resistant for high-strength fine-grained constructional steels. Low-temperature ductility at -60°C.

Easy weldability in all positions except vertical-down. Very low hydrogen content (acc. AWS condition HD < 4 ml/100 g).

Base materials

Quenched and tempered fine-grained steels up to 690 MPa yield strength

S620Q, S620QL, S690Q, S690QL, S620QL1-S690QL1, alform plate 620 M, 700 M, aldur 620 Q, 620 QL, 620 QL1, aldur 700 Q, 700 QL, 700 QL1

ASTM A 514 Gr. F, H, Q; A 709 Gr. 100 Type B, E, F, H, Q; A 709 Gr. HPS 100W

Typical analysis of all-weld metal

wt.-%	C	Si	Mn	Cr	Ni	Mo
	0.05	0.4	1.7	0.4	2.1	0.5

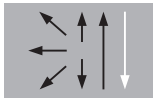
Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength R _{p0.2} MPa	Tensile strength R _m MPa	Elongation A (L ₀ =5d ₀) %	Impact values ISO-V KV J	
				20°C	-60°C
u	780 (≥ 690)	840 (≥ 760 – 960)	20 (≥ 17)	110	60 (≥ 47)
s	750	800	20	80	
v	750	790	20	80	

u untreated, as-welded

s stress relieved 580 °C/2h / furnace down to 300 °C / air

Operating data



Polarity	DC+
Electrode identification	FOX EV 85 11018-G E 69 6 Mn2NiCr-Mo B
Redrying	if necessary 300 – 350°C, min. 2h

Dimension mm	Current A
2.5 × 350	80 – 100
3.2 × 350	100 – 140
3.2 × 450	100 – 140
4.0 × 450	140 – 180
5.0 × 450	190 – 230

Preheat, interpass temperature and post-weld heat treatment as required by the base metal.

Approvals

TÜV (04313), DB (10.014.22), BV, CE

Classifications
EN ISO 3580-A
E Mo B 4 2 H5

EN ISO 2560-A
E 46 5 Mo B 4 2 H5

AWS A5.5 / SFA-5.5
E7018-A1 H4
Characteristics and typical fields of application

Basic low-hydrogen electrode for 0.5% Mo-alloyed boiler, plates, and tube steels. Approved in long-term condition up to 550°C service temperature. For high quality welds of long term stressed components with reliable mechanical properties under high and low temperature conditions. Crack resistant, tough and ageing resistant. Very low hydrogen content (acc. to AWS condition HD < 4 ml/100 g). Metal recovery approximately 115%.

Base materials

Creep resistant steels and similar alloyed cast steels, steels resistant to caustic cracking and ageing resistant steels

16Mo3, 20MnMoNi4-5, 15NiCuMoNb5, S235JR-S355JR, S235JO-S355JO, S450JO, S235J2-S355J2, S275N-S460N, S275M-S460M, P235GH-P355GH, P355N, P285NH-P460NH, P195TR1-P265TR1, P195TR2-P265TR2, P195GH-P265GH, L245NB-L415NB, L450QB, L245MB-L450MB, GE200-GE300

ASTM A 29 Gr. 1013, 1016; A 106 Gr. C; A, B; A 182 Gr. F1; A 234 Gr. WP1; A 283 Gr. B, C, D; A 335 Gr. P1; A 501 Gr. B; A 533 Gr. B, C; A 510 Gr. 1013; A 512 Gr. 1021, 1026; A 513 Gr. 1021, 1026; A 516 Gr. 70; A 633 Gr. C; A 678 Gr. B; A 709 Gr. 36, 50; A 711 Gr. 1013; API 5 L B, X42, X52, X60, X65

Typical analysis of all-weld metal

wt.-%	C	Si	Mn	Mo
	0.08	0.4	0.8	0.5

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength $R_{p0.2}$ MPa	Tensile strength R_m MPa	Elongation A ($L_0=5d_0$) %	Impact values ISO-V KV J	
				20°C	-50°C
u	490 (≥ 460)	590 (530 – 680)	24 (≥ 22)	170	50 (≥ 47)
a	480 (≥ 460)	580 (530 – 680)	27 (≥ 22)	160 (≥ 47)	75 (≥ 47)

u untreated, as welded

a annealed 620°C/2h / furnace down to 300°C / air

Operating data

Polarity	DC+
Electrode identification	FOX DMO Kb 7018-A1 E Mo B
Redrying	300 - 350 °C/2h

Dimension mm	Current A
2.5 × 250	80 – 110
2.5 × 350	80 – 110
3.2 × 350	100-140
4.0 × 350/450	130-180
5.0 × 450	190-230

Preheating, interpass temperature, and post-weld heat treatment as required by the base metal.

Approvals

TÜV (00019), KTA 1408.1 (8053), DB (10.014.82), ABS, DNV GL, CE

BÖHLER FOX DCMS Kb

Stick electrode, low-alloyed, creep resistant

SMAW

Classifications

EN ISO 3580-A
E CrMo1 B 4 2 H5

AWS A5.5 / SFA-5.5
E8018-B2 H4

Characteristics and typical fields of application

Basic coated, core wire alloyed low hydrogen electrode for 1% Cr 0.5% Mo alloyed boiler, plate, and tube steels. Approved in long-term condition up to +570°C service temperature. Fully alloyed core wire which will provide reliable creep rupture properties for the whole service life of a boiler plant. High ductility and crack resistance. The weld metal deposit is heat treatable. Very low hydrogen content (acc. AWS condition HD < 4 ml/100 g). Metal recovery approximately 115%. Suitable for step-cooling application. Bruscato ≤ 15ppm. post-weld tempering at 660 – 700°C for at least ½ h followed by cooling in furnace down to 300°C and still air.

Base materials

Creep resistant steels and similar alloyed cast steels, case hardening and nitrite able steels of similar chemical composition, similar alloyed heat treatable steels with tensile strength up to 780 MPa, steels resistant to caustic cracking

1.7335 13CrMo4-5, 1.7262 15CrMo5, 1.7728 16CrMoV4, 1.7218 25CrMo4, 1.7225 42CrMo4, 1.7258 24CrMo5, 1.7354 G22CrMo5-4, 1.7357 G17CrMo5-5

ASTM A 182 Gr. F12; A 193 Gr. B7; A 213 Gr. T12; A 217 Gr. WC6; A 234 Gr. WP11; A335 Gr. P11, P12; A 336 Gr. F11, F12; A 426 Gr. CP12

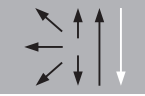
Typical analysis of all-weld metal

wt.-%	C	Si	Mn	Cr	Mo	P	Sb	Sn	As
	0.08	0.25	0.8	1.1	0.5	≤ 0.010	≤ 0.005	≤ 0.005	≤ 0.005

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength R _{p0.2} MPa	Tensile strength R _m MPa	Elongation A (L ₀ =5d ₀) %	Impact values ISO-V KV J 20°C
a	480 (≥ 460)	580 (≥ 550)	23 (≥ 20)	160 (≥ 47)
v	380	520	28	190
a annealed 680 °C/2h / furnace down to 300 °C / air				
v quenched/tempered 930 °C/0.5 h / air 680 °C/10 h / furnace down to 300 °C / air				

Operating data

	Polarity	DC+	Dimension mm	Current A
	Electrode identification	FOX DCMS Kb 8018-B2 E CrMo1 B	2.5 × 250	80 – 110
	Redrying	300-350°C/2h	2.5 × 350	80 – 110
			3.2 × 350	100 – 140
			4.0 × 350	130 – 180
			4.0 × 450	130 – 180
		5.0 × 450	180 – 220	

Preheat and interpass temperature acc. to the requirements of the base material (for 13CrMo4-5 at 200 - 250°C, annealing after welding at 660 - 700°C, min 1/2 h / oven to 300°C / air cooling).

Approvals

TÜV (00728.), DB (10.014.42), ABS, DNV GL, NAKS (Ø 3.2 mm; Ø 4.0 mm), CE

BÖHLER FOX CM 2 Kb

Stick electrode, low-alloyed, creep resistant

Classifications

EN ISO 3580-A
E CrMo2 B 4 2 H5

AWS A5.5 / SFA-5.5
E9018-B3 H4 R

Characteristics and typical fields of application

Basic coated, core wire alloyed stick electrode for welding 2.25% Cr 1% Mo alloyed steels. Approved in long-term condition up to +600°C service temperature. Applicable for welds in refineries, boiler construction, and thermal power plants. Core wire alloyed electrode which will provide reliable creep rupture properties. Crack resistant and ductile deposit, high creep rupture strength, low hydrogen content (acc. AWS condition HD < 4 ml/100 g). Good weldability in all positions except vertical down. Deposit is nitride-able and heat treatable. Metal recovery approximately 110%. Suitable for Step Cooling.

Base materials

high temperature steels and similar alloyed cast steels, QT-steels similar alloyed up to 980 MPa tensile strength, similar alloyed case hardening steels, nitriding steels

1.7380 10CrMo9-10, 1.7276 10CrMo11, 1.7281 16CrMo9-3, 1.7383 11CrMo9-10, 1.7379 G17CrMo9-10, 1.7382 G19CrMo9-10
ASTM A 182 Gr. F22; A 213 Gr. T22; A 234 Gr. WP22; 335 Gr. P22; A 336 Gr. F22; A 426 Gr. CP22

Typical analysis of all-weld metal

wt.-%	C	Si	Mn	Cr	Mo	P	Sb	Sn	As
	0.08	0.3	0.7	2.2	1.0	≤ 0.010	≤ 0.005	≤ 0.006	≤ 0.005

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength $R_{p0.2}$ MPa	Tensile strength R_m MPa	Elongation A ($L_0=5d_0$) %	Impact values ISO-V KV J 20°C
a1	580 (≥ 400)	680 (≥ 500)	19 (≥ 18)	150 (≥ 47)
a2	530 (≥ 400)	630 (≥ 500)	20 (≥ 18)	180
v	490 (≥ 400)	600 (≥ 500)	21	180

a1 annealed, 720 °C/1h / furnace down to 300 °C / air

a2 annealed, 720 °C/2h / furnace down to 200 °C / air

v quenched/tempered 930 °C/0.5 h/ air + 680 °C/15 h / air

Operating data



Polarity	DC+	Dimension mm	Current A
Electrode identification	FOX CM 2 Kb 9018-B3 E CrMo2 B	2.5 × 250	80 – 110
Redrying	300-350°C/2h	3.2 × 350	100 – 140
		4.0 × 350	130 – 180
		4.0 × 450	130 – 180
		5.0 × 450	180 – 230

Preheating and interpass temperatures 200 – 350°C. post-weld annealing at 700 – 750°C at least 1 hour followed by cooling in furnace down to 300°C and still air.

Approvals

TÜV (00722), DB (10.014.81), ABS, DNV GL, CE, NAKS (Ø 3,2; Ø 4,0 mm)

Classifications

EN ISO 3580-A

E CrMo5 B 4 2 H5

AWS A5.5 / SFA-5.5

E8018-B6 H4 R

Characteristics and typical fields of application

Basic coated, core wire alloyed electrode for creep resistant steels, suited in pressure vessels and in the crude oil industry. Preferably suited for X12CrMo5 (5 Cr 0.5 Mo) steels. Approved in long-term condition up to +650 °C service temperature. High crack resistance, very low hydrogen content (acc. AWS condition HD < 4 ml/100 g). Good weldability in all positions except vertical down. The weld deposit is heat treatable. Metal recovery approximately 115 %.

Base materials

Creep resistant steels and similar alloyed cast steels, QT-steels similar alloyed up to 1180 MPa tensile strength

1.7362 X12CrMo5

ASTM A 182 Gr. F5; A 193 Gr. B5; A 213 Gr. T5; A217 Gr. C5; A 234 Gr. WP5; A 314 Gr. 501; A335 Gr. P5 u. P5c; A 369 Gr. FB 5; A 387 Gr. 5; A 426 Gr. CP5

Typical analysis of all-weld metal

wt.-%	C	Si	Mn	Cr	Mo
	0.08	0.3	0.8	5.0	0.6

Mechanical properties of all-weld metal - typical values (min. values)

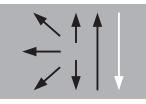
Condition	Yield strength R _{p0.2} MPa	Tensile strength R _m MPa	Elongation A (L ₀ =5d ₀) %	Impact values ISO-V KV J 20°C
a	520 (≥ 460)	620 (≥ 590)	21 (≥ 17)	90 (≥ 47)
a2	≥ 460	≥ 590	≥ 17	
v	440	580	26	110

a annealed, 730 °C/2h / furnace down to 300 °C / air

a2 annealed, 760 °C/1h/ furnace down to 200 °C / air

v quenched/tempered 960 °C/0.5 h / oil 730 °C/0.5 h / furnace down to 300 °C / air

Operating data

	Polarity	DC +	Dimension mm	Current A
	Electrode identification	FOX CM 5 Kb 8018-B6 E CrMo 5 B	2.5 × 250	70 – 90
	Redrying	300-350°C/2h	3.2 × 350	110 – 130
			4.0 × 350	140 – 170

Preheat and interpass temperatures 300 – 350°C. post-weld annealing at 730 – 760°C for at least 1 hour followed by cooling in furnace down to 300°C and still air.

Approvals

TÜV (00725), CE



BÖHLER FOX 2,5 Ni

Stick electrode, low-alloyed, basic coated, cryogenic

SMAW

Classifications

EN ISO 2560-A

E 46 8 2Ni B 4 2 H5

AWS A5.5 / SFA-5.5

E8018-C1 H4 R

Characteristics and typical fields of application

Basic Ni-alloyed electrode for unalloyed and Ni-alloyed fine grained construction steels. Tough, crack resistant weld deposit. Low temperature toughness to -80°C .

Good weldability in all position except vertical down. Very low hydrogen content (acc. AWS condition HD < 4 ml/100 g weld metal).

Base materials

Cryogenic constructional steels and Ni-steels, cryogenic steels for ship building

10Ni14, 12Ni14, 13MnNi6-3, 15NiMn6, S275N-S460N, S275NL-S460NL, S275M-S460M, S275ML-S460ML, P275NL1-P460NL1, P275NL2-P460NL2

ASTM A 203 Gr. D, E; A 333 Gr. 3; A334 Gr. 3; A 350 Gr. LF1, LF2, LF3; A 420 Gr. WPL3, WPL6; A 516 Gr. 60, 65; AA 529 Gr. 50; A 572 Gr. 42, 65; A 633 Gr. A, D, E; A 662 Gr. A, B, C; A 707 Gr. L1, L2, L3; A 738 Gr. A; A 841 A, B, C

Typical analysis of all-weld metal

wt.-%	C	Si	Mn	Ni
	0.04	0.3	0.8	2.4

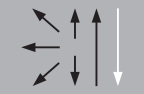
Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength $R_{p0.2}$ MPa	Tensile strength R_m MPa	Elongation A ($L_0=5d_0$) %	Impact values ISO-V KV J	
				20°C	-80°C
u	490 (≥ 460)	570 ($\geq 530 - 680$)	30 (≥ 20)	180	110 (≥ 47)
s	470	550	30	200	

u untreated, as welded

s stress relieved 580 °C/2h / furnace down to 300 °C/air

Operating data



	Polarity	Dimension mm	Current A
	DC+	2.5 × 350	70 – 100
	Electrode identification	3.2 × 350	110 – 140
		4.0 × 450	140 – 180
	Redrying	5.0 × 450	190 – 230
	if necessary: 300 – 350 °C / min. 2 h		

Preheat, interpass temperature and post-weld heat treatment as required by the base metal.

Approvals

TÜV (00147), DB (10.014.16), ABS, WIWEB, DNV GL, LR, RINA, CE



BÖHLER FOX ETI

Stick electrode, mild steel, rutile coated

SMAW

Classifications

EN ISO 2560-A
E 42 0 RR 1 2

AWS A5.1 / SFA-5.1
E6013

Characteristics and typical fields of application

Rutile coated electrode offering top weldability in all positions except vertical-down. Extremely smooth beads, self-detaching slag, minimum spattering and excellent welding properties on A.C. Excellent re-striking characteristics and easy handling. Good deposition lengths attainable. Versatile applications in trade and industry.

Base materials

Steels up to a yield strength of 420 MPa (60ksi)

S235JR-S355JR, S235JO-S355JO, P195TR1-P265TR1, P195GH-P265GH, L245NB-L360NB, L245MB-L360MB, L415NB, L415MB, ship building steels: A, B, D

ASTM A 106, Gr. A, B; A 283 Gr. A, C; A 285 Gr. A, B, C; A 501, Gr. B; A 573, Gr. 58, 65, 70; A 633, Gr. A, C; A 711 Gr. 1013; API 5 L Gr. B, X42, X52, X60

Typical analysis of all-weld metal

wt.-%	C	Si	Mn
	0.07	0.4	0.5

Mechanical properties of all-weld metal - typical values (min. values)

Condition	Yield strength R _e	Tensile strength R _m	Elongation A (L ₀ =5d ₀)	Impact values ISO-V KV J	
	MPa	MPa	%	20°C	-0°C
u	430 (≥ 420)	520 (≥ 500 – 640)	28 (≥ 20)	65	55 (≥ 47)
u untreated, as welded					

Operating data



Polarity	DC – / AC
Electrode identification	FOX ETI 6013 E 42 0 RR
Redrying	not necessary

Dimension mm	Current A
2.0 × 250	45 – 80
2.5 × 250	60 – 110
2.5 × 350	60 – 110
3.2 × 350	90 – 140
3.2 × 450	90 – 140
4.0 × 350	110 – 190
4.0 × 450	110 – 190
5.0 × 450	170 – 240

Approvals

TÜV (01097), ABS, BV, DNV GL, LR, CE