Covered electrodes, low alloyed

Brand Standard AWS Standard EN ISO	Chemical Composition (%) Typical Values	Mechanical Properties Typical Values	Ø x L (mm)	Approvals	Characteristics and Applications
BOHLER FOX N DMO Kb AWS A5.5: E7018-A1 H4R EN ISO 3580-A: E Mo B 4 2 H5	C: 0.06 Si: 0.35 Mn: 0.60 S: 0.010 P: 0.015 Cr: 0.04 Mo: 0.50	Heat treatment: 620°C, 1h UTS: 580 MPa YS: 475 MPa El: 24% CVN Impact: +25°C: 180J	2.50 x 350 3.15 x 450 4.00 x 450 5.00 x 450	IBR	Basic coated electrode for high quality welded joints of 0.5% Mo alloyed boiler, plate and tube steels. Suitable in long term condition up to + 500°C service temperature. Crack resistant, ductile deposit and high creep rupture strength. Diffusible H2 content less than 4ml/100gm. Self lifting slag, flat and shiny bead. Excellent arc force helps to achieve radiographic quality weld deposit. Deposition Efficiency 115%.
BOHLER FOX N DCMS Kb AWS A5.5: E8018-B2 H4R EN ISO 3580 - A: E Cr Mo 1B 42 H5	C: 0.070 Si: 0.40 Mn: 0.60 S: 0.010 P: 0.015 Cr: 1.30 Mo: 0.50 As: <0.005 Sb: <0.005 Sn: <0.005	Heat treatment: 690°C, 1h UTS: 605 MPa YS: 510 MPa El: 23% CVN Impact: +25°C: 150J	2.50 x 350 3.15 x 450 4.00 x 450 5.00 x 450	IBR	Basic coated electrode for 1.25% Cr, 0.5% Mo alloyed boiler, plate, and tube steels. Suitable in long-term condition up to +570 °C service temperature. Reliable creep ruptures properties for the whole service life of a boiler plant. High toughness, crack resistant, weld metal can be quenched and tempered. Penetrating arc and excellent in positional welding. Diffusible Hydrogen content < 4ml/100 gm. Deposition efficiency 115%.
PHOENIX CHROMO 1 AWS A5.5: E8018-B2 EN ISO 3580-A: E CrMo1 B 4 2 H5	C: 0.06 Si: 0.25 Mn: 0.85 Cr: 1.20 Mo: 0.50 P: < 0.012 As: < 0.010 Sb: < 0.005 Sn: < 0.005	Heat treatment: 690°C / 10h UTS: 550 MPa YS: 460 MPa El: 22% CVN Impact: +20°C: 120J -20°C: 100J -40°C: 60J	2.5 x 350 3.2 x 350/450 4.0 x 350/450 5.0 x 450	TÜV, CE	Basic covered CrMo alloyed electrode. Cryogenic, suitable for quenching and tempering; resistant to caustic cracking; creep resistant in short time range up to 500°C (932°F) and in long time range up to 570 °C (1058°F). Electrode for heavy duty steam boiler and superheater tube fabrication; for quenched and tempered steels.
BOHLER FOX N CM 2 Kb AWS A5.5: E9018 - B3 H4R EN ISO 3580 - A: E CrMo2 B 4 2 H5	C: 0.075 Si: 0.45 Mn: 0.65 S: 0.010 P: 0.015 Cr: 2.30 Mo: 1.0 As: <0.006 Sb: <0.006 Sn: <0.006	Heat treatment: 690°C, 1h UTS: 660 MPa YS: 560 MPa El: 20% CVN Impact: +25°C: 175J	2.50 x 350 3.15 x 450 4.00 x 450 5.00 x 450	IBR	Basic coated electrode for 2.25% Cr, 1%Mo alloyed boiler, plate and tube steels. Suitable in long term condition up to +600°C service temperature. Crack resistant, tough weld and high creep rupture strength. Diffusible H2 content less than 4ml/100gm. Self lifting slag, flat and shiny bead. Excellent arc force helps to achieve radiographic quality weld deposit. Deposition efficiency 115%.
PHOENIX SH CHROMO 2 KS AWS A5.5: E9015-B3 EN ISO 3580-A: E CrMo2 B 4 2 H5	C: 0.07 Si: 0.25 Mn: 0.70 S: ≤ 0.010 P: ≤ 0.012 Cr: 2.20 Mo: 0.90 As: ≤ 0.010 Sb: ≤ 0.005 Sn: ≤ 0.005	Heat treatment: 690°C, 1h UTS: 460 MPa YS: 310 MPa El: 24% CVN impact: +20°C: 130J Heat treatment: SR + step-cooling UTS: 550 MPa YS: 440 MPa El: 22% CVN Impact: +20°C: 130J -30°C: 80J -40°C: 60J	2.50 x 250 3.20 x 350 4.00 x 350 3.20 x 450 4.00 x 450 5.00 x 450	TÜV, CE	Extra low content of trace elements; step cooling tested; not sensitive to long term embrittlement. Manufacture of chemical apparatus, hydrocrackers; for welding work on heavy duty boilers, superheaters, superheater lines; for welding of CrMo and CrMoV alloyed steels for the petrochemical industry.

Covered electrodes, low alloyed

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BOHLER FOX CM 5 Kb AWS A5.5: E8018-B6H4R EN ISO 3580-A: ECrMo5 B 4 2 H5	C: 0.08 Si: 0.3 Mn: 0.8 Cr: 5.0 Mo: 0.6	Heat treatment: 730°C/2h UTS: 620 MPa (≥590) YS: 520 MPa (≥460) El: 21% (≥ 17) CVN Impact: +20°C: + 90J (≥47)	2.5 x 250 3.2 x 350 4.0 x 350	TÜV, CE	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 approx. 115 %.
PHOENIX SH KUPFER 3 KC AWS A5.5: E9015-G EN ISO 3580-A: E ZCrMoV1 B 4 2 H5	C: 0.13 Si: 0.40 Mn: 1.0 Cr: 1.4 Mo: 1.05 V: 0.25	Heat treatment: SR UTS: 630 MPa YS: 520 MPa El: 18% CVN impact: +20°C: 40J	3.2 x 350 4.0 x 350 5.0 x 450	TÜV, CE	Basic covered CrMoV alloyed electrode. Suitable for low alloyed, creep resistant cast steel similar or same chemical composition. Creep resistant for short term conditions up to 550°C. Phoenix SH Kupfer 3 KC is suited for steam turbines, steam pipes or valve cases. It provides a good welding characteristics, flat smooth weld seams and an easy slag removal.
THERMANIT CHROMO 9 V AWS A5.5: E9015-B91H4R EN ISO 3580-A: E CrMo9 1 B 4 2 H5	C: 0.09 Si: 0.2 Mn: 0.6 Cr: 9.0 Mo: 1.1 Ni: 0.8 V: 0.2 Nb: 0.05 N: 0.04	Heat treatment: 760°C/2h UTS: 680 MPa YS: 550 MPa El: 17% CVN impact: +20°C: 47J Heat treatment: 760°C/4h UTS: 620 MPa YS: 530 MPa El: 17% CVN impact: +20°C: 47J	2.5 x 250 3.2 x 350 4.0 x 350 5.0 x 450	TÜV, CE	The basic coated CrMoVNb electrode is specially designed for welding of creep resistant tempered martensitic 9% Cr steels used for turbine and boiler fabrication in thermal power plants as well as in the chemical industry. Generally for vertical up welding with very good welding characteristics. The chemical composition is optimized in order to provide a high creep resistant and ductile weld metal and is characterized by low hydrogen content and low level of trace elements. This electrode is core wire alloyed thus a very homogeneous alloy dispersal is provided.
THERMANIT MTS 3 AWS A5.5: E9015-B91 H4 EN ISO 3580-A: E CrMo91 B 42 H5	C: 0.10 Si: 0.2 Mn: 0.6 Cr: 8.5 Mo: 0.9 Ni: 0.5 V: 0.2 Nb: 0.05 N: 0.04	Heat treatment: 760°C/2h UTS: 710 MPa (≥ 620) YS: 580 MPa (≥ 530) El: 19% (≥ 17) CVN impact: 70J (> 47)	2.50 x 250 3.20 x 350 4.00 x 350 5.00 x 450	TÜV, CE	The basic coated CrMoVNb core wire alloyed electrode is specially designed for welding of creep resistant tempered martensitic 9 % Cr steels used for turbine and boiler fabrication in thermal power plants as well as in the chemical industry. Approved for long term use at service temperatures up to 650°C. Thermanit MTS 3 provides good welding characteristics in all positions except vertical down, a stable arc, low spattering, good slag detachability and excellent striking and re-striking properties.

Covered electrodes, low alloyed

Brand Standard AWS Standard EN ISO	Chemical Composition (%) Typical Values	Mechanical Properties Typical Values	Ø x L (mm)	Approvals	Characteristics and Applications
THERMANIT CHROMO 9 V MOD AWS A5.5: E9015-B91H4R EN ISO 3580-A: EZ CrMo91 B 4 2 H5	C: 0.10 Si: 0.2 Mn: 0.8 Cr: 9.0 Mo: 1.1 Ni: 0.1 V: 0.2 Nb: 0.05 N: 0.04	Heat treatment: 760°C/2h UTS: ≥ 680 MPa YS: ≥ 550 MPa El: ≥ 17% CVN impact: +20°C: ≥ 47J	2.5 x 250 3.2 x 350 4.0 x 350 5.0 x 450	-	The basic coated CrMoVNb alloyed electrode is specially designed for welding of creep resistant tempered martensitic 9% Cr steels used for turbine and boiler fabrication in thermal power plants as well as in the chemical industry. Thermanit Chromo 9 V Mod provides good welding characteristics in all positions except vertical down a stable arc, low spattering, good slag detachability and excellent striking and re-striking properties. The chemical composition is optimized in order to provide a high creep resistant and ductile weld metal and meets the requirement for restricted Mn + Ni content (≤ 1 wt. %). It is characterized by low hydrogen content and low level of trace elements. This electode has a half synthetic cover concept.
THERMANIT MTS 616 AWS A5.5: E9015-E92 H4 EN ISO 3580-A: E Z CrMoWVNb9 0, 5 2 B 4 2 H5	C: 0.11 Si: 0.2 Mn: 0.6 Cr: 8.8 Mo: 0.5 Ni: 0.6 V: 0.2 W: 1.7 Nb: 0.04 N: 0.04	Heat Treatment: 760°C/2h UTS: 730 MPa (≥ 620) YS: 590 MPa (≥530) El: 19% (≥17) CVN impact: +20°C: 50J (≥41)	2.5 x 300 3.2 x 350 4.0 x 350	TÜV, CE	The basic coated core wire alloyed electrode is specially designed for welding of creep resistant tempered martensitic 9 % Cr steels. The electrode is used for the fabrication of turbine and boiler components in thermal power plants. It features good welding characteristics in all positions except vertical down, a stable arc, low spattering, good slag detachability and excellent striking and re-striking properties. The chemical composition is optimized in order to provide a high creep resistant and ductile weld metal and is characterized by low hydrogen content and low level of trace elements.
PHOENIX SH SCHWARZ 3 K NI AWS A5.5: E9018-G EN ISO 2560-A: E 50 4 1NiMo B 4 2 H5	C: 0.06 Si: 0.30 Mn: 1.25 P: ≤ 0.01 S: ≤ 0.01 Mo: 0.40 Ni: 0.95 Cu: ≤ 0.08	Heat treatment: As welded UTS: 620 MPa YS: 540 MPa El: 20% CVN Impact: +20°C: 140J -40°C: 50J	2.5 x 350 3.2 x 350 4.0 x 350 5.0 x 450	TÜV, CE	Basic covered NiMo alloyed electrode with a weld metal of special metallurgical purity for nuclear reactor construction. Quality controlled according to KTA 1408.2; very low H2 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.
THERMANIT MTS 4 EN ISO 3580-A: E CrMoWV12 B 4 2 H5	C: 0.18 Si: 0.3 Mn: 0.6 Cr: 11.0 Mo: 1.0 Ni: 0.6 W: 0.5 V: 0.3	Heat treatment: 760°C / 4h UTS: 700 MPa YS: 590 MPa El: 15% CVN Impact: +20°C: 35J	2.5 x 250 3.2 x 350 4.0 x 350 5.0 x 450	TÜV, CE	High temperature resistant up to 550°C (1022°F), resistant to scaling up to 600°C (1112°F). For surfacing and joining applications on matching/similar high temperature 12% Cr steels/cast steel grades, suitable for quenching and tempering.

Covered electrodes, low alloyed

Brand Standard AWS Standard EN ISO	Chemical Composition (%) Typical Values	Mechanical Properties Typical Values	Ø x L (mm)	Approvals	Characteristics and Applications
BOHLER FOX 2.5 Ni AWS A5.5: E8018-C1H4R EN ISO 2560-A: E 46 8 2Ni B 4 2 H5	C: 0.04 Si: 0.3 Mn: 0.8 Ni: 2.4	Heat treatment: As welded UTS: 570 MPa (≥ 530 – 680) YS: 490 MPa (≥ 460) El: 30% (≥ 20) CVN Impact: +20°C: 180J -80°C: 110J (≥ 47)	2.5 x 350 3.2 x 350 4.0 x 450 5.0 x 450	TÜV, ABS, DB, WIWEB, DNV GL, LR, RINA, CE	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 < 4ml/100g weld metal).
BOHLER FOX EV 60 AWS A5.5: E8018-C3H4R EN ISO 2560-A: E 46 6 1Ni B 42 H5	C: 0.07 Si: 0.4 Mn: 1.15 Ni: 0.9	Heat treatment: 580°C / 2h UTS: 580 MPa YS: 470 MPa El: 27% CVN Impact: +20°C: 180J	2.5 x 350 3.2 x 350 4.0 x 350/450 5.0 x 450	TÜV, DNV GL, RMR, ABS, CRS, CE, VG 95132	Basic 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°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). CTOD tested at -40°C. Test values for SSC test are available.
BOHLER FOX EV 65 AWS A5.5: E8018-GH4R / E8018-D1H4R EN ISO 18275-A: E 55 6 1NiMo B 4 2 H5	C: 0.06 Si: 0.3 Mn: 1.2 Ni: 0.8 Mo: 0.35	Heat treatment: 580°C / 2h UTS: 630 MPa YS: 580 MPa El: 25% CVN Impact: +20°C: 160J	2.5 x 350 4.0 x 350/450 5.0 x 450	TÜV, NAKS, VG 95132, BV, RMR, ABS, CE	Basic 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). BOHLER FOX EV 65 can be used in sour gas applications (HIC Test acc. NACE TM-02-84). Test values for SSC test are available on request.
BOHLER FOX EV 70 AWS A5.5: E9018-GH4R / E9018-D1H4R (mod.) EN ISO 18275-A: E 55 6 1NiMo B 4 2 H5	C: 0.04 Si: 0.3 Mn: 1.2 Ni: 0.9 Mo: 0.4	Heat treatment: 580°C / 2h UTS: 700 MPa YS: 650 MPa El: 24% CVN Impact: +20°C: 130J	2.5 x 350 3.2 x 350 4.0 x 450 5.0 x 450	TÜV, SEPROZ, CE	Basic, Mo-Ni alloyed covered electrode exhibiting high ductility and crack resistance for applications on high strength, fine-grained steels. Suitable for service temperatures between -60°C and +350°C. Metal recovery approx. 115%. Easy to handle in all positions except vertical down. Very low hydrogen content (acc. AWS class HD < 4 ml/100 g weld metal). Preheat and interpass temperatures, as well as post weld heat treatment as required by the base metal.
BOHLER FOX DCMV AWS A5.5: E9018-G EN ISO 3580-A: E ZCrMoV1 B 4 2 H5	C: 0.12 Si: 0.30 Mn: 0.9 Cr: 1.2 Mo: 1.0 V: 0.22	Heat treatment: As welded UTS: 1000 MPa YS: 720 MPa El: 12% CVN Impact: +20°C: 22J Heat treatment: 680°C / 8h UTS: 770 MPa (≥ 620) YS: 680 MPa (≥ 530) El: 19% (≥ 17) CVN Impact: +20°C: 90J (≥ 47)	3.2 x 350 4.0 x 450 5.0 x 450	TÜV, LTSS, SEPROZ, CE	Basic electrode for highly stressed joint and production welds on GS-17 CrMoV5-10 type high temperature cast steel used in the construction of steam turbines and valve casings. Approved in long term condition up to +600°C service temperature. High creep rupture strength thanks to the C, Cr, Mo and V content. High fracture toughness, low hydrogen content, good welding characteristics. The deposit is heat treatable. Metal recovery approx. 115%.

Covered electrodes, low alloyed

Brand Standard AWS Standard EN ISO	Chemical Composition (%) Typical Values	Mechanical Properties Typical Values	Ø x L (mm)	Approvals	Characteristics and Applications
BOHLER FOX DMV 83 Kb AWS A5.5: E8018-G EN ISO 3580-A: E MoV B 4 2 H5	C: 0.065 Si: 0.35 Mn: 1.2 Cr: 0.4 Mo: 1.0 V: 0.5	Heat treatment: 720°C / 2h UTS: 660 MPa (≥ 550) YS: 510 MPa (≥ 460) El: 22% (≥ 18) CVN Impact: +20°C: 200J (≥ 47)	2.5 x 250 3.2 x 350 4.0 x 350	TÜV, SEPROZ, CE	Basic core wire alloyed stick electrode with special suitability for 14MoV6-3 (1/2 Cr 1Mo) steels. Approved in long term condition up to +580°C service temperature. Crack resistant and ductile deposit, low hydrogen content. Good weldability in all positions except vertical down. Metal recovery approx. 115 %
BOHLER FOX CM 9 Kb AWS A5.5: E8018-B8 EN ISO 3580-A: E CrMo9 B 4 2 H5	C: 0.08 Si: 0.25 Mn: 0.65 Cr: 9.0 Mo: 1.0	Heat treatment: 760°C / 1h UTS: 730 MPa (≥ 620) YS: 610 MPa (≥ 530) El: 20% (≥ 18) CVN Impact: +20°C: 70J (≥ 34)	2.5 x 250 3.2 x 350 4.0 x 350	TÜV, CE	Basic coated, core wire alloyed electrode for creep resistant steels, suited in pressure vessel, particularly in the petrochemical industry. Preferably used for 9% Cr 1 % Mo steels e.g. X12CrMo9-1 (P9).Approved in long term condition up to +600 °C service temperature. The weld metal is heat treatable. Metal recovery approx. 115 %.
BOHLER FOX C 9 MV AWS A5.5: E9015-B91H4 EN ISO 3580-A: E CrMo 9 1 B 4 2 H5	C: 0.10 Si: 0.2 Mn: 0.6 Cr: 8.5 Ni: 0.5 Mo: 0.9 Nb: 0.05 V: 0.2 N: 0.04	Heat treatment: 760°C / 2h UTS: 710 MPa (≥ 620) YS: 580 MPa (≥ 530) El: 19% (≥ 17) CVN Impact: +20°C: 70J (≥ 47)	2.50 x 250 3.20 x 350 4.00 x 350 5.00 x 450	TÜV, CE	The basic coated CrMoVNb core wire alloyed electrode is specially designed for welding of creep resistant tempered martensitic 9 % Cr steels used for turbine and boiler fabrication in thermal power plants as well as in the chemical industry. Approved for long term use at service temperatures up to 650°C. Bohler FOX C 9 MV provides good welding characteristics in all positions except vertical down, a stable arc, low spattering, good slag detachability and excellent striking and re-striking properties. The chemical composition is optimized in order to provide a high creep resistant and ductile weld metal and is characterized by low hydrogen content and low level of trace elements.