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 H4 EN ISO 3580-A: E CrMo2 B 4 2 H5	C: 0.07 Si: 0.22 Mn: 0.75 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: 660 MPa (≥ 620) YS: 540 MPa (≥ 530) El: 21 %(≥18) CVN impact: +20°C: 180J (≥47)	2.50 x 250 3.20 x 350 3.20 x 450 4.00 x 350 4.00 x 450 5.00 x 450	TÜV, CE	The 2,25Cr-1Mo type weld metal exhibits a bainitic microstructure with favorable mechanical properties in tempered and quenched condition. The range of application covers joint welding of similar alloyed creep resistant steel and steel casting in thermal power and chemical industry. Approved for application under creep condition at design temperatures up to 600°C. Due to the low content of residual and tramp elements the weld metal offers a Bruscato factor < 12 ppm. Thus, being resistant to temper embrittlement and complies with the requirements on step-cooling testing. The basic coating guarantees low level of diffusible hydrogen in the weld metal.

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BOHLER FOX CrMo 2V AWS A5.5: E9015-G EN ISO 3580-A: E Z CrMo2V B 4 2 H5	C : 0.09 Si : 0.25 Mn : 0.75 Cr : 2.5 Mo : 1.0 V : 0.25 Nb : 0.01	Heat treatment: 705°C, 8h UTS : 660 MPa (585-760) YS: 550 MPa (415-620) El: 19% (18) CVN impact: +20°C: 140J -20°C: 100J -30°C: 70J (54) -40°C: 55J	3.2 × 450 4.0 × 450 5.0 × 450	VdTÜV (10230)	BOHLER FOX CrMo 2V is a core wire alloyed electrode with basic coating for welding of 2.25Cr-1Mo-0.25V steels. The weld metal exhibits a bainitic microstructure with favorable mechanical properties in tempered condition. The range of application covers joint welding of similar alloyed creep resistant steel for the fabrication of thick walled pressure vessel in the petrochemical industry. Approved for application under creep condition at design temperatures up to 550 °C. Impact energy is excellent down to temperatures <-30 °C. Being resistant to temper embrittlement and complies with the requirements on step-cooling testing. The optimized coating results in minimal moisture pick up and guarantees low level of diffusible hydrogen in the weld metal.
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 (≥550) YS: 520 MPa (≥460) El: 21% (≥ 17) CVN Impact: +20°C: + 130J (≥47)	2.5 x 250 3.2 x 350 4.0 x 350	TÜV, CE	BÖHLER FOX CM 5 kb is a covered electrode with basic coating for shielded metal arc welding. The 5Cr-0.6Mo type weld metal exhibits a martensitic-bainitic microstructure with favorable mechanical properties in tempered and quenched condition. The range of application covers joint welding of similar alloyed creep resistant steel and steel casting in thermal power and chemical industry. Approved for long-term service under creep condition up to 650 °C. The basic coating guarantees low level of diffusible hydrogen in the weld metal and a metal recovery of approximately 115%.
BOHLER FOX CM 9 Kb AWS A5.5: E8018-B8 H4 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/2h UTS: 715 MPa (≥620) YS: 580 MPa (≥ 530) El: 25% (≥18) CVN impact: +20°C: 80J (≥34)	2.5 × 250 3.2 × 350 4.0 × 350 5.0 × 450	TÜV, CE	BOHLER FOX CM 9 Kb is a core wire alloyed covered electrode with basic coating for shielded metal arc welding. The 9Cr-1Mo type weld metal exhibits a fully tempered martensitic microstructure with favorable mechanical properties in post weld heat treated condition. The range of application covers joint welding of similar alloyed creep resisting steels tube, pipe, plate and forgings used in the thermal power and petrochemical industry. BÖHLER FOX CM 9 Kb is aproved for long-term service up to 600 °C. Its basic coating guarantees low level of diffusible hydrogen in the weld metal and metal recovery of approximately 115 %.
THERMANIT CHROMO 9 V AWS A5.5: E9015-B91 H4 EN ISO 3580-A: E CrMo9 1 B 4 2 H5	C: 0.1 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: 730 MPa (≥620) YS: 600 MPa (≥ 530) El: 19% (≥ 17) CVN impact: +20°C: 80J (≥ 47)	2.5 x 250 3.2 x 350 4.0 x 350 5.0 x 450	TÜV, CE	Thermanit Chromo 9 V is a covered electrode with basic coating for shielded metal arc welding. The 9Cr-1Mo-VNb type weld metal exhibits a fully tempered martensitic microstructure with favorable mechanical properties in post weld heat treated condition. The range of application covers joint welding of similar alloyed creep strength enhanced ferritic steels like ASTM grade 91 tube, pipe, plate, forgings and castings, used in the thermal power and petrochemical industry. Thermanit Chromo 9 V is approved for long-term service at temperatures up to 650 °C. The covering concept of Thermanit Chromo 9 V ensures easy handling, designed for welding under difficult conditions in combination with low level of diffusible hydrogen.

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-B91 H4 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: 730 MPa (≥ 620) YS: 595 MPa (≥ 530) El: 19% (≥ 17)CVN impact: +20°C: 80J (≥ 47)	2.5 x 250 3.2 x 350 4.0 x 350 5.0 x 450	CE	Thermanit Chromo 9 V Mod is a basic coated stick electrode. The 9Cr-1Mo-VNb type weld metal exhibits a fully tempered martensitic microstructure with favorable mechanical properties in post weld heat treated condition. The range of application covers joint welding of similar alloyed creep strength enhanced ferritic steels like ASTM grade 91 tube, pipe, plate, forgings and castings, used in the thermal power and petrochemical industry. The chemical composition is optimized in order to provide a high creep resistant and ductile weld metal after post weld heat treatment along with low level of trace elements. The covering concept of Thermanit Chromo 9 V Mod ensures easy handling, designed for welding under diffi cult conditions in combination with low level of diffusible hydrogen.
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 9Cr-1Mo-VNb type weld metal exhibits a fully tempered martensitic microstructure with favorable mechanical properties in post weld heat treated condition. The range of application covers joint welding of similar alloyed creep strength enhanced ferritic steels like ASTM grade 91 tube, pipe, plate, forgings and castings, used in the thermal power and petrochemical industry. Approved for long-term service at temperatures up to 650 °C. The chemical composition is optimized in order to provide a high creep resistant and ductile weld metal after post weld heat treatment along with low level of trace elements. Thanks to the restricted Mn+Ni content of less than 1.2 wt. % the A C1 temperature is certainly above 780 °C.
THERMANIT MTS 616 AWS A5.5: E9015-B92 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 5.0 × 450	TÜV, IBR, 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.
BOHLER FOX EV 64 (PHOENIX SH SCHWARZ 3 K NI) AWS A5.5: E9018-G EN ISO 2560-A: E 50 4 Z1NiMo B 4 2 H5	C: 0.06 Si: 0.30 Mn: 1.4 P: ≤ 0.01 S: ≤ 0.01 Mo: 0.5 Ni: 0.95 Cu: ≤ 0.08	Heat treatment: As welded UTS: 620 MPa YS: 540 MPa (≥ 530) El: 20% (≥18) CVN Impact: +20°C: 140J -40°C: 60J (≥ 47)	2.5 x 350 3.2 x 350 4.0 x 350 5.0 x 450	TÜV, KTA, CE	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.

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, DB, ABS, BV, DNV, LR, WIWEB, 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) with a moisture resistant coating.
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: As welded UTS: 600 MPa (550 – 680) YS: 510 MPa (≥ 460) El: 29% (≥ 20) CVN Impact: +20°C: 200J -60°C: 120J (≥47)	2.5 x 350 3.2 x 350 4.0 x 350/450 5.0 x 450	TÜV, DNV, RMR, VG 95132, ABS, CE	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°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) with a moisture resistant coating.
BOHLER FOX EV 65 AWS A5.5: E8018-G H4R / E8018-D1 H4R (mod.) 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: As welded UTS: 650 MPa (610 – 780) YS: 590 Mpa (≥ 550) El: 25% (≥ 18) CVN Impact: +20°C: 190J -60°C: 90J (≥47)	2.5 × 350 3.2 × 350 4.0 × 350/450 4.8 × 450 5.0 × 450	TÜV, NAKS, VG 95132, BV, RMRS, 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: As welded UTS: 670 MPa (≥620 – 780) YS: 590 MPa (≥ 550) El: 24% (≥18) CVN Impact: +20°C: 160J -60°C: 70J (≥ 47)	2.5 x 350 3.2 x 350 4.0 x 450 5.0 x 450	TÜV, CE	Basic coated, Mo-Ni alloyed 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) with moisture resistant coating.
BOHLER FOX N EV85-G AWS A5.5: E 11018-G H4R EN ISO 18275-A: E 69 6 Mn2NiCrMo B 4 2 H5	C: 0.05 Si: 0.20 Mn: 1.40 S: 0.010 P: 0.020 Cr: 0.30 Ni: 1.65 Mo: 0.35	Heat treatment: As welded UTS : 820 MPa YS: 710 MPa El: ≥18% CVN Impact: -51°C: 55J	2.50 x 350 3.15 x 450 4.00 x 450 5.00 x 450	-	Bohler Fox N EV85-G basic coated low hydrogen type electrode specially designed for use in high strength applications and formulated to resist cracking under conditions of high humidity and restraints. Weld deposit is of radigraphic quality and sound mechanical properties. Suitable for penstocks, earth moving equipment and other heavy steel fabrications made from Q & T high tensile steels etc. Very low hydrohen content (HD ~ 4ml /100 gm of weld metal)