Covered electrodes, unalloyed

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 6013 AWS A5.1: E6013 EN ISO 2560 - A: E 38 A RC 11	C: 0.06 Si: 0.30 Mn: 0.45 P: 0.025 S: 0.021	Heat treatment: As welded UTS: 520 MPa YS: 440 MPa El: 25% CVN Impact: 0°C: 55J	2.50 x 350 3.15 x 350/450 4.00 x 450 5.00 x 450	IBR, IRS	Excellent weldability in all position thus ease of manipulation & high welder appeal. The deposited weld metal is of radiographic quality. Excellent re-striking and arc stability characteristics and usable on low OCV transformers (OCV~45V). Good fluidity & excellent passage through joints thus helps easy & controlled flow of weld metal including bad fit-up joints & tack welding. Typical applications are storage tanks, boiler tubes, railway wagons, ships, trawlers, dredgers, machinery construction, bridges & sheet metal works.
MARUTI FS AWS A5.1: E6012	C: 0.08 Si: 0.30 Mn: 0.40 P: 0.025 S: 0.025	Heat treatment: As welded UTS: 510 MPa YS: 430 MPa El: 23% CVN Impact: 0°C: 50J	2.50 x 350 3.15 x 350/450 4.00 x 450 5.00 x 450	BIS	A medium coated, all position electrode for jobs of structural importance. The electrode operates with quiet arc and deposits a smooth bead with fine ripples. It gives medium penetration, least spatter and easy slag removal. It is easy to operate in all positions including vertical down. Suitable for general purpose mild steel welding, steel structures, tanks, railway wagons, storage tanks etc.
MARUTI - A1 AWS A5.1: E6013	C: 0.08 Si: 0.30 Mn: 0.40 P: 0.025 S: 0.025	Heat treatment: As welded UTS: 510 MPa YS: 430 MPa El: 23% CVN Impact: 0°C: 50J	2.50 x 350 3.15 x 350/450 4.00 x 450 5.00 x 450	BIS	A medium coated all position mild steel rutile coated electrode. It gives normal penetration, finely rippled bead and easy slag removal. Suitable for structures, building construction, vessels, tanks, pipeline and railway wagons etc.
MARUTI - 44 AWS A5.1: E6013 EN ISO 2560 A: E 38 A RC 11	C: 0.07 Si: 0.25 Mn: 0.45 P: 0.025 S: 0.025	Heat treatment: As welded UTS: 520 MPa YS: 450 MPa El: 24% CVN Impact: 0°C: 56J	2.50 x 350 3.15 x 350/450 4.00 x 450 5.00 x 450	BIS, IBR, BHEL, NTPC, LRS, EIL	A medium heavy coated rutile type electrode, specially designed for radiographic quality welds. Low spatter, easy slag removal, adequate penetration and smooth bead are its special features. Suitable for welding rail coaches, wagons, storage tanks, pipeline, pressure vessel and heavy structure etc.
MARUTI - 66 AWS A5.1: E6013 EN ISO 2560 - A: E 38 A RC 11	C: 0.07 Si: 0.25 Mn: 0.45 P: 0.025 S: 0.022	Heat treatment: As welded UTS: 530 MPa YS: 450 MPa El: 24% CVN Impact: 0°C: 58J	2.50 x 350 3.15 x 350/450 4.00 x 450 5.00 x 450	BIS, IBR	A heavy coated rutile type electrode for achieving welds of superior finish and radiographic quality. It gives low spatter and excellent self lifting slag, striking and re-striking are excellent. Suitable for wagon building, locomotive fabrication, auto component, pipelines and steel furniture. Also suitable for thin steel due to its fine droplet transfer etc.
MARUTI - XL AWS A5.1: E6013 EN ISO 2560 A: E 38 A RC 11	C: 0.06 Si: 0.25 Mn: 0.45 P: 0.025 S: 0.022	Heat treatment: As welded UTS: 520 MPa YS: 440 MPa El: 24% CVN Impact: 0°C: 56J	2.50 x 350 3.15 x 350/450 4.00 x 450 5.00 x 450	BIS	A rutile type medium coated electrode, gives smooth arc with low spatter, slag comes off easily and gives shining bead of smooth profile & radiographic quality. Suitable for welding rail coaches, wagons, storage tanks, pipeline, pressure vessel and heavy structure etc.

Covered electrodes, unalloyed

Brand Standard AWS Standard EN ISO	Chemical Composition (%) Typical Values	Mechanical Properties Typical Values	Ø x L (mm)	Approvals	Characteristics and Applications
MARUTI 63X-AP AWS A5.1: E6013 EN ISO 2560 A: E 38 A RC 11	C: 0.06 Si: 0.30 Mn: 0.45 P: 0.025 S: 0.022	Heat treatment: As welded UTS: 520 MPa YS: 440 MPa El: 24% CVN Impact: 0°C: 56J	2.50 x 350 3.15 x 350/450 4.00 x 450 5.00 x 450	BIS, IBR	Medium rutile coated mild steel electrode designed for welding of unalloyed structural steels in all positions including vertical down. The electrode gives smooth radiographic quality weld with low spatter and less smoke. Slag is self detachable and re-striking is excellent. Suitable for welding of varying thickness of MS plates in different types joints and ship steels, railway wagon, storage tanks, pipeline, pressure vessels and heavy structures.
MARUTI 6013 AWS A5.1: E6013	C: 0.07 Si: 0.30 Mn: 0.40 P: 0.025 S: 0.022	Heat treatment: As welded UTS: 510 MPa YS: 440 MPa El: 23% CVN Impact: 0°C: 52J	2.50 x 350 3.15 x 350/450 4.00 x 450 5.00 x 450	BIS, IBR, LRS, MND, TPL, RDSO Class A-2	It is a medium coated rutile type electrode for all position welding. The electrode is characterized by smooth and stable arc, low spatter, easy slag removal and fine rippled bead. Weld deposit good chemical and mechanical properties with radiography quality. Suitable for the general fabrications, structural steels, truck bodies, dies, steel furniture and maintenance work etc.
ULTRA 7016 AWS A5.1: E7016	C: 0.06 Si: 1.30 Mn: 0.50 P: 0.025 S: 0.020	Heat treatment: As welded UTS: 540 MPa YS: 470 MPa El: 28% CVN Impact: -30°C: 80J	2.50 x 350 3.15 x 450 4.00 x 450 5.00 x 450	RDSO Class A3-B1	Ultra 7016 is a basic coated low hydrogen electrode for welding of medium and high tensile structural steel and depositing buffer layer before hard surfacing. Yields sound radiographic welds having excellent mechanical properties. Suitable for railway coaches, ships, oil tanks, heavy duty structure, earth moving machinery and also joining mild steel to cast iron etc. Also suitable for buffer layers on CI.
ULTRA 7018 AWS A5.1: E7018 EN ISO 2560 A: E 42 5 B 4 2 H5	C: 0.05 Si: 0.40 Mn: 1.20 P: 0.025 S: 0.02 Cr: 0.02 Mo: 0.003 Ni: 0.015	Heat treatment: As welded UTS: 550 MPa YS: 460 MPa El: 30% CVN Impact: -30°C: 90J	2.50 x 350 3.15 x 350/450 4.00 x 450 5.00 x 450	BIS, CIB, BHEL, MND, NTPC, RDSO Class A4 – B2	Ultra 7018 is a basic coated electrode with very good welding characteristics, including out of position work. With weld metal recovery about 110%, thus higher productivity. Weld of consistent radiographic quality is achieved along with extremely good slag detachability thus greater weld appeal.
BOHLER FOX N EV 48 AWS A5.1: E7018 EN ISO 2560 - A: E 42 3 B 3 2 H5	C: 0.05 Si: 0.40 Mn: 1.20 P: 0.025 S: 0.020 Cr: 0.02 Mo: 0.003 Ni: 0.015	Heat treatment: As welded UTS: 560 MPa YS: 460 MPa El: 28% CVaM Impact: -30°C: 100J Heat treatment: 610°C / 12h UTS: 530 MPa YS: 432 MPa El: 30% CVN Impact: -30°C: 110J	2.50 x 350 3.15 x 350/450 4.00 x 450 5.00 x 450	IBR, LRS IRS	Basic covered electrode with very good welding characteristics, including out of position work. High impact properties at -30°C, thus produces tougher weld. Weld metal recovery about 115%, thus higher productivity. Extremely good slag detachability, thus greater weld appeal. Low spatter and finely rippled bead with regular profile reduces machining work. Weld of consistent radiographic quality is achieved.

Covered electrodes, unalloyed

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 EV 48-1 AWS A5.1: E7018-1 EN ISO 2560 - A: E 42 5 B 3 2 H5	C: 0.045 Si: 0.45 Mn: 1.3 P: 0.024 S: 0.015 Cr: 0.02 Mo: 0.003 Ni: 0.015	Heat treatment: As welded UTS: 570 MPa YS: 465 MPa El: 28% CVN Impact: -45°C: 90J Heat treatment: 610°C / 12h UTS: 536 MPa YS: 436 MPa El: 30% CVN Impact: -45°C: 62J	2.50 x 350 3.15 x 350/450 4.00 x 450 5.00 x 450	IBR, LRS, IRS	Basic coated electrode with excellent welding characteristic and positional welding. Tough weld with high impact strength at -45°C. Weld metal recovery about 115%, thus higher productivity. Extremely good slag detachability thus greater welder comfort. Low spatter and finely rippled bead with regular profile reduces dressing work. Weld of consistent radiographic quality is achieved.
BOHLER FOX N EV 50 AWS A5.1: E7018 H4R EN ISO 2560 - A: E 42 5B 42 H5	C: 0.08 Si: 0.5 Mn: 1.25 P: 0.020 S: 0.015	Heat treatment: As welded UTS: 575 MPa YS: 470 MPa El: 27% CVN Impact: -30°C: 100J	2.50 x 350 3.15 x 350/450 4.00 x 450 5.00 x 450	IBR, LRS, ABS	Basic covered electrode with very good welding characteristics including out of position work. Excellent impact properties down to - 30°C. CTOD tested at -10°C and shows good resistance to crack propagation. Diffusible Hydrogen level < 4ml /100 gm. weld metal. Weld metal recovery about 115%. Crack free weld metal when welding high carbon steels. Suitable for use in tank construction, boiler & pressure vessel manufacturing, vehicle manufacturing, offshore applications and ship building.
BOHLER FOX N EV 50-1 AWS A5.1: E7018-1 H4R EN ISO 2560 - A: E 42 5B 4 2 H5	C: 0.08 Si: 0.5 Mn: 1.3 P: 0.015 S: 0.012	Heat treatment: As welded UTS: 575 MPa YS: 480 MPa El: 28% CVN Impact: -45°C: 80J	2.50 x 350 3.15 x 350/450 4.00 x 450 5.00 x 450	IBR, LRS	Basic covered electrode with very good welding characteristics including out of position work. Good impact properties down to -45°C. CTOD tested at -10°C and shows good resistance crack propagation. Diffusible Hydrogen level < 4ml /100 gm. weld metal. Weld metal recovery about 115%. Crack free weld metal when welding high carbon steels. Suitable for use in tank construction, boiler & pressure vessel manufacturing, vehicle manufacturing, offshore applications and ship building.
BOHLER FOX CEL + AWS A5.1: E6010 EN ISO 2560-A: E 38 2 C 2 1	C: 0.17 Si: 0.15 Mn: 0.6	Heat treatment: As welded UTS: 520 MPa (470 - 600) YS: 430 MPa (≥380) El: 26% (≥ 22) CVN Impact: +20°C: 105J -20°C: 60J (≥ 47) -30°C: 50J (≥ 27)	2.5 x 300 3.2 x 350 4.0 x 350	CE	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, BOHLER 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. BOHLER FOX CEL+ can be used in sour gas applications (HIC-Test acc. to NACE TM-02-84). Test values of SSC-test are available too.

Covered electrodes, unalloyed

Brand Standard AWS Standard EN ISO	Chemical Composition (%) Typical Values	Mechanical Properties Typical Values	Ø x L (mm)	Approvals	Characteristics and Applications
BOHLER FOX CEL 70-P AWS A5.5: E7010-P1 EN ISO 2560-A: E 42 3 C 25	C: 0.15 Si: 0.1 Mn: 0.45 Ni: 0.17	Heat treatment: As welded UTS: 560 MPa (500 – 640) YS: 460 MPa (≥ 420) El: 23% (≥ 22) CVN Impact: +20°C: 100J -20°C: 80J -30°C: 65J (≥ 47)	3.2 x 350 4.0 x 350 5.0 x 350	TÜV, CE	Cellulose electrode for vertical down welding of high strength large diameter pipelines. Especially recommended for hot passes, filler and cover layers. Highly economical compared with conventional vertical up welding. BOHLER FOX CEL 70-P provides an intense arc and a fluid weld metal. It can be used in sour gas applications (HIC-Test acc. to NACE TM-02-84). Test values of SSC-test are available too.
BOHLER FOX CEL 80-P AWS A5.5: E8010-P1/E8010-G EN ISO 2560-A: E 46 3 1Ni C 2 5	C: 0.15 Si: 0.15 Mn: 0.7 Ni: 0.8	Heat treatment: As welded UTS: 580 MPa (550 – 680) YS: 490 MPa (≥460) El: 23% (≥20) CVN Impact: +20°C: 90J -20°C: 80J -30°C: 60J (≥ 47)	3.2 x 350 4.0 x 350 5.0 x 350	TÜV, CE	Cellulose electrode for vertical down welding of high strength, large diameter pipelines. Highly economical compared with conventional vertical up welding. Especially recommended for hot pass, filler and cover layers. The BOHLER FOX CEL 80-P provides a more intensive arc and a more fluid weld metal as compared to the well known BOHLER FOX CEL 85. BOHLER FOX CEL 80-P can also be used in sour gas applications (HIC-Test acc. to NACE TM-02-84). Test values for SSC-test are available too.
BOHLER FOX BVD 85 AWS A5.5: E8045-P2H4R / E8018-GH4R EN ISO 2560-A: E 46 5 1Ni B 4 5 H5	C: 0.05 Si: 0.4 Mn: 1.1 Ni: 0.9	Heat treatment: As welded UTS: 560 MPa (550 – 680) YS: 500 MPa (≥460) El: 27% (≥20) CVN Impact: +20°C: 170J -30°C: 120J -40°C: 100J -50°C: 65J (≥ 47)	3.2 x 350 4.0 x 350 4.5 x 350	TÜV, CE	Basic 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 porosity. Due to this and the good welding characteristics this special basic electrode offers easy handling even under field conditions. Bohler 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.