

Lasting Connections

DISTRIBUTOR PRODUCT PORTFOLIO FOR ASIA PACIFIC





LASTING CONNECTIONS

As a pioneer in innovative welding consumables, BÖHLER Welding offers a unique product portfolio for joint welding worldwide. More than 2000 products are adapted continuously to the current industry specifications and customer requirements, certified by well-respected institutes and thus approved for the most demanding welding applications.

BÖHLER Welding shares its experience and knowledge and co-operates closely with industrial customers and distributors. In doing so, BÖHLER Welding offers joining solutions that have been developed together with customers and partners and successfully proven in practice.

Our clients benefit from a partner with

- » the highest expertise in joining, rendering the best application support globally available
- » specialized and best in class product solutions for their local and global challenges
- » an absolute focus on customer needs and their success
- » a worldwide presence through factories, offices and distributors

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COVERED ELECTRODES, UNALLOYED

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L (mm)	Approvals	Characteristics and applications
BÖHLER FOX S EV 50 AWS A5.1: E7018 H4R	C: 0.08 Si: 0.50 Mn: 1.40 P: 0.009 S: 0.01	Re: 490 MPa Rm: 560 MPa A: 30 % CVN Impact: +20 °C: 160 J -40 °C: 55 J	2.50 x 350 3.25 x 350 3.25 x 450 4.00 x 350 4.00 x 400 4.00 x 450 5.00 x 450	ABS, LR, DNV-GL, BKI, CE	Basic covered electrode with excellent strength and toughness. Metal recovery approx. 115 %. Crack free weld metal when welding high carbon steels.
BÖHLER FOX S EV 50-1 AWS A5.1: E7018-1H4R	C: 0.08 Si: 0.50 Mn: 1.40 Cr: < 0.05 Mo: < 0.05 Mo: < 0.05 P: 0.009 S: 0.01	Re: 490 MPa Rm: 560 MPa A: 30 % CVN Impact: +20 °C: 190 J -50 °C: 90 J PWHT: 620 °C / 2 hrs Re: 440 MPa Rm: 530 MPa A: 35 % CVN Impact: +20 °C: 220 J -50 °C: 120 J	2.50 x 350 3.25 x 350 3.25 x 450 4.00 x 450 5.00 x 450	ABS, LR, DNV-GL, BKI, CE	Basic covered electrode with excellent strength and toughness properties down to -50 °C. CTOD tested at -10 °C. Suitable for use in tank construction, boiler and pressure vessel manufacture, apparatus engineering, vehicle manufacture, offshore application and ship building.
BÖHLER FOX S EV 47 AWS A5.1 : E7016 H4R	C: 0.07 Si: 0.40 Mn: 0.90	Re: 460 MPa Rm: 545 MPa A: 34 % CVN Impact: +20 °C: 190 J -46 °C: 90 J -50 °C: ≥ 47 J	2.50 x 350 3.25 x 350 3.25 x 450 4.00 x 450 5.00 x 450	ABS, DNV-GL, CE	Basic electrode for high quality welds. Weld metal is extremely ductile, crack resistant and ageing resistant, thus especially suited for rigid weldments with heavy seam cross sections.
BÖHLER FOX S EV Pipe-1 AWS A5.1 : E7016-1H4R	C: 0.06 Si: 0.60 Mn: 0.90	Re: 480 MPa Rm: 570 MPa A: 30 % CVN Impact: -40 °C: 60 J -46 °C: 50 J	2.50 x 350 3.25 x 350 3.25 x 450 4.00 x 350	ABS, CE	Basic electrode with some additions of rutile and silicates. Weld metal toughness is available down to -46 °C.
BÖHLER FOX S 6013 AWS A5.1: E6013	C: 0.06 Si: 0.30 Mn: 0.40	Re: 430 MPa Rm: 520 MPa A: 23 % CVN Impact: 0 °C: 50 J	2.50 x 350 3.25 x 350 4.00 x 350 5.00 x 450	ABS, BKI	Rutile-cellulosic coated electrode engineered for easy operating in all positions including vertical down. Excellent welding properties in AC polarity, good striking and restriking characteristic, sound penetration, flat beads. Popular for general steel construction.
BÖHLER FOX S OHV AWS A5.1: E6013	C: 0.08 Si: 0.40 Mn: 0.45	Re: 477 MPa Rm: 550 MPa A: 20 % CVN Impact: +20 °C: 55 J 0 °C: 50 J	2.50 x 350 3.25 x 350 3.25 x 450 4.00 x 350 4.00 x 450 5.00 x 450	ABS, BKI	Rutile-cellulosic electrode with good weldability in all positions including vertical-down. Most popular E6013 type, suitable for small transformers with low OCV.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L (mm)	Approvals	Characteristics and applications
BÖHLER FOX CEL + AWS A5.1: E6010	C: 0.17 Si: 0.15 Mn: 0.6	Re: 430 MPa Rm: 520 MPa A: 26 % CVN Impact: +20 °C: 105 J 0 °C: 95 J -20 °C: 60 J -30 °C: 50 J	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. BÖHLER FOX CEL+ can be used in sour gas applications (HIC-Test acc. to NACE TM-02-84).

FLUX AND METAL-CORED WIRES, UNALLOYED

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
BÖHLER Q 71 RC (C1) AWS A5.20: E71T-1C	C: < 0.12 Si: < 0.90 Mn: < 1.75 P: < 0.03 S: < 0.03	Shielding gas: CO ₂ Re: ≥ 400 MPa Rm: 490 - 660 MPa A: ≥ 22 % CVN Impact: -20 °C: ≥ 27 J	1,2 1,6	ABS, DNV, LR	Rutile flux cored wire with fast freezing slag. Excellent welding characteristics in all positions. Suitable for butt and fillet welding of hulls, storage tanks, mechanical and constructional steel structure and bridge.
BÖHLER Q 71 RC (M) AWS A5.20: E71T-1M	C: < 0.12 Si: < 0.90 Mn: < 1.75 P: < 0.03 S: < 0.03	Shielding gas: Ar + 15 – 25 % CO ₂ Re: ≥ 390 MPa Rm: 490 - 670 MPa A: ≥ 22 % CVN Impact: -20 °C: > 27 J	1,2 1,6	-	Rutile flux cored wire with fast freezing slag. Excellent welding characteristics in all positions. Very good mechanical properties, easy slag removability, low spatter level, smooth and well shaped beads.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
BÖHLER Q 71 RC AWS A5.20: E71T-1/T-9/T-12M-JH8 E71T-1/T-9/T-12C-JH4	C1 C: < 0.05 Si: < 0.45 Mn: < 1.10 M21 C: < 0.06 Si: < 0.50 Mn: < 1.12	Shielding gas: CO ₂ Re: 480 MPa Rm: 500 - 640 MPa A: 25 % CVN Impact: -40 °C: 40 J Shielding gas: M21 Re: 500 MPa Rm: 550 - 660 MPa A: 26 % CVN Impact: -40 °C: 90 J	1,2 1,6	TÜV, DB, ABS LR, DNV-GL BV, CWB, RINA, CE	All position rutile flux cored wire with fast freezing slag system. Suitable for welding with shielding gas M21 and 100% CO ₂ . User friendly welding characteristics in all positions with one wire diameter 1.2 mm and same parameter setting. Excellent mechanical properties, easy slag removal, low spatter loss, smooth, finely rippled bead surface, X-ray quality weld.
BÖHLER Q 71 NG AWS A5.20: E71T-8-JH8	C: 0.15 Si: 0.20 Mn: 0.60 P: 0.010 S: 0.009 Al: 0.60	Shielding gas: NO Re: 400 MPa Rm: 490 - 660 MPa A: ≥ 22 % CVN Impact: -30 °C: ≥ 27 J	1,2 1,6	-	A self-shielded flux cored wire designed for all-position welding with excellent CVN Impact properties in as welded condition at - 30 °C, suitable for butt, fillet welding of 490MPa steel and low temperature steel of structure such as structural steel, buildings and storage tanks, etc.
BÖHLER Q 70 MC AWS A5.18: E70C-6M H4	C: < 0.07 Si: < 0.07 Mn: < 1.50	Shielding gas: M20 / M21 Re: 490 MPa Rm: 550 - 660 MPa A: 25 % CVN Impact: -40 °C: 47 J	1,2	TÜV, ABS LR, DNV-GL BV, CWB, CE	Metal-cored all positional high-efficiency wire for semi-automatic and fully automatic joint welding of unalloyed and fine-grained constructional steels. Service temperatures from -40°C (27J) to +450°C when using mixed gas.

SEAMLESS FLUX AND METAL-CORED WIRES, UNALLOYED

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
diamondspark 46 RC(C1) AWS A5.20: E71T-1C H4 / E71T-9C H4	C: 0.065 Si: 0.45 Mn: 1.3	Shielding gas: C1 Re: 520 MPa Rm: 580 MPa A: 25 % CVN Impact: +20 °C: 100 J -20 °C: 95 J -30 °C: 70 J	1,0 1,2 1,4 1,6	TÜV, DB, DNV-GL, ABS, LR, BV, RINA, RS, CE	Seamless rutile flux cored wire for single- or multilayer welding of Carbon, Carbon-Manganese steels and similar types of steels including fine grain steels with pure CO ₂ shielding gas. Excellent weldability in all positions especially vertical upward position, also with high parameters (300 A), very low spatter losses, fast freezing, easy to remove slag and smooth and bright bead.
diamondspark 44 RC SR (C1) AWS A5.20: E71T-12C JH4	C: 0.04 Si: 0.40 Mn: 1.3 Ni: 0.40	PWHT: 620 °C / 13 hrs Re: 460 MPa Rm: 550 MPa A: 29 % CVN Impact: -40 °C: 95 J -60 °C: 60 J	1,0 1,2 1,4 1,6	ABS, DNV-GL, BV, LR, CE	Seamless rutile flux cored wire with pure CO ₂ shielding gas. The seamless technology guarantees constant low diffusible Hydrogen in all situations of humidity and environment. CTOD tested at -10 °C (14 °F). This product can be used in sour gas applications. (HIC tested acc. to NACE TM-0284).
diamondspark 52 RC AWS A5.20: E71T1M/T-9M/T-12M JDH4 E71T1C/T-9C/T-12C DH4	M21 C: 0.06 Si: 0.40 Mn: 1.45 C1 C: 0.04 Si: 0.35 Mn: 1.25	Shielding gas: M21 Re: 500 MPa Rm: 590 MPa A: 26% CVN Impact: -20 °C: 100 J -46 °C: 50 J PWHT: 620 °C / 1 hrs Re: 510 MPa Rm: 590 MPa A: 26 % CVN Impact: -46 °C: 41 J	1,0 1,2 1,4 1,6	TÜV, DB, DNV-GL, ABS, LR, BV, CWB, CE RINA, RS AWS D1.8	Seamless rutile flux cored wire for single- or multilayer welding of Carbon, Carbon-Manganese steels and similar types of steels including fine grain steels with Argon-CO ₂ shielding gas or pure CO ₂ . Excellent weldability in all positions with high welding speed, very low spatter losses, good bead appearance, fast freezing and easy to remove slag. D1.8 Seismic Supplement approved. This product can be used in sour gas applications.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
diamondspark 52 MC AWS A5.18: E70C-6M H4	M21 C: 0.07 Si: 0.07 Mn: 1.5	Shielding gas: M21 Re: 490 MPa Rm: 600 MPa A: 27 % CVN Impact: -40 °C: 170 J -50 °C: 70 J PWHT: 580 °C / 2 hrs Re: 450 MPa Rm: 550 MPa A: 27 % CVN Impact: -40 °C: 100 J	1,0 1,2 1,4 1,6	TÜV, DB, DNV-GL, ABS, LR, BV, CWB, CE	Seamless metal cored wire with Argon-CO ₂ or pure CO ₂ shielding gas. Features include: high yield, good weldability, excellent bead appearance, very low spatter losses and exceptional mechanical properties at low temperatures (-50 °C) in as welded conditions as well with post weld heat treatment. This wire is especially suitable for automated-robotized applications and for root pass welding for piping and butt-joints. This wire is CTOD-tested.
diamondspark 54 MC AWS A5.18: E70C-6M H4	M21 C: 0.06 Si: 0.80 Mn: 1.6 C1 C: 0.05 Si: 0.60 Mn: 1.50	Shielding gas: M21 Re: 500 MPa Rm: 600 MPa A: 29 % CVN Impact: -40 °C: 90 J -60 °C: 60 J Shielding gas: C1 Re: 460 MPa Rm: 560 MPa A: 30 % CVN Impact: -40 °C: 80 J -50 °C: 60 J	1,0 1,2 1,4 1,6	TÜV, DB, DNV-GL, ABS, LR, BV, RINA, CWB,	Seamless metal cored wire for single- or multilayer welding of Carbon, Carbon-Manganese and similar fine grain steels with Argon-CO ₂ or pure CO ₂ shielding gas. This wire is especially suitable for automated-robotic applications and for root pass welding for piping and butt-joints. This product can be used in sour gas applications. (HIC tested acc. to NACE TM-0284).

SOLID GMAW WIRES, UNALLOYED

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
BÖHLER SG 2 AWS A5.18: ER70S-6	C: 0.07 Si: 0.85 Mn: 1.5	Shielding gas: M21 / CO ₂ Re: ≥ 420 MPa Rm: 500-640 MPa A: ≥ 20 % CVN Impact: -30 °C: ≥ 47 J	0,8 1,0 1,2 1,6	TÜV, DB, CE, DNV-GL	Copper-coated solid wire suited for universal application in boiler and vessel fabrication and in structural steel engineering. Largely spatter-free metal transfer both when using gas mixtures and carbon dioxide.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
BÖHLER SG 3 AWS A5.18: ER70S-6	C: 0.09 Si: 0.95 Mn: 1.70	Shielding gas: M21 Re: 480 MPa Rm: 530-680 MPa A: 26 % CVN Impact: -40 °C: 50 J	0,8 0,9 1,0 1,2 1,6	TÜV, DB, ABS, CWB DNV-GL, CE	Copper-coated solid wire with spatter-free metal transfer both when using gas mixtures and carbon dioxide. Thanks to its high current carrying capacity this filler metal is also optimally suited for welding thick-walled sheet and plate structures.
ECOspark 420 AWS A5.18: ER70S-6	C: 0.08 Si: 0.90 Mn: 1.45	Shielding gas: M21 Re: 440 MPa Rm: 500-640 MPa A: 28 % CVN Impact: -50 °C: 80 J Shielding gas: CO ₂ Re: 430 MPa Rm: 500-630 MPa A: 26 % CVN Impact: -40 °C: 95 J	0,8 0,9 1,0 1,2 1,6	TÜV, DB, ABS, CWB CE	Solid wire electrode with 'engineered nanotech surface' designed for reliable welding performance within a wide parameter range. ECOspark wires are characterised by very good feeding properties at high wire feeding rates, very stable arc performance and significant lower oxide / silicate forming on the weld surface. This makes them especially suited for fully mechanised processes.
ECOspark 460 AWS A5.18: ER70S-6	C: 0.01 Si: 1.0 Mn: 1.70	Shielding gas: M21 Re: 480 MPa Rm: 530-680 MPa A: 26 % CVN Impact: -50 °C: 80 J Shielding gas: CO ₂ Re: 470 MPa Rm: 530-680 MPa A: 27 % CVN Impact: -40 °C: 80 J	0,8 0,9 1,0 1,2 1,6	TÜV, DB, DNV-GL, ABS CE	Solid wire electrode with 'engineered nanotech surface' designed for reliable welding performance within a wide parameter range. Especially suited for fully mechanised processes where the wire comes in BASEdrum or the environmental friendly ECOdrum bulk package.

GTAW RODS, UNALLOYED

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
BÖHLER S ER70S-2 AWS A5.18: ER70S-2	C: 0.05 Si: 0.5 Mn: 1.2	Re: 420 MPa Rm: 520 MPa A: 24 % CVN Impact: +20 °C: 150 J -30 °C: 47 J	1,6 2,0 2,4 3,2	-	A copper coated GTAW rod containing Al, Ti and Zr as strong oxidizers in addition to Mn and Si and is often referred to as triple deoxidised. This has advantages when rimming or semi-killed mild steels are welded or where joint preparations are rusty or contaminated.
BÖHLER S EMK 6 AWS A5.18: ER70S-6	C: 0.07 Si: 0.85 Mn: 1.48 P: ≤ 0.020 S: ≤ 0.015	Re: 430 MPa Rm: 550 MPa A: 40 % CVN Impact: -50 °C: 90 J PWHT: 620 °C / 2hrs Re: 400 MPa Rm: 510 MPa A: 28 % CVN Impact: -50 °C: 100 J	1,6 2,0 2,4 3,2	ABS	A copper coated, manganese-silicon alloyed GTAW wire for all general engineering and structural steels fabrication with minimum yield strength of 400 MPa. The additional deoxidizers also provide better wetting, giving a flatter bead shape and the capability of faster travel speeds.
BÖHLER S EML 5 AWS A5.18: ER70S-3	C: 0.07 Si: 0.6 Mn: 1.2	Re: 420 MPa Rm: 510 MPa A: 30 % CVN Impact: -40 °C: 100 J -50 °C: 70 J	1,6 2,0 2,4 3,0	ABS	Copper coated mild steel GTAW rod with low Si content and provide sufficient deoxidation. Used for high integrity weld with excellent x-ray quality. It is suited for root pass welding and multi pass welding.
BÖHLER S ER70S-G AWS A5.18: ER70S-G	C: 0.07 Si: 0.85 Mn: 1.48 P: ≤ 0.020 S: ≤ 0.015	Re: 430 MPa Rm: 550 MPa A: 40 % CVN Impact: -40 °C: 100 J -50 °C: 90 J	1,6 2,0 2,4 3,2		A copper coated, manganese-silicon alloyed GTAW wire for welding of all general engineering and structural steels. The additional deoxidizers also provide better wetting, giving a flatter bead shape and the capability of faster travel speeds.

SAW WIRE/FLUX COMBINATIONS, UNALLOYED

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
Union S EM12K / UV C 300 AWS A5.17: F7A2-EM12K EN ISO 14171-A: S 38 3 AB S2Si	C: 0.04 Si: 0.50 Mn: 1.5 P: 0.02 S: 0.01	Re: 410 MPa Rm: 500 MPa A: 35% CVN Impact: -29 °C: 100 J	1,6 2,0 2,4 3,2 4,0		Union S EM12K - UV C 300 is a wire flux combination for SAW joining and surfacing applications with general-purpose structural steel and pipe steels. A nice bead appearance and good wetting properties, together with good slag detachability and low hydrogen content in the weld metal (≤ 5 ml/100 g) characterize this wire/flux combination.
Union S EM12K / UV C 301 AWS A5.17: EM12K AWS A5.17: F7A2-EM12K EN ISO14171-A: S 42 3 AB S2Si EN ISO 14174: SA AB 1 67 AC H5	C: 0.06 Si: 0.46 Mn: 1.48 P: ≤ 0.017 S: ≤ 0.011	Re: 430 MPa Rm: 530 MPa A: 34% CVN Impact: -29 °C: 68 J	1,6 2,0 2,4 3,2	CE	Joining and surfacing applications with general-purpose structural steel and pipe steels. A nice bead appearance and good wetting properties, together with good slag detachability.
Union S EM12K / UV C 305 AWS A5.17: EM12K AWS A5.17: F7AZ-EM12K EN ISO14171-A: S 42 Z AB S2Si EN ISO 14174: SA AB 1 67 AC H5	C: 0.05 Si: 0.6 Mn: 1.20 P: ≤ 0.03 S: ≤ 0.01	Re: 430 MPa Rm: 530 MPa A: 34% +20 °C: 70 J 0 °C: 40 J	1,6 2,0 2,4 3,2		A wire flux combination for joining applications with general purpose steels. It is particularly well-suited for single-wire or twin-arc fillet welding with small wire diameter with high welding speed. Wall thickness <10 mm.
Union S EM12K / UV C 401 AWS A5.17: EM12K AWS A5.17: F7A4 - EM12K / F7P4 - EM12K EN ISO14171-A: S 42 4 AB S2Si EN ISO 14174: SA AB 1 67 AC H5	C: 0.06 Si: 0.45 Mn: 1.45 P: ≤ 0.02 S: ≤ 0.015	Re: 430 MPa Rm: 520 MPa A: 36 % CVN Impact: -40 °C: 80 J	1,6 2,0 2,4 3,2 4,0	ABS	Suitable for single and multi-pass welding of general-purpose structural steels, boiler and pipe steels. The welding characteristics are good, producing a smooth weld bead with excellent slag detachability.
Union S EM12K / UV C 418 TT AWS A5.17: EM12K AWS A5.17: F7A8-EM12K / F6P8-EM12K EN ISO14171-A: S 42 6 FB S2Si EN ISO 14174: SA FB 1 55 AC H5	C: 0.08 Si: 0.30 Mn: 1.12 P: ≤ 0.015 S: ≤ 0.015	Re: ≥ 420 MPa Rm: ≥ 510 MPa A: ≥ 30 % CVN Impact: -40 °C: 120 J -60 °C: ≥ 100 J PWHT: 620 °C / 1 Hr Re: 390 MPa Rm: 490 MPa A: 36 % CVN Impact: -60 °C: 220 J	1,6 2,0 2,4 3,2 4,0	ABS	A wire flux combination universally applicable in shipbuilding, steel construction and in the fabrication of boilers and containers. A nice bead appearance and good wetting properties, together with good slag detachability and low hydrogen content in the weld metal (≤ 5 ml/100 g) characterize this wire/flux combination. It is particularly suitable for multi-pass welding of thick plates.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
Union S EH10K / UV C 418 TT AWS A5.17: EH10K AWS A5.17: F7A4-EH10K, F7P4-EH10K EN ISO14171-A S 46 4 FB S3	C: 0.08 Si: 0.20 Mn: 1.50 P: ≤ 0.015 S: ≤ 0.005 Cu: 0.05	Re: 470 MPa Rm: 560 MPa A: 30 % CVN Impact: -40 °C: 90 J -60 °C: 70 J	2,4 3,2 4,0		A good seam appearance and good wetting properties, together with good slag detachability and low hydrogen content characterize this wire/flux combination. It is particularly suitable for multi-pass welding of thick plates.
Union S EH12K / UV C 418 TT AWS A5.17: EH12K AWS A5.17: F7A8-EH12K / F7P8-EH12K EN ISO14171-A: S 46 6 FB S3Si	C: 0.08 Si: 0.40 Mn: 1.65 P: ≤ 0.011 S: ≤ 0.004	Re: ≥ 460 MPa Rm: ≥ 520 MPa A: ≥ 30 % CVN Impact: -40 °C: 190 J -60 °C: 120 J PWHT: 620 °C / 1 Hr Re: 420 MPa Rm: 530 MPa A: ≥ 30 % CVN Impact: -60 °C: 160 J	1,6 2,0 2,4 3,2 4,0	ABS	A nice bead appearance and good wetting properties, together with good slag detachability and low hydrogen content in the weld metal (≤ 5 ml/100 g) characterize this wire/flux combination. CTOD tested at -10 °C. It is particularly suitable for multi-pass welding of thick plates.
Union S EH14 / UV C 418 TT AWS A5.17: EH14 AWS A5.17: F7A8-EH14, F7P8-EH14 EN ISO 14171-A: S 38 4 FB S4	C: 0.09 Si: 0.18 Mn: 1.86 P: 0.018 S: 0.011	Re: 490 MPa Rm: 600 MPa A: 30 % CVN Impact: -60 °C: 75 J PWHT: 620 °C / 1 Hr Re: 450 MPa Rm: 560 MPa A: 30 % CVN Impact: -60 °C: 80 J	1,6 2,0 2,4 3,2 4,0	ABS	A wire flux combination universally applicable in shipbuilding, steel construction and in the fabrication of boilers and containers. A nice bead appearance and good wetting properties, together with good slag detachability and low hydrogen content in the weld metal (≤ 5 ml/100 g) characterize this wire/flux combination.
diamondspark S 55 HP + UV C 418 TT / UV 418 TT AWS A5.17: F7A8-EC1 / F7P8-EC1 EN ISO 14171-A: S 46 6 FB T3 H5	C: 0.07 Si: 0.3 Mn: 1.60	Re: 470 MPa Rm: 575 MPa A: 29 % CVN Impact: -40 °C: 150 J -60 °C: 90 J	2,4 3,2 4,0	ABS	This is a coppered seamless basic flux cored wire with good resistance to deformation and is very easy to straighten to ensure the best current transfer with a low contact tip consumption. The wire is not sensitive to moisture pick up. The weld metal demonstrates very good toughness properties at low temperatures, which gives the fabricator the possibility to weld with high heat-input at high welding speed resulting in very high productivity: e.g: single wire 4,0 mm, 900 Amps (~20 kg/hour) with a good bead appearance, nice fusion and good slag detachability.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
diamondspark S 56 HP + UV 400 AWS A5.17: F7A8-ECG / F7P8-ECG EN ISO 14171-A: S 46 6 AB TZ3 H5	C: 0.06 Si: 0.3 Mn: 1.60	Re: 480 MPa Rm: 550 MPa A: 28 % CVN Impact: -40 °C: 160 J -60 °C: 110 J	2,4 3,2 4,0	TÜV	A coppered seamless basic flux cored wire with a good resistance to deformation and best current transfer with a low contact tip consumption. The wire is not sensitive to moisture pick up. Also suitable for 2-run technology where the combination shows an improved welding behavior with good charpy toughness.
diamondspark S 56 HP + UV C 401 AWS A5.17: F7A8-ECG / F7P8-ECG EN ISO 14171-A: S 46 6 AB TZ3 H5	C: 0.06 Si: 0.3 Mn: 1.60	Re: 480 MPa Rm: 550 MPa A: 28 % CVN Impact: -40 °C: 160 J	2,4 3,2 4,0		A coppered seamless basic flux cored wire with a good resistance to deformation and best current transfer with a low contact tip consumption. The wire is not sensitive to moisture pick up. High welding speed resulting in very high productivity: e.g: single wire 3,2 mm, 800 Amps (~17 kg/hour) with a good bead appearance, nice fusion and good slag detachability.

**Flux and wire combination can be changed according to technical requirements.

SAW FLUX, UNALLOYED

Product Name Classification AWS Classification EN	Flux Type	Main constituents: %	Grain size EN ISO 14174	Characteristics and applications
UV C 305 EN ISO 14174: SA AR 1 67 AC H5	aluminate-rutile	SiO ₂ + TiO ₂ : 20 CaO + MgO: 15 Al ₂ O ₃ + MnO: 45 CaF ₂ : 12	2 - 16	An agglomerated flux designed for joining applications on general purpose structural and pipe steels. Suitable for use on DC and AC. Very good slag removal.
UV C 301 EN ISO 14174: SA AB 1 67 AC H5	aluminate-basic	SiO ₂ + TiO ₂ : 20 CaO + MgO: 28 Al ₂ O ₃ + MnO: 34 CaF ₂ : 12	2 - 16	An agglomerated flux of aluminate-basic type for joining and surfacing applications with general-purpose structural steel and pipe steels. The flux is characterized by low silicon and moderate manganese pick-up.

Product Name Classification AWS Classification EN	Flux Type	Main constituents: %	Grain size EN ISO 14174	Characteristics and applications
UV C 401 EN ISO 14174: SA AB 1 67 AC H5	aluminate- basic	SiO ₂ + TiO ₂ : 19 CaO + MgO: 31 Al ₂ O ₃ + MnO: 29 CaF ₂ : 20	3 - 20	An agglomerated aluminate-basic flux, designed for joining and surfacing applications with general-purpose structural steels, fine grained structural steels, boiler and pipe steels. The flux is characterized by its low silicon and moderate manganese pickup.
UV C 418 TT EN ISO 14174: SA FB 1 55 AC H5	fluoride - basic	SiO ₂ + TiO ₂ : 16 CaO + MgO: 33 Al ₂ O ₃ + MnO: 20 CaF ₂ : 27	3 - 20	An agglomerated fluoride-basic flux for joining and surfacing applications with dissimilar steels. Mainly for high strength and cryogenic fine grained structural steels. This flux is suited for many SAW wires on AC and DC current. Also suited for tandem and multi-wire systems.
UV 418 TT EN ISO 14174: SA FB 1 55 AC H5	fluoride - basic	SiO ₂ + TiO ₂ : 15 CaO + MgO: 38 Al ₂ O ₃ + MnO: 20 CaF ₂ : 25	3 - 20	An agglomerated fluoride-basic flux from Europe for joining and surfacing applications. Mainly for high strength and cryogenic fine grained structural steels. This flux is suited for many SAW wires on AC and DC current. Also suited for tandem and multiwire systems.
UV C 419 TT-W EN ISO 14174: SA FB 1 56 AC H5	fluoride - basic	SiO ₂ + TiO ₂ : 15 CaO + MgO: 34 Al ₂ O ₃ + MnO: 20 CaF ₂ : 27	3 - 20	An agglomerated flux of fluoride basic type for joining and surfacing applications. Mainly for joining and surfacing applications with creep resistant steel. Very good slag detachability. Excellent for narrow gap welding.

COVERED ELECTRODES, LOW- AND MEDIUM ALLOYED CREEP RESISTANT

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
BÖHLER FOX DMO Kb AWS A5.5: E7018-A1H4	C: 0.08 Si: 0.4 Mn: 0.8 Mo: 0.5	PWHT: 620 °C / 15 hrs Rp0.2: 480 MPa Rm: 580 MPa A: 27 % CVN Impact: +20 °C: 170 J -50 °C: 75 J	2.5 x 250 2.5 x 350 3.2 x 350 4.0 x 350 4.0 x 450 5.0 x 450	TÜV, DB, ABS, DNV-GL, CE	Basic low-hydrogen electrode for 0.5 % Mo-alloyed boiler, plates, and tube steels. 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.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
BÖHLER FOX DCMS Kb AWS A5.5: E8018-B2H4	C: 0.08 Si: 0.25 Mn: 0.8 Cr: 1.1 Mo: 0.5	680 °C / 2hrs Rp0.2: 480 MPa Rm: 580 MPa A: 23 % CVN Impact: +20 °C: 160 J	2.5 x 250 2.5 x 350 3.2 x 350 4.0 x 350 4.0 x 450 5.0 x 450	TÜV, DB, ABS, DNV-GL, LTSS, SEPROZ, CE, NAKS	Basic low hydrogen electrode for 1 % Cr 0.5 % Mo alloyed boiler, plate, and tube steels. 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.
BÖHLER FOX CM 2 Kb AWS A5.5: E9018-B3H4R	C: 0.08 Si: 0.3 Mn: 0.7 Cr: 2.2 Mo: 1.0	690 °C / 1hrs Rp0.2: 580 MPa Rm: 680 MPa A: 19 % CVN Impact: +20 °C: 150 J	2.5 x 250 3.0 x 350 4.0 x 350 4.0 x 450 5.0 x 450	TÜV, DB, ABS, DNV-GL, CE, NAKS	Basic covered stick electrode for welding 2.25 % Cr 1 % Mo alloyed steels. 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.
BÖHLER FOX CM 5 Kb AWS A5.5: E8018-B6H4R	C: 0.08 Si: 0.3 Mn: 0.8 Cr: 5.0 Mo: 0.6	730 °C / 2hrs Rp0.2: 520 MPa Rm: 620 MPa A: 21 % CVN Impact: +20 °C: > 90 J	2.5 x 250 3.2 x 350 4.0 x 350	TÜV, LTSS, SEPROZ, CE	Basic core wire alloyed electrode for creep resistant steels and steels for hot hydrogen service. Preferably used for X12CrMo5 (5 Cr 0.5 Mo) steels.
BÖHLER FOX CM 9 Kb AWS A5.5: E8018-B8 H4	C: 0.08 Si: 0.25 Mn: 0.65 Cr: 9.0 Mo: 1.0	760 °C / 1 hrs Rp0.2: 610 MPa Rm: 730 MPa A: 20 % CVN Impact: +20 °C: 70 J	2.5 x 250 3.2 x 350 4.0 x 350 5.0 x 450	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).
BÖHLER FOX P 22 (LC) AWS A5.5: E8018-B3L	C: 0.04 Si: 0.30 Mn: 0.60 Cr: 2.2 Mo: 1.0	Annealed: 690 °C / 10 h Rp0.2: ≥ 460 MPa Rm: ≥ 550 MPa A: ≥ 22 CVN Impact: +20 °C: ≥ 120 J -20 °C: ≥ 47 J	2.5 x 250 3.2 x 350 4.0 x 350		Fully synthetic basic coated Cr-Mo alloyed low carbon electrode, preferred for welding of creep-resistant steels alloyed with 2,25% Cr, 1% Mo. Applicable for weld repair when post-weld heat treatment is not possible. The lower carbon content provides lower hardness in the as welded condition.
BÖHLER FOX C 9 MV AWS A5.5: E9015-B91H4	C: 0.1 Si: 0.2 Mn: 0.6 Cr: 8.5 Ni: 0.5 Mo: 0.9 Nb: 0.05 V: 0.2 N: 0.04	PWHT: 760 °C / 2h Rp0.2: 580 MPa Rm: 710 MPa A: 19 CVN Impact: +20 °C: 75 J	2.5 x 250 3.2 x 350 4.0 x 350 5.0 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.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
Thermanit MTS 3 LNi AWS A5.5: E9015-B91 H4	C: 0.1 Si: 0.2 Mn: 0.8 Cr: 9.0 Ni: 0.1 Mo: 1.1 Nb: 0.05 V: 0.2 N: 0.04	PWHT: 760 °C / 2h Rp0.2: ≥ 550 MPa Rm: ≥ 680 MPa A: ≥ 17 % CVN Impact: +20 °C: ≥ 47 J	2.5 x 250 3.2 x 350 4.0 x 350		Basic coated CrMoVNb alloyed electrode 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. Meets the requirement for restricted Mn + Ni content (< 1 wt. %).
Thermanit MTS 616 AWS A5.5: E9015-B92 H4	C: 0.11 Si: 0.2 Mn: 0.6 Cr: 8.8 Ni: 0.6 Mo: 0.5 Nb: 0.04 V: 0.2 N: 0.04 W: 1.7	PWHT: 760 °C / 2h Rp0.2: 590 MPa Rm: 730 MPa A: 19 % CVN Impact: +20 °C: 50 J	2.5 x 250 3.2 x 350 4.0 x 350 5.0 x 450	TÜV, CE	Basic coated, core wire alloyed electrode, specially designed for welding of creep resistant tempered martensitic 9% Cr steels. 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.
Thermanit MTS 616 LNi AWS A5.5: E9015-B92 H4 E9015-G	C: 0.11 Si: 0.2 Mn: 0.7 Cr: 8.8 Ni: 0.4 Mo: 0.5 Nb: 0.04 V: 0.2 N: 0.05 W: 1.6	PWHT: 760 °C / 2h Rp0.2: ≥ 530 MPa Rm: ≥ 620 MPa A: ≥ 17 CVN Impact: +20 °C: ≥ 41	2.5 x 250 3.2 x 350 4.0 x 350 5.0 x 450		Basic coated CrMoVNb alloyed electrode 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. Provides good welding characteristics in all positions except vertical down. Meets the requirement for restricted Mn + Ni content (< 1 wt. %).
Phoenix SH Chromo 2 KS AWS A5.5: E9015-B3 H4	C: 0.07 Si: 0.22 Mn: 0.75 Cr: 2.2 Mo: 0.9 S: 0.010 P: 0.012 Sb: 0.005 Sn: 0.005 As: 0.010	PWHT: 690 °C / 1h Rp0.2: 540 MPa Rm: 660 MPa A: 21% CVN Impact: +20 °C: 180J -30 °C: 140J -40 °C: 125J	2.5 x 250 3.2 x 350 3.2 x 450 4.0 x 350 4.0 x 450 5.0 x 450	TÜV, CE	A core wire alloyed stick electrode with basic coating. The 2,25Cr-1Mo type weld metal exhibits a bainitic microstructure. 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.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
BÖHLER FOX BVD 90 AWS A5.5: E9018-G H4 R E9045-P2 H4 R (mod.)	C: 0.05 Si: 0.3 Mn: 1.2 Ni: 2.2	Rp0.2: 580 MPa Rm: 650 MPa A: 27 CVN Impact: +20 °C: 170 J -20 °C: 130 J -30 °C: 110 J -40 °C: 90 J -50 °C: 70 J	2.5 x 350 3.2 x 350 4.0 x 350 5.0 x 350	GAZPROM, TÜV, CE	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. Special design and development work has enabled this electrode to provide exceptional striking characteristics and the avoidance of start porosity.
BÖHLER FOX 20 MVW EN ISO 3580-A: E CrMoWV12 B 4 2 H5	C: 0.18 Si: 0.3 Mn: 0.7 Cr: 11.0 Ni: 0.55 Mo: 0.9 V: 0.25 W: 0.5	PWHT: 760 °C / 2h Rp0.2: 580 MPa 780 MPa A: 18 CVN Impact: +20 °C: 45 J	2.5 x 250 3.2 x 350 4.0 x 350 5.0 x 450	TÜV, KTA, CE	Basic coated, core wire alloyed electrode for high temperature, heat treatable 12% Cr-steels in turbine and boiler construction as well as in the chemical industry. Preferably used for X20CrMoV12-1.
BÖHLER FOX EV 75 AWS A5.5: E10018-G H4R E10018M H4R (mod.)	C: 0.05 Si: 0.4 Mn: 1.6 Cr: 0.4 Ni: 2.0 Mo: 0.4	PWHT: 580 °C / 2h Rp0.2: 680 MPa Rm: 730 MPa A: 22 CVN Impact: +20 °C: 110 J	2.5 x 350 3.2 x 350 4.0 x 450 5.0 x 450	CE	Basic coated, Mn-Ni-Cr-Mo - alloyed electrode with high ductility and crack resistance for high-strength, quenched and tempered fine-grained constructional steels.
BÖHLER FOX EV 85 AWS A5.5: E11018-G H4R E11018M H4R (mod.)	C: 0.05 Si: 0.4 Mn: 1.7 Cr: 0.4 Ni: 2.1 Mo: 0.5	PWHT: 580 °C / 2h Rp0.2: 750 MPa Rm: 800 MPa A: 20% CVN Impact: +20 °C: 80 J	2.5 x 350 3.2 x 350 4.0 x 450 5.0 x 450	TÜV, BV DB, CE	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.
BÖHLER FOX EV 90 AWS A5.5: E11018-G (E11018M mod.)	C: 0.06 Si: 0.2 Mn: 1.6 Cr: 0.38 Ni: 1.85 Mo: 0.4	PWHT: 580 °C / 2h Rp0.2: 690 MPa Rm: 740 MPa A: 19 CVN Impact: +20 °C: 120 J -50 °C: 47 J	2.5 x 350 3.2 x 350 4.0 x 450 5.0 x 450	WIWEB, DB TÜV, BV, CE DNV-GL ABS	Basic coated NiCrMo alloyed electrode for welding of high strength steels (typical yield strength 690 MPa). Very low moisture pickup during long term storage. For high strength fine grained structural steels, for cast steel qualities; weld metal insensitive to cold cracking.
BÖHLER FOX EV 105 AWS A5.5: E12018-G (E12018M mod.)	C: 0.08 Si: 0.4 Mn: 1.45 Cr: 0.80 Ni: 2.20 Mo: 0.50	Rp0.2: 930 MPa Rm: 1000 MPa A: 17 CVN Impact: +20 °C: 90 J -40 °C: 47 J	3.2 x 350 4.0 x 450 5.0 x 450	CE	Basic coated NiCrMo alloyed electrode for welding of high strength steels (typical yield strength 890 MPa) Low hydrogen content <5 ml/100 g (HD) in the weld metal. For high strength fine grained structural steels.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
T Phoenix Cr1Mo AWS A5.5: E8018-B2H4R	C: 0.08 Si: 0.25 Mn: 0.8 Mo: 0.50 Cr: 1.2	PWHT: 690 °C / 1 hrs Rp0.2: 540 MPa Rm: 630 MPa A: 26 % CVN Impact: +20 °C: 180 J -20 °C: 140 J	3.2 x 350 4.0 x 350 5.0 x 450	TÜV, CE	Basic covered Cr-Mo alloyed electrode. Creep resistant in short time range up to 500 °C (932 °F) and in long time range up to 570 °C (1058 °F). Low content trace elements. Largely insensitive to long-term embrittlement.
T Phoenix Cr2Mo AWS A5.5: E9018-B3H4R	C: 0.08 Si: 0.30 Mn: 0.78 Mo: 1.1 Cr: 2.3 Ni: 0.04 Cu: 0.05	PWHT: 690 °C / 1 hrs Rp0.2: 640 MPa Rm: 730 MPa A: 23 % CVN Impact: +20 °C: 180 J -30 °C: 100 J	3.2 x 350 4.0 x 350 5.0 x 450	TÜV, CE	Suited for the welding of 2.25Cr-1Mo low alloyed and creep resistant steels in boiler, tank, and pipeline etc.

COVERED ELECTRODES, LOW- AND MEDIUM ALLOYED HIGH STRENGTH

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
BÖHLER FOX EV 60 AWS A5.5: E8018-C3H4R	C: 0.07 Si: 0.4 Mn: 1.15 Ni: 0.9	Rp0.2: 510 MPa Rm: 600 MPa A: 27 % CVN Impact: +20 °C: 200 J -60 °C: 120 J	2.5 x 350 3.2 x 350 4.0 x 350 4.0 x 450 5.0 x 450	TÜV, DNV-GL, RMR, CRS, VG 95132, CE, ABS	Basic Ni- alloyed electrode with excellent mechanical properties, particularly high toughness and crack resistance. For higher strength fine- grained constructional steels. CTOD tested at -40 °C. Test values for SSC-test are available.
BÖHLER FOX EV 60 PIPE AWS A5.5: E8016-G H4R	C: 0.07 Si: 0.6 Mn: 1.2 Ni: 0.9	Rp0.2: 540 MPa Rm: 620 MPa A: 27 % CVN Impact: -20 °C: 140 J -40 °C: 110 J	2.5 x 350 3.2 x 350 4.0 x 350 4.0 x 450 5.0 x 450	BV, CE	Basic coated electrode excellent for positional welding for filler and cover passes for pipes, tubes and plates. Good impact properties down to -40°C, low hydrogen content (HD < 4 ml/100 g).

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
BÖHLER FOX EV 65 AWS A5.5: E8018-GH4R / E8018-D1H4R (mod.)	C: 0.06 Si: 0.3 Mn: 1.2 Ni: 0.8 Mo: 0.35	Rp0.2: 650 MPa Rm: 700 MPa A: 24 % CVN Impact: +20 °C: 160 J -60 °C: 70 J	2.5 x 350 3.2 x 350 4.0 x 350 4.0 x 450 4.8 x 450 5.0 x 450	TÜV, CE NAKS, VG 95132, BV, RMR, ABS,	Basic electrode with high ductility and crack resistance, for high-strength fine-grained steels. Resistant to ageing. Can be used in sour gas applications (HIC-Test acc. NACE TM-02-84).
BÖHLER FOX EV 70 AWS A5.5: E9018-GH4R / E9018-D1H4R (mod.)	C: 0.04 Si: 0.3 Mn: 1.2 Ni: 0.9 Mo: 0.4	Rp0.2: 650 MPa Rm: 700 MPa A: 24 % CVN Impact: +20 °C: 160 J -60 °C: 70 J	2.5 x 350 3.2 x 350 4.0 x 450 5.0 x 450	TÜV, SEPROZ, CE	Basic Mo-Ni alloyed electrode exhibiting high ductility and crack resistance for applications on high-strength fine-grained steels.
BÖHLER FOX S 1 Ni AWS A5.5: E7018-GH4R	C: 0.08 Si: 0.50 Mn: 1.20 Ni: 0.9 P: 0.01 S: 0.01	Rp0.2: 460 MPa Rm: 560 MPa A: 30 % CVN Impact: -46 °C: 110 J -50 °C: 100 J -60 °C: 90 J	2.50 x 350 3.25 x 450 4.00 x 450	ABS	Basic coated electrode producing tough and crack free welded joints. All position electrodes for offshore applications and Nickel content around 1%. Excellent mechanical properties (CVN Impact down to -60 °C).
BÖHLER FOX NiCuCr AWS A5.5: E8018-W2H4R	C: 0.05 Si: 0.4 Mn: 0.7 Cr: 0.6 Cu: 0.45 Ni: 0.6	Rp0.2: 520 MPa Rm: 570 MPa A: 27 % CVN Impact: +20 °C: 200 J -40 °C: 130 J	2.5 x 350 3.2 x 350 4.0 x 450	RMR, CE	NiCuCr alloyed basic electrode for welding weathering resistant constructional steels. Excellent mechanical properties and high crack resistance even when subjected to restraint.
BÖHLER FOX NIMO AWS A5.5: E10018-D2	C: 0.1 Si: 0.3 Mn: 1.9 Mo: 0.4 Ni: 0.9	Rp0.2: 600 MPa Rm: 690 MPa A: 18 % CVN Impact: +20 °C: 100 J -20 °C: 50 J -40 °C: 47 J	2.5 x 350 3.2 x 350 4.0 x 450 5.0 x 450		Basic covered MnNiMo alloyed electrode. For creep resistant steels and cast steel grades, valves and oil tools according to sour gas specification.
BÖHLER FOX S 2.5Ni AWS A5.5: E8018-C1H4R	C: 0.05 Si: 0.3 Mn: 0.8 Ni: 2.4	Rp0.2: 500 MPa Rm: 580 MPa A: 32 % CVN Impact: -60 °C: 110 J -80 °C: 80 J	2.50 x 350 3.25 x 350 4.00 x 450 5.00 x 450		Ni-alloy, basic coated stick electrode for unalloyed and Ni-alloy fine-grained structural steels. Tough, crack resistant weld metal. Very low hydrogen content (under AWS condition HD < 4mL/100g).
BÖHLER FOX S E8016-C1 AWS A5.5: E8016-C1H4R	C: 0.07 Si: 0.36 Mn: 0.86 Ni: 2.4	Rp0.2: 540 MPa Rm: 650 MPa A: 27 % CVN Impact: -60 °C: 130 J	2.50 x 350 3.25 x 350 4.00 x 450 5.00 x 450		Basic coated stick electrode for unalloyed and Ni-alloyed fine-grained structural steels. Ideal weldability in all position except for vertical down.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
BÖHLER FOX S E8016-G AWS A5.5: E8016-GH4	C: 0.06 Si: 0.6 Mn: 1.3 Ni: 0.8	Rp0.2: 540 MPa Rm: 620 MPa A: 29 % CVN Impact: -30 °C: 80 J -50 °C: 50 J	2.50 x 350 3.25 x 350 4.00 x 450		Basic electrode suited for positional welding of root passes using both D.C. negative and D.C. positive polarity as well as for filler and cover passes of pipes, tubes and structural/plates on DC or even AC polarity.
BÖHLER FOX CEL 70-P AWS A5.5: E7010-P1	C: 0.15 Si: 0.10 Mn: 0.45 Ni: 0.17	Re: 460 MPa Rm: 560 MPa A: 23 % CVN Impact: 23 -20 °C: 80 J -30 °C: 65 J	3.2 x 350 4.0 x 350 4.8 x 350 5.0 x 350	TÜV, CE	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.
BÖHLER FOX CEL 80-P AWS A5.5: E8010-P1 / E8010-G	C: 0.15 Si: 0.15 Mn: 0.7 Ni: 0.8	Re: 490 MPa Rm: 580 MPa A: 23 % CVN Impact: +20 °C: 90 J -20 °C: 80 J -30 °C: 60 J	3.2 x 350 4.0 x 350 4.8 x 350 5.0 x 350	TÜV, CE	Electrode for vertical-down welding of high strength, large diameter pipelines. Especially recommended for hot pass, filler and cover layers. Can also be used in sour gas applications (HIC-Test acc. to NACE TM-02-84).
BÖHLER FOX CEL 90 AWS A5.5: E9010-P1 / E9010-G	C: 0.17 Si: 0.15 Mn: 0.9 Ni: 0.8	Re: 560 MPa Rm: 650 MPa A: 21 % CVN Impact: -30 °C: 65 J	4.0 x 350 5.0 x 350	TÜV, CE	Cellulose-coated electrode for vertical-down welding of high strength large diameter pipelines. The electrode allows good weld pool visibility, and easy manipulation, as well as high safety margins against porosity and slag inclusions.
BÖHLER FOX BVD 85 AWS A5.5: E8045-P2 / E8018-G	C: 0.05 Si: 0.4 Mn: 1.1 Ni: 0.9	Re: 500 MPa Rm: 560 MPa A: 27 % CVN Impact: +20 °C: 170 J -50 °C: 65 J	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. Deposition rate is 80 – 100 % higher than for vertical up welding.
T Phoenix 3MK AWS A5.5: E7018-A1	C: 0.08 Si: 0.35 Mn: 0.8 Mo: 0.48	PWHT: 620 °C / 1 hrs Rp0.2: 480 MPa Rm: 520 MPa A: 28 % CVN Impact: +20 °C: 180 J -50 °C: 75 J	2.5 x 300 3.2 x 350 4.0 x 350 5.0 x 450	TÜV, CE	Basic covered electrode. Cold toughness at temperature as low as - 50 °C. Suited for circumferential welds in conduit pipes as well as boiler, pressure vessel.

FLUX AND METAL-CORED WIRES, LOW- AND MEDIUM ALLOYED

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
FOXcore DMO RC AWS A5.29: E81T1-A1M-H8	C: 0.04 Si: 0.25 Mn: 0.75 Mo: 0.5	Shielding gas: M21; 620 °C / 1 hr Rp0.2: 510 MPa Rm: 570 MPa A: 23 % CVN Impact: +20 °C: 140 J	1,2	TÜV, DB, CE	Rutile flux-cored wire which provides easy all-position weldability, primarily designed for the welding of 0,5% Mo alloyed base metals, that are used for the fabrication of vessels, high-pressure storage tanks, pipe systems as well as for structural steel applications.
FOXcore DCMS RC AWS A5.29: E81T1-B2M-H8	C: 0.06 Si: 0.22 Mn: 0.75 Cr: 1.2 Mo: 0.47	Shielding gas: M21 PWHT: 690 °C / 1h Rp0.2: 580 MPa Rm: 640 MPa A: 24 % CVN Impact: +20 °C: 50	1,2	TÜV, IBR, CE	It is a low alloyed, flux-cored wire with rutile filling, primarily designed for the welding of 1% Cr and 0,5% Mo alloyed creep-resistant base metals, that are used for the fabrication of high-pressure vessels and pipe systems.
FOXcore CM 2 RC AWS A5.29: E91T1-B3M-H8	C: 0.08 Si: 0.25 Mn: 0.8 Cr: 2.25 Mo: 1.1	Shielding gas: M21 PWHT: 690 °C/1 h Rp0.2: 650 MPa Rm: 700 MPa A: 19 % CVN Impact: +20 °C: 50 J	1,2	TÜV, CE	It is a low alloyed, flux-cored wire with rutile filling, primarily designed for the welding of 2.25% Cr and 1% Mo alloyed creep-resistant base metals(e.g. 10CrMo9-10), that are used for the fabrication of high-pressure vessels and pipe systems.
FOXcore C9 MV RC AWS A5.29: E91T1-B9M-H4	C: 0.10 Si: 0.2 Mn: 0.7 Cr: 9.0 Ni: 0.2 Mo: 1.0 V: 0.2 Nb: 0.04 N: 0.04	Shielding gas: M21 PWHT: 760 °C / 2 hr Rp0.2: 590 MPa Rm: 730 MPa A: 18 % CVN Impact: +20 °C: 40 J	1,2	TÜV	It is a rutile- basic flux cored wire for the welding of creep resistant, tempered 9 % chromium steels in turbine, boiler and pipework construction as well as in the foundry industry. The wire is especially designed for the ASTM steels T91 / P91. The chemistry of the product is according to LOW NICKEL content requirements, (Ni + Mn) < 1wt.%.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
BÖHLER Ti 81-TNi1C AWS A5.29: E81T-1C	C: 0.12 Si: 0.8 Mn: 1.5 Ni: 1.0	Rp0.2: ≥ 470 MPa Rm: 575 - 690 MPa A: 19 % CVN Impact: -40 °C: ≥ 27 J	1,2 1,6	ABS	It is a rutile flux cored wire designed for all-position welding with excellent CVN Impact properties in as welded condition at - 40 °C. Suitable for butt, fillet welding of 490N/mm ² class high strength steel and low temperature steel of structure such as ships, bridges, buildings and storage tanks etc.

SEAMLESS FLUX AND METAL-CORED WIRES, LOW- AND MEDIUM ALLOYED

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
diamondspark Ni1 RC (C1) AWS A5.29: E81T1-Ni1C-JH4	C: 0.07 Si: 0.35 Mn: 1.1 Ni: 0.85	Shielding gas: C1 Rp0.2: 550 MPa Rm: 600 MPa A: 24 % CVN Impact: -40 °C: 80 J	1,2 1,4 1,6	TÜV, DNV-GL, ABS LR, CE	Seamless rutile, nickel alloyed, flux cored wire for single or multilayer welding of carbon, carbon-manganese steels and high strength steels with pure CO ₂ shielding gas.
diamondspark Ni1 MC AWS A5.28: E80C-Ni1 H4	C: 0.06 Si: 0.50 Mn: 1.3 Ni: 0.90	Shield gas: M21 PWHT: 580 °C/ 3 Hr Rp0.2: 500 MPa Rm: 560 MPa A: 26 % CVN Impact: -60 °C: 90 J	1,2 1,6	TÜV , ABS DNV-GL, DB CWB, CE	Seamless all positional, Nickel alloyed, metal cored wire for single- or multilayer welding of high strength steels. This product can be used in sour gas applications. (HIC tested acc. to NACE TM-0284). Test values for SSC are available upon request. This wire is CTOD tested at -40°C.
diamondspark Ni1.5 RC (C1) AWS A5.29: E81T1-K2C-JH4	C: 0.04 Si: 0.3 Mn: 1.2 Ni: 1.5	Shielding gas: C1 Rp0.2: 580 MPa Rm: 650 MPa A: 25 % CVN Impact: -40 °C: 100 J -60 °C: 90 J	1,2	ABS, BV, DNV-GL, LR, RS	High performance seamless rutile flux cored wire, for the welding of medium alloyed steel and for low temperature applications with pure CO ₂ shielding gas.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
diamondspark NiCu1 RC AWS A5.29: E81T1-WGM H4	C: 0.05 Si: 0.40 Mn: 1.20 Ni: 1.10 Cu: 0.50	Shielding gas: M21 Rp0.2: 530 MPa Rm: 620 MPa A: 25 % CVN Impact: -40 °C: 70	1,0 1,2 1,4 1,6	CE	Seamless rutile, Nickel-Copper alloyed, flux cored wire for single- or multilayer welding of atmospheric corrosion resistant steels with Ar-CO ₂ shielding gas.
diamondspark NiCu1 MC AWS A5.28: E80C-G H4	C: 0.06 Si: 0.45 Mn: 1.20 Ni: 0.50 Cu: 0.50	Shielding gas: M21 Rp0.2: 490 MPa Rm: 590 MPa A: 27 % CVN Impact: -40 °C: 100 -60 °C: 70	1,2 1,6	CE	Seamless, Nickel-Copper alloyed, metalcored wire for single or multilayer welding of corrosion resistant steels with Ar-CO ₂ shielding gas. This wire is especially suitable for bridge constructions and chimney.
diamondspark 700 RC (C1) AWS A5.29: E111T1-GC-JH4	C: 0.05 Si: 0.30 Mn: 1.85 Ni: 2.20 Mo: 0.15	Shielding gas: C1 Rp0.2: 750 MPa Rm: 790 MPa A: 18 % CVN Impact: -40 °C: 70	1,2	CE	Seamless rutile, Nickel-Molybdenum alloyed, flux cored wire for single- or multilayer welding of high strength steels to be used with pure CO ₂ shielding gas. The low diffusible hydrogen content and the outstanding mechanical properties at low temperatures makes this wire perfect for applications using high- and ultra-high strength steel grades.
diamondspark X60 RC-Pipe AWS A5.29: E81T1-Ni1M-JH4	C: 0.05 Si: 0.40 Mn: 1.30 Ni: 0.85	Shielding gas: M21 Rp0.2: 550 MPa Rm: 610 MPa A: 25 % CVN Impact: -40 °C: 100 -60 °C: 75	1,2	TÜV, CE,	Seamless rutile, Nickel alloyed, flux cored wire for single- or multi-layer welding of Carbon, Carbon-Manganese steels and high strength steels with Argon-CO ₂ . The wire is CTOD tested at -10°C. (14°F). This product can be used in sour gas applications. (HIC tested acc. to NACE TM-0284).
diamondspark X70 RC-Pipe (N) AWS A5.29: E91T1-GM-JH4	C: 0.05 Si: 0.30 Mn: 1.6 Ni: 0.85 Mo: 0.25	Shielding gas: M21 Rp0.2: 620 MPa Rm: 690 MPa A: 22 % CVN Impact: -40 °C: 100 J -60 °C: 80	1,2	CE	Seamless rutile, Nickel-Manganese alloyed flux-cored wire for single- or multilayer welding of carbon, carbon-manganese steels and high strength steels with Ar-CO ₂ shielding gas. This product is CTOD tested at -10°C(14°F) and can be used in sour gas applications (HIC tested acc. to NACE TM-0284).
diamondspark X80 RC-Pipe AWS A5.29: E101T1-K2M-JH4	C: 0.04 Si: 0.45 Mn: 1.45 Ni: 1.6 Mo: 0.15	Shielding gas: M21 Rp0.2: 680 MPa Rm: 720 MPa A: 22 % CVN Impact: -40 °C: 80 J	1,2	CE	Seamless rutile Nickel-Molybdenum alloyed flux cored wire especially designed for semi- and fully automatic welding in pipeline applications for high strength steels X80-X90 base materials thanks to exceptional mechanical properties at low temperatures as well as the low content of diffusible hydrogen.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
diamondspark 550 MC AWS A5.28: E90C-K3H4	C: 0.06 Si: 0.45 Mn: 1.30 Ni: 1.0 Mo: 0.5	Shielding gas: M21 Rp0.2: 690 MPa Rm: 750 MPa A: 22 % CVN Impact: -60 °C: 60	1,2 1,4 1,6	CE	Seamless, Nickel-Molybdenum alloyed, metal cored wire for single or multi-layer welding of low alloyed and high strength steels with Ar-CO ₂ shielding gas. This wire is especially suitable for root pass welding in off-shore and pipeline applications.
diamondspark 620 MC AWS A5.28: E100C-GH4	C: 0.10 Si: 0.50 Mn: 1.80 Ni: 0.90 Mo: 0.55	Shielding gas: M21 Rp0.2: 780 MPa Rm: 820 MPa A: 20 % CVN Impact: -40 °C: 70 J	1,2 1,6	ABS, DNV-GL	Seamless, Nickel-Molybdenum alloyed, metal-cored wire for single - or multilayer welding of high strength steels with Ar-CO ₂ shielding gas. This wire is especially suitable for pipe welding of special base material like ASTM A519 Gr. 4130; it meets the NACE requirements.
diamondspark 700 MC AWS A5.28: E110C-K4H4	C: 0.07 Si: 0.70 Mn: 1.60 Cr: 0.35 Ni: 2.00 Mo: 0.30	Shielding gas: M21 Rp0.2: 770 MPa Rm: 830 MPa A: 19 % CVN Impact: -40 °C: 130 J -60 °C: 85 J	1,0 1,2 1,6	TÜV, DB, DNV-GL, CE LR, CWB	Metal cored wire manufactured with seamless laser technology is developed for shielded arc welding of thermo mechanically and quenched and tempered fine grained structural steels. Is used for high strength steel constructions, crane and vehicle manufacturing, for ship building, offshore applications and also for penstocks.
diamondspark 900 MC AWS A5.28: E120C-GH4	C: 0.06 Si: 0.70 Mn: 1.90 Cr: 0.5 Ni: 2.1 Mo: 0.4	Shielding gas: M21 Rp0.2: 920 MPa Rm: 980 MPa A: 17 % CVN Impact: +20 °C: 80 J -50 °C: 70	1,2	TÜV, CE, DB	Metal cored wire, manufactured with seamless laser technology, is developed for shielded arc welding of thermo mechanically and quenched and tempered produced fine grained structural steels. A balanced metallurgy combined with a very precise production technology results in high strength combined with very good toughness behaviour and excellent welding performance.
diamondspark 960 MC EN ISO 18276-A: T89 4 ZMn2NiCrMo M M21 1 H5 EN ISO 18276-B: TZ834T15-1M21A- N4C1M2-UH5	C: 0.06 Si: 0.70 Mn: 1.90 Cr: 0.6 Ni: 2.2 Mo: 0.5	Shielding gas: M21 Rp0.2: 980 MPa Rm: 1020 MPa A: 16 % CVN Impact: +20 °C: 80 J -40 °C: 60	1,2	TÜV, CE, DB	Metal cored wire manufactured with seamless laser technology is developed for shielded arc welding of thermo mechanically and quenched and tempered produced fine grained structural steels. This filler material is used for high strength steel constructions and also for crane and vehicle manufacturing.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
diamondspark CM 2 MC AWS A5.28: E90C-B3H4	C: 0.06 Si: 0.35 Mn: 1.10 Cr: 0.6 Ni: 2.2 Mo: 1.0	Shielding gas: M21 Rp0.2: 980 MPa Rm: 1020 MPa A: 16 % CVN Impact: +20 °C: 80 J -40 °C: 60	1,2 1,6	TUC, CE	Seamless, Cr-Mo alloyed, metal-cored wire for single or multi-layer welding of creep resistant steels. Features include: high yield, good weldability, excellent bead appearance, very low spatter losses. Wire with very low amount of diffusible hydrogen (< 3ml/100g) that reduces the risk of cracks.

SOLID GMAW WIRES, LOW- AND MEDIUM-ALLOYED

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
Pipeshield X 60 AWS A5.18: ER70S-6	C: 0.80 Si: 0.85 Mn: 1.50	Shielding gas: C1 Rp0.2: 420 MPa Rm: 540 MPa A: ≥ 25 % CVN Impact: -20 °C: 47 J	1,2		Pipeshield X series of solid wires for GMAW are specifically designed for fully automatic circumferential all position pipe welding. Pipeshield X combine the benefits of engineered wire surfaces and thoroughly controlled chemical compositions leading to good impact values even at low temperatures. Pipeshield X 60 covers pipe steel grades up to API X60.
Pipeshield X 70 AWS A5.18: ER70S-6	C: 0.69 Si: 0.95 Mn: 1.65 S: ≤ 0.015 P: ≤ 0.020	Shielding gas: C1 Rp0.2: 485 MPa Rm: 595 MPa A: ≥ 25 % CVN Impact: -20 °C: 120 J -40 °C: 60 J	1,0 1,2	TUC, CE	Pipeshield X 70 covers pipe steel grades up to API X70 offering good impact toughness at low temperatures down to -40 °C (-40 °F) and CTOD values at -10 °C (14 °F). Root pass capability up to X80. This product can be used in sour gas applications. (HIC tested acc. to NACE TM-0284).
Pipeshield X 80 AWS A5.28: ER80S-G	C: 0.65 Si: 0.69 Mn: 1.55 Ni: 0.9 Ti: + S: ≤ 0.015 P: ≤ 0.020	Shielding gas: C1 Rp0.2: 485 MPa Rm: 570 MPa A: ≥ 25 % CVN Impact: -20 °C: 70 J	0,9 1,0 1,02 1,2	TUC, CE	The 1% i-alloyed Pipeshield X 80 covers pipe steel grades up to API X80 offering good impact toughness at low temperatures down to -60 °C (-76 °F) and CTOD values at -10 °C (14 °F). Root pass capability up to X100. This product can be used in sour gas applications. (HIC tested acc. to NACE TM-0284).

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
Pipeshield X 90 AWS A5.28: ER90S-G	C: 0.80 Si: 0.60 Mn: 1.80 Ni: 0.9 Mo: 0.30	Shielding gas: C1 Rp0.2: 590 MPa Rm: 680 MPa A: ≥ 22 % CVN Impact: +20 °C: 120 J -40 °C: 47 J	0,9 1,0 1,2		Pipeshield X 90 covers pipe steel grades up to API X80Q and is designed for welding in all positions. Good cryogenic impact energy down to -60°C and low hydrogen contents in the deposit.
BÖHLER EMK 8 AWS A5.18: ER70S-6	C: 0.10 Si: 1.0 Mn: 1.70	Shielding gas: C1 Rp0.2: 470 MPa Rm: 580 MPa A: ≥ 28 % CVN Impact: -40 °C: 50 J	0,8 1,0 1,2	TÜV, DB, ABS, DNV-GL LR, CE	Copper coated solid wire used for GMAW of structural components with increased strength requirements. It has excellent welding characteristics at high currents and is optimally suited for welding thick-walled components. These types are especially suited for robotic welding.
BÖHLER EMK 8 NC AWS A5.18: ER70S-6	C: 0.10 Si: 1.0 Mn: 1.70	Shielding gas: C1/M21 Rp0.2: 480 MPa Rm: 620 MPa A: ≥ 26 % CVN Impact: -40 °C: 80 J	1,0 1,2 1,6	TÜV, DB, CE	Non coppered solid wire designed for extremely low spatter formation and excellent feeding properties at high wire feed rates. The non coppered welding wires of the EMK NC series are characterised by very good feeding properties at high wire feeding rates, by a very stable arc performance and significant lower oxide / silicate forming on the weld surface.
BÖHLER DMO-IG AWS A5.28: ER70S-A1 (ER80S-G)	C: 0.10 Si: 0.60 Mn: 1.10 Mo: 0.5	Shielding gas: Ar + 18%CO ₂ PWHT: 620 °C / 1h Rp0.2: 450 MPa Rm: 570 MPa A: ≥ 25 % CVN Impact: +20 °C: 150 J -40 °C: 47 J	0,8 1,0 1,2	TÜV, DB, NAKS, CE	GMAW solid wire electrode for welding of low alloy and creep resistant steels. Suitable for joints produced with CO ₂ or gas mixture. Application area includes boiler, pressure vessel, tanks, pipeline, and crane constructions as well as in structural steel engineering.
BÖHLER DCMS-IG AWS A5.28: ER80S-G / ER80S-B2 (mod.)	C: 0.11 Si: 0.60 Mn: 1.10 Mo: 0.5 Cr: 1.2	PWHT: 620 °C / 1h Shielding gas: Ar + 18%CO ₂ Rp0.2: 440 MPa Rm: 570 MPa A: ≥ 23 % CVN Impact: +20 °C: 140 J	0,8 1,0 1,2 1,6	TÜV, DB, CE SEPROZ,	GMAW wire for 1.25 % Cr 0.5 % Mo alloyed boiler, plate and tube steels as well as for the welding of quenched and tempered and case hardening steels. Preferably used for the steels 13CrMo4-5 or ASTM A335 P11/P12. Uniform copper bonding with low total copper content.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
BÖHLER CM 5-IG AWS A5.28: ER80S-B6	C: 0.6 Si: 0.4 Mn: 0.5 Mo: 0.6 Cr: 5.6	PWHT: 730 °C / 2h Shielding gas: Ar + 18%CO ₂ Rp0.2: 520 MPa Rm: 620 MPa A: ≥ 20 % CVN Impact: +20 °C: 47 J	1,2		GMAW wire suitable for 5 % Cr 0.5 % Mo alloyed steels and steels for hot hydrogen service, particularly in oil refineries. Preferably used for steel grades as X12CrMo5 and P5 at service temperatures up to +650 °C. The wire shows very good feeding characteristics, resulting in smooth welding and flow behaviour. Uniform copper bonding with low total copper content.
Thermanit MTS 3 AWS A5.28: ER90S-B9	C: 0.1 Si: 0.3 Mn: 0.5 Mo: 1.0 Cr: 9.0 Ni: 0.5 Nb: 0.06 V: 0.2	PWHT: 760 °C / 2h Shielding gas: M12 (M13) Rp0.2: 520 MPa Rm: 620 MPa A: ≥ 16 % CVN Impact: +20 °C: 47 J	1,0 1,2		Suited for joining and surfacing applications with quenched and tempered 9% Cr steels, particularly for matching high temperature resistant parent metal T91 / P91 according to ASTM.
Union NiMoCr AWS A5.28: ER100S-G / [ER100S-1(mod.)]	C: 0.08 Si: 0.60 Mn: 1.7 Cr: 0.20 Mo: 0.50 Ni: 1.50	Shielding gas: M21 Rp0.2: 720 MPa Rm: 780 MPa A: 16 % CVN Impact: +20 °C: 100 J -60 °C: 47 J	0,8 1,0 1,2	TÜV, DB, ABS, BV, DNV-GL, LR, CE VG 95132-1	Low-alloyed solid wire electrode for shielded arc welding of quenched and tempered and thermomechanically treated fine grained structural steels; for joint welding of wear resistant steels. For use with CO ₂ and gas mixture. For use in crane and vehicle manufacturing.
BÖHLER alform® 700-IG AWS A5.28: ER110S-G	C: 0.09 Si: 0.7 Mn: 1.7 Cr: 0.30 Ni: 1.85 Mo: 0.60	Shielding gas: M21 Rp0.2: ≥ 790 MPa Rm: 880 - 1080 MPa A: ≥ 16 % CVN Impact: +20 °C: ≥ 90 J -50 °C: ≥ 47 J	1,0 1,2	NAKS	Medium alloyed solid wire electrode for shielded arc welding of quenched and tempered fine grained structural steels. Outstanding tough weld metal at low temperature when deposited with gas mixture. Good deformability; outstanding mechanical properties even at higher electric heat input per unit length of weld.
BÖHLER alform® 900-IG AWS A5.28: ER120S-G	C: 0.1 Si: 0.8 Mn: 1.8 Cr: 0.35 Ni: 2.3 Mo: 0.60	Shielding gas: M21 Rp0.2: ≥ 890 MPa Rm: 940 - 1180 MPa A: ≥ 15 % CVN Impact: -60 °C: ≥ 47 J	1,0 1,2		Outstanding tough weld metal at low temperature when deposited with gas mixture. Good resistance to cold cracking due to high purity of the wire surface. For use in crane and vehicle manufacturing.

GTAW RODS, LOW- AND MEDIUM ALLOYED

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
BÖHLER DMO-IG AWS A5.28: ER70S-A1 (ER80S-G)	C: 0.1 Si: 0.6 Mn: 1.1 Mo: 0.5	Shielding gas: 100% Argon 620 °C / 1hr Rp0.2: 480 MPa Rm: 570 MPa A: 27 % CVN Impact: +20 °C: 230 J	1,6 2,0 2,4 3,0 3,2	TÜV, KTA, DB, BV, DNV-GL, CRS, CE, NAKS	GTAW rod for welding of low alloy and creep resistant steels. Application area includes boiler, pressure vessel, tanks, pipeline, and crane constructions as well as in structural steel engineering.
BÖHLER DCMS-IG AWS A5.28: ER80S-G / ER80S-B2 (mod.)	C: 0.10 Si: 0.6 Mn: 1.0 Cr: 1.20 Mo: 0.50	Shielding gas: 100% Argon PWHT: 680 °C / 1h Rp0.2: 440 MPa Rm: 570 MPa A: 25 % CVN Impact: +20 °C: 250 J	1,6 2,0 2,4 3,0	TÜV, NAKS, SEPROZ, CE	GTAW rod for 1.25 % Cr 0.5% Mo alloyed boiler, plate and tube steels as well as for the welding of quenched and tempered and case hardening steels. Preferably used for the steels 13CrMo4-5 or ASTM A335 P11/P12.
BÖHLER CM 2-IG AWS A5.28: ER90S-G / ER90S-B3(mod.)	C: 0.08 Si: 0.6 Mn: 0.9 Cr: 2.5 Mo: 1.0	Shielding gas: 100% Argon PWHT: 720 °C / 2 h Rp0.2: 470 MPa Rm: 600 MPa A: 23 % CVN Impact: +20 °C: 190 J (≥ 47)	1,6 2,0 2,4 3,0		GTAW rod for 2.25 % Cr 1 % Mo alloyed boiler, plate and tube steels as well as in oil refineries. Preferably used for base metal 10CrMo9-10 (ASTM A335 P22). Also for similarly alloyed quenched and tempered steels as well as case hardening steels.
BÖHLER CM 5-IG AWS A5.28: ER80S-B6	C: 0.08 Si: 0.4 Mn: 0.5 Cr: 5.6 Mo: 0.6	Shielding gas: 100% Argon PWHT: 730 °C / 2 h Rp0.2: 500 MPa Rm: 620 MPa A: 20 % CVN Impact: +20 °C: 200 J	1,6 2,0 2,4 3,0	TÜV, SEPROZ, CE	GTAW rod for 5% Cr 0.5% Mo steels and steels for hot hydrogen service, particularly for application in oil refineries and the base metals X12CrMo5 / P5.
Thermanit MTS 3 AWS A5.28: ER90S-B9	C: 0.1 Si: 0.3 Mn: 0.5 Cr: 9.0 Ni: 0.5 Mo: 1.0 V: 0.2 Nb: 0.06	Shielding gas: 100% Argon PWHT: 760 °C / 2 h Rp0.2: 530 MPa Rm: 620 MPa A: 17 % CVN Impact: +20 °C: 50 J	2,0 2,4 3,2	TÜV, CE,	High temperature resistant, resistant to scaling up to 600 °C (1112 °F). Suited for joining and surfacing applications with quenched and tempered 9 % Cr steels, particularly for matching high temperature resistant parent metal T91 / P91 according to ASTM.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
Thermanit MTS 3 LNi AWS A5.28: ER90S-B9	C: 0.1 Si: 0.3 Mn: 0.7 Cr: 9.0 Ni: < 0.3 Mo: 1.0 V: 0.2 Nb: 0.06	Shielding gas: Ar PWHT: 760 °C / 2h Rp0.2: 540 MPa Rm: 620 MPa A: ≥ 17 % CVN Impact: +20 °C: 50 J	2,0 2,4 3,2		TIG rod / wire for joining and surfacing applications with quenched and tempered 9% Cr steels, particularly for matching high temperature resistant parent metal T91 / P91 according to ASTM. Mn+Ni < 1%.
Thermanit MTS 616 AWS A5.28: ER90S-G [ER90S-B9(mod.)]	C: 0.1 Si: 0.25 Mn: 0.5 Cr: 8.5 Ni: 0.5 Mo: 0.4 V: 0.2 Nb: 0.06 W: 1.6	Shielding gas: Ar PWHT: 760 °C / 2h Rp0.2: 560 MPa Rm: 720 MPa A: ≥ 15 % CVN Impact: +20 °C: 41 J	2,0 2,4	TÜV, CE	High temperature resistant. Suited for joining and surfacing applications with matching high temperature resistant parent metal P92 according to ASTM. A 335.

SAW WIRE/FLUX COMBINATIONS, LOW AND MEDIUM-ALLOYED

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
Union S 2 Mo + UV 418TT Wire - AWS A5.23: EA2 Wire / Flux AWS A5.23: F8A6/ F8P6-EA2-A2 EN ISO 14171: S 46 4 FB S2Mo	C: 0.07 Si: 0.20 Mn: 0.95 Mo: 0.45	Rp0.2: 470 MPa Rm: 550 MPa A: 25 % CVN Impact: +20 °C: 160 J -40 °C: 47 J	2,0 2,5 3,0 4,0	TÜV, DB, CE	Very good impact toughness of weld metal at low temperatures.
Union S 2 CrMo + UV 420 TTR / UV 420 TTR-W Wire - AWS A5.23: EB2R Wire / Flux - AWS A5.23 F8P2-EB2R-B2 EN ISO 14174: UV 420 TTR: SA FB 1 65 DC UV 420 TTR-W: SA FB 1 65 AC	C: 0.08 Si: 0.20 Mn: 1.0 Cr: 1.1 Mo: 0.45	Heat treatment: 690 °C / 2 hrs Rp0.2: 470 MPa Rm: 550 MPa A: ≥ 20 % CVN Impact: +20 °C: 130 J -20 °C: 100 J -30 °C: 80 J	2,0 2,5 3,0 4,0	TÜV, CE	The low P-pickup of 0,004 % max. makes it particularly suitable for use in reactor construction as well as for welding of hydrocrackers.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
Union S 1 CrMo 2 + UV 420 TTR-W Wire - AWS A5.23: EB3 Wire / Flux - AWS A5.23: F9P2-EB3R-B3R EN ISO 24598-A UV 420 TTR-W: S S CrMo2 FB	UV 420 TTR-W *AC C: 0.15 Si: 0.20 Mn: 0.75 Cr: 2.3 Mo: 1.0 X-factor: <12	UV 420 TTR-W *AC Heat treatment: 690 °C / 10 hrs Rp0.2: > 550 MPa Rm: > 680 MPa A: > 18 % CVN Impact: -20 °C: > 80 J -30 °C: > 54 J -40 °C: > 27 J	2,5 3,0 4,0		Union S 1 CrMo 2 – UV 420 TTR-W is the optimal choice for prevention of long term temper-embrittlement. The weld metal is characterized by a high degree of purity, and meets the most stringent toughness requirements at low/subzero temperatures, also after step-cooling heat treatment. The very good welding behavior on AC and DC+ make it possible to weld with single wire (DC+ or AC) and tandem (DC+/AC or AC/AC) in narrow gap joint configurations without limitation in thickness.
Union S 2 NiMo 1 + UV 418 TT Wire - AWS A5.23: ENi1 Wire / Flux - AWS A5.23: F8A10/F8P10-ENi1-Ni1 EN ISO 14171-A S 50 6 FB SZ2Ni1Mo0,3	C: 0.06 Si: 0.20 Mn: 1.20 Ni: 0.93 Mo: 0.25 P: ≤ 0.010 S: ≤ 0.010	Heat treatment: 621 °C / 1 hr Rp0.2: 470 MPa Rm: 550 MPa A: 25 % CVN Impact: +20 °C: 180 J -40 °C: 140 J -60 °C: 80 J	2,5 3,2 4,0		Union S 2 NiMo 1 - UV 418 TT is a wire flux combination for submerged arc welding of non- and low alloyed steel grades. Recommended for multi-pass butt welding of medium and high tensile steels e.g. in off-shore constructions (wind power) and oil and gas industry including sour service applications. Good CTOD results have been reported even at very low test temperatures.
Union S 3 NiMo 1 + UV 420 TTR Wire - AWS A5.23: EF3 Wire / Flux - AWS A5.23: F9A8/F9P8-EF3-F3-N EN ISO 26304-A S 55 4 FB S3Ni1Mo H5	C: 0.08 Si: 0.25 Mn: 1.60 Ni: 0.90 Mo: 0.50	Heat treatment: 600 °C / 2hrs Rp0.2: > 560 MPa Rm: > 660 MPa A: > 22 % CVN Impact: +20 °C: > 140 J -60 °C: > 47 J	2,5 3,0 3,2 4,0	TÜV, CE	Union S 3 NiMo 1 - UV 420 TTR is a wire flux combination for submerged arc welding of unalloyed and low alloyed steel grades. The wire / flux combination is extensively used for the manufacturing of nuclear pressure vessels and also used in oil and gas industry for the welding of high strength low alloy steel grades where good strength and toughness properties are required with controlled hardness levels.
Union S 3 NiMoCr + UV 422 TT-LH Wire AWS A5.23: EF5 Wire / Flux - AWS A5.23: F11A8-EG-F6-H4 EN ISO 26304-A S 69 6 FB SZ3Ni2,5CrMo H5	C: 0.07 Si: 0.35 Mn: 1.65 Cr: 0.35 Ni: 2.00 Mo: 0.57 P: ≤ 0.015 S: ≤ 0.012	Rp0.2: 780 MPa Rm: 835 MPa A: 19 % CVN Impact: +20 °C: 125 J -40 °C: 105 J -60 °C: 100 J -80 °C: 80 J	2,0 2,4 3,0 4,0		A wire-flux combination for submerged arc welding of high strength steel grades. This combination is recommended for over-matching strength requirements in S690 applications, combined with the highest requirements to charpy toughness. Very low amount of diffusible hydrogen (ISO 3690).

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
Thermanit MTS 3 + Marathon 543 Wire AWS A5.23: EB91 Wire / Flux AWS A5.23: F9PZ-EB91-B91 EN ISO 24598-A S S CrMo91 FB	C: 0.09 Si: 0.22 Mn: 0.70 Cr: 8.9 Ni: 0.40 Mo: 0.95 V: 0.18 Nb: 0.05 N: 0.04	PWHT: 760 °C/4 hrs Rp0.2: 540 MPa Rm: 700 MPa A: 18 % CVN Impact: +20 °C: ≥ 47 J	2,5 3,0 3,2	TÜV, CE	Thermanit MTS 3 is a matching filler metal for welding high temperature and creep resistance 9% chromium steel like T(P)91. Marathon 543 is an agglomerated welding flux of the fluoride basic type with high basicity.
diamondspark S 700 HP + UV 422 TT-LH Wire AWS A5.23: ECF5 Wire / Flux - AWS A5.23: F11A10 / F11P6-ECF5-F5 H4 EN ISO 26304-A: S 69 6 FB TZ H5	C: 0.05 Si: 0.3 Mn: 1.6 Cr: 0.3 Ni: 2.7 Mo: 0.5	Rp0.2: 730 MPa Rm: 790 MPa A: 20 % CVN Impact: 0 °C: 140 J -60 °C: 80 J	2,4 3,2 4,0	ABS, DNV-GL, LRS, CE	A wire flux combination for joint welding of high-strength, quenched and tempered fine grained structural steels up to MSYS = 690 MPa. The weld metal demonstrates very good toughness at low temperatures and good strength properties, which allows to weld with relative high heat-input at high welding speed resulting in high productivity.
Union S EA2 + UV C 401 Wire AWS A5.23: EA2 Wire / Flux AWS A5.23: F8A6 / F8P6-EA2-A2 EN ISO 14171-A S 46 4 AB S2Mo	C: 0.07 Si: 0.3 Mn: 1.15 Mo: 0.45 P: ≤ 0.015 S: ≤ 0.015	Rp0.2: 470 MPa Rm: 560 MPa A: 24 % CVN Impact: -20 °C: 100 J -40 °C: 47 J	2,4 3,2 4,0 4,8	ABS	A wire flux combination suited for fine-grained constructional steels of increased strength, specially used in boiler, vessel and pipe construction.
Union S EA2 + UV C 418 TT Wire AWS A5.23: EA2 Wire / Flux AWS A5.23: F8A6 / F8P6-EA2-A2 EN ISO 14171-A S 46 4 FB S2Mo	C: 0.07 Si: 0.2 Mn: 1.12 Mo: 0.45 P: ≤ 0.015 S: ≤ 0.015	Rp0.2: 490 MPa Rm: 570 MPa A: 25 % CVN Impact: -40 °C: 90 J -51 °C: 47 J	2,4 3,2 4,0 4,8	ABS	Wire flux combination suited for fine-grained constructional steels of increased strength, specially used in boiler, vessel and pipeline construction.
Union S Ni1 + UV C 401 Wire AWS A5.23: ENi1 Wire / Flux AWS A5.23: F8A4 / F8P4-ENi1-Ni1 EN ISO 14171-A S 46 6 AB SZ2Ni1Mo	C: 0.06 Si: 0.25 Mn: 1.3 Mo: 0.22 Ni: 0.9 P: 0.01 S: 0.005	Rp0.2: 530 MPa Rm: 590 MPa A: 29 % CVN Impact: -40 °C: 90 J	2,4 3,2 4,0	ABS	Wire flux combination for submerged arc welding of unalloyed and low alloyed fine grain steel grades with minimum specified yield strength (MSYS) between 420 and 500 MPa.
Union S Ni1 + UV C 418 TT Wire - AWS A5.23: ENi1 Wire / Flux AWS A5.23: F8A8 / F8P8 -ENi1-Ni1 EN ISO 14171-A S 46 6 FB SZ2Ni1Mo	C: 0.06 Si: 0.20 Mn: 1.18 Mo: 0.24 Ni: 0.91 P: 0.009 S: 0.004	Rp0.2: 520 MPa Rm: 580 MPa A: 31 % CVN Impact: -40 °C: 160 J -60 °C: 90 J	2,4 3,2 4,0	ABS	Wire flux combination for submerged arc welding of unalloyed and low alloyed fine grain steel grades with minimum specified yield strength (MSYS) between 420 and 500 MPa, universally applicable in off-shore and heavy lifting constructions.

**Flux and wire combination can be changed according to technical requirements.

SAW FLUX/LOW AND MEDIUM-ALLOYED

Product Name Classification AWS Classification EN	Flux Type	Main constituents: %	Grain size EN ISO 14174	Characteristics and applications
UV 418 TT EN ISO 14174: SA FB 1 55 AC H5	Agglomerated fluoride basic	SiO ₂ +TiO ₂ : 15 CaO+MgO: 38 Al ₂ O ₃ +MnO: 20 CaF ₂ : 25	3 – 20	A neutral flux for joining and surfacing of high strength fine grained structural steels. The silicon and manganese pickups and burn-off rates are neutral because of its metallurgical behaviour.
UV 419 TT-W EN ISO 14174: S A FB 1 55 AC S A FB 1 55 DC H5	Agglomerated fluoride basic	SiO ₂ +TiO ₂ : 15 CaO+MgO: 35 Al ₂ O ₃ +MnO: 21 CaF ₂ : 26	3 – 20	An agglomerated fluoride-basic flux for submerged arc welding of unalloyed and low alloyed steel grades. The basic flux has a neutral metallurgical behaviour regarding to Mn and Si, and is mainly recommended for multi-run procedures for relatively higher wall thickness.
UV 420 TT/ UV 420 TT-LH EN ISO 14174: SA FB 1 65 DC / SA FB 1 65 DC H5	Agglomerated fluoride basic	SiO ₂ +TiO ₂ : 15 CaO+MgO: 35 Al ₂ O ₃ +MnO: 21 CaF ₂ : 26	3 – 25	An agglomerated flux of fluoride basic type characterised by the neutral metallurgical behaviour. In combination with suitable wire electrodes, the weld metal exhibits good toughness properties at low temperatures.
UV 420 TTR EN ISO 14174: SA FB 1 65 DC / SA FB 1 65 AC	Agglomerated fluoride basic	SiO ₂ +TiO ₂ : 15 CaO+MgO: 35 Al ₂ O ₃ +MnO: 21 CaF ₂ : 26	3 – 20	An agglomerated fluoride-basic flux, mainly for joining and surfacing applications with creep resistant steels. UV 420 TTR-W permits sound welding on AC, achieving a higher level of toughness when welding with CrMo-alloyed SAW wires.
UV 420 TTR-C EN ISO 14174: SA FB 1 65 DC	Agglomerated fluoride basic	SiO ₂ +TiO ₂ : 15 CaO+MgO: 35 Al ₂ O ₃ +MnO: 21 CaF ₂ : 26	3 – 20	UV 420 TTR-C is applied in high strength and creep resistant applications that need PWHT at relatively high temperatures for long duration. Also suited for weldments that will be exposed to a normalising heat treatment (N+A / Q +A). The flux has Carbon support as special feature.
UV 422 TT-LH EN ISO 14174: SA FB 1 65 DC H4	Agglomerated fluoride basic	SiO ₂ +TiO ₂ : 18 CaO+MgO: 42 Al ₂ O ₃ +MnO: 19 CaF ₂ : 19	3 – 20	UV 422 TT-LH is an agglomerated fluoride-basic flux for submerged arc welding of non-alloyed and low alloyed steel grades. The flux has been optimised for the highest strength levels (700 till 1100 MPa) with high toughness requirements. The flux generates a very low amount of diffusible hydrogen content.
UV 420 TTR-W EN ISO 14174: SA FB 1 65 AC	Agglomerated fluoride basic	SiO ₂ +TiO ₂ : 14 CaO+MgO: 34 Al ₂ O ₃ +MnO: 21 CaF ₂ : 27	3 – 20	An agglomerated fluoride-basic flux for Submerged Arc Welding of un- and low-alloyed steel grades. During welding the flux shows very nice operative characteristics on both AC and DC+, and is suitable for Tandem process.

Product Name Classification AWS Classification EN	Flux Type	Main constituents: %	Grain size EN ISO 14174	Characteristics and applications
Marathon 543 EN ISO 14174: SA FB 2 55 DC H5	Agglomerated fluoride basic	SiO ₂ +Al ₂ O ₃ : 35 CaF ₂ +CaO+MgO: 60	3 – 20	Marathon 543 is an agglomerated fluoride-basic flux with a high basicity. For joining and surfacing applications of creep resistant CrMo steels such as grade 91 and 92 with SAW wire Thermanit MTS 3 and Thermanit MTS 616.

COVERED ELECTRODES, STAINLESS

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L (mm)	Approvals	Characteristics and applications
Avesta 308L-16 AWS A5.4: E308L-16	C: 0.02 Si: 0.7 Mn: 0.6 Cr: 19.8 Ni: 9.5 Mo: 0.05	Rp0.2: 430 MPa Rm: 560 MPa A: 45 % CVN Impact: +20 °C: 65 J -120 °C: 32 J	2.50 x 300 3.25 x 350 4.00 x 350 5.00 x 350	ABS, CWB, CE	19Cr-9Ni stainless steel rutile electrode for all position welding of 1.4301/ASTM 304 type base metal. Good corrosion resistance under fairly severe conditions, e.g. in oxidizing acids and cold or dilute reducing acids.
Avesta 308H-16 AWS A5.4: E308H-16	C: 0.07 Si: 0.8 Mn: 0.6 Cr: 20.5 Ni: 9.7 Mo: 0.09	Rp0.2: 450 MPa Rm: 605 MPa A: 40 % +20 °C: 55 J -40 °C: 40 J	2.5 x 300 3.2 x 350 4.0 x 350		Avesta 308H-16 is a high carbon Cr-Ni electrode primarily intended for welding ASTM 304 and 304H type stainless steel exposed to temperature up to 700 °C.
Avesta 316L -16 AWS A5.4: E316L-16	C: 0.02 Si: 0.75 Mn: 0.55 Cr: 18.8 Ni: 12.0 Mo: 2.55 Mo: 0.05	Rp0.2: 430 MPa Rm: 575 MPa A: 40 % CVN Impact: +20 °C: 65 J -40 °C: 45 J	2.50 x 300 3.25 x 350 4.00 x 350 5.00 x 350	ABS, CWB, CE	Cr-Ni-Mo rutile stainless steel electrode with excellent weldability and smooth bead surface. Weld metal features a good resistance against intergranular corrosion (IGC ASTM A262 Practice E).
AVESTA 309L-16 AWS A5.4: E309L-16	C: 0.02 Si: 0.7 Mn: 0.8 Cr: 23.5 Ni: 12.4 Mo: 0.05	Rp0.2: 450 MPa Rm: 560 MPa A: 40 % CVN Impact: +20 °C: 55 J -46 °C: 40 J	2.50 x 300 3.25 x 350 4.00 x 350 5.00 x 350	ABS, CWB, CE	23Cr-12Ni stainless steel rutile - coated electrode; with good corrosion resistance below 300 ° C; Electrode designed for dissimilar welding between stainless steel and carbon steel (austenitic / ferrite).
Avesta 308L-16 Cryo AWS A5.4: E308L-16	C: 0.02 Si: 0.5 Mn: 1.2 Cr: 19.5 Ni: 10.4 Mo: 0.05 Cu: 0.03 N: 0.05	Rp0.2: 630 MPa Rm: 820 MPa A: 25 % CVN Impact: -196 °C: 35 J LE: >0.38 mm	2.5 x 300 3.2 x 350 4.0 x 350 5.0 X 400	ABS	AVESTA 308L-16 Cryo is a Cr-Ni electrode with carefully controlled ferrite content that is suitable for cryogenic and low temperature application down to -196 °C with lateral expansion > 0,38 mm.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L (mm)	Approvals	Characteristics and applications
Avesta 316L-16 Cryo AWS A5.4: E316L-16	C: 0.03 Si: 0.45 Mn: 1.6 Cr: 18.5 Ni: 12.6 Mo: 2.2 Cu: 0.04 N: 0.07	Rp0.2: 430 MPa Rm: 575 MPa A: 35 % CVN Impact: +20 °C: 65 J -196 °C: 35 J LE: >0.38 mm	2.5 x 300 3.2 x 350 4.0 x 350	ABS	Avesta 316L-16 Cryo is a rutile-basic Cr-Ni-Mo alloyed stick electrode with controlled ferrite content. The electrode is designed to produce high quality weld deposits and is suitable for welding ASTM 316L type steels in cryogenic application where the requirement is ≥ 0.38 mm LE and ≥ 32 J impact strength at -196 °C.
Avesta 347-16 AWS A5.4: E347-16	C: 0.03 Si: 0.8 Mn: 0.5 Cr: 19 Ni: 10.0 Nb: 0.25	Rp0.2: 431 MPa Rm: 598 MPa A: 46 % CVN Impact: +20 °C: 55 J -40 °C: 45 J	2.50 x 300 3.25 x 350 4.00 x 350		The electrode is rutile type and intended for high temperature service or applications. For welding of Ti-stabilized steels such as ASTM 321 and 347 that are exposed to service temperature exceeding 400 °C.
Avesta 308L-17 AWS A5.4: E308L-17	C: 0.02 Si: 0.75 Mn: 0.7 Cr: 19.7 Ni: 9.7	Rp0.2: 420 MPa Rm: 580 MPa A: 40 % CVN Impact: +20 °C: 60 J -120 °C: 33 J	2.50 x 350 3.25 x 350 4.00 x 450 5.00 x 450	ABS, DNV-GL, CWB, CE	Avesta 308L-17 is a Cr-Ni rutile acid electrode for all position welding of ASTM 304 and 304L stainless steels. Weld metal features a good resistance against intergranular corrosion (IGC ASTM A262 Practice E).
Avesta 308/308H AC/DC AWS A5.4: E308H-17	C: 0.06 Si: 0.7 Mn: 1.1 Cr: 20.0 Ni: 10.0	Rp0.2: 430 MPa Rm: 600 MPa A: 37 % CVN Impact: +20 °C: 60 J	2.50 x 350 3.25 x 350 4.00 x 450	TÜV, CE	Rutile coated electrode designed for welding of creep resistant austenitic stainless steels such as 1.4948 / 304H, exposed to temperatures above 400°C. Resulting weld microstructure is austenite with 5 – 10% ferrite.
Avesta 316L-17 AWS A5.4: E316L-17	C: 0.02 Si: 0.75 Mn: 0.65 Cr: 18.3 Ni: 12.3 Mo: 2.6	Rp0.2: 430 MPa Rm: 560 MPa A: 40 % CVN Impact: +20 °C: 57 J -120 °C: 57 J	2.50 x 300 3.25 x 350 4.00 x 350 5.00 x 350	ABS, DNV-GL, CWB, CE	Avesta 316L-17 is a Cr-Ni-Mo rutile acid electrode. Produced using fully alloyed wire to provide excellent weldability in all position welding and smooth weld bead surface. Weld metal features have a good resistance against intergranular corrosion (IGC ASTM A262 Practice E).
Avesta 309L-17 AWS A5.4: E309L-17	C: 0.02 Si: 0.75 Mn: 0.74 Cr: 23.5 Ni: 13.3	Rp0.2: 440 MPa Rm: 560 MPa A: 35 % CVN Impact: +20 °C: 60 J -40 °C: 45 J	2.50 x 300 3.25 x 350 4.00 x 450 5.00 x 450	ABS, DNV-GL, CWB, CE	High alloyed low carbon rutile acid electrode designed for dissimilar welding between stainless and mild or low alloy steels. The electrode is also well suited as a buffer layer when performing overlay welding on mild steels, providing an 18 Cr 8 Ni deposit from the very first layer.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L (mm)	Approvals	Characteristics and applications
Avesta 310-17 AWS A5.4: E310-17	C: 0.12 Si: 0.5 Mn: 2.2 Cr: 27 Ni: 21	Rp0.2: 460 MPa Rm: 630 MPa A: 37 % CVN Impact: +20 °C: 90 J -196 °C: 42 J	2.50 x 300 3.25 x 350 4.00 x 450		It is a 25Cr-20Ni electrode for welding of ASTM 310S and related types of high temperature stainless steels. 310 has a fully austenitic structure, which makes it somewhat more sensitive to hot cracking than 309L.
Avesta 309LMo-17 AWS A5.4: E309LMo-17	C: 0.020 Si: 0.80 Mn: 0.80 Cr: 22.5 Ni: 13.5 Mo: 2.5	Rp0.2: 490 MPa Rm: 640 MPa A: 32 % CVN Impact: +20 °C: 30 J	2.00 x 300 2.50 x 300 3.25 x 350 4.00 x 450 5.00 x 450	ABS, DNV-GL, CWB, CE	The electrode is designed for dissimilar welding between Mo-Alloyed stainless with mild or low alloy steels. It can also be used for overlay welding, providing an 18 Cr 8 Ni 2 Mo deposit from the very first layer.
Avesta S 310H-15 AWS A5.4: E310H-15	C: 0.4 Si: 0.5 Mn: 2.0 Cr: 25.5 Ni: 21.0	Rp0.2: 610 MPa Rm: 780 MPa A: 14 % Hardness: (Brinell) 220	2.5 x 300 3.2 x 350 4.0 x 350		Basic coated stainless electrode designed to weld austenitic cast alloys of the type 0.4 C 25 Cr, 20Ni. These alloys are designed to operate at high temperature up to 1000°C.
Avesta 253 MA EN ISO 3581-A: E 21 10 R	C: 0.08 Si: 1.50 Mn: 0.70 Cr: 22.00 Ni: 10.50 N: 0.18	Rp0.2: 555 MPa Rm: 730 MPa A: 43 % CVN Impact: +20 °C: 57 J	2.0 x 300 2.5 x 350 3.2 x 350 4.0 x 400 5.0 x 400		Primarily designed for welding the high temperature steel Outokumpu 253MA, used for furnaces combustion, burners, chambers etc with excellent resistance to oxidation up to 1100°C. The electrode has a ferrite content of approx 10% which give good resistance to hot cracking.
BÖHLER Q SE 316L-16 AWS A5.4: E316L-16	C: 0.02 Si: 0.8 Mn: 0.55 Cr: 19.0 Ni: 12.0 Mo: 2.1	Rp0.2: 400 MPa Rm: 540 MPa A: 35 % CVN Impact: +20 °C: 50 J	2.5 x 300 3.2 x 350 4.0 x 350		Electrode designed for welding Cr-Ni-Mo alloyed stainless steels. The electrode provides good all-round weldability with smooth bead surface.
BÖHLER Q SE 308L-16 AWS A5.4: E308L-16	C: 0.03 Si: 0.85 Mn: 0.55 Cr: 18.5 Ni: 9.0	Rp0.2: 410 MPa Rm: 550 MPa A: 38 % CVN Impact: +20 °C: 60 J	2.5 x 300 3.2 x 350 4.0 x 350		Electrode designed for welding Cr-Ni alloyed stainless steels. The electrode provides good all-round weldability with smooth bead surface.
BÖHLER Q SE 309L-16 AWS A5.4: E309L-16	C: 0.03 Si: 0.85 Mn: 0.6 Cr: 23.0 Ni: 12.5	Rp0.2: 460 MPa Rm: 560 MPa A: 35 % CVN Impact: +20 °C: 60 J	2.5 x 300 3.2 x 350 4.0 x 350		Electrode designed for dissimilar welding between stainless steel and mild steel or low alloy steels. The electrode provides good all-round weldability with smooth bead surface.
Avesta 2205 Basic AWS A5.4: E2209-15	C: 0.03 Si: 0.6 Mn: 1.2 Cr: 22.8 Ni: 8.9 Mo: 3.1 N: 0.16	Rp0.2: 620 MPa Rm: 820 MPa A: 26 % CVN Impact: +20 °C: 90 J -40 °C: 70 J	2.5 x 300 3.2 x 350 4.0 x 350		Primarily designed for welding 22Cr duplex stainless steels used in offshore, shipyards, chemical tankers, chemical/petrochemical, pulp & paper, etc. For improved impact toughness welding in all positions except vertical down.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L (mm)	Approvals	Characteristics and applications
Avesta 2209-16 AWS A5.4: E2209-16	C: 0.02 Si: 0.7 Mn: 0.6 Cr: 22.8 Ni: 9.1 Mo: 3.0 Cu: 0.04 N: 0.15	Rp0.2: 630 MPa Rm: 820 MPa A: 25 % CVN Impact: +20 °C: 45 J -46 °C: 35 J	2.5 x 300 3.2 x 350 4.0 x 350 5.0 x 400		22Cr-9Ni-3Mo duplex stainless steel rutile coated electrode. Its deposited metal has good pitting corrosion resistance below 250 °C. It has good resistance to stress corrosion under the condition of hydrogen sulfide.
Avesta 2209-17 AWS A5.4: E2209-17	C: 0.025 Si: 0.87 Mn: 0.63 Cr: 22.94 Ni: 9.57 Mo: 2.89 N: 0.15	Rp0.2: 685 MPa Rm: 850 MPa A: 26 % CVN Impact: +20 °C: 38 J -40 °C: 31 J	2.50 x 350 3.25 x 350 4.00 x 450 5.00 x 450	ABS	Cr, Ni Mo alloyed duplex electrode for welding duplex steel such as 2205. However the somewhat lower penetration and fluidity of the weld should be considered.
BÖHLER FOX CN 25/9 CUT AWS A5.4: E2595-15	C: 0.03 Si: 0.45 Mn: 1.3 Cr: 25.6 Ni: 8.8 Mo: 4.1 N: 0.23 PREN: > 42	Rp0.2: 730 MPa Rm: 880 MPa A: 25 % CVN Impact: +20 °C: 64 J -50 °C: 32 J Hardness HB: 250	2.5 x 300 3.2 x 350 4.0 x 350 5.0 x 350		Basic electrode for welding of ferritic-austenitic super duplex steels. By virtue of specific alloy composition the deposit has, in addition to high tensile strength and toughness, also excellent resistance to stress corrosion cracking and pitting corrosion.
BÖHLER FOX CN 18/11 AWS A5.4: E308-15	C: 0.05 Si: 0.3 Mn: 1.3 Cr: 19.4 Ni: 10.4	Rp0.2: 420 MPa Rm: 580 MPa A: 40 % CVN Impact: +20 °C: 85 J -40 °C: 57 J	2.50 x 250 3.20 x 350 4.00 x 350	TÜV, KTA, CE	Basic coated, core wire alloyed electrode. Controlled delta ferrite content (3 – 8 FN) for heat and creep resistant austenitic CrNi-steels with increased carbon contents (e.g. 1.4948 / 304H), for boiler, reactor and turbine fabrication. High resistance to hot cracking.
BÖHLER FOX CN 17/4 PH AWS A5.4: E630-15 (mod.) EN ISO 3581-A: E Z 17 4 Cu B 4 3 H5	C: 0.03 Si: 0.30 Mn: 0.60 Cr: 16.00 Ni: 5.10 Mo: 0.4 Nb: 0.2 Cu: 3.2	PWHT: 540 °C / 3 hrs Rp0.2: 940 MPa Rm: 1030 MPa A: 10 % CVN Impact: +20 °C: 20 J	3.20 x 350 4.00 x 350	CE	Basic coated electrode with high strength for welding of similar precipitation hardening rolled, forged and cast CrNiCu-steels. Popular for components in the paper industry, rotors of compressors, fan blades, press plates in the plastic processing industry and in the aerospace industry.
BÖHLER FOX E 308 H AWS A5.4: E308H-16	C: 0.05 Si: 0.6 Mn: 0.8 Cr: 19.8 Ni: 10.2	Rp0.2: 420 MPa Rm: 580 MPa A: 40 % CVN Impact: +20 °C: 70 J	2.50 x 300 3.20 x 350 4.00 x 350	TÜV, CE	Rutile-basic coated electrode of E 19 9 H R / E308H-16 type for welding of creep resistant CrNi-alloyed austenitic stainless steels such as 1.4948 / 304H. Controlled ferrite content of 3 – 8 FN. The deposit is resistant to embrittlement and scaling.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L (mm)	Approvals	Characteristics and applications
BÖHLER FOX E 347 H AWS A5.4: E347-15	C: 0.05 Si: 0.3 Mn: 1.3 Cr: 19.0 Ni: 10.2 Nb: 0.56	Rp0.2: 460 MPa Rm: 635 MPa A: 40 % CVN Impact: +20 °C: 100 J	2.50 x 300 3.20 x 350 4.00 x 350	CE	Basic coated electrode for welding of CrNi-alloyed austenitic stainless steels such as 1.4541 / 347H for service temperatures up to 400°C. Controlled ferrite content of 3 – 8 FN.

FLUX AND METAL-CORED WIRES, STAINLESS

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
FOXcore 308L-T0 AWS A5.22: E308LT0-4(1)	C: 0.03 Si: 0.7 Mn: 1.5 Cr: 19.5 Ni: 10.5	Shielding gas: M21, C1 Rp0.2: 380 MPa Rm: 560 MPa A: 40 % CVN Impact: +20 °C: > 47 J -120 °C: > 32 J	1,2 1,6		Rutile flux-cored wire for welding of stainless steels such as 1.4307 / 304L. Easy handling and high deposition rate result in high productivity with excellent welding performance and very low spatter formation. The wide arc ensures even penetration and side-wall fusion to prevent lack of fusion. Suitable for service temperatures from -196°C to 350°C.
FOXcore 316L-T0 AWS A5.22: E316LT0-4(1)	C: 0.03 Si: 0.7 Mn: 1.5 Cr: 18.8 Ni: 12.0 Mo: 2.7	Shielding gas: M21, C1 Rp0.2: 400 MPa Rm: 560 MPa A: 38 % CVN Impact: +20 °C: > 47 J -120 °C: > 32 J	1,2 1,6		Rutile flux-cored wire for welding of stainless steels such as 1.4435 / 316L. Increased travel speeds as well as self-releasing slag with little demand for cleaning and pickling provide considerable savings in time and money. The wire shows good wetting behavior and results in a finely rippled surface pattern.
FOXcore 309L-T0 AWS A5.22: E309LT0-4(1)	C: 0.03 Si: 0.75 Mn: 1.4 Cr: 22.8 Ni: 12.4	Shielding gas: M21, C1 Rp0.2: 400 MPa Rm: 540 MPa A: 35 % CVN Impact: +20 °C: > 47 J -60 °C: > 32 J	1,2 1,6		Rutile flux-cored wire for welding of dissimilar joints of Cr and CrNi(Mo)-steels and unalloyed or low-alloyed steels, as well as weld cladding of unalloyed or low-alloyed base metals preferably in flat or horizontal position. Ferrite measured with FeritScope MP30 14 – 22 FN.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
FOXcore 308L-T1 AWS A5.22: E308LT1-4(1)	C: 0.03 Si: 0.7 Mn: 1.5 Cr: 19.8 Ni: 10.5	Rp0.2: 380 MPa Rm: 535 MPa A: 39 % CVN Impact: +20 °C: 70 J -196 °C: 36 J	0,9 1,2 1,6	TÜV, DB, ABS, CWB, DNV-GL, CE	Rutile flux-cored wire designed for welding 1.4307 / 304L type stainless steels with good corrosion resistance under moderately severe conditions, e.g. in oxidizing acids and cold or dilute reducing acids.
FOXcore 316L-T1 AWS A5.22: E316LT1-4(1)	C: 0.03 Si: 0.7 Mn: 1.5 Cr: 19.0 Ni: 12.0 Mo: 2.7	Rp0.2: 430 MPa Rm: 560 MPa A: 34 % CVN Impact: +20 °C: 65 J -120 °C: 40 J	0,9 1,2 1,6	TÜV, DB, ABS, BV, CWB, DNV-GL, LR, CE	Rutile flux-cored wire for welding of stainless steels such as EN 1.4435 / AISI 316L. The fast freezing slag offers excellent weldability and slag control in all positions. Easy handling and high deposition rate result in high productivity with excellent welding performance and very low spatter formation.
FOXcore 309L-T1 AWS A5.22: E309LT1-4(1)	C: 0.03 Si: 0.7 Mn: 1.4 Cr: 23.0 Ni: 12.5	Rp0.2: 420 MPa Rm: 540 MPa A: 36 % CVN Impact: +20 °C: 65 J -60 °C: 50 J	0,9 1,2 1,6	TÜV, DB, ABS, LR, RINA BV, CE, DNV-GL,	Rutile flux-cored wire for welding of dissimilar joints of Cr and CrNi(Mo) steels and unalloyed or low-alloyed steels, as well as weld cladding of unalloyed or low-alloyed base metals. Ferrite measured with Fischer Feritescope 14 – 22 FN.
FOXcore 309LMo-T1 AWS A5.22: E309LMoT1-4(1)	C: 0.03 Si: 0.7 Mn: 1.4 Cr: 23.0 Ni: 12.5 Mo: 2.7 FN: 23-36	Shielding gas: Ar + 18 % CO ₂ Rp0.2: 540 MPa Rm: 705 MPa A: 28 % CVN Impact: +20 °C: 65 J -20 °C: 44 J	0,9 1,2	TÜV, BV, LR, DNV-GL, CWB, CE, ABS	Primarily designed for welding dissimilar joints between stainless steels and low-alloyed steels. It can also be used for overlay welding, providing an 18Cr-8Ni-2Mo deposit from the very first layer and for joining of various steels. The fast freezing slag offers excellent weldability and slag control in all positions.
FOXcore 2209-T1 AWS A5.22: E2209T1-4(1)	C: 0.029 Si: 0.7 Mn: 1.0 Cr: 23.0 Ni: 9.1 Mo: 3.2 N: 0.13 FN: 40-60 PREN: > 35	Shielding gas: Ar + 18 % CO ₂ Rp0.2: 600 MPa Rm: 800 MPa A: 27 % CVN Impact: +20 °C: 58 J -46 °C: 45 J Hardness HB: 260	1,2	TÜV, BV, CWB, DNV-GL, LR, RINA, ABS CE	Rutile duplex stainless steel flux-cored wire for welding of 22Cr steel grades such as 1.4462 / UNS S31803, S32205 and similar. Can also be used for dissimilar joints and weld cladding. Meets the corrosion test requirements per ASTM G48 Methods A, B and E (25°C). Over-alloyed in nickel to promote austenite formation. Ferrite measured with Fischer Feritescope 35–45 FN.
FOXcore 2594-T1 AWS A5.22: E2594T1-4(1)	C: 0.03 Si: 0.7 Mn: 0.9 Cr: 25.3 Ni: 9.8 Mo: 3.7 N: 0.23 PREN > 41	Rp0.2: 690 MPa Rm: 890 MPa A: 27 % CVN Impact: +20 °C: ≥ 60 J -40 °C: ≥ 38 J Hardness HB: 260	1,2	CE	Rutile flux-cored wire designed for welding ferritic-austenitic superduplex steel and equivalent steel grades. Meet the corrosion test requirements per ASTM G48 Methods A, B and E (40 °C). Over-alloyed in nickel to promote austenite formation. The weldability is excellent in the vertical-up and overhead welding positions.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
FOXcore 2594-T1 HD AWS A5.22: E2594T1-4(1)	C: 0.03 Si: 0.7 Mn: 0.9 Cr: 25.3 Ni: 9.8 Mo: 3.7 N: 0.23 PREN > 41	Rp0.2: 640 MPa Rm: 880 MPa A: 26 % CVN Impact: +20 °C: ≥ 60 J -50 °C: ≥ 41 J Hardness HB: 250	1,2	CE	Rutile flux-cored wire designed for welding ferritic-austenitic superduplex steel and equivalent steel grades such as 1.4410 / UNS S32570 and 1.4501 / UNS S32760. Developed to fulfill severe requirements, such as those in NORSOK M-601 and similar standards. Meet the corrosion test requirements per ASTM G 48 Methods A, B and E (40 °C). Overalloyed in nickel to promote austenite formation. Ferrite measured with FeritScope FMP30 45 – 51 FN.
FOXcore 2209-T1 HD AWS A5.22: E2209T1-4(1)	C: 0.29 Si: 0.7 Mn: 0.9 Cr: 23.2 Ni: 9.0 Mo: 3.2 N: 0.14 PREN > 35	Rp0.2: 635 MPa Rm: 825 MPa A: 28 % CVN Impact: +20 °C: ≥ 80 J -50 °C: ≥ 52 J Hardness HB: 250	1,2	CE	Rutile flux-cored wire designed for welding duplex stainless steel. Developed to satisfy severe requirements, such as those in NORSOK M-601 and similar standards. Meets the corrosion test requirements per ASTM G48 Methods A, B and E (25 °C).
Avesta FC 308L-T1 AWS A5.22: E308LT1-1	C: 0.02 Si: 0.7 Mn: 1.3 Cr: 19.2 Ni: 10.2 Mo: 0.01	Rp0.2: 390 MPa Rm: 570 MPa A: 39 % CVN Impact: -20 °C: ≥ 60 J	1,2		Avesta FC 308L-T1 is designed for welding austenitic stainless steel type 19Cr 10Ni or similar. Provides excellent usability with stable arc, less spatter, good bead appearance, better slag removal. It is designed for all-round welding and can be used in all positions without changing parameter settings.
Avesta FC 309L-T1 AWS A5.22: E309LT1-1	C: 0.03 Si: 0.6 Mn: 1.5 Cr: 23.2 Ni: 12.8 Mo: 0.02	Rp0.2: 390 MPa Rm: 550 MPa A: 35 % CVN Impact: -20 °C: ≥ 50 J	1,2		Avesta FC 309L-T1 is a high-alloy 23Cr 13Ni wire primarily intended for surfacing on low-alloy steels and for dissimilar welds between mild steel and stainless steels. It provides excellent usability with stable arc, less spatter, good bead appearance, and better slag removal.
Avesta FC 316L-T1 AWS A5.22: E316LT1-1	C: 0.03 Si: 0.7 Mn: 1.3 Cr: 18.0 Ni: 12.2 Mo: 2.5	Rp0.2: 390 MPa Rm: 570 MPa A: 39 % CVN Impact: -20 °C: ≥ 60 J	1,2		Avesta FC 316L-T1 is designed for welding austenitic stainless steel type 17Cr 12Ni 2.5Mo or similar. This filler metal is also suitable for welding titanium and niobium stabilised steels such as ASTM 316Ti in case where the construction will be operating at temperatures below 400°C.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
Avesta FC 308L- T0 AWS A5.22: E308LT0-1	C: 0.02 Si: 0.7 Mn: 1.3 Cr: 19.2 Ni: 10.2 Mo: 0.01	Rp0.2: 390 MPa Rm: 570 MPa A: 39 % CVN Impact: -20 °C: ≥ 60 J	1,2		Avesta FC 308L-T0 is designed for welding austenitic stainless steel type 19Cr 10Ni or similar. Avesta FC 308L-T0 provides excellent weldability in flat as well as horizontal position.
Avesta FC 307-T1 AWS A5.22: E307T1-1	C: 0.09 Si: 0.7 Mn: 4.1 Cr: 19.5 Ni: 9.5 Mo: 0.9	Rp0.2: 420 MPa Rm: 620 MPa A: 39 % Hardness: (HB)~200	1,2		One of the most universal alloys and for some applications a cost-efficient alternative to E312 or E309L. For tough buffer and intermediate layers, for cladding of rails and switches, valve seats and in hydropower plants.
FOXcore 347 H-T1 AWS A5.22: E347HT1-4(1)	C: 0.45 Si: 0.6 Mn: 1.3 Cr: 18.5 Ni: 10.5 Nb: 0.45	Shielding gas Ar + 18% CO ₂ Rp0.2: 370 MPa Rm: 560 MPa A: 45 % CVN Impact: -20 °C: 95 J -120 °C: 55 J -196 °C: 38 J PWHT: 600 °C / 36 Hr Rp0.2: 375 MPa Rm: 570 MPa A: 44 % CVN Impact: -20 °C: 90 J -120 °C: 35 J -196 °C: 28 J	1,2		Rutile flux-cored wire for welding of creep resistant austenitic CrNi-steels such as 1.4912 / 347H suitable for service temperatures above 400 °C. Application examples are heat exchangers, hot separators, hydrocracking and hydrodesulphurization in refineries. The bismuth-free weld deposit (Bi ≤ 10 ppm) and controlled ferrite content of 4 – 8 FN meet the recommendations of API RP582 and AWS A5.22 for high temperature service or post-weld heat treatment.
FOXcore 316L-T1 Cryo AWS A5.22: E316LT1-4(1)	C: 0.03 Si: 0.7 Mn: 1.4 Cr: 18.1 Ni: 12.5 Mo: 2.1	Rp0.2: 400 MPa Rm: 550 MPa A: 36 % CVN Impact: +20 °C: 75 J -196 °C: 35 J	1,2	TÜV, RINA DNV-GL, LR CE	Rutile flux-cored wire with controlled weld metal ferrite content (3 – 6 FN). Particularly good cryogenic toughness and lateral expansion down to -196 °C as specified for LNG applications. Suitable for service temperatures from -196 °C to 350 °C. The scaling temperature is approximately 850 °C in air.
FOXcore 308L-T1 Cryo AWS A5.22: E308LT1-4(1)	C: 0.03 Si: 0.6 Mn: 1.4 Cr: 19.3 Ni: 10.9	Rp0.2: 390 MPa Rm: 540 MPa A: 40 % CVN Impact: +20 °C: 70 J -196 °C: 42 J	1,2		Rutile flux-cored wire for welding of stainless steels such as 1.4307 / 304L with good corrosion resistance under moderately severe conditions. The carefully controlled chemical composition gives a weld metal with a ferrite content in the range of 3 – 6 FN and very good toughness down to -196 °C as specified for LNG applications.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
FOXcore 308 H-T1 AWS A5.22: E308HT1-4(1)	C: 0.05 Si: 0.6 Mn: 1.2 Cr: 19.4 Ni: 10.1	Rp0.2: 370 MPa Rm: 560 MPa A: 45 % CVN Impact: +20 °C: 90 J	1,2	TÜV, CE	Rutile flux-cored wire for welding of CrNi austenitic stainless steels such as 1.4948 / 304H for elevated service temperatures. The higher carbon content as compared to E308LT1, provides improved creep resistance properties, which is advantageous at temperatures above 400 °C. Max. temperature according to the TÜV approval is 700 °C.
FOXcore 308L-MC AWS A5.22: EC308L	C: 0.025 Si: 0.6 Mn: 1.4 Cr: 19.8 Ni: 10.5	(Shielding Gas) (Ar + 2.5 % CO ₂) Rp0.2: 420 MPa Rm: 560 MPa A: 36 % CVN Impact: +20 °C: 90 J -120 °C: 50 J -196 °C: 42 J	1,2	TÜV, CWB CE	Austenitic metal-cored wire for welding matching and similar, stabilized or unstabilized, corrosion resistant austenitic CrNi-steels. The easy handling and high deposition rate result in high productivity with excellent welding performance and very low spatter formation. Ferrite measured with FeritScope FMP30 4 – 12 FN.
FOXcore 316L-MC AWS A5.22: EC316L	C: 0.025 Si: 0.6 Mn: 1.4 Cr: 18.8 Ni: 12.2 Mo: 2.7	(Shielding Gas) (Ar + 2.5 % CO ₂) Rp0.2: 420 MPa Rm: 560 MPa A: 35% CVN Impact: +20 °C: 65 J -196 °C: 38 J	1,2	TÜV, CWB CE	Austenitic metal-cored wire for welding matching and similar, stabilized or unstabilized, corrosion resistant austenitic CrNiMo-steels. Ferrite measured with FeritScope FMP30: 4 – 12 FN.
FOXcore 307-MC AWS A5.22: EC307(mod.) EN ISO 17633-A: T 18 8 Mn M M12 1	C: 0.1 Si: 0.6 Mn: 6.3 Cr: 18.8 Ni: 9.2	(Shielding Gas) (Ar + 2.5 % CO ₂) Rp0.2: 408 MPa Rm: 608 MPa A: 40% CVN Impact: +20 °C: 45 J -60 °C: 40 J	1,2	TÜV, CWB CE	Austenitic metal-cored wire for numerous applications. This is for instance utilized for robotic welding of exhaust systems in the automotive industry. Used for fabrication, repair and maintenance. The weld deposit offers exceptionally high ductility and elongation, also after high dilution of problem steels.
FOXcore 309L-MC AWS A5.22: EC309L	C: 0.025 Si: 0.6 Mn: 1.4 Cr: 23.0 Ni: 12.5	(Shielding Gas) (Ar + 2.5 % CO ₂) Rp0.2: 408 MPa Rm: 608 MPa A: 40% CVN Impact: +20 °C: 75 J -120 °C: 51 J	1,2	CWB, CE	Austenitic metal-cored wire type for welding dissimilar joints between high-alloyed Cr and corrosion resistant austenitic CrNi(Mo) steels and mild or low-alloyed steels. Suitable for service temperatures from -120 °C to 300°C.

GMAW WIRES, STAINLESS

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
BÖHLER GMA 308LSi AWS A5.9: ER308LSi	C: 0.02 Si: 0.85 Mn: 1.9 Cr: 20.0 Ni: 10.1	Rp0.2: 430 MPa Rm: 580 MPa A: 41 % CVN Impact: +20 °C: 110 J	0,8 0,9 1,0 1,2	CE, DB	GMAW solid wire of type G 19 9 L Si / ER308LSi designed for high quality welding, good wetting and feeding characteristics and excellent weld metal CVN values down to -196 °C. Resistance to intergranular corrosion up to +350 °C.
BÖHLER GMA 309LSi AWS A5.9: ER309LSi	C: 0.02 Si: 0.85 Mn: 2.1 Cr: 23.5 Ni: 13.6	Rp0.2: 450 MPa Rm: 685 MPa A: 36 % CVN Impact: +20 °C: 130 J	0,8 0,9 1,0 1,2	CE, DB	GMAW solid wire of type G 23 12 LSi / ER309LSi. This is a standard alloy for welding dissimilar joints with average ferrite content 16 FN. It is designed for very good welding and wetting characteristics as well as good safety after dilution when welding dissimilar joints.
BÖHLER GMA 316LSi AWS A5.9: ER316LSi	C: 0.02 Si: 0.80 Mn: 1.7 Cr: 18.4 Ni: 12.4 Mo: 2.3	Rp0.2: 440 MPa Rm: 580 MPa A: 38 % CVN Impact: +20 °C: 100 J -120 °C: 65 J	0,8 0,9 1,0 1,2	CE	GMAW solid wire of type G 19 12 3 L / ER316L designed for high quality welding, good wetting and feeding characteristics as well as reliable corrosion resistance up to +400 °C. Low temperature service down to -196 °C.
BÖHLER GMA 347 AWS A5.9: ER347	C: 0.04 Si: 0.55 Mn: 1.3 Cr: 19.4 Ni: 9.7 Nb: 0.5	Rp0.2: 460 MPa Rm: 630 MPa A: 40 % CVN Impact: +20 °C: 110 J -20 °C: ≥32 J	0,8 1,0 1,2 1,6	CE	GMAW solid wire of type G 19 9 Nb/ER347 designed for high quality welding, good wetting and feeding characteristics as well as reliable corrosion resistance up to +400 °C.
BÖHLER GMA 430L Nb EN ISO 14343-A: G Z 18 L Nb	C: 0.012 Si: 0.38 Mn: 0.5 Cr: 18.5 Nb: 0.35 Cu: 0.04	Brinell Hardness: Untreated: 150 HB Annealed: 130 HB	0,9 1,0 1,2	CE	Special wire electrode for catalytic converters and silencers, exhaust mufflers, pipe junctions and intake manifolds made of same-type or similar-type materials. Outstanding sliding and feeding characteristics. Very good welding and flow behavior.
BÖHLER GMA 410NiMo AWS A5.9: ER410NiMo	C: 0.02 Si: 0.45 Mn: 0.5 Cr: 12.4 Ni: 4.7 Nb: 0.5	Rp0.2: 890 MPa Rm: 960 MPa A: 17 % CVN Impact: +20 °C: 80 J -20 °C: ≥32 J	1,0 1,2 1,6	CE	GMAW solid wire of type G 13 4 designed for numerous applications. For the fabrication and repair welding of hydro turbine components made of soft martensitic 13 % Cr 4 % Ni alloyed steels and cast steels.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
BÖHLER GMA 2209 AWS A5.9: ER2209	C: 0.02 Si: 0.5 Mn: 1.69 Cr: 22.9 Ni: 8.8 N: 0.15 Mo: 3.2	Rp0.2: 620 MPa Rm: 780 MPa A: 29 % CVN Impact: +20 °C: 80 J -40 °C: 65 J	0,8 1,0 1,2 1,6	CE	Besides the high tensile strength, the special advantage of the weld is its excellent toughness behaviour down to -40 °C. Good resistance to stress corrosion cracking in chlorine and hydrogen sulphide bearing environments.

GTAW RODS, STAINLESS

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
BÖHLER TIG 308L AWS A5.9: ER308L	C: 0.02 Si: 0.45 Mn: 2.00 Cr: 19.8 Ni: 10 Mo: 0.04	Rp0.2: 385 MPa Rm: 575 MPa A: 40 % CVN Impact: +20 °C: 150 J	1,6 2,0 2,4 3,2	ABS	Good welding and wetting characteristics as well as corrosion resistance up to +350 °C.
BÖHLER TIG 309L AWS A5.9: ER309L	C: 0.02 Si: 0.40 Mn: 1.80 Cr: 23.00 Ni: 13.60	Rp0.2: 450 MPa Rm: 590 MPa A: 38 % CVN Impact: +20 °C: 200 J -40 °C: 120 J	1,6 2,0 2,4 3,2	ABS	This is a standard alloy for welding dissimilar joints and designed for very good welding and wetting characteristics as well as good safety after dilution when welding dissimilar joints.
BÖHLER TIG 316L AWS A5.9: ER316L	C: 0.023 Si: 0.40 Mn: 1.67 Cr: 18.00 Ni: 11.00 Mo: 2.30	Rp0.2: 460 MPa Rm: 605 MPa A: 32 % CVN Impact: +20 °C: 175 J -196 °C: 75 J	1,6 2,0 2,4 3,2	ABS	Is engineered to create a weld deposit of high purity, superior hot cracking and corrosion resistance.
Thermanit H-347 AWS A5.9: ER347 EN ISO 14343-A: W 19 9 Nb	C: 0.05 Si: 0.5 Mn: 1.8 Cr: 19.6 Ni: 9.5	Rp0.2: 490 MPa Rm: 660 MPa A: 35 % CVN Impact: +20 °C: 140 J -196 °C: ≥ 27 J	1,0 1,2 1,6 2,0 2,4 3,2 4,0	TÜV, DB, CE	Solid wire TIG rod of W 19 9 Nb / ER347 type for joining and surfacing application with matching and similar stabilized and non-stabilized austenitic CrNi(N)-steels and cast steel grades. Max. service temperature 400°C. Corrosion resistance similar to matching stabilized austenitic CrN-steels.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
Avesta GT 2209 AWS A5.9: ER2209 EN ISO 14343-A: W 22 9 3 N L	C: ≤ 0.015 Si: 0.48 Mn: 1.67 Cr: 22.86 Ni: 8.70 Mo: 3.00 N: 0.18 PREN ≥ 35	Rp0.2: 610 MPa Rm: 780 MPa A: 36 % CVN Impact: +20 °C: 150 J -40 °C: 100 J	1,0 1,2 1,6 2,0 2,4 3,2 4,0	ABS, DNV-GL, CE	Primarily designed for welding the duplex grade and similar grades but can also be used for welding SAF 2304 type of steels. Provides a ferritic-austenitic weldment that combines many of the good properties of both ferritic and austenitic stainless steel.
Thermanit 25/09 CUT AWS A5.9: ER2594 EN ISO 14343-A: W 25 9 4 N L	C: 0.02 Si: 0.35 Mn: 0.4 Cr: 25.0 Ni: 9.5 Mo: 4.0 N: 0.25 PREN ≥ 40	Rp0.2: 660 MPa Rm: 860 MPa A: 28 % CVN Impact: +20 °C: 170 J -60 °C: 150 J	1,6 2,0 2,4 3,2	TÜV, CE	Ferritic-austenitic superduplex stainless steel such as EN 1.4410 / UNS S32750 and EN 1.4501 / UNS S32760. Can also be used for joints between superduplex and austenitic alloys or carbon steels and for welding duplex type EN 1.4462 / UNS S32205 if extra high corrosion resistance is required, e.g. in root runs in tubes and pipe. Meets the corrosion test requirements per ASTM G48 Methods A, B and E (40 °C).

SAW WIRE/FLUX COMBINATIONS, STAINLESS

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
Avesta S 308L S + Marathon 431 / Avesta C 807 Wire: AWS A5.9: ER308L Flux: EN ISO 14174: SA FB 2 DC	C: 0.02 Si: 0.6 Mn: 1.2 Cr: 19.5 Ni: 9.5	Rp0.2: >380 MPa Rm: >550 MPa A: >35 % CVN Impact: +20 °C: 90 J -196 °C: 35 J	2,0 2,4 3,2 4,0		It is a wire-flux combination for submerged arc welding of stainless steels grade like 1.4301/ASTM 304. The wire can also be used for welding titanium and niobium stabilised steels such as ASTM 321 and ASTM 347 in cases where the construction will be used at temperatures not exceeding 400 °C.
Avesta S 316L S + Marathon 431 / Avesta C 807 Wire: AWS A5.9: ER316L Flux: EN ISO 14174: SA FB 2 DC	C: 0.02 Si: 0.6 Mn: 1.2 Cr: 18.0 Ni: 11.6 Mo: 2.3	Rp0.2: >380 MPa Rm: >540 MPa A: >35 % CVN Impact: +20 °C: 90 J -196 °C: 30 J	2,0 2,4 3,2 4,0		It is a wire-flux combination for submerged arc welding of austenitic stainless steel type 17 Cr 12 Ni 2.5 Mo or similar where high resistance to general and intercrystalline corrosion is required. The filler metal is also suitable for welding titanium and niobium stabilised steel such as ASTM 316Ti.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
Avesta S 309L S + Marathon 431 / Avesta C 807 Wire: AWS A5.9: ER309L Flux: EN ISO 14174: SA FB 2 DC	C: 0.015 Si: 0.6 Mn: 1.3 Cr: 23.5 Ni: 13.2	Rp0.2: > 380 MPa Rm: > 600 MPa A: > 25 % CVN Impact: +20 °C: > 100 J	2,0 2,4 3,2 4,0		It is a wire-flux combination for submerged arc welding. This is a standard combination for welding dissimilar joints, and the first layer in weld overlay (wire cladding). The average ferrite content is 16 FN. Suitable up to service temperatures of +300 °C.
Thermanit H 347 + Marathon 431 AWS A5.9: ER347 Flux: EN ISO 14174: SA FB 2 DC	C: 0.038 Si: 0.60 Mn: 1.3 Cr: 19.0 Ni: 9.5 Nb: 0.55	Rp0.2: > 380 MPa Rm: > 550 MPa A: > 30 % CVN Impact: +20 °C: > 65 J -120 °C: > 40 J	2,4 3,2 4,0	TÜV, CE	It is a wire-flux combination for submerged arc welding of stainless steel grades like 1.4541 / 347. Marathon 431 is an agglomerated basic flux that ensures good welding properties with nice bead appearance and good slag detachability.
Thermanit 22/09 + Marathon 431 / Avesta C 805-D AWS A5.9: ER2209 Flux: EN ISO 14174: SA FB 2 DC	C: 0.02 Si: 0.50 Mn: 1.4 Cr: 22.2 Ni: 8.3 Mo: 3.1 N: 0.14	Rp0.2: > 450 MPa Rm: > 690 MPa A: > 20 % CVN Impact: +20 °C: > 80 J -40 °C: > 40 J	2,4 3,0 3,2	TÜV, CE, ABS, DNV-GL, LR	It is a wire-flux combination for submerged arc welding for welding duplex steel grades like 1.4462 / S31803 used in offshore, shipyards, chemical tankers, chemical/petrochemical, pulp & paper, etc.
Thermanit 25/09 CuT - Marathon 805 AWS A5.9: ER2594 Flux: EN ISO 14174: SA AF 2 DC	C: 0.015 Si: 0.55 Mn: 0.7 Cr: 26.2 Ni: 9.5 Mo: 3.8 N: 0.22 Cu: 0.5 W: 0.6	Rp0.2: 700 MPa Rm: 890 MPa A: 23 % CVN Impact: -46 °C: 70 J (>45)	2,4 3,2		It is a wire/flux combination for submerged arc welding of super duplex stainless steel grades like SAF 2507, ASTM S32760, S32550 and S31260. The weld metal shows excellent resistance to pitting- and crevice corrosion. Suitable for service temperatures from -40 °C to +220 °C.

**Flux and wire combination can be changed according to technical requirements.

SAW FLUX, STAINLESS*

Product Name Classification AWS Classification EN	Flux Type	Main constituents: %	Grain size EN ISO 14174	Characteristics and applications
Marathon 805 (Avesta Flux 805) EN ISO 14174: SA AF 2 DC	Agglomerated, aluminate fluoride-basic, Cr-compensating	SiO ₂ : 9 Al ₂ O ₃ : 36 CaF ₂ : 48 Cr: 2.5	3 - 16	It is a basic, slightly Chromium-compensated agglomerated flux. Primarily designed for welding with high-alloyed stainless fillers such as 904L and 2205. Standard Cr-Ni and Cr-Ni-Mo fillers can also be welded with excellent results.
Avesta C 805 D EN ISO 14174: SA AF 2 56 55 Mo DC	Agglomerated aluminum-fluoride basic	SiO ₂ : 10 Al ₂ O ₃ : 40 CaF ₂ : 50	3 - 16	It is an agglomerated basic type welding flux. Specially designed for joining duplex stainless steels but can also be used for austenitic stainless wires types 308L, 316L and 309L. The flux is alloyed with Cr and Mo which will improve the corrosion resistance.
Marathon 431 (Avesta Flux 807) EN ISO 14343: SA FB 2 DC	Agglomerated Fluoride Basic	SiO ₂ : 8 CaO+MgO+MnO: 52 CaF ₂ : 52	4 - 14	It is an agglomerated basic welding flux for welding stainless high alloyed CrNi(Mo) steels. The weld seams are smooth and finely rippled without any slag residues.
Avesta C 807 EN ISO 14174: SA FB 2 DC	Agglomerated Fluoride Basic	SiO ₂ +TiO ₂ : 10 Al ₂ O ₃ : 38 CaF ₂ : 50	3 - 16	It is an agglomerated basic welding flux for welding stainless high alloyed CrNi (Mo) steels. Besides the good slag detachability, the flux also provides good fillet weld properties.
Avesta C 806 EN ISO 14174: SA FB 2 DC	Agglomerated Fluoride Basic	SiO ₂ +TiO ₂ : 18 Al ₂ O ₃ +MnO: 20 CaF ₂ : 34 CaO+MgO: 29	3 - 16	It is specially designed for joining austenitic stainless wires type 308L, 316L and 309L for applications where high impact strength values and high corrosion resistance is required.
Marathon 203 (BÖHLER BB 203) EN ISO 14174: SA FB 2 DC	Agglomerated Fluoride Basic	SiO ₂ : 18 CaO+MgO+MnO: 60 CaF ₂ : 33	3 - 16	It is an agglomerated fluoride-basic flux for submerged arc welding recommended for joining martensitic CrNi-steels; joining (and cladding) of unstabilized stainless austenitic CrNi(Mo)-steels. The flux has a high basicity-index and provides a high purity in the weld metal resulting in good mechanical properties.

COVERED ELECTRODES, NICKEL-BASE

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
UTP 7015 AWS A5.11: ENiCrFe-3	C: 0.025 Si: 0.4 Mn: 6.0 Cr: 16.0 Ni: Balance Nb: 2.2 Fe: 6.0	Rp0.2: 400 MPa Rm: 670 MPa A: 40 % CVN Impact: +20 °C: 120 J -196 °C: 80 J	2.5 x 300 3.2 x 300 4.0 x 350 5.0 x 400	TÜV, DNV-GL, KTA	UTP 7015 is employed for joining and surfacing of nickel-base materials. It is also recommended for welding different materials, such as austenitic to ferritic steels, as well as for weld claddings on unalloyed and low-alloyed steels, e. g. for reactor construction.
UTP 6222 Mo AWS A5.11: ENiCrMo-3	C: 0.023 Si: 0.4 Mn: 0.6 Cr: 22.0 Mo: 9.0 Ni: Balance Nb: 3.3 Fe: < 1	Rp0.2: > 450 MPa Rm: > 760 MPa A: 30 % CVN Impact: +20 °C: 75 J -196 °C: 45 J	2.5 x 250 3.2 x 300 4.0 x 350 5.0 x 400	TÜV, DNV-GL, ABS, BV	UTP 6222 Mo is particularly suited for joining and surfacing on nickel alloys, austenitic steels, low temperature nickel steels, austenitic-ferritic-joints and claddings of the same or similar nature.
UTP 6170 Co AWS A5.11: ENiCrCoMo-1 (mod.) EN ISO 14172: E Ni 6117 (NiCr-22Co12Mo)	C: 0.06 Si: 0.7 Mn: 0.1 Cr: 21.0 Mo: 9.0 Ni: Balance Co: 11.0 Al: 0.7 Ti: 0.3 Fe: 1.0	Rp0.2: > 450 MPa Rm: > 700 MPa A: > 35 % CVN Impact: +20 °C: 80 J	2.5 x 300 3.2 x 300 4.0 x 350 5.0 x 400	TÜV, DNV-GL, KTA	UTP 6170 Co is suitable for joining high-temperature and similar nickel-base alloys, heat resistant austenitic and cast alloys, such as 2.4663 (NiCr23Co12Mo), 2.4851 (NiCr23Fe), 1.4876 (X10 NiCrAlTi 32 21), 1.4859 (GX10 NiCrSiNb 32 20). The weld metal is resistant to hot-cracking and is used for service temperatures up to 1100° C.
Thermanit Nicro 182 AWS A5.11: ENiCrFe-3	C: 0.025 Si: 0.4 Mn: 6.0 Cr: 16.0 Ni: Balance Nb: 2.2 Fe: 6.0	Rp0.2: 400 MPa (≥ 360) Rm: 670 MPa A: 40 % CVN Impact: +20 °C: 120 J -196 °C: 80 J	2.5 x 300 3.2 x 300 4.0 x 350 5.0 x 400	TÜV, CE	Basic electrode, core-wire-alloyed for high grade welding of nickel-base alloys, creep resistant steels, heat resisting and cryogenic materials, dissimilar joints and low-alloyed steels with difficult welding behaviour.
Thermanit 620 AWS A5.11: ENiCrMo-6	C: 0.05 Si: 0.25 Mn: 2.9 Cr: 12.5 Mo: 5.9 Nb+Ta: 1.2 W: 1.4 Fe: 4.8 Ni: Balance	Rp0.2: 430 MPa Rm: ≥ 695 MPa A: 39 % CVN Impact: -196 °C: 80 J	2.5 x 300 3.2 x 300 4.0 x 350		High-recovery nickel-base covered electrode of E Ni 6620 / ENiCrMo-6 type primarily developed for 9% Ni steels for liquefied natural gas (LNG) and 5% nickel steels for liquefied ethylene gas (LEG) storage and transportation. Typical applications are welding of cryogenic gas storage tanks and tankers.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
UTP SOUDONEL D AWS A5.11: ENiCrMo-6	C: 0.05 Si: 0.3 Mn: 3.5 Cr: 14.0 Mo: 6.5 Nb: 0.7 W: 1.1 Fe: 7.5 Ni: Balance	Rp0.2: 420 MPa Rm: ≥ 690 MPa A: 35 % CVN Impact: -196 °C: ≥ 50 J	2.5 x 300 3.2 x 300 4.0 x 350 5.0 x 400	TÜV, DNV-GL	The high-efficiency nickel-base stick electrode UTP Soudonel D is especially suited for welding cold-tough nickel steels, such as X8Ni9. Recovery is of 150%. The typical application field is welding of cryogenic gas storage tanks and tankers (9% Ni steels for Liquefied Natural Gas LNG, 5% Ni steels for Liquefied Ethylene Gas LEG).
UTP 7015 MO AWS A5.11: ENiCrFe-2	C: 0.04 Si: 0.4 Mn: 3.0 Cr: 16.0 Mo: 1.5 Nb: 2.2 Fe: 6.0 Ni: Balance	Rp0.2: > 380 MPa Rm: > 620 MPa A: > 35 % CVN Impact: > 50 J	2.5 x 300 3.2 x 300 4.0 x 350 5.0 x 400	TÜV, DNV-GL	UTP 7015 Mo is a basic-coated stick electrode for joining similar heat-resistant NiCrFe alloys, heat-resistant austenitic steels, cryogenic Ni-steels and heat-resistant austenitic-ferritic steels.
UTP 759 Kb AWS A5.11: ENiCrMo-13	C: < 0.02 Si: < 0.2 Mn: 0.5 Cr: 22.5 Mo: 15.5 Fe: 1.0 Ni: Balance	Rp0.2: > 450 MPa Rm: > 720 MPa A: > 30 % CVN Impact: > 60 J	2.5 x 250 3.2 x 300 4.0 x 350	TÜV	UTP 759 Kb is employed primarily for welding components in environmental plants and plants for chemical processes with highly corrosive media. The special composition of the coating extensively prevents the precipitation of inter-metallic phases.

FLUX AND METAL-CORED WIRES, NICKEL-BASE

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
FOXcore 625-T1 AWS A5.34: ENiCrMo3 T1-4	C: 0.02 Si: 0.5 Mn: 0.3 Cr: 20.7 Ni: bal. Mo: 8.5 Nb: 3.3 Fe: ≤ 1.0	Rp0.2: 490 MPa Rm: 750 MPa A: 30 % CVN Impact: +20 °C: 70 J -196 °C: 60 J	1,2	TÜV, ABS, BV, DNV-GL	Nickel-base rutile flux-cored wire for welding of nickel-base alloys with high molybdenum content, e.g. Alloy 625 and Alloy 825, as well as superaustenitic stainless steels such as 254 SMO® (1.4547 / UNS S31254). With exceptional mechanical properties and low temperature ductility, this wire can be used for welding 9Ni-steels for cryogenic applications. Meets the corrosion test requirements per ASTM G48 Methods A, B and E (50°C).

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
FOXcore NICRO 82-T0 AWS A5.34: ENiCr3T0-4	C: 0.03 Si: 0.4 Mn: 3.2 Cr: 19.5 Ni: bal. Nb: 2.5 Fe: ≤ 2.5	Rp0.2: 385 MPa Rm: 650 MPa A: 39 % CVN Impact: +20 °C: 130 J -196 °C: 120 J	1,2	TÜV	Nickel-base rutile flux-cored wire of T Ni 6082 R / ENiCr3T0 type for welding of many creep-resistant steels and nickel-base alloys. Well-suited for dissimilar welding of stainless and nickel alloys to mild steels and some copper alloys.

SOLID GMAW WIRES, NICKEL-BASE

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
UTP A 6222 Mo-3 / UTP A 6222 Mo AWS A5.14: ERNiCrMo-3	C: ≤ 0.02 Si: ≤ 0.2 Cr: 22.0 Mo: 9.0 Nb: 3.5 Fe: < 1.0 Ni: Balance	Rp0.2: >460 MPa Rm: >740 MPa A: >30 % CVN Impact: +20 °C: 100 J -196 °C: 85 J	0,8 1,0 1,2 1,6	TÜV, DNV-GL, ABS	It has a high nickel content and is suitable for welding high-strength and high corrosion resistant nickel-base alloys. It can be used for joining ferritic steel to austenitic steel as well as for surfacing on steel. It is also possible to weld 9 % nickel steels using this wire due to its high yield strength. The special features of the weld metal of UTP A 6222 Mo include a good creep rupture strength, corrosion resistance, resistance to stress and hot cracking.
Thermanit NICRO 82 AWS A5.14: ERNiCr-3	C: 0.02 Si: 0.2 Mn: 2.8 Cr: 19.5 Nb: 2.5 Fe: < 2.0 Ni: > 67	Rp0.2: 380 MPa Rm: 420 MPa A: 35 % CVN Impact: +20 °C: 90 J	0,8 1,0 1,2 1,6	TÜV, CE, DNV-GL	Nickel alloy; heat and high temperature resistant. Good toughness at subzero temperatures as low as -269 °C (-452 °F). Good for welding austenitic-ferritic joints.
Thermanit NIMO C 24 AWS A5.14: ERNiCrMo-13	C: 0.01 Si: 0.2 Mn: 0.5 Cr: 23.0 Mo: 16.0 Fe: < 1.5 Ni: Balance	Rp0.2: 420 MPa Rm: 700 MPa A: 40 % CVN Impact: +20 °C: 60 J	0,8 1,0 1,2 1,6	TÜV, CE,	Nickel based alloy. High corrosion resistance in reducing and, above all, in oxidizing environments. For joining and surfacing with matching and similar alloys and cast alloys. For welding the clad side of plates of matching and similar alloys.

GTAW RODS, NICKEL-BASE

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
UTP A 068 HH AWS A5.14: ERNiCr-3	C: < 0.02 Si: < 0.2 Mn: 3.0 Cr: 20.0 Ni: Balance Nb: 2.7 Fe: 0.8	Rp0.2: >380 MPa Rm: >640 MPa A: >35 % CVN Impact: +20 °C: 160 J -196 °C: 80 J	1,6 2,0 2,4 3,2	TÜV, KTA, ABS, DVN-GL	UTP A 068 HH is predominantly used for joining identical or similar high heat resistant Ni-base alloys, heat resistant austenites, and for joining heat resistant austenitic-ferritic materials. Also used for joinings of high C content 25/35 CrNi cast steel to 1.4859 or 1.4876 for petrochemical installations with service temperatures up to 900° C.
UTP A 6222 Mo AWS A5.14: ERNiCrMo-3	C: < 0.02 Si: < 0.2 Cr: 22.0 Mo: 9.0 Ni: Balance Nb: 3.5 Fe: 1.0	Rp0.2: >460 MPa Rm: >740 MPa A: >30 % CVN Impact: +20 °C: 100 J -196 °C: 85 J	1,6 2,0 2,4 3,2	TÜV, DVN-GL, ABS	UTP A 6222 Mo has a high nickel content and is suitable for welding high-strength and high corrosion resistant nickel-base alloys. It can be used for joining ferritic steel to austenitic steel as well as for surfacing on steel.
UTP A 6170 CO AWS A5.14: ERNiCrCoMo-1	C: 0.06 Si: < 0.3 Cr: 22.0 Mo: 8.5 Ni: Balance Co: 11.5 Ti: 0.4 Al: 1.0 Fe: 1.0	Rp0.2: >450 MPa Rm: >750 MPa A: >30 % CVN Impact: +20 °C: > 120 J	1,6 2,0 2,4 3,2	TÜV	UTP A 6170 Co is particularly used for joining heat-resistant and creep-resistant nickel-base alloys of identical and similar nature, high-temperature austenitic and cast alloys. The weld metal is resistant to hot-cracking. It is used for operating temperatures up to 1100 °C.
UTP A 759 AWS A5.14: ERNiCrMo-13	C: < 0.01 Si: 0.1 Cr: 22.5 Mo: 15.5 Ni: Balance Fe: < 1.0	Rp0.2: >450 MPa Rm: >720 MPa A: >35 % CVN Impact: +20 °C: > 100 J	1,6 2,0 2,4 3,2	TÜV, GL	UTP A 759 is suitable for welding components in plants for chemical processes with highly corrosive media. For joining materials of the same or similar natures and those materials with low alloyed steels such as for surfacing on low alloyed steels.
UTP A 4221 AWS A5.14: ERNiFeCr-1	C: 0.01 Si: 0.25 Mn: 0.8 Cr: 20.5 Ni: 41.0 Mo: 3.1 Cu: 1.8 Fe: Balance	Rp0.2: 360 MPa Rm: >550 MPa A: >30 % CVN Impact: +20 °C: > 100 J	2,4		Is suitable for joining and surfacing of alloys of similar nature, is specially designed for welding alloy 825 (2.4858, UNS N08825). Fully austenitic weld metal with high resistance against stress corrosion cracking and pitting in media containing chloride ions.

SAW WIRES/FLUX COMBINATIONS, NICKEL-BASE

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
UTP UP 6222 Mo + Record NiCrW / Record NiCrW - 412 AWS A5.14: ERNiCrMo-3 EN ISO 18274: S Ni 6625 (NiCr22Mo9Nb)	C: < 0.02 Si: < 0.2 Cr: 21.0 Mo: 9.0 Ni: Balance Nb: 3.3 Fe: 1.0	Rp0.2: 460 MPa Rm: 725 MPa A: 40 % CVN Impact: +20 °C: 80 J -196 °C: 65 J	1,6 2,0 2,4 3,2		Is applied for joint welding of base materials with the same or with a similar composition, e. g. Alloy 625 (UNS N06625) or NiCr22Mo9Nb, Material-No. 2.4856 or mixed combinations with stainless steels and carbon steels.
Thermanit Nicro 82 + Marathon 444 AWS A5.14: ERNiCr-3 Flux: EN ISO 14174 : SA FB 2 AC	C: 0.012 Si: 0.25 Cr: 20.2 Mn: 3.0 Ni: Balance Nb: 2.4 Fe: < 2.0	Rp0.2: 380 MPa Rm: 580 MPa A: 35 % CVN Impact: +20 °C: 110 J	1,6 2,4	TÜV, GL	Austenite ferrite joints, joints of stainless, heat resistant, creep resistant and cryogenic steels. It is applicable for chemical apparatus construction on high temperature metals as well as in low temperature sections down to -196 °C.

SAW FLUX, NICKEL-BASE

Product Name	Classification	General Characteristics	Characteristics and applications
Record NiCrW-412	DIN EN ISO 14174: SA FB 2	Current: DC (+/-) and AC - 800A max. Basicity index: 2.1 Grain size: 0.4 – 1.4 mm Apparent density: 1.0 Consumption: 1 (kg flux/ kg wire) Redrying: 1-2h at 350 +/- 50 °C	Record NiCrW-412 is a basic agglomerated flux for SAW of Ni-alloys in joining and overlay applications. Also suitable for cryogenic applications.
Record NiCrW	DIN EN ISO 14174: SA FB 2	Current: DC (+/-) and AC - 800A max. Basicity index: 4.5 Grain size: 0.4 – 1.4 mm Apparent density: 1.0 Consumption: 1 (kg flux/ kg wire) Redrying: 1-2h at 350 +/- 50 °C	Record NiCrW is a high basic agglomerated flux designed for welding and cladding of NiCr(Mo) alloys. It has a high resistance against hot cracking thanks to its low silicon pick-up.

Product Name	Classification	General Characteristics	Characteristics and applications
Marathon 444	DIN EN ISO 14174: SA FB 2 AC	Current: DC (+/-) and AC - 900A max. Basicity index: 2.9 Grain size: 0.3 – 1.6 mm Apparent density: 1.0 Consumption: 1.0 (kg flux/ kg wire) Redrying: 2hrs min at 300-350 °C	Marathon 444 is a highly basic agglomerated welding flux, designed for welding and cladding of NiCr(Mo) alloys. Highly resistant against hot cracking thanks to its low level of Si pick up.

GMAW WIRES, ALUMINIUM

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
Union AlMg 5 AWS A5.10: ER5356	Al: bal. Mn: 0.05 - 0.2 Cr: 0.05 - 0.2 Mg: 4.5 - 5.5 Ti: 0.06 - 0.2 Fe: < 0.4 Si: < 0.25	Re: 110 MPa Rm: 240 MPa A: 17 %	1,0 1,2 1,6	TÜV, DB, DNV-GL, LR	Solid wire for AlMg alloys containing up to 5 % Mg. Seawater resistant weld metal. Good colour matching with base metal after anodizing.
Union AlMg 4.5 Mn AWS A5.10: ER5183	Al: bal. Mg: 0.5-1.0 Cr: 0.05 - 0.25 Mg: 4.3 - 5.2 Ti: < 0.15 Si: < 0.4	Re: 125 MPa Rm: 275 MPa A: 17 %	1,0 1,2 1,6	TÜV, DB, DNV-GL, LR, BV	Solid wire for AlMg alloys. Seawater resistant weld metal. Thicker plate materials require preheating to 150 °C (302 °F).
Union Al Si 5 AWS A5.10: ER4043	Al: bal. Si: 4.5 - 6.0 Fe: < 0.6 Mg: < 0.2 Ti: < 0.15 Mn: < 0.15	Re: 40 MPa Rm: 120 MPa A: 8 %	1,0 1,2 1,6	DB	Solid wires for GMAW welding of aluminium alloys. Very fluid weld pool.

GTAW RODS, ALUMINIUM

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
Union AlMg 5 AWS A5.10: ER5356	Al: bal. Mn: 0.05 - 0.2 Cr: 0.05 - 0.2 Mg: 4.5 - 5.5 Ti: 0.06 - 0.2 Fe: < 0.4 Si: < 0.25	Re: 110 MPa Rm: 240 MPa A: 17 %	1,6 2,0 2,4 3,2 4,0 5,0	TÜV, DB	TIG welding rod for AlMg alloys containing up to 5 % Mg. Seawater resistant weld metal. Good colour matching with base metal after anodizing. Thorough cleaning of the workpiece bevels is necessary. Thicker plate materials require preheating to 150 °C (302 °F).
Union AlMg 4.5 Mn AWS A5.10: ER5183	Al: bal. Mg: 0.5-1.0 Cr: 0.05 - 0.25 Mg: 4.3 - 5.2 Ti: < 0.15 Si: < 0.4	Re: 125 MPa Rm: 275 MPa A: 17 %	1,6 2,0 2,4 3,2 4,0	TÜV, DB, CE	TIG welding rod for AlMg alloys. Seawater resistant weld metal. Thorough cleaning of the workpiece bevels is necessary. Thicker plate materials require preheating to 150 °C (302 °F).
Union AlSi 5 AWS A5.10: ER4043	Al: bal. Si: 4.5 - 6.0 Fe: < 0.6 Mg: < 0.2 Ti: < 0.15 Mn: < 0.15	Re: 40 MPa Rm: 120 MPa A: 8 %	1,6 2,0 2,4 3,2 4,0	DB CE	Rod for GTAW of Al alloys containing up to 2% of alloying elements and for aluminium alloys containing up to 7% Si. The weld metal is not suitable for anodizing for decorative purposes. Very fluid weld pool. Not applicable for welding hardenable alloys in high stressed zones.

CLADDING, COVERED ELECTRODES

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
UTP 6222 Mo AWS A5.11: ENiCrMo-3	C: 0.03 Si: 0.4 Mn: 0.6 Cr: 22.0 Mo: 9.0 Ni: bal. Nb: 3.3 Fe: < 1	Rp0.2: > 450 MPa Rm: > 760 MPa A: > 30 % CVN Impact: -196 °C: 45 J	2.5 x 250 3.2 x 300 4.0 x 350 5.0 x 400	TÜV, DNV-GL, ABS, BV	Particularly suited for joining and surfacing on nickel alloys, austenitic steels, low temperature nickel steels, austenitic-ferritic joints and claddings of the same or similar nature, like 2.4856 (NiCr22Mo 9 Nb), 1.4876 (X30 NiCrAlTi 32 20), 1.4529 (X2 NiCrMoCu 25 20 5).

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
UTP 068 HH AWS A5.11: ENiCrFe-3 (mod.) EN ISO 14172: E Ni 6082 (NiCr20Mn3Nb)	C: 0.025 Si: 0.4 Mn: 5.0 Cr: 19.0 Mo: 1.5 Nb: 2.2 Ni: bal. Fe: 3.0	Rp0.2: 420 MPa Rm: 680 MPa A: 40 % CVN Impact: -196 °C: 80 J	2.0 x 250 2.5 x 300 3.2 x 300 4.0 x 350 5.0 x 400	TÜV, KTA, ABS, BV, DNV-GL	Predominantly used for joining identical or similar heat-resistant Ni-base alloys, heat-resistant austenites. Specially used for joining of high carbon containing 25/35 CrNi cast steel to 1.4859 or 1.4876 for petrochemical installations with working temperatures up to 900° C. Can be used for repair welding of hardly weldable steels such as heat-treatable steels or tool steels.
UTP 8 FN AWS A5.15: E NiFe-CI	C: < 2.0 Mn: < 2.5 Si: < 4.0 Ni: 45 - 60 Fe: bal. S: < 0.03 Cu: < 2.5 Al: < 1.0	Rm: > 320 MPa Hardness HB: > 190	3.2 x 350 4.0 x 350		UTP 8 FN is designed for joining and surfacing of grey cast irons with lamellar or globular graphite and cast steel materials, also for joining with steel or cast steel.
UTP 83 FN AWS A5.15: E NiFe-CI	C: 1.3 Ni: 52.0 Fe: bal.	Hardness HB: 190 HB	2.5 x 300 3.2 x 350 4.0 x 350		UTP 83 FN is suitable for surfacing and joining of all commercial cast iron grades, such as lamellar grey cast iron and nodular cast iron, malleable cast iron and for joining these materials to steel or cast steel.
UTP 85 FN AWS A5.15: E NiFe-CI	C: 1.2 Ni: 54.0 Fe: bal.	Rp0.2: approx. 320 MPa Hardness HB: approx. 200	2.5 x 300 3.2 x 350 4.0 x 350 5.0 x 400		UTP 85 FN is suitable for surfacing and joining of all grades of cast iron, particularly nodular cast iron (GGG 38-60) and for joining these materials with steel and cast steel.
UTP 86 FN AWS A5.15: E NiFe-CI	C: 1.2 Ni: bal. Fe: 45	Rp0.2: approx. 340 MPa Hardness HB: approx. 220	2.5 x 300 3.2 x 350 4.0 x 350	DB	It is suitable for joining and surfacing of lamellar grey cast iron EN GJL 100 - EN GJL 400, nodular cast iron (spheroidal cast iron) EN GJS 400 - EN GJS 700 and malleable cast iron grades EN GJMB 350 - EN GJMB 650 as well as for joining these materials with each other or with steel and cast steel.
UTP 80 M AWS A5.11 : E NiCu-7	C: < 0.05 Si: 0.7 Mn: 3.0 Cu: 29.0 Ti: 0.7 Al: 0.3 Fe: 1.0 Ni: bal.	Rp0.2: > 300 MPa Rm: > 480 MPa A: > 30 % CVN Impact: +20 °C: > 80 J	2.5 x 300 3.2 x 350 4.0 x 350 5.0 x 400	TÜV, ABS, DNV-GL	Suitable for joining and surfacing of nickel-copper alloys and of nickel-copper-clad steels. Particularly suited for the following materials: 2.4360 NiCu30Fe, 2.4375 NiCu30Al. UTP 80 M is also used for joining different materials, such as steel to copper and copper alloys, steel to nickel-copper alloys.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
UTP 6170 Co AWS A5.11: ENiCrCoMo-1 (mod.) EN ISO 14172: E Ni 6117 (NiCr22Co12Mo)	C: 0.06 Si: 0.7 Mn: 0.1 Cr: 21.0 Mo: 9.0 Ni: bal. Co: 11.0 Fe: 1.0 Al: 0.7 Ti: 0.3	Rp0.2: > 450 MPa Rm: > 700 MPa A: > 35 % CVN Impact: +20 °C: > 80 J	2.5 x 250 3.2 x 300 4.0 x 350	TÜV	UTP 6170 Co is suitable for joining high temperature and similar nickel-base alloys, heat resistant austenitic and cast alloys, such as 2.4663 (NiCr23Co12Mo), 2.4851 (NiCr23Fe), 1.4876 (X10 NiCrAlTi 32 21), 1.4859 (GX10 NiCrSiNb 32 20).
UTP CELSIT 706 AWS A5.13: E CoCr-A	C: 1.1 Cr: 27.5 W: 4.5 Co: bal.	40 – 42 HRC Hardness at 500 °C approx. 30 HRC Hardness at 700 °C approx. 160 HB	3.2 x 350 4.0 x 350 5.0 x 350		Used for hardfacing on parts subject to a combination of erosion, corrosion, cavitation, impact, pressure, abrasion and high temperatures up to 900 °C, such as tight surfaces on fittings, valve seats and cones for combustion engines, gliding surfaces metal-metal, highly stressed hot working tools without thermal shock, milling mixers and drilling tools.
UTP 80 Ni AWS A5.11 : E Ni-1	C: < 0.02 Si: 0.8 Mn: 0.25 Ti: 2.0 Al: 0.2 Fe: 0.1 Ni: bal.	Rp0.2: > 300 MPa Rm: > 450 MPa A: > 30 % CVN Impact: +20 °C: > 160 J	2.5 x 300 3.2 x 300 4.0 x 350	TÜV	Suited for joining and surfacing on commercial pure nickel grades, including LC nickel, nickel alloys and nickel-clad steels. These materials are employed primarily in the construction of pressure vessels and apparatus in the chemical industry, in the food industry and for power generation.

MAINTENANCE AND REPAIR, COVERED ELECTRODES

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
UTP S 613 Kb AWS A5.1: E7018-1 H4R	C: 0.04 Si: 0.5 Mn: 0.8 Fe: bal.	Rp0.2: > 420 MPa Rm: > 510 MPa A: > 25 % CVN Impact: -30 °C: > 35 J	2.50 x 350 3.25 x 350 4.00 x 350 5.00 x 350		UTP S 613 Kb is a basic-coated stick electrode for joining on structural steels. Typical usage can be of repairs of structural cracks of excavators, kiln, pulverizing mill, crusher and blast furnace structure.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
UTP S 63 AWS A5.4: E307-16	C: 0.1 Si: 0.8 Mn: 5.0 Cr: 19.0 Ni: 8.5 Fe: bal.	Rp0.2: > 350 MPa Rm: > 600 MPa A: > 40 % CVN Impact: +20 °C: 60 J	2.50 x 350 3.25 x 350 4.00 x 350 5.00 x 450		Non alloy structural and heat treatable steels can be welded, also in combination with austenitic CrNi steels. Universally applicable for surfacing of work pieces exposed to impact, pressure and rolling wear.
UTP S 65 AP AWS A5.4: E312-16 Mod EN ISO 3581-A: ~ E 29 9 R 1 2	C: 0.1 Si: 1.20 Mn: 1.00 Cr: 30.00 Ni: 9.50 Fe: bal.	Rp0.2: > 640 MPa Rm: > 820 MPa A: 25 %	2.50 x 350 3.25 x 350 4.00 x 350 5.00 x 350		Outstanding weldability, even at low amperage and with AC power. Stable arc, spatter free and excellent slag removal. Ideal for repair & build-up of carbon steels, alloy steels & unknown steels such as gears, cams, shafts, hot cuts, hot trim plates and dies. Hardness of the pure weld deposit : Approx. 250 HB.
UTP S DUR 350 AWS A5.13: E Fe 1	C: 0.16 Si: 1.10 Mn: 1.40 Cr: 1.90 Fe: bal.	Hardness of the pure weld deposit approx. 380 HB 1 layer on steel with C = 0.5 % approx. 420 HB	3.25 x 350 4.00 x 450 5.00 x 450		Good abrasion resistance and multi-layer build up ability. Particularly suited for wear resistant surfacing on Mn-Cr-V alloyed parts, such as frogs, track rollers, chain support rolls, sprocket wheels, guide rolls etc. Weld metal is machinable with tungsten carbide tools.
UTP S BMC	C: 0.70 Si: 0.70 Mn: 15.0 Cr: 12.0 Fe: bal.	Hardness of the pure weld deposit approx. 260 HB After work hardened 48 - 53 HRC	3.25 x 350 4.00 x 450 5.00 x 450		Suitable for build-up and claddings on part subject to highest pressure and shock in combination with abrasion. Surfacing can be made on ferritic steel as well as austenitic hard Mn-steel and joints on hard Mn-steel can be welded. Rapid work hardening and high toughness.
UTP S DUR 250 EN 14700: E Fe1	C: 0.15 Si: 1.10 Mn: 1.20 Cr: 0.8 Fe: bal.	Hardness of the pure weld deposit approx. 270 HB 1 layer on steel with C = 0.5 % approx. 320 HB	3.25 x 450 4.00 x 450 5.00 x 450		UTP S DUR 250 is used for surfacing on parts, where a tough and easily machinable deposit is required, such as rails, gear wheels, shafts, crane wheels, track roller and other parts on farming and building machineries.
UTP S 718 S EN 14700: E Fe14	C: 3.5 Si: 1.2 Mn: 2.5 Cr: 28 Fe: bal.	Hardness of the pure weld deposit approx. 60 HRC	3.25 x 350 4.00 x 450 5.00 x 450		This electrode is designed especially to roughen the sugar milling rolls by applying a hard coating in the form of small globules in the surface of the teeth of the mass thus reducing dramatically the sugarcane slippage.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
UTP S DUR 600 EN 14700: E Fe8	C: 0.5 Si: 2.3 Mn: 0.4 Cr: 9.0 Fe: bal.	Hardness of the pure weld deposit 55 HRC 1 layer on high Mn-steel 22 HRC 2 layer on high Mn-steel 40 HRC	2.5 x 300 3.2 x 350 4.0 x 450 5.0 x 450	DB	Universally applicable for cladding on parts of steel, cast steel and high Mn-steel, subjected simultaneously to abrasion, impact and compression. Typical application fields are the earth moving and stone treatment industry, e.g. excavator teeth, bucket knives, crusher jaws and cones, mill hammers etc., but also for cutting edges on cold cutting tools.
UTP S DUR 650 KB EN 14700: E Fe8	C: 0.8 Si: 0.6 Mn: 0.3 Cr: 7.0 Mo: 0.5 V: 0.7 Fe: bal.	1 layer on high Mn-steel 22 HRC	3.2 x 450 4.0 x 450 5.0 x 450		Is suitable for cladding structural parts subject to abrasion combined with impact. The main applications are tools in the earth moving industry and crushing plants as well as cold and hot working tools.
UTP S Ledurit 61 AWS A5.13: EFeCr-A8 EN 14700: E Fe14	C: 3.2 Si: 1.3 Cr: 32.0 Fe: bal.	2 layer on high Mn-steel 40 HRC	3.2 x 350 4.0 x 450 5.0 x 450		Chromium carbide deposits suited for highly wear resistant claddings on part subjected to grinding abrasion combined with medium impact such as conveyor screws, scraper blades, digging teeth, mixer wings, crusher hammers and rotors.
UTP Ledurit 65 EN 14700: E Fe16	C: 4.5 Cr: 23.5 Mo: 6.5 Nb: 5.5 V: 1.5 W: 2.2 Fe: bal.	Hardness of the pure weld deposit approx. 65 HRC 1 layer on steel with C = 0,15 % approx. 58 HRC 1 layer on high Mn-steel approx. 55 HRC	3.2 x 350 4.0 x 450 5.0 x 450		It is suited for highly abrasion resistant claddings on parts subject to extreme sliding mineral abrasion, also at elevated temperatures up to 500 °C. The extremely high abrasion resistance is reached by the very high content of special carbides (Mo, V, W, Nb). Main application fields are surfacings on earth moving equipment, working parts in the cement and brick industry as well as in steel mills for radial breakers and revolving-bar screens of sintering plants. Recovery approx. 265 %.
UTP S 813 AWS A5.15: Est	C: < 0.1 Si: 0.5 Mn: 1.0 Cr: 4.5 Ni: 13 Fe: Balance	Hardness of the pure weld deposit approx. 25 - 35 HRC	2.5 x 350 3.2 x 350 4.0 x 450 5.0 x 450		Basic low hydrogen steel electrode alloyed with Nickel for build-up of grey cast iron. The application is for buffer layer of cast iron before hard facing.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
UTP A 8051 Ti EN ISO 1071: S C NiFe-2	C: 0.1 Mn: 3.5 Ni: 55.0 Ti: 0.5 Fe: Balance	Rp0.2: >300 MPa Rm: >500 MPa A: >25 % Hardness HB: approx. 200	0,8 1,0 1,2		UTP A 8051 Ti is particularly suited for MIG/MAG welding of ferritic and austenitic nodular cast iron as well as for joining it with unalloyed and high-alloyed steels, copper and nickel alloys. Build-up layers on grey cast iron qualities are also possible. Special applications are construction welding of ductile centrifugal casting tubes, such as joggles and flange joints, fittings, pumps.
LOTUS-90 Low Heat Input Cutting Electrode	-	Not applicable	3.15 x 350 4.0 x 350 5.0 x 350		Gouging aluminium, cast irons, other metals, bevelling cracks, removing unwanted metal and unwanted sections old rivets etc. -No oxygen, other gas or special electrode holder required -Exothermic coating concentrates arc force -Further finishing not necessary -Oxide free 'U' groove
UTP Vanadium 500 Standard: Special Development	-	60 - 65 HRC	4.0 x 450 5.0 x 450		The UTP VANADIUM 500 is a stick electrode for arcing on sugar mill rolls in the sugar cane industry. A soft transfer with exact sizes of the drops improves the grinding of sugar cane. A special Chrome/Vanadium alloy offers excellent resistance against abrasion.
UTP AF Vanadium 500 Standard: Special Development	-	60 - 65 HRC	2,0 2,4 2,8 3,2		Open-Arc flux cored wire for manual or fully automatic on-site "arc-ing" of sugar mill rolls in view of enhancing the gripping surfaces due to the excessive wear taking place on the rolls during crushing. Special Chromium/Vanadium alloy and homogeneous droplet transfer.
UTP Vanadium SG Standard: Special Development	-	66 HRC 1 layer on C-Steel approx. 60 HRC	4.0 x 450 5.0 x 450 6.0 x 450		The UTP VANADIUM SG is a new high alloy extruded hard surfacing electrode with high level of primary chromium carbides resistant to wet abrasion. The UTP VANADIUM SG improves the efficiency and extends the life of mill rolls by increasing the gripping action and providing wear abrasion resistance.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
UTP S 68H AWS A5.4: E310-16	C: 0.1 Si: 0.65 Mn: 2.0 Cr: 26.2 Ni: 21.8 Fe: Balance	Rp0.2: 430 MPa Rm: 560 MPa A: 35 % CVN Impact: +20 °C: 50 J Hardness HB: 170	2.50x350 3.25x350 4.00x350		Is rutile coated stick electrode for joining and surfacing of heat resistant Cr Steel, CrSi, CrAl, CrNi Steel / Cast Steels. Excellent creep and high temperature corrosion resistance with operational service temperature up to 1100°C.

MAINTENANCE AND REPAIR, FLUX CORE WIRE

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
SK-C 13Cr4Ni-G EN14700: T Fe7	C: 0.04 Si: - Mn: 0.6 Cr: 13.0 Ni: 5.0 Mo: 0.8	Hardness: HRC: 40	1,2		Gas-shielded flux cored wire. For hardfacing of steel parts subjected to adhesive wear with corrosion and impact. Continuous casting roller, valve seats, impellers, steam turbine parts.
SK-C 17Cr4Ni-G EN14700: T Fe7	C: 0.04 Si: 0.5 Mn: 1.0 Cr: 17.0 Ni: 5.5 Mo: 1.0	Hardness: HRC: 37	1,2		Gas-shielded flux cored wire. For hardfacing of steel parts subjected to adhesive wear with corrosion and impact. Suited for hydro turbines components for power generation.
SK-C 162 MO-O EN14700: T Z Fe16	C: 5.5 Mn: 0.8 Cr: 28.5 Mo: 0.4 Others: 0.5 Fe: Bal.	Hardness: HRC: 64	2,8		High Chromium alloy adding Mo designed for resisting high stress grinding abrasion with low impact. Suitable for wear plates, coal and cement vertical mill.
SK-C 162-O EN14700: T Z Fe16	C: 5.5 Mn: 0.3 Cr: 27.0 Others: 0.5 Fe: Bal.	Hardness: HRC: 63	2,4 2,8		High Chromium alloy designed for resisting high stress grinding abrasion with low impact. Suitable for wear plates, coal and cement vertical mill.
SK-C 164-O EN14700: T Z Fe16	Hardness: HRC: 63	Hardness: HRC: 64	2,8		Self-shielded flux cored wire. High Chromium alloy designed for resisting high stress grinding abrasion with low impact. Typical applications include wear plates, coal and cement vertical mill.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
SK-C 253-O EN14700: T Z Fe1	C: 0.15 Mn: 1.0 Cr: 2.0 Mo: 0.5	Hardness: HRC: 43 HB: 420	2,8		Rebuilding and hardfacing of Carbon steel parts. Suitable for Crawler tractor rollers and idlers, shafts, cylinders, mine car wheels, crane wheels.
SK-C 258TiC-O EN14700: T Fe8	C: 1.8 Si: 0.3 Mn: 1.0 Cr: 5.8 Mo: 1.2 Ti: 4.2	Hardness: HRC: 58	2,8		Self-shielded flux cored wire. Suitable for crusher rollers, hammers, asphalt mixer blades, agriculture tools, cane knives and shredders, bed knives in the wood pulp industry.
SK-C 402-O EN14700: T Fe10	C: 0.15 Si: - Mn: 7.0 Cr: 19.0 Ni: 9.0	Hardness: HRC: 180	2,8		Self-shielded flux cored wire. Austenitic alloy type 18CrNiMo designed for joining dissimilar metals and for buffer layer deposits prior to hardfacing. Joining of wear plates on shovel buckets, rebuilding of rails, press rams.
SK-C 410NiMo-O EN14700: T Z Fe7	C: 0.1 Si: - Mn: 1.0 Cr: 13.0 Ni: 5.0 Mo: 1.0	Hardness: HRC: 41	2,8		Self-shielded flux cored wire. Hardfacing of steel parts subjected to adhesive wear with corrosion. Suitable for continuous casting roller line.
SK-C 420N-O EN14700: T Z Fe8	C: 0.4 Si: - Mn: 0.9 Cr: 13.0 Ni: 0.15 Mo: 0.5	Hardness: HRC: 56	2,8		Self-shielded flux cored wire depositing a fully martensitic steel to improve resistance to thermal fatigue and inter granular corrosion. Suitable for continuous casting roller line.
SK-C 430-O EN14700: T Z Fe1	C: 0.1 Si: - Mn: 1.0 Cr: 2.0 Mo: 0.5	Hardness: HRC: 39 HB: 370	2,8		Rebuilding and hardfacing of Carbon steel parts. Suitable for crawler tractor rollers and idlers, shafts, cylinders, mine car wheels, crane wheels.
SK-C 714N-O EN14700: T Z Fe7	C: 0.04 Si: - Mn: 1.2 Cr: 13.0 Mo: 0.4 Ni: 5.5 N: 0.15	Hardness: HRC: 43	2,8		Depositing a fully martensitic steel to enhance the resistance of thermal fatigue and inter granular corrosion. (Continuous casting roller line).
SK-C 866-OB EN14700: T Z Fe16	C: 5.0 Si: - Mn: 1.0 Cr: 23.0 B: 1.0 Others: 2.0 Fe: Bal.	Hardness: HRC: 65	2,8		Self-shielded flux cored wire. Used for wear plates of coking plant, groundnut oil expeller screws, palm oil expeller screws, screw transmission equipment, bucket teeth on bucket-wheel excavator, shovel bucket teeth and lips.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
SK-C A40-O EN14700: T Z Fe16	C: 5.0 Mn: 1.0 Cr: 20.0 Nb: 6.0 Fe: Bal.	Hardness: HRC: 58	2,8		Chromium-niobium alloy designed to resist grinding abrasive wear with moderate impact. Used for gyratory crusher mantles and bowls, crusher hammers, crusher cylinders, ripper teeth.
SK-C A41-O EN14700: T Z Fe16	C: 5.0 Mn: 1.2 Cr: 28.0 Nb: 6.0	Hardness: HRC: 60	2,8		Chromium-niobium alloy designed to resist grinding abrasive wear with moderate impact. Used for gyratory crusher mantles and bowls, crusher hammers, crusher cylinders, ripper teeth.
SK-C A43-O EN14700: T Z Fe16	C: 5.5 Mn: 0.3 Cr: 20.0 Nb: 7.0	Hardness: HRC: 64	2,8		Chromium-niobium alloy designed to resist high stress grinding abrasion at service temperature up to 450 °C. Used for wear plates, groundnut oil expeller screws, screens in the coal industry, bucket teeth on bucket-wheel excavator, shovel bucket teeth and lips.
SK-C A45-O EN14700: T Z Fe16	C: 5.5 Si: 0.5 Mn: 0.2 Cr: 21.0 Nb, Mo, V, W: 20.0 Fe: Bal.	Hardness: HRC: 64	2,8		Chromium-niobium alloy. Used for wear plates, groundnut oil expeller screws, screens in the coal industry, bucket teeth on bucket-wheel excavator, shovel bucket teeth and lips.
SK-C AP-O EN14700: T Fe9	C: 0.5 Si: 0.5 Mn: 16.0 Cr: 13.0 Ni: 0.5 Fe: Bal.	Hardness: HB: 210	2,8		Self-shielded flux cored wire. Rebuilding and joining of carbon and 14%Mn steel, buffer layer prior to hardfacing. Used for railway rails and crossovers, mill shaft drive ends, gyratory crusher mantles, repointing of shovel teeth.
SK-C BU-O EN14700: T Z Fe1	C: 0.1 Si: 0.7 Mn: 1.0 Cr: 0.5 Mo: 0.34 Ti: 0.9	Hardness: HRC: 315	2,8		Rebuilding alloy for carbon steel parts. Used for crawler tractor links, crane wheels, shafts, buffer layer for continuous rollers, mine car wheels.
SK-C WP60-O EN14700: T Z Fe16	C: 4.5 Mn: 0.2 Cr: 27.0 B: 0.3	Hardness: HRC: 60	2,8		High Chromium alloy designed for resisting high stress grinding abrasion with low impact. Wear plates.
SK-C WP65-O EN14700: T Z Fe16	C: 4.5 Mn: 0.2 Cr: 27.0 B: 1.0	Hardness: HRC: 65	2,8		High Chromium alloy designed for resisting high stress grinding abrasion with low impact. Wear plates.
SK-C WP-O EN14700: T Z Fe15 (mod.)	C: 5.4 Si: 1.3 Mn: 0.2 Cr: 27.0 Fe: Bal.	Hardness: HRC: 63	2,8		High Chromium alloy designed for resisting high stress grinding abrasion with low impact. Wear plates.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
UTP-C VANADIUM 500 EN14700: T Z Fe8	C: 3.0 Si: 1.5 Mn: 0.5 Cr: 8.2 V: 0.3 Fe: Bal.	Hardness: HRC: 63	2,8		Alloy designed specifically for semi or fully automatic on-site "arcing" of sugar mill cane crushing rolls in view of enhancing the gripping surfaces and prevent excessive wear taking place on the rolls during crushing.

MAINTENANCE AND REPAIR, SAW

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
SK-C 258L-SA + SK-C Record SA EN14700: T Fe7	C: 0.1 Si: 0.4 Mn: 2.0 Cr: 6.0 Mo: 2.0 W: 2.0	Hardness: HRC - 44	3,2		SAW flux cored wire for hard facing. Martensitic alloy designed to give an outstanding resistance to abrasion, heavy impact, abrasive erosion and crack. Suitable for cable sheaves, bed knives, steel mill rolls, crane wheels, forging dies.
SK-C 258 SA + SK-C Record SK EN14700: T Fe7	C: 0.5 Si: - Mn: 2.0 Cr: 6.5 Mo: 2.0 W: 2.0	Hardness: HRC - 57	3,2		SAW cored wire for hard facing. Suitable for cable sheaves, bed knives, steel mill rolls, crane wheels, forging dies.
SK-C 410NiMo-SA + SK-C Record SA EN14700: T Fe7	C: 0.05 Si: 0.5 Mn: 1.0 Cr: 12.0 Mo: 1.0 Ni: 5.0	Hardness: HRC - 40	3,2		SAW flux cored wire for hard facing. Designed to enhance the resistance of metal to metal abrasion, abrasive erosion and crack. Suitable for continuous casting roller.
SK-C 420-SA + SK-C Record SA EN14700: T Fe8	C: 0.1 Si: 0.5 Mn: 1.5 Cr: 12.5	Hardness: HRC - 55	3,2		SAW flux cored wire for hard facing. Designed to enhance the resistance of metal to metal abrasion, abrasive erosion and crack. Suitable for continuous casting roller.

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
SK-C 430C-SA + SK-C Record SA EN14700: T Fe7	C: 0.05 Si: 0.5 Mn: 1.0 Cr: 18.5	Hardness: HB - 170	3,2		SAW flux cored wire for hard facing. Designed to resist corrosion at high temperatures, particularly in presence of sulphurous gas. Suitable for continuous casting rollers line, steam and gas turbine parts, valve seats.
SK-C 430C-SA + SK-C Record SK EN14700: T Fe7	C: 0.03 Si: 0.5 Mn: 1.1 Cr: 18.0	Hardness: HB 160 HB - 160	3,2		SAW flux cored wire for buffering. Designed to resist corrosion at high temperature, particularly in presence of sulphurous gas. Suitable for continuous casting roller.
SK-C 742N-SK + SK-C Record SK EN14700: T Fe7	C: 0.05 Mn: 1.5 Cr: 12.0 Mo: 1.5 Ni: 3.5 V: 0.2 N: 0.1	Hardness: HRC - 40	3,2		SAW cored wire for hard facing. Designed to enhance the resistance of metal to metal abrasion, abrasive erosion and crack. Suitable for continuous casting roller.
SK-C 743-SA + SK-C Record SK EN14700: T Fe7	C: 0.04 Si: 0.4 Mn: 1.3 Cr: 16.0 Mo: 1.0 Ni: 5.5 N: 0.06	Hardness: HRC - 35	3,2		SAW cored wire for hard facing. Designed to enhance the resistance of metal to metal abrasion, abrasive erosion and crack. Suitable for continuous casting roller.
SK-C BU-S + SK-C Record SA EN14700: T Fe1	C: 0.1 Mn: 1.0 Cr: 1.0 Mo: 0.5	Hardness: HB - 241	3,2		SAW flux cored wire for hard facing. Suitable for any steels (can be welded), except 14Mn% steel. Good machinability.
SK-C BU-S SK-C Record SK EN14700: T Fe1	C: 0.1 Si: 0.7 Mn: 1.0 Cr: 1.0 Mo: 0.5 Fe: Bal.	Hardness: HB - 241	3,2		SAW flux cored wire for hard facing. Typical applications include crawler tractor links, crane wheels, shafts, buffer layer for continuous casting rolls, mine car wheels.

BRAZING, SOLID WIRES / RODS

Product Name Classification AWS Classification EN	Chemical composition (%) Typical values	Mechanical properties Typical values	Ø x L	Approvals	Characteristics and applications
FONTARGEN A 200 SM AWS A5.7: ER Cu ISO 24373: S Cu 1898 (CuSn1)	Sn: 0.8 Mn: 0.3 Si: 0.3 Cu: Rem.	Melting range: 1020 – 1050 °C CVN Impact: +20 °C: 75 J Hardness: 50-60 HB	0,8 1,0 1,2 1,6		Joint and build-up welding on oxygen-free copper and copper alloys. Suitable for out-of position welding. Clean base materials in the welding spheres and preheat if over 3 mm (per mm of plate thickness approx. 100 °C, but not more than 600 °C). Suitable for welding of galvanised steel (MIG-brazing).
FONTARGEN A 210 AWS A5.8 : RB Cu Zn – A EN ISO 3677 : B-Cu 60 Zn (Si) – 875/895	Cu: 60 Si: 0.3 Sn: < 0.2 Zn: Rem.	Melting range: 875 – 895 °C Rm: > 350 MPa A: > 35 %	2,0 2,5 3,0 4,0		Brazing alloy with good flowing properties, hardly sensitive to over heating. Suitable for gap brazing and coating of steel, cast iron, malleable cast iron, nickel and nickel alloys, as well as copper and copper alloys with a solidus of > 900 °C.
FONTARGEN A 3005 AWS A5.8: BCuP-3 EN ISO 3677: B-Cu89PAg-645/815	Ag: 5 Cu: 89 P: 6	Melting range: 645 – 815 °C Rm: 250 MPa A: 8 %	1,5 2,0 3,0		Copper-phosphorus alloy with low silver content, good flowing properties and high ductility. Suitable for gap brazing of copper and copper alloys. Joint brazing at working temperatures between -60 °C and +150 °C.
FONTARGEN A 3015 AWS A5.8: BC uP-5 EN ISO 3677: B-Cu80AgP-645/800	Ag: 15 Cu: 80 P: 5	Melting range: 645 – 800 °C Rm: 250 MPa A: 10 %	2,0 3,0		Thin fluid copper-phosphorus alloy with high silver content and high ductility, even at low temperatures. Suitable for gap brazing of copper and copper alloys. Recommended for joints with strong thermal load and vibrations.
FONTARGEN A 320 AWS A5.8 : B Ag – 36 EN ISO 3677 : B-Ag 45 Cu Zn Sn – 640/680	Ag: 45 Cu: 27 Zn: 25.5 Sn: 2.5 Si: 0.15	Melting range: 640 – 680 °C Rm: 350 – 430 MPa A: 12 %	2,0 2,5 3,0 4,0	DVGW, GW 2, VG 81245	Cadmium free brazing alloy for gap brazing of alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys.
FONTARGEN A 340 AWS A5.8: BA _{Ag} -140 EN ISO 3677: B-Ag40CuZnSn-650/710	Ag: 40 Cu: 30 Zn: 28 Sn: 2 Si: 0.15	Melting range: 650 – 710 °C Rm: 350 – 430 MPa A: 20 %	1,5 2,0 3,0	VG 81245	Silver alloy, cadmium free, insensitive to overheating. Gap brazing of alloyed and unalloyed steel, nickel and nickel alloys, malleable cast iron, copper and copper alloys and carbides. Seawater resistant, according to marine standard VG 82145, part 3.
FONTARGEN A 2115/8 M AWS A5.7: ERCuAl-A1 EN ISO 24373: S Cu 6100 (CuAl7)	Al: 8 Ni: 0.5 Mn: 0.2 Fe: 0.2 Cu: Remainder	Melting range: 1030 – 1040 °C Rm: 380 – 450 MPa A: 45 %	0,8 1,0 1,2		MIG-brazing of aluminium plated and uncoated steel plates. Applications: Auto body, magnetic solenoids, air conditioning and container building. The corrosion resistance galvanized steel plates remain unaffected. Suitable for joining of aluminium-bronze, high-strength brass and steel. Range of applications: Car body, ship building, heating and cooling as well as container building.

PICKLING & PASSIVATION

Product Name	Product Type	Characteristics and applications
Avesta Pickling Gel 122	Gel	A universal pickling gel, with a more free-flowing consistency that facilitates the application and gives a high coverage. Suitable for use and storage in warmer climates.
Avesta BlueOne Pickling Paste 130	Paste	A unique world patented safer-to-use pickling paste. This low-fuming pickling paste reduces toxic nitric fumes by 80 %. Suitable for pickling of standard stainless steel grades such as 304 and 316.
Avesta RedOne Pickling Paste 140	Paste	A powerful world patented safer-to-use pickling paste. This low-fuming pickling paste reduces toxic nitric fumes by 50 %. Suitable for pickling of heavy-duty applications such as high-alloyed stainless steel grades like duplex and SMO, and for pickling at lower temperatures.
Avesta Pickling Spray 204	Spray	A powerful pickling spray for heavy-duty applications such as high-alloyed stainless steel grades such like duplex and SMO, and pickling at lower temperatures.
Avesta RedOne Pickling Spray 240	Spray	A unique, safer-to-use pickling spray. This low-fuming pickling spray reduces toxic nitric fumes by 50 %. Suitable for pickling of standard stainless steel grades such as 304 and 316.
Avesta Pickling Bath 302	Liquid	A concentrated pickling bath which should be diluted with water depending on the stainless steel grade. Suitable for immersion pickling of objects or circulation pickling of pipe systems.
Avesta Cleaner 401	Spray	A heavy-duty stainless steel cleaner. Suitable for pre-cleaning and degreasing of stainless steel surfaces before pickling. Could also be used for maintenance cleaning to restore and brighten stainless steel surfaces and remove surface rust.
Avesta Neutraliser 502	Liquid	For simple neutralization of acidic rinse water resulting from pickling. This rinse water is acidic and contains dissolved metals including chromium and nickel. For environmental reason this water should be treated before discharge.
Avesta Passivator 601	Spray	A traditional nitric acid based well-proven passivator. It can also be used after pickling to accelerate the rebuilding of the protective layer of chromium oxide.
Avesta FinishOne Passivator 630	Spray	An acid-free passivator, which creates no hazardous waste. The passivator can be used after mechanical cleaning of stainless steel surfaces to remove remaining grinding dust and iron particles. It can also be used after pickling to accelerate the rebuilding of the protective layer of chromium oxide.
Avesta Moly Test 960	Liquid	Easy identifying of stainless steel grades. The Moly-Drop test helps to differentiate 304 (EN 1.4301) grade stainless steel from 316 grade (EN 1.4436)
Avesta Spray Pump SP-25	Pump	A customized pump system for Finishing Chemicals. The pump is specially designed for the demanding spraying of cleaning solutions.

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We are a leader in the welding industry with over 100 years of experience, more than 50 subsidiaries and more than 4,000 distribution partners around the world. Our extensive product portfolio and welding expertise combined with our global presence guarantees we are close when you need us. Having a profound understanding of your needs enables us to solve your demanding challenges with Full Welding Solutions - perfectly synchronized and as unique as your company.



Lasting Connections – Perfect alignment of welding machines, consumables and technologies combined with our renowned application and process know-how provide the best solution for your requirements: A true and proven connection between people, products and technologies. The result is what we promise: Full Welding Solutions for Lasting Connections.



Tailor-Made Protectivity™ – The combination of our high-quality products and application expertise enables you to not only repair and protect metal surfaces and components. Our team of engineers, experienced in your specific applications, offer you customized solutions resulting in increased productivity for your demanding challenge. The result is what we promise: Tailor-Made Protectivity™.



In-Depth Know-How – As a manufacturer of soldering and brazing consumables, we offer proven solutions based on 60 years of industrial experience, tested processes and methods, made in Germany. This in-depth know-how makes us the internationally preferred partner to solve your soldering and brazing challenge through innovative solutions. The result is what we promise: Innovation based on in-depth know-how.

The Management System of voestalpine Böhler Welding Group GmbH, Peter-Mueller-Strasse 14-14a, 40469 Duesseldorf, Germany has been approved by Lloyd's Register Quality Assurance to: ISO 9001:2015, ISO 14001:2015, OHSAS 18001:2007, applicable to: Development, Manufacturing and Supply of Welding and Brazing Consumables. More information: www.voestalpine.com/welding



