TIG rods, unalloyed

Brand Standard AWS Standard EN ISO	Chemical Composition (%) Typical Values	Mechanical Properties Typical Values	Ø x L (mm)	Approvals	Characteristics and Applications
BOHLER N ER 70 S-2 AWS A5.18: ER70S-2	C: 0.05 Si: 0.50 Mn: 1.20 Ti: + Zr: + Al: +	Heat treatment: As welded UTS: ≥520 MPa YS: ≥420 MPa El: ≥23% CVN Impact: +20°C: ≥80J -30°C: ≥27J	1.6 x 1000 2.0 x 1000 2.4 x 1000 3.2 x 1000	-	BOHLER N ER 70 S-2 is a copper coated GTAW rod containing Al, Ti and Zr as strong deoxidants in addition to Mn and Si and is often referred to as triple deoxidized copper coated wire with very low impurity levels. This has advantages when rimming or semi-killed mild steels are welded or where joint preparations are rusty or contaminated. BOHLER N ER 70 S-2 is primarily used for single pass welding. For applications involving single and multipass GTAW and/ or low temperature toughness requirements down to –30°C we recommend our GTAW rod BOHLER N ER 70 S-2.

TIG rods, low alloyed

Brand Standard AWS Standard EN ISO	Chemical Composition (%) Typical Values	Mechanical Properties Typical Values	Ø x L (mm)	Approvals	Characteristics and Applications
BOHLER DMO-IG AWS A5.28: ER70S-A1 (ER80S-G) EN ISO 636-A / 21952-A: W W2Mo / W MoSi	C: 0.1 Si: 0.6 Mn: 1.1 Mo: 0.5	Heat treatment : 620°C / 1h UTS: 570 MPa YS: 480 MPa El: 27% CVN Impact: +20°C: 230J	1.6 x 1000 2.0 x 1000 2.4 x 1000 3.0 x 1000 3.2 x 1000	TÜV, DB, KTA, 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. Approved in long-term service up to 550 °C.
UNION I CrMo AWS A5.28: ER80S-G [ER80S-B2(mod.)] EN ISO 21952-A: W CrMo1Si	C: 0.10 Si: 0.60 Mn: 1.00 Cr: 1.10 Mo: 0.50	Heat treatment: 620°C / 1h UTS: 560 MPa YS: 450 MPa El: 22% CVN Impact: +20°C: 90J	2.0 x 1000 2.5 x 1000 3.2 x 1000	TÜV, DB, CE	Welding rod / wire for the welding with argon. Suitable for manufacturing creep resistant steels in boiler, tank, pipeline and nuclear reactor construction.
UNION I 1,2 Ni AWS A5.28: ER80S-G EN ISO 636-A: W 46 6 W3Ni1	C: 0.10 Si: 0.70 Mn: 1.40 Ni: 1.30	Heat treatment: As welded UTS: 600 MPa YS: 470 MPa El: 25% CVN Impact: +20°C: 150J -60°C: 47J	2.0 x 1000 2.4 x 1000 3.2 x 1000	TÜV, DB, DNV, KTA 1408.1, CE	Ni-alloyed welding rod/wire. Good flow characteristics in out of position welding. Very good impact toughness of weld metal at low temperatures. Tested according to KTA 1408.

TIG rods, low alloyed

Brand Standard AWS Standard EN ISO	Chemical Composition (%) Typical Values	Mechanical Properties Typical Values	Ø x L (mm)	Approvals	Characteristics and Applications
BOHLER DCMS-IG AWS A5.28: ER80S-G, ER80S-B2 (mod.) EN ISO 21952-A: W CrMo1Si	C: 0.1 Si: 0.6 Mn: 1.0 Cr: 1.2 Mo: 0.5 P: ≤ 0.015 As: ≤ 0.010 Sb: ≤ 0.005 Sn: ≤ 0.006	Heat treatment: 680 °C / 1h UTS: 570 MPa (≥550) YS: 440 MPa (≥ 355) El: 25% (≥20) CVN Impact: +20 °C: 250J (≥47)	1.6 x 1000 2.0 x 1000 2.4 x 1000 3.0 x 1000	TÜV, SEPROZ, CE, NAKS	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. Approved in long-term condition up to +570 °C service temperature. Suitable for step cooling applications. Bruscato ≤ 15 ppm. The deposit is noted for its good mechanical properties and good toughness. Further, good resistance to cracking, when attacked by caustic soda, and the fact that it is suitable for nitriding, quenching and tempering are additional features. The values of the creep rupture strength lay within the scatter band of the material 13CrMo4-5. Very good operating characteristics.
UNION ER80S-B2 AWS A5.28: ER80S-G, ER80S-B2 EN ISO 21952-A: W CrMo1	C: 0.10 Si: 0.55 Mn: 0.60 Cr: 1.30 Mo: 0.50	Heat treatment: 620 °C / 1h UTS: 550 MPa YS: 470 MPa El: 19% CVN Impact: +20 °C: 90J	1.6 x 1000 2.0 x 1000 2.4 x 1000 3.0 x 1000 3.2 x 1000	On request	GTAW rod for 1.25 % Mo alloyed boiler, plate and tube steels as well as in oil refineries. Approved in long-term service up to 600 °C / 1100 °F service temperature. Very good operating characteristics. *For step- cooling applications we can offer special products.
UNION I CrMo 910 AWS A5.28: ER90S-G [ER90S-B3(mod.)] EN ISO 21952-A: W CrMo2Si	C: 0.07 Si: 0.6 Mn: 1.0 Cr: 2.55 Mo: 1.0	Heat treatment: 620 °C / 1h UTS: 590 MPa YS: 470 MPa El: 20% CVN Impact: +20 °C: 80J	2.0 x 1000 2.5 x 1000 3.0 x 1000	TÜV, DB, CE	Low-alloyed welding rod / wire for the welding with argon. Suitable for manufacturing creep resistant steels in boiler, tank, pipeline and nuclear reactor construction.
BOHLER CM 2-IG AWS A5.28: ER90S-G, ER90S-B3 (mod.) EN ISO 21952-A: W CrMo2Si	C: 0.08 Si: 0.6 Mn: 0.9 Cr: 2.5 Mo: 1.0 P: ≤ 0.010 As: ≤ 0.010 Sb: ≤ 0.005 Sn: ≤ 0.006	Heat treatment: 720 °C / 2h UTS: 600 MPa (≥550) YS: 470 MPa (≥400) El: 23% (≥ 18) CVN Impact: +20°C: 190J (≥47)	1.6 x 1000 2.0 x 1000 2.4 x 1000 3.0 x 1000	TÜV, SEPROZ, CE, NAKS	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). Approved in long term condition up to +600°C service temperature. Also for similarly alloyed quenched and tempered steels as well as case hardening steels. The weld metal meets all prerequisites for reliable long term creep properties without embrittlement due to very low content of trace elements. Very good operating characteristics. *For step cooling applications we can offer special products.
UNION ER90S-B3 AWS A5.28: ER90S-G, ER90S-B3 EN ISO 21952-A: W CrMo2	C: 0.09 Si: 0.55 Mn: 0.60 Cr: 2.55 Mo:1.05	Heat treatment: 690°C/ 1h UTS: 620 MPa (≥550) YS: 540 MPa (≥400) El: 20% (≥18) CVN Impact: +20°C: 80J (≥47)	1.6 x 1000 2.0 x 1000 2.4 x 1000 3.2 x 1000	On request	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). Approved in long-term condition up to +600 °C service temperature. Also for similarly alloyed quenched and tempered steels as well as case hardening steels. The weld metal meets all prerequisites for reliable long term creep properties without embrittlement due to very low content of trace elements. Very good operating characteristics. *For step cooling applications we can offer special products.

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TIG rods, low alloyed

Brand Standard AWS Standard EN ISO	Chemical Composition (%) Typical Values	Mechanical Properties Typical Values	Ø x L (mm)	Approvals	Characteristics and Applications
BOHLER CM 5-IG AWS A5.28: ER80S-B6 EN ISO 21952-A: W CrMo5Si	C: 0.08 Si: 0.4 Mn: 0.5 Cr: 5.6 Mo: 0.6	Heat treatment: Annealed, 730°C / 2h UTS: 620 MPa (≥590) YS: 500 MPa (≥470) El: 20% (≥17) CVN Impact: +20°C: 200J (≥47)	1.6 x 1000 2.0 x 1000 2.4 x 1000 3.0 x 1000	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. Approved in long-term condition up to +650°C service temperature.
BOHLER C 9 MV-IG AWS A5.28: ER90S-B9 EN ISO 21952-A: W CrMo91	C: 0.11 Si: 0.3 Mn: 0.5 Cr: 9.0 Ni: 0.5 Mo: 0.9 V: 0.2 Nb: 0.06	Heat treatment: Annealed, 760°C / 2h UTS: 760 MPa (≥620) YS: 640 MPa (≥415) El: 19% (≥17) CVN Impact: +20°C: 150J (≥47)	2.0 x 1000 2.4 x 1000	TÜV, CE, NAKS	GTAW rod for high temperature, creep resistant martensitic 9–12% chromium steels in turbine and boiler fabrication and in the chemical industry. Especially designed for the ASTM steels T91 / P91. Approved in long term condition up to +650°C service temperature.
THERMANIT MTS 3 AWS A5.28: ER90S-B9 EN ISO 21952-A: W CrMo91	C: 0.1 Si: 0.3 Mn: 0.5 Cr: 9.0 Mo: 1.0 Ni: 0.5 Nb: 0.06 V: 0.2	Heat treatment: 760°C / 2h UTS: 620 MPa YS: 530 MPa El: 17% CVN Impact: +20°C: 50J	2.0 x 1000 2.4 x 1000 3.2 x 1000	TÜV, CE,	High temperature resistant, resistant to scaling up to 600°C. Suited for joining and surfacing applications with quenched and tempered 9% Cr steels, particularly for matching high temperature resistant parent metal like T91 / P91 according to ASTM.
BOHLER NiMo 1-IG AWS A5.28: ER90S-G EN ISO 16834-A: W Mn3Ni1Mo	C: 0.08 Si: 0.6 Mn: 1.8 Mo: 0.3 Ni: 0.9	Heat treatment: As welded UTS: 700 MPa (640-820) YS: 620 MPa (≥550) El: 23% (≥18) CVN Impact: +20°C: 140J -40°C: 110J -60°C: ≥47J	2.4 x 1000	-	GTAW rod for high strength quenched and tempered fine grained constructional steels. The rod is suited for joint welding in boiler, pressure vessel, pipeline, and crane construction as well as in structural steel engineering. Due to the precise addition of micro alloying elements NiMo 1-IG rod features excellent ductility and crack resistance in spite of its high strength. Good cryogenic impact energy down to –60°C, low hydrogen contents in the deposit are advantages of this rod.
THERMANIT MTS 616 AWS A5.28: ER90S-G [ER90S-B9(mod.)] EN ISO 21952-A: WZ CrMoWVNb 9 0,5 1,5	C: 0.1 Si: 0.25 Mn: 0.5 Cr: 8.5 Mo: 0.4 Ni: 0.5 W: 1.6 V: 0.2 Nb: 0.06 N: 0.04	Heat treatment: 760°C / ≥ 2h UTS: 720 MPa YS: 560 MPa El: 15% CVN Impact: +20°C: 41J	2.0 x 1000 2.4 x 1000	TÜV, CE	High temperature resistant. Suited for joining and surfacing applications with matching high temperature resistant parent metal P92 according to ASTM A 335.