BÖHLER Ti 60 T-FD SR

Seamless Cored Wire

All-positional rutile flux-cored wire for welding high strength steel with stress relieve requirement, using Ar-CO_2 shielding gas

Features	User benefits	
» Fast freezing rutile slag system	» Productive positional welding	
» Welder-friendly	» Low defect rate	
» Deep penetration	» Low defect rate	
» Smooth wetting	» Good fatigue resistance	
» Low spatter	» Less post weld cleaning	
» Dependable feedability	» Increased arc time	
» Copper-coated seamless cored wire	» Excellent current transfer » Resistance to moisture absorption	
» Low-hydrogen weld metal	» Low risk of HAC	
» CTOD tested at -10 °C	» Excellent mechanical properties	

For offshore and other demanding industries with impact requirements down to -60 °C, as welded and stress relieved

Seamless tubular, copper-coated cored wire from the Diamond Spark range. For single- or multi-layer welding of low-temperature steels up to 500 MPa yield strength and impact requirements down to -60 °C in the as welded and stress relieved conditions, using Ar-CO_2 shielding gas. Alloyed with < 1 % Ni to meet the NACE MR0175 requirement for SSC safe service in sour environments in oil and gas exploration and processing. Superb weldabilty in all welding positions. Seamless wire design, giving optimal protection against moisture reabsorption, assuring very low-hydrogen weld metal. CTOD tested at -10 °C.

Exceptional weldability, productivity and low-hydrogen performance

BÖHLER Ti 60 T-FD SR is an all-positional rutile cored wire with excellent weldability. It is characterized by a smooth spray-arc droplet transfer in all welding positions, with very low spatter losses. Slag is easily removed. Welds have a deep penetration and a nice appearance with smooth wetting onto plate edges. If desired, a single current/voltage setting can be applied for all welding positions. Its fast freezing slag enables deposition rates in positional welding up to three times as high as obtainable with any other manual arc welding process. Root runs are welded economically on ceramic weld metal support. The seamless, copper-coated wire design adds sufficient stiffness and glide to overcome friction in liners, welding guns and contact tips. The copper-coating enhances current transfer between contact tip and wire resulting in a stable arc. Controlled wire cast and helix largely avoids “dog tailing”, promoting straight, well positioned welds. The seamless design offers the best possible protection against moisture reabsorption during storage and use of the wires and thereby against hydrogen induced cracking. Diffusible hydrogen level is typically 2 - 3 ml / 100 g weld metal.

Main applications in offshore fabrication

» Constructions requiring stress relieve treatment
» Vessels
» Receivers

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Classifications			Operating data	Allows welding with standard power sources.	
EN ISO 17632-A	AWS A5.36		Welding positions	Polarity	Shielding gas
T50 6 1Ni P M 1 H5	E81T1-M21AP8-Ni1-H4			DC+	EN ISO 14175: M21

Typical chemical composition, all weld metal, wt. %				
Shielding gas	C	Si	Mn	Ni
M21	0.07	0.40	1.3	0.85

Mechanical properties, all weld metal (single values typical)						
Shielding gas	Condition	Yield strength $R_{p0.2\%}$ MPa	Tensile strength R_m MPa	Elongation A_5 %	CVN Impact toughness ISO-V KV J -40 °C	-60 °C	CTOD tested
M21	As welded	520 (≥ 500)	600 (560 - 690)	25 (≥ 20)	120	100 (≥ 47)	-10 °C
	SR: 620 °C / 2 h	500 (≥ 470)	580 (550 - 680)	29 (≥ 20)	120	90 (≥ 47)	
	SR: 620 °C / 6 h	490 (≥ 470)	570 (550 - 680)	30 (≥ 20)	110	60 (≥ 47)	

Steels to be welded			
EN	ASTM		
S355JR, S355J0, S355J2, S450J0 S355N-S460N, S355NL-S460NL S355M-S460M, S355ML-S460ML S460Q, S500Q, S460QL, S500QL, S460QL1, S500QL1, P355GH, P355NH, P420NH, P460NH, P355N-P460N P355NH-P460NH, P355NL1-P460NL1, P355NL2-P460NL2, L245NB-L415NB, L245MB-L485MB, L360QB-L485QB aldur 500Q, aldur 500QL, aldur 500QL1	A 350 Gr. LF2 A 516 Gr. 65, 70 A 572 Gr. 42, 50, 60, 65 A 573 Gr. 70	A 588 Gr. B, C, K A 633 Gr. A, C, D, E A 662 Gr. B, C A 678 Gr. B	A 707 Gr. L2, L3 A 841 Gr. A, B, C API 5 L: X42-X70 X52Q, X60Q, X65Q, X70Q

Approvals
ABS, DNV-GL; LR, CE

Overview spool types

Plastic spool D200

Precision layer wound

Dimensions:
Ø external 200 mm
Ø internal 52 mm
Width 47 mm

Available spool weight:
5 kg

Available diameters:
1.0 mm
1.2 mm (Art. Nr. 81857)
1.4 mm
1.6 mm

Wire basket spool BS300

Precision layer wound

Dimensions:
Ø external 300 mm
Ø internal 180 mm
Width 100 mm

Available spool weight:
15 kg

Available diameters:
1.0 mm
1.2 mm (Art. Nr. 83601)
1.4 mm
1.6 mm

Wire basket spool K300

Precision layer wound

Dimensions:
Ø external 300 mm
Ø internal 180 mm
Width 100 mm

Available spool weight:
16 kg

Available diameters:
1.0 mm
1.2 mm (Art. Nr. 81856)
1.4 mm
1.6 mm (Art. Nr. 81858)

Plastic spool D300

Precision layer wound

Dimensions:
Ø external 300 mm
Ø internal 52 mm
Width 100 mm

Available spool weight:
15 kg

Available diameters:
1.0 mm
1.2 mm (Art. Nr. 84364)
1.4 mm
1.6 mm