

BÖHLER Ti 52 T-FD (HP)

Seamless Cored Wire



Ultra low hydrogen seamless rutile flux cored wire for welding high strength steel with stress relieve requirement using Argon-CO₂ shielding gas.

Product features	Product Benefits	Customer benefits
<ul style="list-style-type: none"> » Seamless design » Extremely clean manufacturing process 	<ul style="list-style-type: none"> » Ultra-low-hydrogen weld metal » Total resistance against moisture absorption during storage and use 	<ul style="list-style-type: none"> » Optimal protection against hydrogen cracking
<ul style="list-style-type: none"> » Fast freezing rutile slag system 	<ul style="list-style-type: none"> » Enhancing travel speed and arc stability in positional welding 	<ul style="list-style-type: none"> » Productive positional welding
<ul style="list-style-type: none"> » Wide parameter window 	<ul style="list-style-type: none"> » More spray arc welding 	<ul style="list-style-type: none"> » Easy arc setting
<ul style="list-style-type: none"> » Excellent feedability 	<ul style="list-style-type: none"> » Low contact tip wear 	<ul style="list-style-type: none"> » Less down-time for maintenance
<ul style="list-style-type: none"> » Stable arc 	<ul style="list-style-type: none"> » Low spatter 	<ul style="list-style-type: none"> » Less post-weld cleaning
<ul style="list-style-type: none"> » Copper coated 	<ul style="list-style-type: none"> » Excellent current transfer » Rust resistance 	<ul style="list-style-type: none"> » Easy handling » Safer storage
<ul style="list-style-type: none"> » Designed chemistry 	<ul style="list-style-type: none"> » Excellent CVN impact toughness down to -50 °C also after long terms stress relieving » Excellent CVN impact toughness down to -30 °C and excellent mechanical strength in case of PWHT at high T. (up to 705 °C x 16 h). Applicable in case of dissimilar weld with Cr-Mo creep resistant steels » Meeting NACE MR 0175 including HIC and SSC 	<ul style="list-style-type: none"> » Wide margin to cover both strength and CVN impact requirements also when PWHT is applied, including medium thickness pressure vessels- » Suitable for dissimilar weld between C-Mn steel and CrMo steel (such as gr.11, gr. 22 and gr.22V) without buttering, e.g. for reactors skirts. » Suitable for challenging O&G Upstream applications, e.g. welding of offshore platforms modules. » Suitable for sour service

BÖHLER Ti 52 T-FD (HP) is a seamless all-positional rutile cored wire with excellent weldability, productivity and low-hydrogen performance.


It is typically alloyed with 0.4% Ni and weld metal can meet impact requirements down to -50 °C in the as welded and long terms stress relieved conditions up to 12 hrs and more, using Argon-CO₂ shielding gas. It is H.I.C and S.S.C. proven and weld metal hardness is below 248 HV10, hence meeting the NACE MR0175 for service in sour environments. Therefore it is ideal for demanding applications in the O&G Upstream and for process vessels and processing pipeworks, where PWHT is requested also for several hours. Finally It is also proven in case of high temperature PWHT (up to 705 °C x 16 h) with excellent tensile and impact energy properties at -30 °C making it suitable for dissimilar weld between carbon steels and creep resistant steels (such as gr. 11, gr. 22, 22V) without buttering.



Typical applications

- » Pressure vessels
- » Offshore constructions
- » Process piping

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Classifications		Operating data		
EN ISO 17632-A	AWS A5.36	Welding positions	Polarity	Shielding gas
T46 5 P M21 1 H5 - T42 2 P C1 1 H5	E71T1-M21AP6-CS2-H4 - E71T1-C1A0-CS2-H4		DC+	EN ISO 14175: M21

Typical analysis of all-weld metal (wt.-%)					
	Gas	C	Si	Mn	Ni
wt.-%	M21	0.06	0.45	1.30	0.35
wt.-%	C1	0.05	0.35	1.00	0.30

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		
					-29 °C	-40 °C	-50 °C
M21	As welded	500 (≥460)	590 (550-660)	28 (≥22)	-	90 (≥47)	80 (≥47)
	PWHT: 620°C/3h	503	570	24	-	75	65
	PWHT: 620°C/13h	490	550	27	-	70	60
	PWHT: 690°C/ 4h	471	550	33	100	80	-
	PWHT: 705°C/16h	420	540	34	100	70	-

Mechanical properties, Dissimilar Joint in PF position: ASTM A587 Gr.22 - A516 Gr.70								
Shielding gas	Condition	Yield strength $R_{p0.2\%}$ MPa	Tensile strength R_m MPa	Elongation A_5 %	CVN Impact toughness ISO-V KV J			Hardness HV10
					-29 °C	-40 °C	-50 °C	
M21	PWHT: 690°C/16h	423	564	26	65	45	-	190-210

Steels to be welded	
EN	ASTM
S235JR-S355JR, S235JO-S355JO, S450JO, S235J2-S355J2, S275N-S460N, S275M-S460M, P235GH-P355GH, P275NL1-P460NL1, P215NL, P265NL, P355N, P285NH-P460NH, P195TR1-P265TR1, P195TR2-P265TR2, P195GH-P265GH, L245NB-L415NB, L450QB, L245MB-L450MB, GE200-GE240	ASTM A 106 Gr. A, B, C; A 181 Gr. 60, 70; A 283 Gr. A, C; A 285 Gr. A, B, C; A 350 Gr. LF1; A 414 Gr. A, B, C, D, E, F, G; A 501 Gr. B; A 513 Gr. 1018; A 516 Gr. 55, 60, 65, 70; A 573 Gr. 58, 65, 70; A 588 Gr. A, B; A 633 Gr. C, E; A 662 Gr. B; A 711 Gr. 1013; A 841 Gr. A;

Approvals
TÜV, DNV-GL, LR, RINA, CWB, CE

Overview spool types					
Wire basket spool K300			Plastic spool D300		
	Precision layer wound Dimensions: Ø external 300 mm Ø internal 180 mm Width 100 mm	Available spool weight: 16 kg Available diameters: 1.2 mm		Precision layer wound Dimensions: Ø external 300 mm Ø internal 52 mm Width 100 mm	Available spool weight: 15 kg Available diameters: 1.2 mm