



Lasting Connections

# DIAMONDSPARK THE ULTIMATE RANGE OF SEAMLESS CORED WIRES





# DISCOVER THE ULTIMATE RANGE OF SEAMLESS CORED WIRES FROM MARKET LEADER BÖHLER WELDING

You have the most demanding applications in your industry? We have the right cored wires – no matter what challenges you have to face. We offer the widest range of highest quality wires manufactured in Europe – from seamless tubular to the brand new laser sealed types – now united under one roof: diamondspark – premium seamless cored wires.

Fabricated for a new area in high duty cycle welding in mechanized and robotic applications.

Maximize your productivity and benefit from the expertise of the leading supplier for seamless cored wires. Our technical consultancy service will demonstrate the outstanding performance on site or in one of our technology application centers.

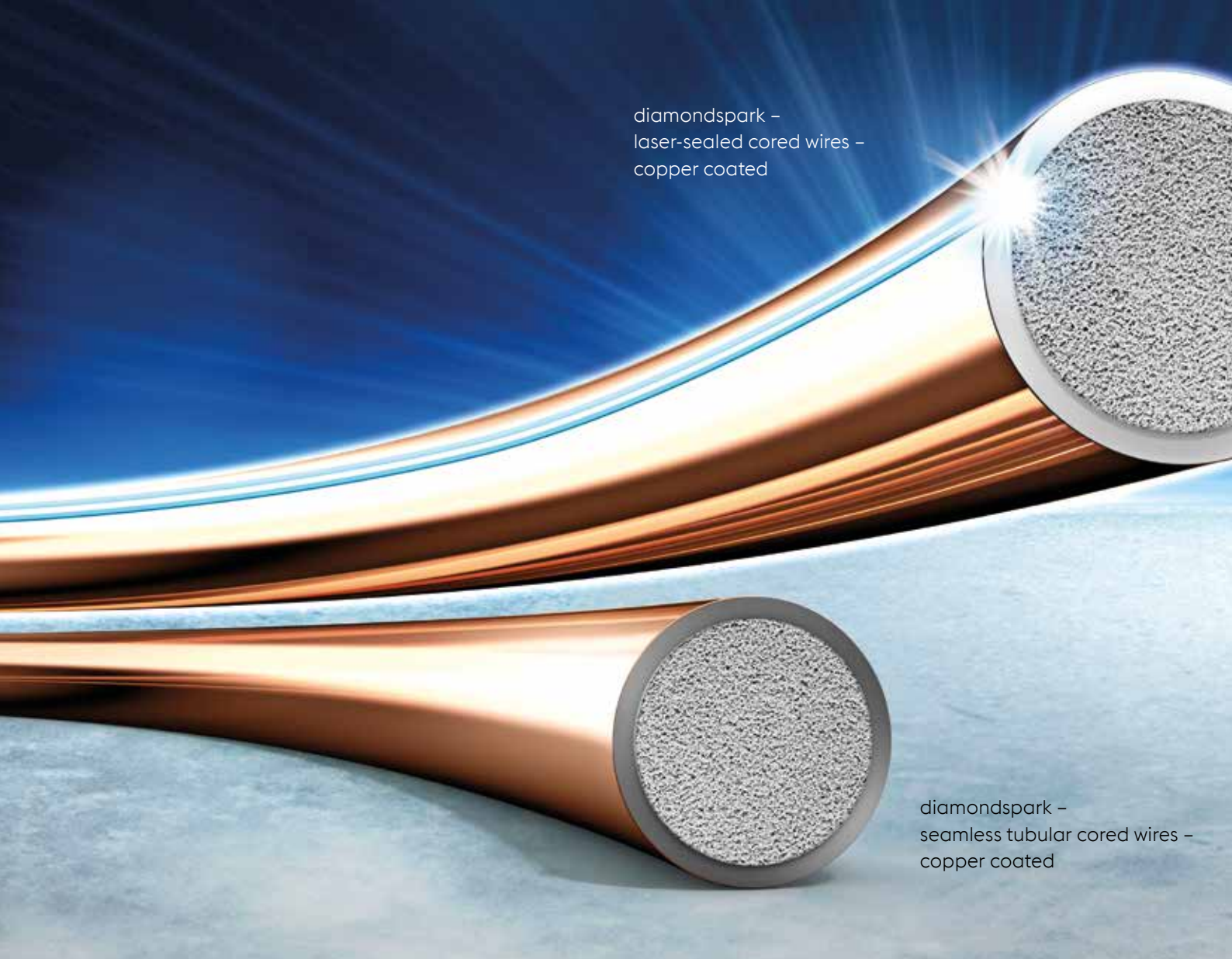
Make your call today and experience the future of seamless cored wires.



CEO Günter Neureiter



Filippo Campaci



diamondspark –  
laser-sealed cored wires –  
copper coated

diamondspark –  
seamless tubular cored wires –  
copper coated

## RELIABLE EXPERTISE FOR LASTING CONNECTIONS

As a pioneer in welding consumables for the joining of metals, Böhler Welding offers a globally unique and customer-focused portfolio for lasting connections. The extensive range of approximately 2.000 products is continuously aligned with latest industry specifications and customer requirements, certified by leading approval authorities, and thereby accredited for even the most challenging applications.

As early as in 1927, Böhler Welding invented the “Seelendraht”, which is generally considered the predecessor of the modern cored wire. Today we reinforce our reputation as leading pioneers in filler materials with brand new laser-sealed types in the diamondspark series – our seamless cored wire portfolio for the most demanding of welding applications.

In addition, Böhler Welding offers its customers and partners the highest level of joining expertise to support them in getting the best out of our products by means of consult and training, on-site when needed.



## DIAMONDSPARK – PREMIUM SEAMLESS CORED WIRES FROM MARKET LEADER BÖHLER WELDING

**diamondspark by Böhler Welding covers a full range of seamless cored wires from two different fabrication technologies tailored to match the needs of demanding applications.**

Established in the market with a vast range of individual types are Böhler Welding tubular seamless cored wires, which are manufactured by filling a tube with flux ingredients and drawing it to end diameter. Completely new are Böhler Welding types fabricated by sealing a folded strip filled with flux ingredients using a laser beam and drawing it to end diameter. Both fabrication routes allow subsequent copper-coating to give the cored wires optimal feeding characteristics and current transfer.

The fabrication method has been anchored in the BÖHLER product name by a suffix T for tubular types and a suffix L for types produced with laser technology.







## DIAMONDSPARK: YOUR PRECISION TOOL FOR MOST DEMANDING MANUFACTURING

**diamondspark – your precision tool for most demanding manufacturing complements our range of seamless cored wires. They enable you to optimize your welding application and ensure highest productivity. diamondspark laser-sealed seamless cored wires are today's best available choice**

- » for welding applications with most stringent requirements for productivity, safety and weld quality
- » such as in robotic serial manufacturing and mechanized welding
- » of high integrity components in demanding industries
- » perfect for high and ultra-high strength steel welding
- » and for hydrogen critical applications.

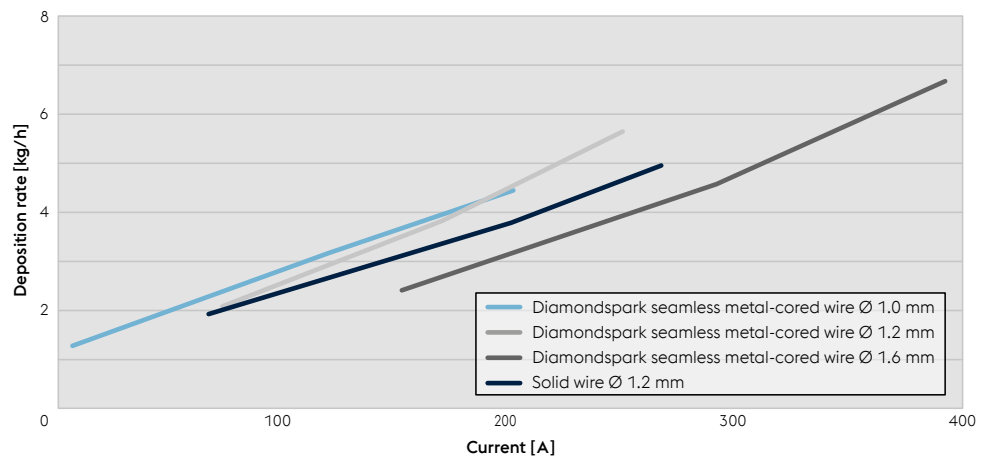
# MAXIMUM WELDING PRODUCTIVITY – WELL-DESIGNED FORMULATIONS

## diamondspark – next level productivity in a growing range of formulations

### High deposition rate.

Böhler Welding seamless cored wires carry all general productivity advantages brought along by the cored wire product design, when compared with solid wires. At equal wire diameters, the current conducting cross section of cored wires is smaller and, therefore, resistance heating in the sheath (I<sup>2</sup>R effect) is higher at the same welding current. This translates into a higher wire melt-off rate and – depending on cored wire type (flux- or metal-cored) – in higher deposition rates than with solid wires.

Diagram showing 1.0, 1.2 and 1.6 mm diamondspark metal-cored wire in comparison with solid wire.



### Growing portfolio.

On top of this basic productivity advantage, diamondspark cored wires make use of the powerful option to very precisely influence welding characteristics with well-designed cored wire formulations. Böhler Welding rutile cored wires with fast freezing slag, for instance, provide deposition rates in positional welding up to three times as high as obtainable with any conventional arc welding process. In the downhand position, Böhler Welding metal-cored wires are the fastest way to join steel plate. Arc stabilizers make favorable spray arc welding start at welding currents where solid wires of the same diameter operate in the short or globular arc mode, with associated superior productivity and virtual absence of spatter. In fillet welding, significantly higher travel speed can be applied than with solid wires, with excellent weld quality.

One of the features of diamondspark metal-cored wires is a wide envelope of applicable welding parameters, enabling easy setting and wider use of productive spray arc parameters.

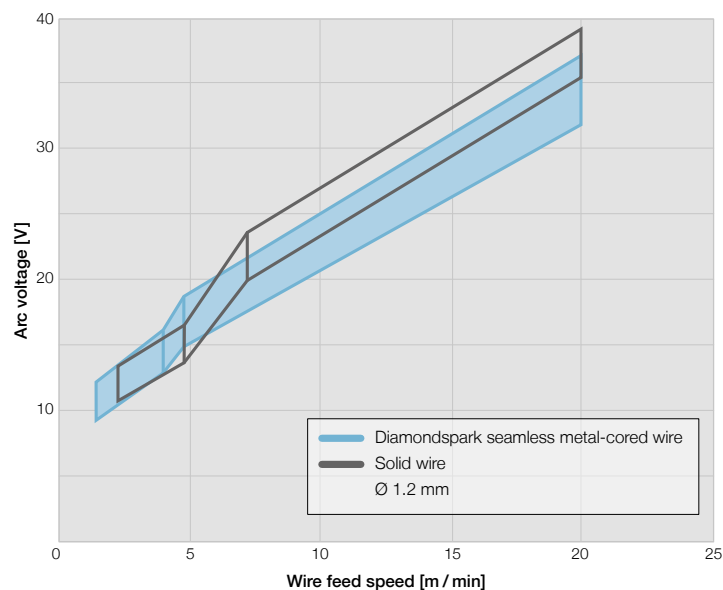






Photo courtesy PALFINGER AG, Austria

# ULTRA DRY – ULTIMATELY PROTECTED

## diamondspark – the new benchmark in low hydrogen and moisture safety

### Hermetically sealed.

Within the field of flux-cored arc welding, the seamless design offers optimal protection against moisture reabsorption and thereby against hydrogen induced cracking / hydrogen assisted cracking (HIC, HAC, cold cracking). For the simple reason that there is no open seam running over the wire length, moisture cannot penetrate into the filling. diamondspark tubular seamless cored wires are produced with very low levels of diffusible hydrogen – typically 2-3 ml / 100g weld metal for rutile types and even lower for metal-cored and basic wires. And they maintain this property until the moment of welding, regardless duration of storage and time of exposure at the work site. With diamondspark seamless cored wires, fabricators always enjoy the best protection they can possibly get in flux-cored arc welding.

As an additional advantage, the copper-coating counteracts the formation of rust on the wire surface, which is a potential source of hydrogen.

### Unique in the market – Ultra-Dry.

diamondspark laser-sealed metal-cored wires are even ultra-dry with average initial hydrogen levels well below 2 ml / 100 g weld metal. Without increasing hydrogen level in weld metal even after long term exposure, these metal-wires provide the very best low-hydrogen performance available in the market.

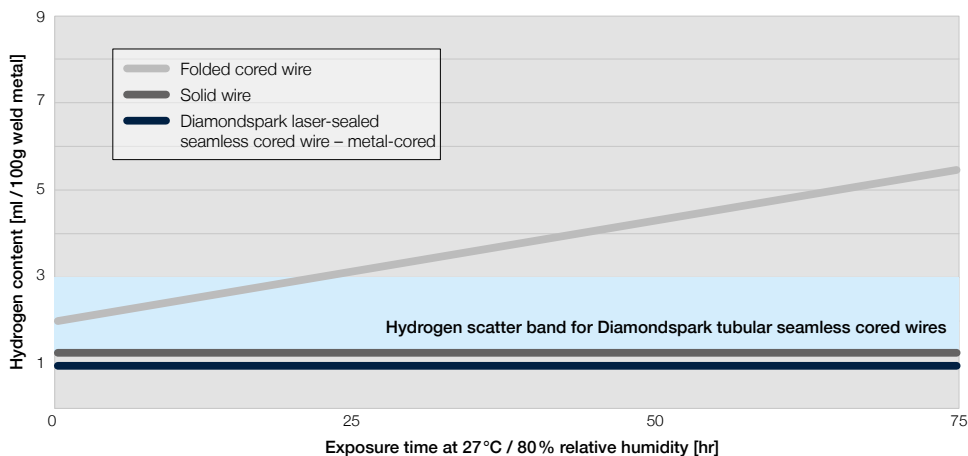
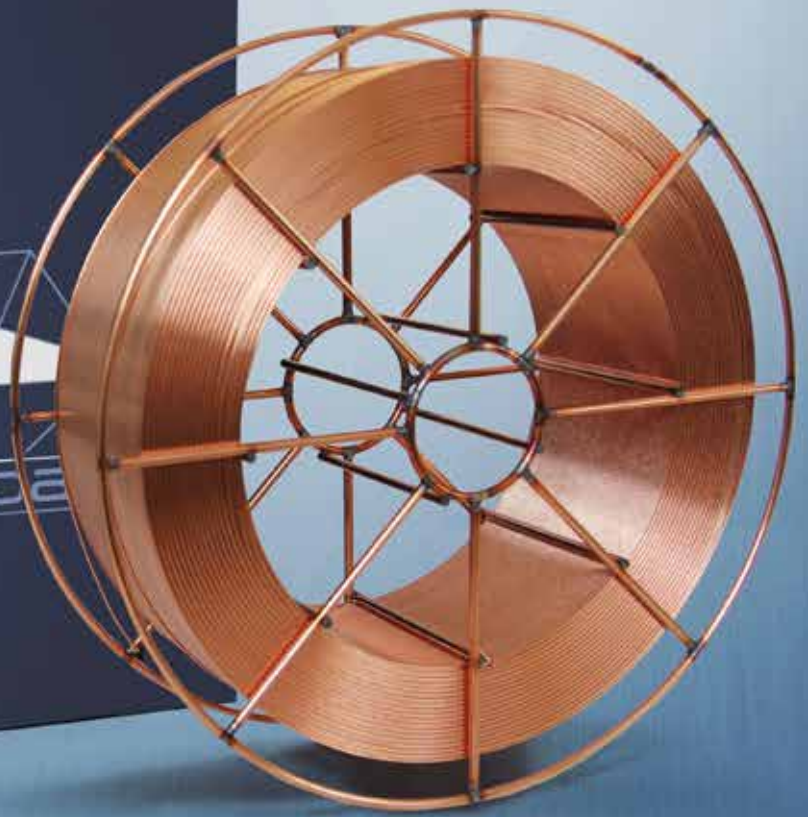


Diagram showing weld metal hydrogen content in relation to exposure time for diamondspark seamless cored wires. diamondspark laser-sealed metal-cored wires are ultra-dry, performing at the level of solid wires.







# INCREASED ARC TIME – LOWER COSTS

## **diamondspark – brilliant characteristics for mechanized and robotic welding**

### **Convincing benefits.**

Whether you weld manually close to the power source or robotic with long liners – problem-free wire feeding is what you will get. 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 – and together with arc stabilizers in the filling – promotes good arc ignition and a stable arc. Controlled wire cast and helix largely avoids “dog tailing”, giving, well positioned welds.

### **Drum system for maximized profitability.**

diamondspark cored wires are available in spools of 16 kg and in octagonal drums with a filling content of 250 kg. Use of the drum avoids 15 spool changes of roughly 10 minutes, compared with wire spools. The result is 150 more minutes of net arc time and a correspondingly higher duty cycle and production output. Use of the drums will thereby immediately lower your welding costs and increase your company’s profit.

However, there is much more to be gained. The implementation of our drum systems – with high quality welding wires and dedicated accessories – will streamline your entire cored wire welding operation and further lower your welding costs.

<b>Features</b>	<b>User benefits</b>
Problem-free feeding	Increased arc time and higher production output
Stable arc	Uniform bead shape and weld penetration
Good arc ignition	High quality welds with multiple starts
Controlled wire cast and helix	Precise weld positioning
Available in 250 kg drums	Drastically increased net arc time

A range of accessories for efficient internal transport and installation of the drums is available, including a choice of four different “click and go” liner types to connect the drums with the wire feed unit.



# DIAMONDSPARK SEAMLESS CORED WIRES – A FULL RANGE FOR NON AND LOW-ALLOYED STEEL

diamondspark seamless copper-coated cored wires for normal strength steel		
Product	Classification	Description
<b>BÖHLER Ti 42 T-FD</b> Rutile, downhand Mixed gas and CO <sub>2</sub>	EN ISO 17632-A: T46 2 R M21 3 H5 / T42 0 R C1 3 H5 A5.36: E70T1-M21A0-CS1-H4 / E70T1-C1AZ-CS1-H4	Seamless tubular, rutile flux cored wire from the diamondspark range. Design for Multi-purpose applications for steels with up to 460 MPa YS, with Argon-CO <sub>2</sub> shielding gas or pure CO <sub>2</sub> , for flat and horizontal positions. Easy to remove and slow freeing slag behaviour. Bead appearance is smooth and bright. This wire is especially suitable for ship building, steel structural work or wherever good bead appearance is required.
<b>BÖHLER Ti 46 T-FD</b> Rutile, all-positional Mixed gas and CO <sub>2</sub>	EN ISO 17632-A: T46 3 P M21 1 H5 / T42 2 P C1 1 H5 A5.36: E71T1-M21A2-CS2-H4 E71T1-C1A0-CS2-H4	Seamless tubular, rutile cored wire from the diamondspark range. Design for Multipurpose applications for steels with up to 460 MPa YS, using M21 (Ar/CO <sub>2</sub> ) shielding gas or pure CO <sub>2</sub> . The weld deposit has excellent mechanical properties till -30°C in mix gas application. The main features of this wire are excellent weldability in all positions, excellent bead appearance, low amount of spatters and easy to remove slag. Due to the seamless design of the wire: hydrogen pickup during operation and storage can be avoided; no porosity issues even on primer plates and very good feeding performance are achievable.
<b>BÖHLER Ti 52 NG T-FD</b> Self-Shielded FCW, all positional	EN ISO 17632-A: T46 Z Y NO 1 A5.36: E71T11-AZ-CS3-H8	Self-shielded seamless tubular flux cored wire from the diamondspark range, designed for all position welding of low and medium alloyed steels. This wire is especially useful for on-site fabrication, structural or repair welding applications, single or multipass welding. Main features: good weldability, also vertical-up Position, good bead appearance, low spatter levels and easy to remove slag. The copper coated surface provides high resistance to rust and the seamless technology grants low moisture pick-up with low content of diffusible hydrogen levels (< H8).
<b>BÖHLER Ti 52 T-FD</b> Rutile, all-positional Mixed gas and CO <sub>2</sub>	EN ISO 17632-A: T46 4 P M21 1 H5 / T46 2 P C1 1 H5 AWS A5.36: E71T1-M21A4-CS1-DH4 / E71T1-C1A2-CS1-DH4	Seamless tubular, rutile cored wire from the diamondspark range. Multi-purpose wire for steel with up to 460 MPa YS. Excellent weldability and very high productivity in positional welding. Good CVN impact toughness down to -40°C. General fabrication, shipbuilding. D1.8 Seismic Supplement approved.
<b>BÖHLER Ti 52 T-FD (HP)</b> Rutile, all-positional Mixed gas and CO <sub>2</sub>	AWS A5.36: E71T1-M21AP6-CS2-H4 / E71T1-C1A0-CS2-H4	Seamless tubular, rutile cored wire from the diamondspark range. Multi-purpose wire for steel with up to 460 MPa YS. Excellent weldability and very high productivity in positional welding. Excellent CVN impact toughness down to -50°C for applications with highest toughness demands e.g. in offshore and shipbuilding.
<b>BÖHLER Ti 52 T-FD (CO<sub>2</sub>)</b> Rutile, all-positional CO <sub>2</sub>	EN ISO 17632-A: T42 2 P C1 1 H5 AWS A5.36: E71T1-C1A0-CS1-H4	Seamless tubular, rutile cored wire from the diamondspark range. Multi-purpose wire for steel with up to 420 MPa YS. Excellent weldability and very high productivity in positional welding. Good CVN impact toughness down to -30°C. For excellent performance in shipbuilding.
<b>BÖHLER Ti 52 T-FD SR (CO<sub>2</sub>)</b> Rutile, all-positional CO <sub>2</sub>	EN ISO 17632-A: T42 4 P C1 1 H5 AWS A5.36: E71T12-C1AP4-CS1-H4	Seamless tubular, rutile cored wire from the diamondspark range. Multi-purpose wire for steel with up to 460 MPa YS with stress relieve requirements. Excellent weldability and very high productivity in positional welding. Good CVN impact toughness down to -40°C, both as welded and stress relieved. For excellent performance in shipbuilding, storage vessels and heavy wall thickness steel constructions. CTOD tested at -10°C.
<b>BÖHLER Kb 42 NG T-FD</b> Self-Shielded FCW, downhand	EN ISO 17632-A: T42 Z W NO 3 A5.36: E70T4-AZ-CS3	Self-shielded seamless tubular flux cored wire from the diamondspark range, especially developed for rail joint welding applications. It is also suitable for welding of low alloyed steel constructions where impact properties are not required. The wire offers excellent welding characteristics with high productivity. It has a slow freezing, easily removable slag system.
<b>BÖHLER Kb 46 T-FD</b> Basic, downhand Mixed gas and CO <sub>2</sub>	EN ISO 17632-A: T42 4 B M21 1 H5 / T42 4 B C1 1 H5 AWS A5.36: E71T5-M21A4-CS1-H4 / E71T5-C1A4-CS1-H4	Seamless tubular, basic cored wire from the diamondspark range. For C- and C-Mn steels up to 420 MPa YS, including fine grain steels. Excellent weldability in flat and horizontal position. Excellent CVN impact toughness down to -60°C.
<b>BÖHLER Kb 52 T-FD</b> Basic, downhand Mixed gas and CO <sub>2</sub>	EN ISO 17632-A: T46 4 B M21 3 H5 / T42 4 B C1 3 H5 AWS A5.36: E70T5-M21A4-CS1-H4 / E70T5-C1A4-CS1-H4	Seamless tubular, basic cored wire from the diamondspark range. Excellent weldability in flat and horizontal position. Very tough weld metal with high crack resistance for steels with high CE and constructions with high restraint. Unlimited wall thickness. Outstanding CVN impact toughness down to -60°C with mixed gas.

<b>BÖHLER HL 46 GS T-MC</b> Metal-cored, downhand Mixed gas	EN ISO 17632-A: T46 Z M21 1 H5 A5.36: E70T15-1M21AZ-CS1-H4	Seamless tubular, metal cored wire from the diamondspark range, for singlelayer welding of galvanized, zinc coated or thin painted sheets (0.8 – 4 mm), Features include: good weldability, excellent bead appearance and low spatter losses. This wire is especially suitable for ship building, auto industry and manufacturing of air condition systems.
<b>BÖHLER HL 46 T-MC</b> Metal-cored, all positional Mixed gas	EN ISO 17632-A: T46 3 M M21 1 H5 AWS A5.36: E70T15-M21A2-CS1-H4	Seamless tubular, metal-cored wire from the diamondspark range. Multi-purpose wire for steel up to 460 MPa YS and CVN impact requirements down to -30 °C. Steady spray arc with minimal spatter and very low silicates production for multi-run welding without interrun cleaning. Ideal for flat and horizontal fillet welds.
<b>BÖHLER HL 51 L-MC</b> Metal-cored, all-positional Mixed gas	EN ISO 17632-A: T46 4 M M 21 1 H5 AWS A5.36: E71T15-M21A4-CS2-H4 / E71T15-M20A4-CS2-H4	Seamless, laser-sealed, metal-cored wire from the diamondspark range with excellent characteristics for high duty cycle, mechanized and robotic welding of unalloyed and fine-grained constructional steel up to 460 MPa yield and impact requirements down to -40 °C. Ultra-low weld metal hydrogen content – at the level of solid wires – for best possible protection against hydrogen assisted / induced cracking.
<b>BÖHLER HL 51 T-MC</b> Metal-cored, all positional Mixed gas and CO <sub>2</sub>	EN ISO 17632-A: T46 6 M M21 1 H5 / T42 5 M C1 1 H5 AWS A5.36: E70T15-M21A8-CS1-H4 / E70T15-C1A6-CS1-H4	Seamless tubular, metal-cored wire from the diamondspark range. Multi-purpose wire for steel up to 460 MPa YS and excellent CVN impact requirements in the as welded (-60 °C) and stress relieved (-40 °C) condition. Steady spray arc with minimal spatter. This wire is especially suitable for automated-robotized applications and for root pass welding for piping and butt-joints. This wire is CTOD-tested.
<b>SUBARC T55 HP &amp; UV 306</b>	EN ISO 14171-A: S 50 4 AR T3 H5 A5.17: F7A5-ECG	Wire-flux combination from the diamondspark range, for submerged arc welding of unalloyed structural steels up to MSYS = 500 MPa in a very wide range of applications. This combination gives the fabricator the possibility to weld with 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. The aluminate-rutile flux has a relative low basicity index and is selected for its excellent welding properties and is suitable for high welding speed and moderate toughness.
<b>SUBARC T55 HP &amp; UV 421 TT</b>	EN ISO 14171-A: S 46 6 FB T3 H5 A5.17: F7A8-EC1 / F7P8-EC1	Wire-flux combination from the diamondspark range, for submerged arc welding of unalloyed structural steels up to MSYS = 460 MP for very good toughness properties at low temperatures. This combination gives the fabricator the possibility to weld with 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. The combination can be used for joining applications in unlimited thickness, with DC+ or AC current, which allows Tandem process (~ 30 kg/hour) with 2 wires (3,2 or 4,0 mm).
<b>SUBARC T55 HP &amp; UV 419 TT-W</b>	EN ISO 14171-A: S 46 6 FB T3 H5 A5.17: F7A8-EC1 / F7P8-EC1	Wire-flux combination from the diamondspark range, for submerged arc welding of unalloyed structural steels up to MSYS = 460 MP for good strength properties after relative long PWHT (e.g. TS ~ 540 MPa after 16 hours 620°C). This combination gives the fabricator the possibility to weld with 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. The combination can be used for joining applications in unlimited thickness, with DC+ or AC current, which allows Tandem process (~ 30 kg/hour) with 2 wires (3,2 or 4,0 mm).
<b>SUBARC T56 HP &amp; UV 400</b>	EN ISO 14171-A: S 46 6 AB T3 H5 A5.17: F7A8-EC1	Wire-flux combination from the diamondspark range, for submerged arc welding of unalloyed structural steels up to MSYS = 460 MP for applications with very high deposit rates (> 30 kg/hour with multiple wires). The weld metal shows relative high toughness. SUBARC T56 HP is optimised for combining with UV 400 for its relative high current carrying capacity and the combination is also recommended for 2 run procedures.

diamondspark seamless copper-coated cored wires for weather resistant steel		
Product	Classification	Description
<b>BÖHLER NiCu1 Ti T-FD</b> Rutile, all-positional Mixed gas	EN ISO 17632-A: T46 4 Z P M21 1 H5 AWS A5.36: E81T1-M21A4-GH4	Seamless tubular, rutile cored wire from the diamondspark range. Excellent weldability and very high productivity in positional welding. For weathering steels. Good CVN impact toughness down to -40 °C. Buildings, bridges.
<b>BÖHLER NiCu1 T-MC</b> Metal-cored, all-positional Mixed gas	EN ISO 17632-A: T46 6 Z M21 M 1 H5 AWS A5.36: E80T15-M21A8-GH4	Seamless tubular, metal-cored wire from the diamondspark range. For weathering steels. Good CVN impact toughness down to -60 °C. Buildings, bridges.
<b>BÖHLER Kb NiCu1 T-FD</b> Basic, downhand Mixed gas	EN ISO 17632-A: T46 6 Z B M21 3 H5 AWS A5.36: E80T5-M21A8-GH4	Seamless tubular, basic cored wire from the diamondspark range. For weathering steels. Very high CVN impact toughness down to -60 °C. Buildings, bridges.
<b>SUBARC TNiCu1 &amp; UV 306</b>	EN ISO 14171-A: S 46 4 AR T2Ni1Cu A5.23: F8A5-ECG-G	Wire-flux combination from the diamondspark range, for submerged arc welding of weather resistant applications. The basic-cored wire provides a little higher deposit rate compared to solid SAW wire. It is mainly applied to clad facades, bridges and other infrastructure structures. With UV 306 it is applied for the best operative characteristics combined with good toughness properties.
<b>SUBARC TNiCu1 &amp; UV 400</b>	EN ISO 14171-A: S 46 6 AB T2Ni1Cu A5.23: F7A8-ECG-G	Wire-flux combination from the diamondspark range, for submerged arc welding of weather resistant applications. The basic-cored wire provides a little higher deposit rate compared to solid SAW wire. It is mainly applied to clad facades, bridges and other infrastructure structures. With UV 400 it can be applied for all wall thicknesses with high toughness properties.
diamondspark seamless copper-coated cored wires for low-temperature steel		
Product	Classification	Description
<b>BÖHLER Ti 60 T-FD</b> Rutile, all-positional Mixed gas	EN ISO 17632-A: T50 6 1Ni P M21 1 H5 AWS A5.36: E81T1-M21A8-Ni1-H4	Seamless tubular, rutile cored wire from the diamondspark range. For low-temperature steels up to 500 MPa YS and impact requirements down to -60 °C. Excellent weldability and very high productivity in positional welding. Alloyed with < 1% Ni to meet NACE offshore requirement. HIC tested according to NACE TM-0284. CTOD tested at -10 °C. Offshore, upstream oil and gas exploration. CTOD tested at -10 °C.
<b>BÖHLER Ti 60 T-FD (CO<sub>2</sub>)</b> Rutile, all-positional CO <sub>2</sub>	EN ISO 17632-A: T46 4 1Ni P C1 1 H5 AWS A5.36: E81T1-C1A4-Ni1-H4	Seamless tubular, rutile cored wire from the diamondspark range. For low-temperature steels up to 500 MPa YS and impact requirements down to -40 °C. Excellent weldability and very high productivity in positional welding. Alloyed with < 1% Ni to meet NACE offshore requirement. Offshore, upstream oil and gas exploration. CTOD tested at -10 °C.
<b>BÖHLER Ti 60 T-FD SR</b> Rutile, all-positional Mixed gas	EN ISO 17632-A: T50 6 1Ni P M21 1 H5 AWS A5.36: E81T1-M21AP8-Ni1-H4	Seamless tubular, rutile cored wire from the diamondspark range. For low-temperature steels with impact requirements down to -60 °C. Excellent weldability and very high productivity in positional welding. As welded and stress relieved. Alloyed with < 1% Ni to meet NACE offshore requirement. Offshore, upstream oil and gas exploration. CTOD tested at -10 °C.
<b>BÖHLER Ti 60 K2 T-FD (CO<sub>2</sub>)</b> Rutile all-positional CO <sub>2</sub>	EN ISO 17632-A: T50 6 1,5Ni P C1 1 H5 AWS A5.36: E81T1-C1A8-K2-H4	Seamless tubular, rutile cored wire from the diamondspark range for use with pure CO <sub>2</sub> shielding gas. Excellent weldability and very high productivity in positional welding. Good CVN impact toughness down to -60 °C as well as the low content of diffusible hydrogen make the wire especially suited for offshore applications.
<b>BÖHLER Ti 2 Ni T-FD</b> Rutile, all-positional Mixed gas	EN ISO 17632-A: T50 6 2Ni P M21 1 H5 AWS A5.36: E81T1-M21A8-Ni2-H4	Seamless tubular, basic cored wire from the diamondspark range. For low-temperature steels with impact requirements down to -60 °C. Excellent weldability and very high productivity in positional welding. Alloyed with 2% Ni for superior CVN impact properties. Offshore, upstream oil and gas exploration. CTOD tested at -50 °C.
<b>BÖHLER Kb 3.5Ni T-FD</b> Basic, downhand Mixed gas	EN ISO 17632-A: T46 8 3Ni B M21 3 H5 A5.36: E80T5-M21A15-Ni3-H4	Seamless tubular basic wire from the diamondspark range, for the welding of steels Nickel alloyed up to 3.5% with Ar-CO <sub>2</sub> shielding gas. Main features: excellent mechanical properties at low temperature (-100 °C), excellent efficiency, good bead appearance and no spatter. Wire with very low presence of diffusible hydrogen (<3ml/100g), especially suitable for cryogenic application like LNG.



<b>BÖHLER Kb 60 T-FD</b> Basic, downhand Mixed gas	EN ISO 17632-A: T46 6 1Ni B M21 3 H5 AWS A5.36: E80T5-M21P8-Ni1-H4	Seamless tubular, basic cored wire from the diamondspark range. Alloyed with < 1% nickel. For the welding of fine grain constructional steel – with impact requirements down to -60 °C – as well as for joining wear resistant steels. Very tough weld metal with high resistance to cracking.
<b>BÖHLER HL 53 T-MC</b> Metal-cored, all-positional Mixed gas	EN ISO 17632-A: T50 6 1Ni M M21 1 H5 AWS A5.36: E80T15-M21A8-Ni1-H4	Seamless tubular, metal-cored wire from the diamondspark range. For low-temperature steels with impact requirements down to -60°C. Alloyed with < 1% Ni to meet NACE offshore requirement. Exceptional mechanical properties down to -60 °C, both as welded and stress relieved. This wire is especially suitable for rootpass welding in offshore and pipeline applications. CTOD tested at -40 °C.
<b>BÖHLER 3.5Ni T-MC</b> Metal-cored, all-positional Mixed gas	EN ISO 17632-A: T46 6 3Ni M M21 1 H5 A5.36: E81T15-M21A8-Ni3-H4	Seamless tubular, metalcored wire from the diamondspark range, for the welding of steels Nickel alloyed up to 3,5% with Ar-CO <sub>2</sub> shielding gas. Main features: excellent mechanical properties at low temperature (-80°C), excellent efficiency, good bead appearance and no spatter. Wire with very low presence of diffusible hydrogen (<3ml/100g weld metal). This wire can be used for applications where PWHT and normalized heat treatment conditions are required.
<b>SUBARC T60 &amp; UV 419 TT-W</b>	EN ISO 14171-A: S 50 6 FB TZ3Ni1 H5 A5.23: F8A8-ECNi1-Ni1	Wire-flux combination from the diamondspark range, for submerged arc welding of of high-strength, quenched and tempered fine grained structural steels up to MSYS = 500/550 MPa. Good toughness properties at low temperatures (-60°C). With a Nickel content below 1% this wire-flux combination meets the NACE-requirements and can be used for sour gas applications.

**diamondspark seamless copper-coated cored wires for high strength steel**

<b>Product</b>	<b>Classification</b>	<b>Description</b>
<b>BÖHLER Ti 75 T-FD</b> Rutile, all-positional Mixed gas	EN ISO 18276-A: T62 4 Mn1.5Ni P M21 1 H5 AWS A5.36: E101T1-M21A4-K2-H4	Seamless tubular, rutile cored wire from the diamondspark range. Ni-Mo-alloyed wire for high strength steels up to 620 MPa YS. Excellent weldability and very high productivity in positional welding. Excellent CVN impact toughness down to -40°C. The exceptional mechanical properties of this wire and the low content of diffusible hydrogen make it especially suitable for offshore applications.
<b>BÖHLER Ti 80 T-FD</b> Rutile, all-positional Mixed gas	EN ISO 18276-A: T69 6 Z P M21 1 H5 AWS A5.36: E111T1-M21A8-GH4	Seamless tubular, rutile cored wire from the diamondspark range. Ni-Mo-alloyed wire for high strength steels up to 690 MPa YS. Excellent weldability and very high productivity in positional welding. Excellent CVN impact toughness down to -60 °C and the low diffusible hydrogen content make it especially suitable for offshore, pipeline and crane applications.
<b>BÖHLER Ti 80 T-FD SR</b> Rutile, all-positional Mixed gas	EN ISO 18276-A: T 69 6 Mn2NiMo P M21 1 H5 A5.36: E111T1-M21A8-K3-H4	Seamless tubular rutile cored wire from the diamondspark range. Nickel-Molybdenum alloyed, flux cored wire for single- or multilayer welding of high strength steels to be used with Argon-CO <sub>2</sub> shielding gas. This core wire with its easy to remove and fast freezing slag shows excellent weldability in all positions, excellent bead appearance and very low spatter losses. The low diffusible hydrogen content of the pure weld metal (2-3ml/100g) and the outstanding mechanical properties at low temperatures (-60°C) make this wire perfect suitable for applications using high- and ultra-high strength steel grades. In particular this product is dedicated to be performed after PWHT for Q&T and also for TMCP steels thanks to his particular formulation that reduce the embrittlement of the weld metal after such treatments with good toughness till -40°C.
<b>BÖHLER Ti 80 T-FD (CO<sub>2</sub>)</b> Rutile, all-positional CO <sub>2</sub>	EN ISO 18276-A: T69 4 Z 9 C1 1 H5 A5.36: E111T1-C1A6-GH4	Seamless tubular rutile cored wire from the diamondspark range. Nickel-Molybdenum alloyed, flux cored wire for single- or multilayer welding of high strength steels to be used with pure CO <sub>2</sub> shielding gas. The low diffusible hydrogen content of the pure weld metal (2-3ml/100g) and the outstanding mechanical properties at low temperatures, makes this wire perfect suitable for applications using high- and ultrahigh strength steel grades. This core wire with its easy to remove and fast freezing slag shows excellent weldability in all positions, excellent bead appearance and low spatter losses.
<b>BÖHLER Kb 65 T-FD</b> Basic, downhand Mixed gas	EN ISO 18276-A: T55 4 1NiMo B M21 3 H5 AWS A5.36: E90T5-M21A4-GH4	Seamless tubular, basic cored wire from the diamondspark range. Ni-Mo-alloyed wire for high strength steels up to 550 MPa YS. Excellent weldability in flat and horizontal positions. Excellent CVN impact toughness down to -40 °C.
<b>BÖHLER Kb 85 T-FD</b> Basic, downhand Mixed gas	EN ISO 18276-A: T69 6 Mn2NiCrMo B M21 3 H5 AWS A5.36: E110T5-M21A8-K4-H4	Seamless tubular, basic cored wire from the diamondspark range. Excellent weldability in flat and horizontal positions. Ni-Mo-alloyed wire for high strength steels up to 690 MPa YS. Excellent CVN impact toughness down to -60 °C.

<b>BÖHLER Kb 85 T-FD (CO<sub>2</sub>)</b> Basic, downhand, CO <sub>2</sub>	EN ISO 18276-A: T69 4 Mn2NiCrMo B C 3 H5 A5.36: E110T5-C1A4-K4-H4	Seamless basic flux cored wire for welding of high strength Nickel-Chromium-Molybdenum alloyed steels with pure CO <sub>2</sub> shielding gas. Features include: excellent weldability in flat and horizontal positions, smooth and bright bead, low spatter losses easy to remove slag, exceptional mechanical properties at low temperatures (-40°C) with low content of diffusible hydrogen (<3ml/100g).
<b>BÖHLER Kb 90 T-FD</b> Basic, downhand Mixed gas	EN ISO 18276-A: T89 4 Mn2Ni1CrMo B M21 3 H5 AWS A5.29: E120T5-GM-H4	Seamless tubular, basic cored wire from the diamondspark range. Excellent weldability in flat and horizontal positions. Ni-Mo-alloyed wire for very high strength steels such as S890QL, S960QL and SQL1100. Excellent CVN impact toughness down to -40°C.
<b>BÖHLER HL 65 T-MC</b> Metal-cored, all-positional Mixed gas	EN ISO8276-A: T55 4 1NiMo M M21 1 H5 AWS A5.36: E90T15-M21A8-K1-H4	Seamless tubular, metal-cored wire from the diamondspark range. Ni-Mo-alloyed wire for high strength steels up to 550 MPa YS. Excellent CVN impact toughness down to -50°C. Especially suited for root pass welding in offshore and pipelines.
<b>BÖHLER HL 75 T-MC</b> Metal-cored, all-positional Mixed gas	EN ISO 18276-A: T62 4 Z M M21 1 H5 AWS A5.36: E101T15-M21A4-G-H4	Seamless tubular, metal-cored wire from the diamondspark range. Ni-Mo- alloyed wire for single - or multilayer welding of high strength steels. This wire is especially suitable for the pipe welding of special base material like ASTM A519 Gr. 4130. It meets the NACE offshore requirements. Excellent CVN impact toughness down to -40°C.
<b>BÖHLER X70 L-MC</b> Metal-cored, all-positional Mixed gas	EN ISO 18276-A: T 69 6 Mn2NiCrMo M M21 1 H5 AWS A5.36: E110T15-M21A8-K4-H4	Seamless laser-sealed, metal-cored wire from the diamondspark range. Wire with excellent characteristics for high duty cycle mechanized and robotic welding of thermo-mechanically or quenched & tempered high strength steel up to a yield strength of 690 MPa. Ultra-low weld metal hydrogen content – at the level of solid wires – for best possible protection against hydrogen assisted / induced cracking.
<b>BÖHLER alform 700 L-MC</b> Metal-cored, all-positional Mixed gas	EN ISO 18276-A: T 69 6 Mn2NiCrMo M M21 1 H5 AWS A5.36: E110T15-M21A8-K4-H4	Seamless laser-sealed, metal-cored wire from the diamondspark range. Specially developed for the high duty cycle mechanized and robotic welding of the voestalpine high strength steel grade alform 700 M. Ultra-low weld metal hydrogen content – at the level of solid wires – for best possible protection against hydrogen assisted / induced cracking.
<b>BÖHLER X90 L-MC</b> Metal-cored, downhand Mixed gas	EN ISO 18276-A: T 89 5 ZMn2NiCrMo M M21 1 H5 AWS A5.36: E131T15-M21A6-K4-H4	Seamless laser-sealed, metal-cored wire from the diamondspark range. Wire with excellent characteristics for high duty cycle mechanized and robotic welding of thermo-mechanically produced or quenched & tempered high strength steel up to a yield strength of 900 MPa. Ultra-low weld metal hydrogen content – at the level of solid wires – for best possible protection against hydrogen assisted / induced cracking. Used for the welding of high strength steel in crane and vehicle manufacturing, shipbuilding and offshore fabrication.
<b>BÖHLER alform 900 L-MC</b> Metal-cored, downhand Mixed gas	EN ISO 18276-A: T 89 5 ZMn2NiCrMo M M21 1 H5 AWS A5.36: E131T15-M21A6-K4-H4	Seamless laser-sealed, metal-cored wire from the diamondspark range. Wire with excellent characteristics for high duty cycle mechanized and robotic welding of thermo-mechanically produced high strength steel up to a yield strength of 900 MPa. Specially developed for the voestalpine high strength steel grade alform 900 x-treme. Ultra-low weld metal hydrogen content – at the level of solid wires – for best possible protection against hydrogen assisted / induced cracking. Used for the welding of high strength steel in crane and vehicle manufacturing, shipbuilding and offshore fabrication.
<b>BÖHLER X96 L-MC</b> Metal-cored, downhand Mixed gas	EN ISO 18276-A: T 89 4 ZMn2NiCrMo M M21 1 H5 AWS A5.36: E131T15-M21A4-K4-H4	Seamless laser-sealed, metal-cored wire from the diamondspark range. Wire with excellent characteristics for high duty cycle mechanized and robotic welding of thermo-mechanically produced or quenched & tempered high strength steel up to a yield strength of 960 MPa. Ultra-low weld metal hydrogen content – at the level of solid wires – for best possible protection against hydrogen assisted / induced cracking. Used for the welding of high strength steel in crane and vehicle manufacturing.
<b>BÖHLER alform 960 L-MC</b> Metal-cored, downhand Mixed gas	EN ISO 18276-A: T 89 4 ZMn2NiCrMo M M21 1 H5 AWS A5.36: E131T15-M21A4-K4-H4	Seamless laser-sealed, metal-cored wire from the diamondspark range. Wire with excellent characteristics for high duty cycle mechanized and robotic welding of thermo-mechanically produced high strength steel up to a yield strength of 960 MPa. Specially developed for the voestalpine high strength steel grade alform 960 x-treme. Ultra-low weld metal hydrogen content – at the level of solid wires – for best possible protection against hydrogen assisted / induced cracking. Used for the welding of high strength steel in crane and vehicle manufacturing.

<b>SUBARC T80 HP &amp; UV 422 TT-LH</b>	EN ISO 26304-A: F11A10-ECF5-F5 / F11P6-ECF5-F5 A5.36: S 69 6 FB TZ H5	Wire-flux combination from the diamondspark range, for 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 strength properties, which allows to weld with relative high current and high productivity with a good bead appearance, nice fusion and good slag detachability. The wire has a high deposit rate (~13 kg/hr for single wire 3,2 mm, 750 Amp, DC+). UV 422 TT-LH is a flux that has been designed for a very low amount of diffusible hydrogen level.
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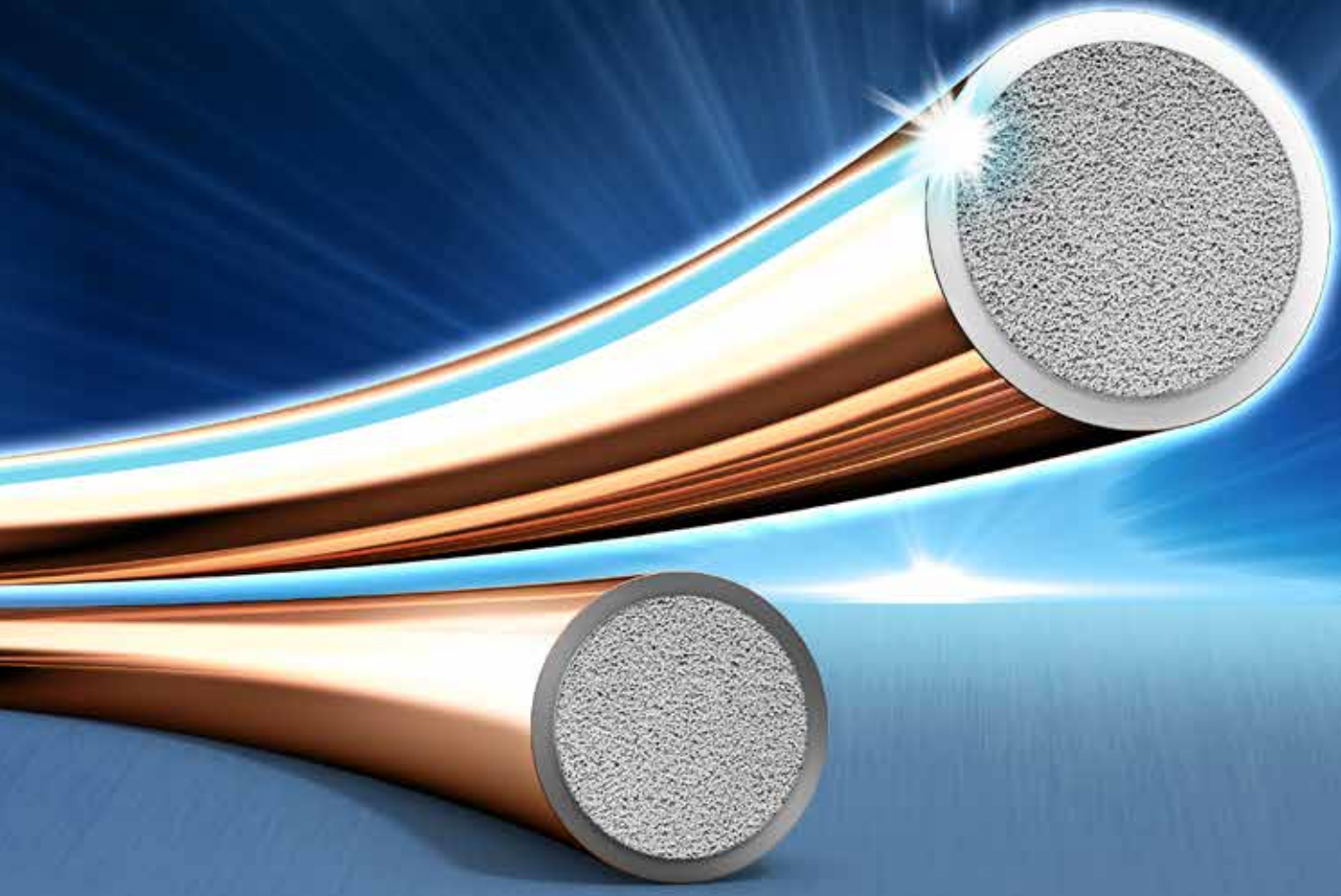
**diamondspark seamless copper-coated cored wires for pipe steel**

Product	Classification	Description
<b>BÖHLER Ti 70 Pipe T-FD</b> Rutile, all-positional Mixed gas	EN ISO 18276-A: T55 5 Mn1Ni P M21 1 H5 AWS A5.36: E91T1-M21A6-K2-H4	Seamless tubular, rutile cored wire from the diamondspark range. Developed for pipeline welding of API 5L grades up to X80. Excellent weldability and very high productivity in positional welding. Well suited for mechanized (orbital) welding. Good CVN impact toughness down to -50°C. Very low-hydrogen weld metal.
<b>BÖHLER Ti 70 Pipe T-FD-N</b> Rutile, all-positional Mixed gas	EN ISO 18276-A: T55 6 Z M21 1 H5 AWS A5.36: E91T1-M21A8-G-H4	Seamless tubular, rutile cored wire from the diamondspark range. This wire is specially developed for productive all-positional pipeline welding and is alloyed with Mn and with <1.0% Ni to meet NACE requirements. Exceptional CVN impact toughness down to -60 °C and CTOD tested at -10 °C. Very low-hydrogen weld metal.
<b>BÖHLER Ti 75 Pipe T-FD</b> Rutile, all-positional Mixed gas	EN ISO 18276-A: T62 4 Mn1.5Ni P M21 1 H5 AWS A5.36: E101T1-M21A4-K2-H4	Seamless tubular rutile nickel-molybdenum alloyed flux cored wire from the Diamondspark range, for single- or multilayer welding of carbon, carbon-manganese steels and high strength steels with Ar-CO <sub>2</sub> shielding gas. The wire is 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. Main features: excellent weldability in all positions, in particular in overhead with very stable arc at lower welding parameters, excellent bead appearance, low spatter losses, fast freezing and easy to remove slag.
<b>BÖHLER Ti 80 Pipe T-FD</b> Rutile, all-positional Mixed gas	EN ISO 18276-A: T69 4 Z P M21 1 H5 AWS A5.36: E111T1-M21A4-GH4	Seamless tubular, rutile cored wire, Ni-Mo alloyed flux-cored wire from the diamondspark range, for single or multipass welding of high strength steels with Ar-CO <sub>2</sub> shielding gas. Main features: excellent weldability in all positions, excellent bead appearance, no spatter; fast freezing and easy removable slag. The exceptional mechanical properties of this wire even at the low temperature (-40°C) as well as the low content of diffusible hydrogen make it especially suitable for pipeline applications.
<b>BÖHLER HL 60 Pipe T-MC</b> Metal-cored, all-positional Mixed gas	EN ISO 17632-A: T46 6 Z M M21 1 H5 AWS A5.36: E80T15-M21A8-K6-H4	Seamless tubular, metal-cored wire from the diamondspark range. For automatic (orbital) welding applications for pipeline construction. Matches the minimum strength requirements of X70 base material. Excellent CVN impact toughness down to -60°C. CTOD tested at -10°C. Very low-hydrogen weld metal.

**diamondspark seamless copper-coated cored wires for creep resistant steel**

Product	Classification	Description
<b>BÖHLER DMO Ti T-FD</b> Rutile, all-positional Mixed gas	EN ISO 18276-A: T 46 0 Mo P M21 1 H5 AWS A5.36: E81T1-M21P0-A1-H4	Seamless tubular, rutile cored wire from the diamondspark range. This wire is specially developed for the productive welding of 0.5% Mo alloyed creep resistant base materials. Excellent weldability and very high productivity in positional welding. Very low-hydrogen weld metal. Applied in the fabrication of tanks, high-pressure vessels, pipe systems as well as for structural steel applications.
<b>BÖHLER DCMS Ti T-FD</b> Rutile, all-positional Mixed gas	EN ISO 18276-A: T Cr Mo1 P M21 1 H5 AWS A5.36: E81T1-M21PY-B2-H4	Seamless tubular, rutile cored wire from the diamondspark range. This wire is specially developed for the productive welding of 1%Cr-0.5% Mo alloyed creep resistant base materials. Excellent weldability and very high productivity in positional welding. Very low-hydrogen weld metal. Applied in the fabrication of high-pressure vessels and pipe systems.
<b>BÖHLER DCMV Ti T-FD</b> Rutile, all-positional Mixed gas	EN ISO 17634-A: T Z P M21 1 H5 AWS A5.36: T69T1-1M21-G-H5	Seamless tubular, rutile cored wire from the diamondspark range, for the welding of creep resistant steels up to 550°C, Chromium-Molybdenum-Vanadium alloyed with Ar/CO <sub>2</sub> shielding gas. This wire is especially suitable for welding steel G17CrMoV5-10, with post-welding heat treatment. Main features: good weldability in all welding positions, fast freezing and easy to remove slag, no spatter at low parameters, good mechanical properties after heat treatment and low content of diffusible hydrogen.

<b>BÖHLER DMO Kb T-FD</b> Basic, downhand Mixed gas	EN ISO 17632-A: T46 6 Mo B M21 3 H5 AWS A5.36: E80T5-M21P8-A1-H4	Seamless tubular, basic cored wire from the diamondspark range. For 0.5% Mo type creep resistant steels. Excellent weldability in flat and horizontal positions. Very low-hydrogen weld metal. Excellent CVN impact toughness down to -60°C, as welded and post weld heat treated.
<b>BÖHLER DCMS Kb T-FD</b> Basic, downhand Mixed gas	EN ISO 17634-A: T CrMo1 B M21 3 H5 AWS A5.36: E80T5-M21PY-B2-H4	Seamless tubular, basic cored wire from the diamondspark range. For 1% Cr-0.5% Mo type creep resistant steels. Excellent weldability in flat and horizontal positions. Very low-hydrogen weld metal.
<b>BÖHLER CM2 Kb T-FD</b> Basic, downhand Mixed gas	EN ISO 17634-A: T CrMo2 B M21 3 H5 AWS A5.36: E90T5-M21PY-B3-H4	Seamless tubular, basic cored wire from the diamondspark range. For 2.25% Cr-0.5% Mo type creep resistant steels. Excellent weldability in flat and horizontal positions. Very low-hydrogen weld metal.
<b>BÖHLER DCMV Kb T-FD</b> Basic, downhand Mixed gas	EN ISO 17634-A: T Z B M21 3 H5 AWS A5.36: E90T5-M21PY-GH4	Seamless tubular, basic cored wire from the diamondspark range. For Cr-Mo-V- alloyed steels resistant to creep. Excellent weldability in flat and horizontal positions. Very low-hydrogen weld metal. This wire is especially suitable for welding steel G17CrMoV5-10 with post weld heat treatment.
<b>BÖHLER CM5 Kb T-FD</b> Basic, downhand Mixed gas	EN ISO 17634-A: T CrMo5 B M21 3 H5 AWS A5.36: E80T5-M21PY-B6-H4	Seamless tubular, basic cored wire from the diamondspark range. For 5% Cr-0.5% Mo type creep resistant steels. Excellent weldability in flat and horizontal positions. Very low-hydrogen weld metal.
<b>BÖHLER DMO T-MC</b> Metal-cored, all-positional Mixed gas	EN ISO 17632-A: T46 2 Mo M M21 1 H5 EN ISO 17634-A: T Mo M M21 1 H5 AWS A5.36: E80T15-M21P0-A1-H4	Seamless tubular, metal-cored wire from the diamondspark range. For 0.5% Mo type creep resistant steels. Very low-hydrogen weld metal.
<b>BÖHLER DCMS T-MC</b> Metal-cored, all-positional Mixed gas	EN ISO 17634-A: T CrMo1 M M21 1 H5 AWS A5.36: E80T15-M21PY-B2-H4	Seamless, tubular, metal-cored wire from the diamondspark range. For 1% Cr-0.5% Mo type creep resistant steels. Very low-hydrogen weld metal.
<b>BÖHLER CM2 T-MC</b> Metal-cored, all-positional Mixed gas	EN ISO 17634-A: T CrMo2 M M21 1 H5 AWS A5.36: E90T15-M21PY-B3-H4	Seamless tubular, metal-cored wire from the diamondspark range. For 2.25% Cr-0.5% Mo type creep resistant steels. Very low-hydrogen weld metal.





Over the coming years, new routes are being explored in the development of steel with elevated strength levels. In order to guarantee both formability and weldability of newly developed grades, manufacturers of steel and welding consumables are facing important tasks in research & development. With the innovative diamondspark laser technology, Böhler Welding is already well prepared. Laser-sealed cored wires from the diamondspark series have been successful in important test programs, showing that laser-sealed cored wires are the best answer to the challenges of the future.

**Univ.-Prof. Dipl.-Ing. Dr.mont. Ronald Schnitzer**  
**Endowed professorship and chair of design of steels –**  
**bmvit professorship for industry**  
**Department of Physical Metallurgy and Materials Testing**  
**Montanuniversität Leoben, Austria**

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With the new laser-sealed cored wires of the diamondspark series, we have the ideal filler material at our disposal to satisfy future welding requirements of high performance concrete pumps. Böhler Welding underlines its leading position in this area as supplier of innovative products developed in co-operation with customers.

**Dipl.-HTL Ing. Horst Jöbstl**  
**Managing Director Schwing GmbH, St. Stefan im Lavanttal, Austria**

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Worldwide, PALFINGER stands for the most innovative, reliable and cost-effective lifting solutions for use on commercial vehicles and in the maritime field. With our technological expertise and experienced staff, we set quality benchmarks in the industries in which we operate. Our core knowledge in design and manufacturing of our cost-effective lifting solutions, combined with the close cooperation with base material suppliers and welding consumable manufacturers is essential to ensure the further development of our equipment. Böhler Welding with their technical expertise in applications and design of welding consumables is a strong and reliable partner of PALFINGER since decades. With the new laser-sealed cored wires from the diamondspark series, Böhler Welding is setting new milestones in welding consumables and support herewith PALFINGER with the continuous development to ensure the global quality benchmark in lifting solutions.

**Franz Wirnsperger**  
**Head of Welding Technology and Analyses PALFINGER AG, Bergheim, Austria**

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**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. As a reliable partner for customers, “lasting connections” are the brand’s philosophy in terms of both welding and people.



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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](http://www.voestalpine.com/welding)



