

Tailor-Made Protectivity™

# THERMAL ARC SPRAYING WITH CORED WIRES





# UTP MAINTENANCE

High-quality industrial-use welding filler metals for maintenance, repair, and overlay welding. By adding the UTP and Soudokay brands to the voestalpine Böhler Welding brand network, the UTP Maintenance can look back on a proud history spanning 60 years as an innovative supplier of welding technology products. UTP Maintenance is the global leader in the repair, maintenance and overlay welding segment.

With roots both in Bad Krozingen (Germany) and Seneffe (Belgium), UTP Maintenance offers the world's most unique product portfolio for filler metals from its own production facilities. The Soudokay brand was established back in 1938, while the UTP brand began operations in 1953. Each of these brands therefore respectively looks back on a long history of international dimension.

By merging into the UTP Maintenance brand, the collective know-how of both brands – gathered over decades in the fields of metallurgy, service and applications engineering – is now united under one umbrella. As a result, a truly unique portfolio of solutions for welding applications has been created in the fields of repair, maintenance and overlay welding.



## Tailor-Made Protectivity™

UTP Maintenance ensures an optimum combination of protection and productivity with innovative and tailor-made solutions. Everything revolves around the customer and their individual requirements.

That is expressed in the central performance promise: **Tailor-Made Protectivity™.**





### Research and Development for Customized Solutions

At UTP Maintenance, research and development, conducted in collaboration with customers, plays a crucial role. Because of our strong commitment to research and development, combined with our tremendous innovative capacity, we are constantly engineering new products, and improving existing ones on an ongoing basis. The result is a vast number of innovative products for solving individual problems and complex matters.

### Customized Products of Superior Quality

We continuously adapt our product portfolio of about 600 products to customer and industry specifications, while ensuring that we meet the highest quality specifications.

From its in-house production facilities, UTP Maintenance delivers innovative, tailor-made welding filler metals for: unalloyed and fine-grained structural steel, low-grade alloyed steels, rust-proof, acid-proof, and heat-proof steels, nickel-based alloys, cast iron, copper and copper alloys, manganese steels, tool steels, and cobalt alloys.

The product portfolio comprises:

- » **Stick electrodes**
- » **Solid wires and rods**
- » **Flux-cored wires**
- » **Submerged arc wires and fluxes**
- » **Submerged arc strips and fluxes**
- » **Spraying and PTA-powders**

### Solutions at Every Point on the Globe

UTP Maintenance provides products and services through the global branches of voestalpine Böhler Welding and its dealer network in more than 150 countries throughout the world. A team of welding engineers stand at the customer's side, providing advice and support in all matters related to the challenges of welding technology.

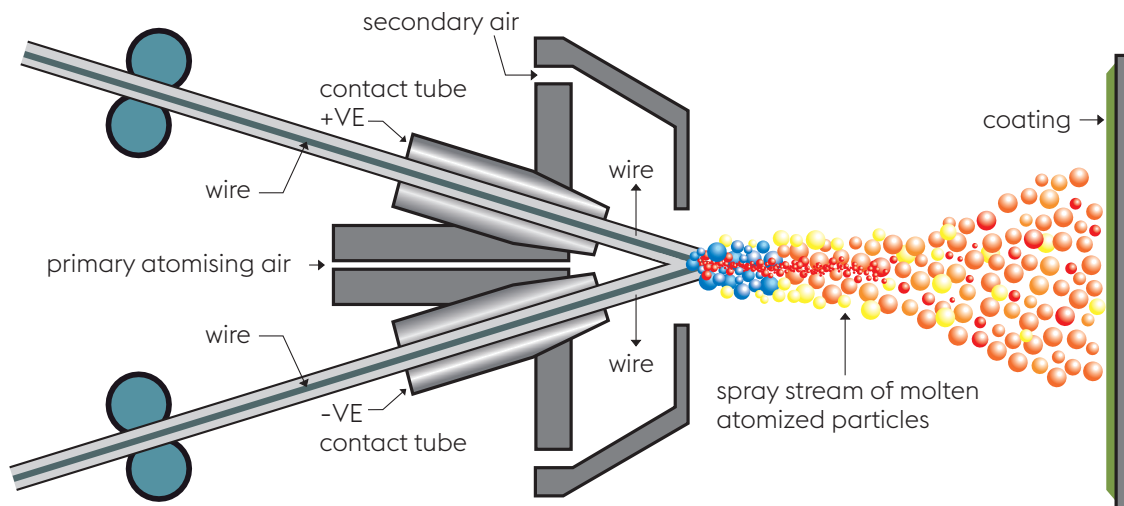
# THERMAL ARC SPRAYING

## Arc spraying with cored wires

Arc spraying is a high productivity thermal spraying process reaching 10-25 kg/h. An electric arc (DC) ignites between two independent continuous moved cored wires that form the spraying material. Compressed air atomizes the molten spraying material into fine droplets and propels them with high speed towards the substrate.

The process is easy to operate and can be used either manually or in an automated manner. The spraying technology is a growing market and fulfils the technical market tendency to protect valuable components with thin, high quality surface layers in a very competitive time.

Product characteristics	User benefits
» Higher productivity compared to weld overlay	» <b>Faster and cost efficient</b> » <b>Less downtime</b>
» No thermal deformation	» <b>No cost for material strengthening and heat treatment</b>
» Possibility of special alloy compositions	» <b>Specific corrosion resistance in combination to wear resistance</b>
» Use of conventional spraying power sources	» <b>Low capital investment and therefore quick return on investment</b>
» Welder-friendly spray arc operation	» <b>Lower risk of spraying defects</b>
» All position spraying	» <b>Easy handling</b>



# ARC SPRAYING CORED WIRES

Product name	Low stress abrasion	High stress abrasion	Corrosion	Heat and oxidation
<b>Abrasion resistant Fe basis; CrC</b>				
SK 235-M			•	•
SK 255-M		•		
SK 260-M			•	
<b>Corrosion resistant Fe-basis</b>				
SK 420-M			•	
<b>Corrosion and heat resistant Ni-basis</b>				
SK 625-M				•
SK 825-M			•	•
SK 830-MF	•		•	•
SK 840-MF			•	
SK 858-M			•	•
<b>Corrosion, abrasion and heat resistant Ni-basis</b>				
SK 888-M		•	•	•
SK 900-MF		•	•	•
SK 868-M			•	•
<b>Corrosion, abrasion and heat resistant Co-basis</b>				
SK STELKAY 6T- M		•	•	•
SK STELKAY 12T- M		•	•	•
SK WINI WIKO		•	•	•
<b>Non ferrous</b>				
SK OXY-M			•	•

Sealers on request and special product combinations on request

# ARC SPRAYING CORED WIRES

Product name	C	Si	Mn	Cr	Mo	Ni	B	Fe	Other	Hardness
<b>Abrasion resistant / Fe basis; CrC</b>										
SK 235-M	0.25	1.5	1.6	25.6			3.3	bal.		600 HV0.3
SK 255-M	4.5	1.3	0.7	26			0.3	bal.		42 - 47 HRC
SK 260-M	2	0.3	0.5					bal.	Al = 4.4	
<b>Corrosion resistant / Fe-basis</b>										
SK 420-M	0.3	0.1	0.4	13				bal.		300 HV0.3
<b>Corrosion and heat resistant / Ni-basis</b>										
SK 625-M	0.01	1.6	0.9	22	8.5	bal.		2.1	Nb = 3.3	240 - 300 HV0.3
SK 825-M	0.01	0.1	0.1		5.0	bal.			Al = 5.0	150 - 200 HV0.3
SK 830-MF	0.04	2.58	0.11	0		bal.	2.6			240 - 300 HV0.3
SK 840-MF	0.7	2.7	0.10	10.6		bal.	2.50			400 - 450 HV0.3
SK 858-M	0.01	0.1	0.1			bal.			Al = 5.0	300 - 350 HV0.3
SK NiCrAlY	0.02	0.4	0.04	19.5		bal.			Al = 10.5 Y = 0.8	250 - 400 HV0.3
<b>Corrosion. abrasion and heat resistant / Ni-basis</b>										
SK 888-M	0.80	3.0	0.17	16.0		bal.	2.80	1.00	W = 15	500 - 600 HV0.3
SK 900-MF	1.1	2.5	0.1	24		bal.	2.7		W = 22	800 - 900 HV0.3
SK 868-M				45		bal.			Ti = 4	
SK STELKAY 6T-M	0.95	1.4	0.8	30				3.0	W = 4.2 Co = bal	
SK STELKAY 12T-M	1.15	1.8	0.9	29				3	W = 6.5 Co = bal	
WINI WICO	0.15	3.0	0.5	27		32.0	2		Co = bal.	350 - 400 HV0.3
<b>Non ferrous</b>	<b>ZrO<sub>2</sub>/Y<sub>2</sub>O<sub>3</sub></b>	<b>Al<sub>2</sub>O<sub>3</sub></b>	<b>Cr<sub>2</sub>O<sub>3</sub></b>							
SK OXY-M	35	35	30			bal.				650 - 1000 HV0.3

Characteristics and field of use	Applications
Chromium alloyed cored wire for arc spraying producing a hard abrasive and corrosion resistant coating up to service temperatures of 900 °C.	<ul style="list-style-type: none"> <li>» Coal fired boilers and whenever more than the usual spraying thickness is requested</li> <li>» Screws, pistons, shafts, seals</li> </ul>
Cored wire designed for spraying of applications submitted to heavy abrasion solicitations; low coefficient of friction to substitute Cr-layer.	<ul style="list-style-type: none"> <li>» Valve shafts</li> <li>» Pistons</li> <li>» Bearings</li> <li>» Plungers</li> </ul>
Exclusively for arc spraying which will provide an extreme. Rough non-skid surface.	<ul style="list-style-type: none"> <li>» Decks of ships</li> <li>» Offshore oil rigs</li> <li>» Stairways</li> <li>» Catwalks</li> <li>» Textile industry for wrap up fabrics</li> </ul>
Chromium alloyed cored wire exclusively developed for arc spraying of applications requiring to ensure a fair corrosion and/or oxidation resistance. Resistant against severe surroundings.	<ul style="list-style-type: none"> <li>» Chemical and food industry</li> <li>» Pistons</li> <li>» etc.</li> </ul>
High corrosion resistant against acid and chlorides. Resistant against oxidation and hot gas corrosion.	<ul style="list-style-type: none"> <li>» Various application in the field of oil and gas and in the chemical industry</li> </ul>
Excellent properties caused by exothermic reaction also as bond coat.	<ul style="list-style-type: none"> <li>» To be applied in boilers for biomass A1 - A4</li> </ul>
Spraying wire with subsequent fusion. For high oxidation; heat and corrosion resistant environments.	<ul style="list-style-type: none"> <li>» Bond coat especially developed for SK 840-MF</li> </ul>
Developed for spraying with subsequent fusion; high oxidation; heat and corrosion resistant. As well resistant against abrasion.	<ul style="list-style-type: none"> <li>» Exhaust hoods &amp; chimneys</li> </ul>
Bond coat corrosion resistant environment.	<ul style="list-style-type: none"> <li>» Biomass boiler</li> </ul>
The ideal bond coat for SK OXY-M with excellent characteristics.	<ul style="list-style-type: none"> <li>» Bond coat for various spraying consumables</li> </ul>
Spraying wire to be used in very extreme corrosion and abrasion atmosphere and extreme temperatures.	<ul style="list-style-type: none"> <li>» Overheater pipes in biomass boilers</li> </ul>
Spraying wire to be used in very extreme abrasion combined with corrosion.	<ul style="list-style-type: none"> <li>» Hammers, cutters, knives in the cement and the brick industry</li> </ul>
	<ul style="list-style-type: none"> <li>» Conveyer in wood industry</li> <li>» Parts with highest wear resistance requirements</li> </ul>
Arc spraying wire designed for atmosphere conditions in biomass and waste boilers.	<ul style="list-style-type: none"> <li>» Biomass and waste to energy boilers for special requirements</li> </ul>
To be used when excellent resistance to metal-metal wear. oxydation. High temperature and corrosive environments must be considered.	<ul style="list-style-type: none"> <li>» Valves in the power industry</li> <li>» Forging and mixing tools</li> <li>» Risers</li> </ul>
To be used when excellent resistance to metal-metal wear. oxydation. High temperature and corrosive environments must be considered.	<ul style="list-style-type: none"> <li>» Valves in the power industry</li> <li>» Forging and mixing tools</li> <li>» Risers</li> </ul>
Arc spraying wire designed for atmosphere conditions in biomass and waste boilers.	<ul style="list-style-type: none"> <li>» Biomass and waste to enboilers</li> </ul>
Special oxides blend to combine wear. oxydation and corrosion resistance and to withstand hot erosion (25 % better hot erosion performance). Use bond coat NiCrAlY FCW.	<ul style="list-style-type: none"> <li>» Cooling pannels of fume extraction units of electric arc furnaces</li> </ul>

# ENVIRONMENT AND UP TO DATE TECHNOLOGIES DO NOT EXCLUDE EACH OTHER

Moreover, technology does support our efforts to save the environment by applying thermal arc spray technology in connection with voestalpine Böhler Welding spraying consumables.

Recent requirements coming from a worldwide trend to protect environment and to manage the increasing the pressure from the market on productivity and efficiency have led us to develop spraying wires that lead to higher lifetime of our customers' machines and production facilities and to a high flexibility when using arc-spraying technique.

In former times, thermal spraying was applied for more or less maintenance and repair purposes only. More and more arc spraying technology is adopted to new technologies such as biomass boiler spraying on new boilers and on new production of components and equipment in order to achieve high performance and durability before tools or parts are worn out.

## Thermal arc spraying is used in many different industries nowadays

### Steel industry

Applicable regulations require dust reduction during steel production of fumes values down to lower  $10 \text{ mg/m}^3$ . Therefore arc spraying can be applied e.g. on water-cooled ducts of EAF's or on dust combustion units of conventional BOF's. As well, drop boxes and further cooling panels and smoke collectors.

For that purpose voestalpine Böhler Welding developed a ceramic containing arc wire SK OXY-M and a special bond wire SK NiCrAlY. For further exposed parts e.g. in sinter plants our SK 900-M is an excellent material. Especially when it comes to thick coatings.



### Power generation

Thermal spray coating is widely used in power generation plants including biomass power generation.

The main reason is to protect units e.g. heat exchanger like boiler walls and super heater against corrosion and erosion in connection with high temperature. The spraying wires used are mostly NiCrMo alloys for biomass boilers and FeCr alloys for coal fired boilers. Nickel based spraying wires such as SK 840-M and SK 825-M will help to achieve requested service life times.

NiCrMo alloys with additions of tungsten like SK 888-M are used when it comes to super heaters, which are exposed to extremely high temperature together with erosion and corrosion. For valves cobalt based cored wires like e.g. SK Stelkay 6-G are used.





## Several industries and applications

### Steel structures

For example SK260M provides a non skid surface coating for protection of ship decks, offshore platforms, stairways etc

### Mechanical engineering

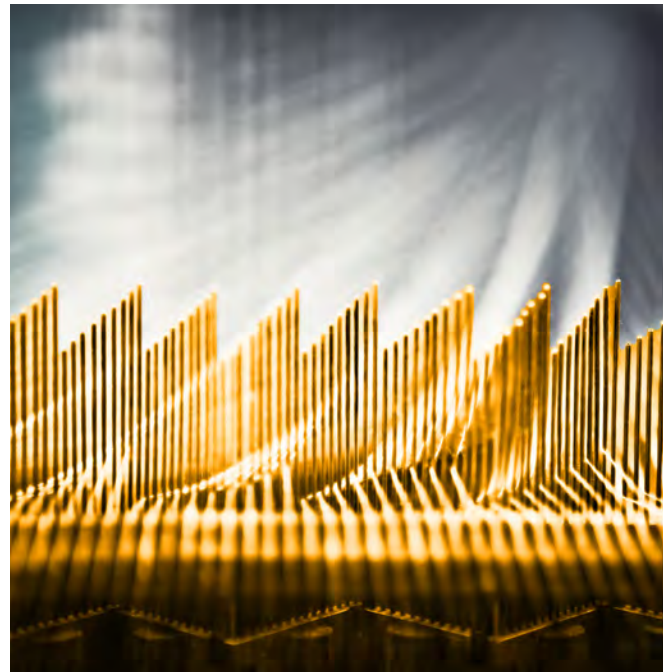
Thermal spraying coatings are widely used in order to provide specific surface properties such as wear and corrosion protection, heat protection, electrical insulation.

Therefore voestalpine Böhler Welding developed a different mixed product portfolio starting with arc spraying wires based on FeCrC for abrasion and erosion, high alloyed wires for protecting lesser alloys against corrosion and special nickel based wires for high temperature corrosion. For special coatings cobalt based wires and ceramic containing wires as listed in table on page 6.

### Textile industry

Various wear resistant coatings are used in machines resp. machine parts in the textile industry.

In order to optimize the production and to meet requested surface quality in connection with getting no electrostatically charging coatings of ceramic oxides are used. Our SK OXY-M used with the special nickel based wire SK NiCrAlY-M will fulfill these requirements



# PACKAGING

UTP Maintenance cored wires are available available in dia. 1,6 mm on wire basket BS300 spools and in drums.

## Basket wire spool BS300



Wire weight:	10 kg
Ø external:	300 mm
Ø inner:	52 mm
Width:	110 mm
Material:	Steel wire coated
Use:	Disposable

## Cardboard Drums



Weight:	150 kg
Height:	510 mm
Ø external:	585 mm

# JOIN! voestalpine Böhler Welding

With over 100 years of experience, voestalpine Böhler Welding is the global top address for the daily challenges in the areas of joint welding, repair, hardfacing and cladding as well as brazing. Customer proximity is guaranteed by more than 40 subsidiaries in 25 countries, with the support of 2,200 employees, and through more than 1,000 distribution partners worldwide. With individual consultation by our application technicians and welding engineers, we make sure that our customers master the most demanding welding challenges. voestalpine Böhler Welding offers three specialized and dedicated brands to cater our customers' and partners' requirements.



**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.



**Tailor-Made Protectivity™** – UTP Maintenance ensures an optimum combination of protection and productivity with innovative and tailor-made solutions. Everything revolves around the customer and their individual requirements. That is expressed in the central performance promise: Tailor-Made Protectivity™.



**In-Depth Know-How** – As a leading brand of soldering and brazing consumables, Fontargen Brazing offers proven solutions based on 50 years of industrial experience, tried and tested processes and methods. This In-Depth Know-How has made Fontargen Brazing an internationally preferred partner for every soldering and brazing task.

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)



