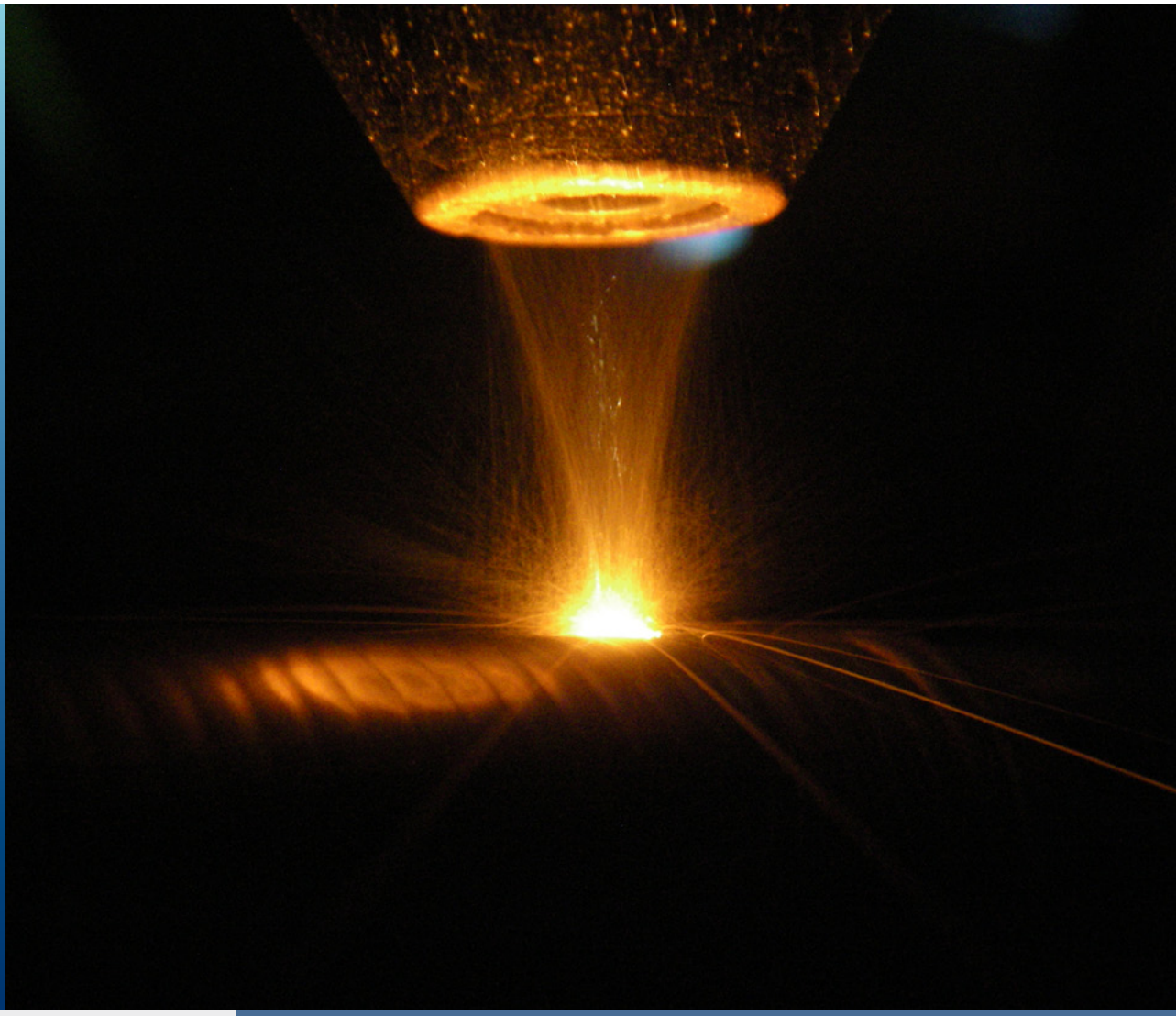
DURUM
VERSCHLEISS-SCHUTZ GMBH



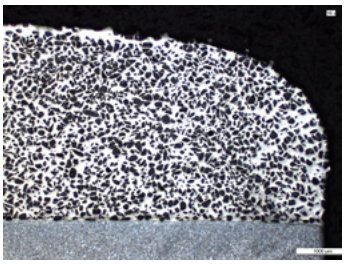
www.durmat.com

DURMAT® Powders and Wires

for Laser Hard-facing

Company

WEAR SOLUTIONS
With Creative Ideas for Practical Solutions



DURUM VERSCHLEISS-SCHUTZ GMBH was established in 1984 as a manufacturer of advanced hard-facing products. Today DURUM has production and service centres in Brazil, France and the USA and exports to more than 80 countries all over the world!

DURUM provides high performance products for Welding and Thermal Spraying. DURUM is a global market leader in the supply of specialized overlaying consumables that can be applied by a range of processes including: Flux-Cored Wire Welding, Plasma Transferred Arc (PTA) Welding, Laser Powder and Wire Welding, Oxy-acetylene Welding, Thermal Spraying.

Besides Willich (Germany) DURUM Group maintains production and workshop facilities in Brazil (São Paulo), France (Saint Victor) and the USA (Houston TX). We also support a network of independent agencies throughout the world. We meet demanding requirements of today's industry with a wide array of Welding and Thermal Spray technologies.

The company employs national and international PhD's; welding engineers and independent experts from well known and respected universities, which ensures that constant material and process development is achieved to the highest standards.

DURUM focuses on "continuous development" and sets a significant annual budget aside for research and development including new product development, product enhancement and the development of highly specialised solutions to the most challenging applications in the industry.

TÜV CERT
DIN EN ISO 9001:2008
Cert. No.: 01 100 040463

- Tungsten Carbide Rods for Oxy-acetylene Welding
- Stellite* - Flux-Cored Wires
- Nickel-, and Iron-based Flux-Cored Wires
- FCAW wires with Tungsten Carbide
- Tungsten Carbides, Complex Carbides and Chromium Carbides for manual Arc Welding
- PTA Welding Powders, Fe-Ni-Co based Powders and special qualities

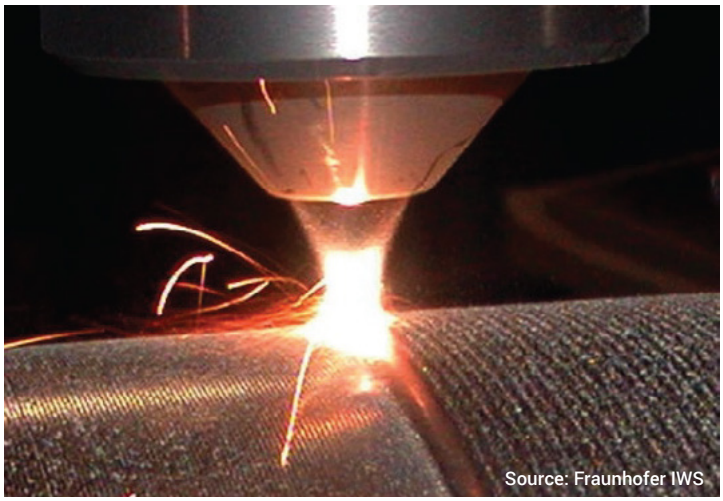
** Stellite is a registered trademark of Kennametal Stellite*

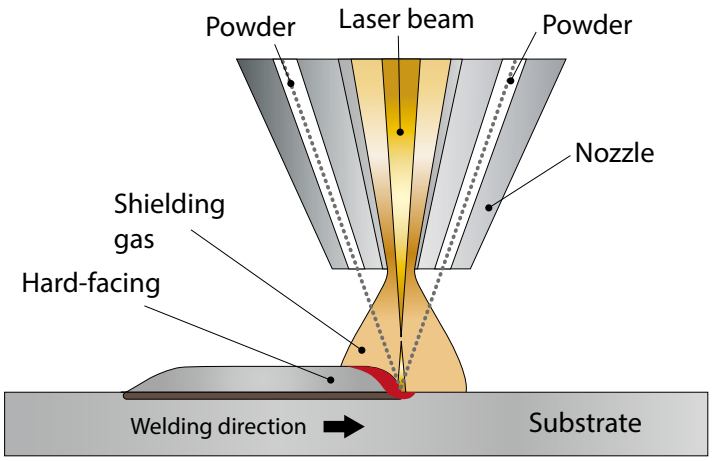
- PTA machines, torches and powder feeders
- Powders and Wires for Laser Cladding
- Powders for Oxy-acetylene Welding and Spraying
- Fused Crushed and Spherical Fused Tungsten Carbides
- Pre-manufactured replacement wear parts
- Tungsten Carbide Wear Plates
- Wear Plates with Chromium Carbides and Complex Carbides
- Thermal Spray Powders (conforming to DIN EN 1274)
- Thermal Spray Wires (conforming to DIN EN 14919)

Basics: Laser-Powder Hard-facing

Laser-Powder Hard-facing

Laser-powder hard-facing produces a high quality coating having low porosity and good surface uniformity. Moreover, laser cladding transfers minimal heat into the part which minimizes distortion and dilution between base material and hard-facing. The typical dilution rate is less than 10 % (depending on parameters). Due to the low dilution rate the process minimizes the loss of alloying elements or hardening of the base material. Laser-powder hard-facing focuses and controls weld depth, offering a clean metallic bond with minimal heat affected zone and fine grain structure, which tends to improve the resistance against corrosion and abrasion. During laser-powder hard-facing a laser beam slightly melts the surface of a metal part. The filler material as powder is fed by a gas stream towards this interaction zone of laser and melt pool. Thereby, a metallurgical bond, pore free layer with minimal dilution is formed. Deposition rates are up to 8 kg/hour, and surfacing thickness ranges from 0.5 to more than 4 mm.





Powder Particle Distribution

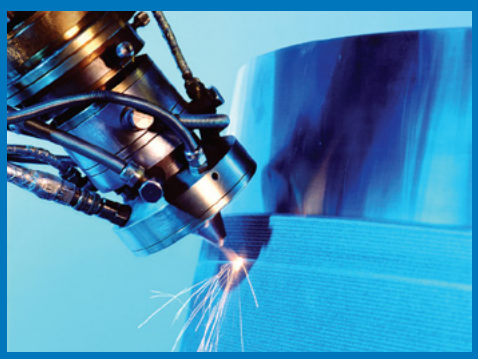
All powders in this guide reflect nominal powder particle size distributions. The majority of powder particles by weight is within the stated size range. Only a small amount being coarser or finer. In general, particles larger or equal to 45 µm are measured by sieve analysis (ASTM B214).

DURMAT® LAS Powders are available in standard grain size distribution **LS** (- 90 / + 45 µm), **LM** (- 125 / + 45 µm) and **LH** (- 160 / + 63 µm). Other grain size distributions are available on request.

Standard Grain Size Distribution		
LS	**LM**	**LH**
-90 / +45 µm	-125 / +45 µm	-160 / +63 µm

Repair welding

Automatic welding of knives



Laser cladding of shafts

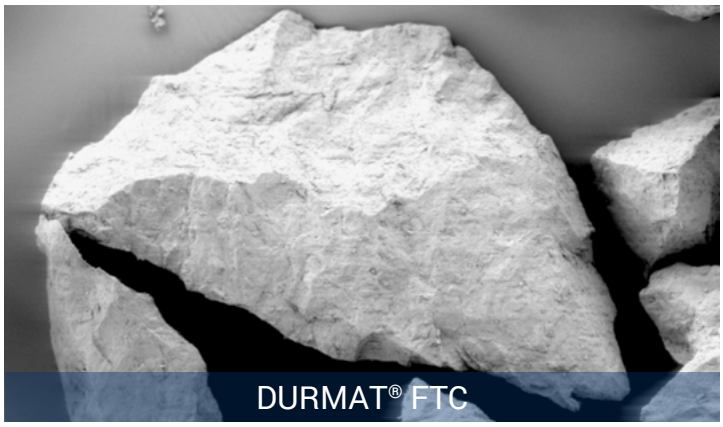
DURMAT® FTC

General information:
Fused Tungsten Carbide (FTC) is an extremely hard, wear resistant material. Its abrasion resistance is superior in terms of wear resistance to all other commercially available materials except diamond. It is far superior to any of the chromium carbide products presently in use and will always deliver very positive test results by comparison. This material forms the basis of all DURUM's abrasion-resisting products.

The properties of the FTC are very much dependent on its structure. FTC which demonstrates at least an 80 % "feather" structure has a macro-hardness of approximately 2,000 HV_{30}. The micro-hardness of this material has been measured at 2,300 - 2,500 $HV_{0.1}$.

FTC has a carbon content of 3.8 - 4.1 %. This corresponds to a ratio of 78 - 80 % W_2C and 20 - 22 % WC. Careful attention must be paid during the processing and application of products containing FTC, that the temperature does not exceed 1,800 °C. Higher temperatures would cause an alteration in the structure resulting in a loss of hardness. If this excessive overheating occurs during the welding procedure, an unproportionately high amount of FTC will be dissolved in the iron matrix, which would also result in a reduction of the material's superior ability to resist wear.

Product	-	DURMAT® FTC	DURMAT® SFTC
Alloy type	-	WC - W_2C	WC - W_2C
Parameter	Unit	Typical data	
C-total	%	3.8 - 4.1	3.8 - 4.1
C-free	%	0.1 max.	0.1 max.
O_2 sieve range	%	0.05 max.	0.05 max.
O_2 sub sieve range	%	0.2 max.	0.2 max.
Fe	%	0.3 max.	0.3 max.
Co	%	0.3 max.	0.3 max.
Hardness	$HV_{0,1}$	2,360	3,000
Structure	-	mainly feather	fine
Density	g/cm³	16 - 17	16 - 17
Melting point	°C/°F	2,860/5,176	2,860/5,176

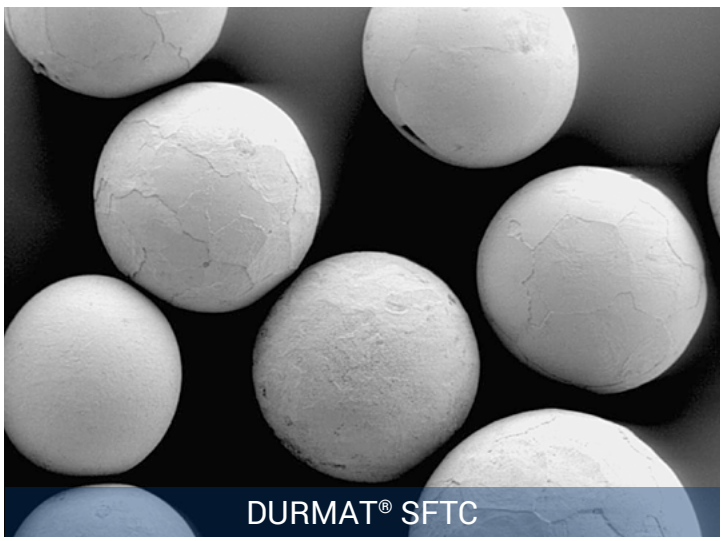

DURMAT® FTC

DURMAT® SFTC

General information:
DURMAT® Spherical Fused Tungsten Carbide (SFTC) is the most wear resistant Fused Tungsten Carbide we can offer.

These spherical fused tungsten carbide particles show a fine non-acicular structure with a higher hardness than conventional FTC (> 3,000 $HV_{0.1}$). The increased apparent density combined with a better flowability enables an increase of hard particles in wear resistant coatings and components produced by infiltration.

Using powder metallurgical processes, it is possible to produce parts of nearly any shape, which can contain hard materials or diamonds together with a metal binder and SFTC, reinforcing the hardness of diamond tools. Excellent for deep well drilling tools and rods, crusher jaws, mixers, concrete & stone saws, hot-pressed tools, screens & conveyors, extrusion housings and hard additives to diamond bits and saws.


DURMAT® SFTC

DURMAT® RF 13

According to their outstanding mechanical properties, hard-facing alloys based on Tungsten Carbide and cobalt take a central position in wear protection. The high demands, which are placed on the wear resistance of such alloys these days, have led to increasingly finer micro structures with optimized compositions, allowing improved, higher performance alloys to be achieved.

Their characteristic, fine-structured composition with crystallite grain sizes of max. 400 nm is their trademark and a guarantee for high wear resistance. Compared to common Tungsten Carbide-Cobalt alloys we have achieved better wear resistance, by using a smaller WC structure. Our DURMAT® RF 13 development using fine-structured WC has resulted in hardness of approximately 1,750 $HV_{0.5}$.

The higher hardness of the nano-scale hard-facing alloy associated with the decreasing WC grain size reduces wear from abrasion considerably. The harder "hard metal" counters abrasion with a greater resistance. Wear progresses significantly slower, as the binding metal layer between the fine grain hard-facing crystallites is exceptionally thin, making it harder to wash out. Due to this structural attribute, only very small hard-facing particles are torn out.

The spherical shape represents a further form of protection, which is further stabilized by the small grain size; a lot more energy has to be applied for fragmentation of small particles compared to large particles due to the presence of less defects.

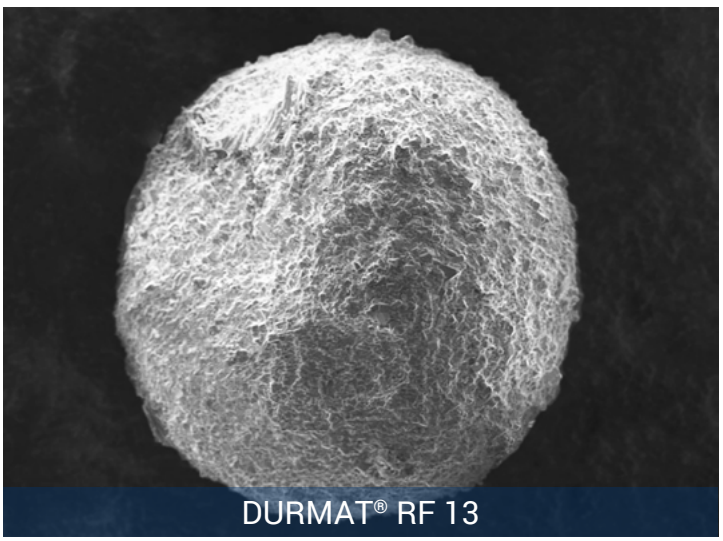
A characteristic, higher wear resistance also occurs with regard to corrosive wear. As a result of the nano-structure and in particular the significantly reduced intermediate binding metal layer, the corrosive media can only reach the cobalt with difficulty, leading to considerable delays in wear. In turn, only the smallest hard-facing particles escape, corrosion is slowed down considerably.

DURMAT® MCWC

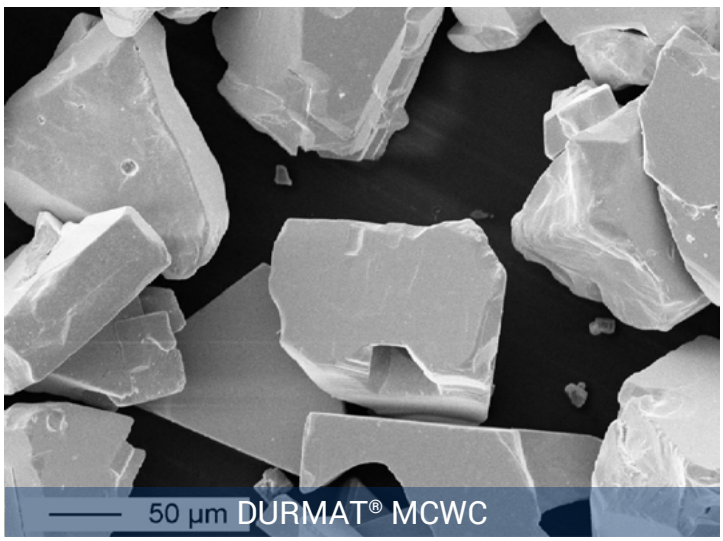
The Macro-Crystalline Tungsten Carbide (DURMAT® MCWC) is a fully carburized stoichiometric compound with a carbon content of 6.14 % by weight.

Based on its stable single-phase micro-structure, nearly no dissolution of the Macro-Crystalline Tungsten Carbides is observed after the welding process. MCWC has good weldability with nickel-based alloys during the PTA application process. The thermodynamically more stable MCWC has a blocky shape with low decarburization during processing.

The carbide hardness amounts 1,700 - 2,000 $HV_{0.1}$. The DURMAT® MCWC can stay in service up to 500 °C (930 °F).



DURMAT® RF 13



50 µm DURMAT® MCWC

DURMAT® NiCrB - Matrix Alloys

Laser metal powders for wear resistant hard-facings.

General characteristics*:
DURMAT® NiCrB - Matrix powder have an excellent resistance to wear, heat and corrosion. Based on the low friction coefficient and selected hardness, NiCrB-coatings have excellent gliding properties on high tensile strength steels. Due to the low melting point (approx. 1,020 - 1,080 °C) the powders show a very good weldability and can be applied with low energy. They are in use for hard-facing of conveyor screws, wear rings or parts for the glas industry, e.g. glass moulds or for buffer layers. The powders can be mixed with Fused Tungsten Carbide DURMAT® FTC, Spherical Fused Tungsten Carbide DURMAT® SFTC, Macro-crystalline Tungsten Carbide DURMAT® MCWC and/or DURMAT® RF 13 to provide maximum wear resistance.

DURMAT®	Cr-Content**	Grain size	Structure	Hardness
833 LAS	4 - 7 %	LS / LM / LH	Ni-Cr-Boride	29 - 33 HRC
855 LAS	13 - 17 %	LS / LM / LH	Ni-Cr-Boride	51 - 56 HRC
856 LAS	6 - 9 %	LS / LM / LH	Ni-Cr-Boride	37 - 41 HRC
857 LAS	13 - 17 %	LS / LM / LH	Ni-Cr-Boride	57 - 61 HRC
858 LAS	11 - 15 %	LS / LM / LH	Ni-Cr-Boride	47 - 51 HRC

** by weight %

DURMAT® NiB - Matrix Alloys

Laser metal powders for wear resistant hard-facings.

General characteristics*:
DURMAT® NiB - Matrix powders have similar properties to DURMAT® NiCrB powders, but they are Cr-free. The low melting point of such alloys minimizes the carbide dissolution. The powders are resistant to heavy abrasion and heat. Its extreme hardness allows for excellent sliding on high tensile strength steels. The powders can be mixed with Fused Tungsten Carbide DURMAT® FTC, Spherical Fused Tungsten Carbide DURMAT® SFTC, Macro-crystalline Tungsten Carbide DURMAT® MCWC and/or DURMAT® RF 13 to provide maximum wear resistance.

DURMAT®	Type	Grain Size	Structure	Hardness
830 LAS	NiSF	LS / LM / LH	Ni-Boride	≈ 30 HRC
840 LAS	NiSF	LS / LM / LH	Ni-Boride	≈ 40 HRC
859 LAS	NiSF	LS / LM / LH	Ni-Boride	≈ 50 HRC

DURMAT® NiCrB-TC Blends

Laser metal powders for wear resistant hard-facings.

General characteristics*:
Depending on application DURMAT® NiCrB-TC powders can contain a high volume of Tungsten Carbides, such as Fused Tungsten Carbide DURMAT® FTC, Spherical Fused Tungsten Carbide DURMAT® SFTC, Macro-crystalline Tungsten Carbide DURMAT® MCWC and/or DURMAT® RF 13. Due to the high Tungsten Carbide content, the powder is extremely resistant against abrasion and erosion.

DURMAT®	Type	Grain Size	Carbide Content**	Matrix Hardness
863 LAS	NiCrB - DURMAT® SFTC	LS / LM / LH	60 %	38 - 42 HRC
865 LAS	NiCrB - DURMAT® SFTC	LS / LM / LH	60 %	50 - 52 HRC
879 LAS	NiCrB - DURMAT® FTC	LS / LM / LH	60 %	58 - 61 HRC
884 LAS	NiCrB - DURMAT® MCWC	LS / LM / LH	60 %	30 - 33 HRC
885 LAS	NiCrB - DURMAT® MCWC	LS / LM / LH	60 %	50 - 52 HRC
810 LAS	NiCrB - DURMAT® RF 13	LS / LM / LH	60 %	38 - 42 HRC

** by weight %

DURMAT® NiB-TC Powders, blends

Laser metal powders for wear resistant hard-facings.

General characteristics*:
Depending on application DURMAT® NiB-TC powders can contain a high volume of Tungsten Carbides, such as Fused Tungsten Carbide DURMAT® FTC, Spherical Fused Tungsten Carbide DURMAT® SFTC, Macro-crystalline Tungsten Carbide DURMAT® MCWC and/or DURMAT® RF 13. Due to the high Tungsten Carbide content, the powder is extremely resistant against abrasion and erosion.

DURMAT®	Type	Grain Size	Carbide Content**	Matrix Hardness
861 LAS	NiB - DURMAT® FTC	LS / LM / LH	60 %	48 - 51 HRC
862 LAS	NiB - DURMAT® SFTC	LS / LM / LH	60 %	48 - 51 HRC
893 LAS	NiB + Special Blend DURMAT® FTC/SFTC	LS / LM / LH	60 %	≈ 50 HRC

* by weight %

DURMAT® NiCrMo - Alloys and TC-Blends

Laser metal powders for wear resistant hard-facings.

General characteristics*:
DURMAT® NiCrMo -Matrix powders have an excellent resistance to corrosion (e.g. in acids with chloride content) and oxidation. The coatings show high ductility. The main application field is surfacing of components for the chemical industry, components for off-shore operations, oil exploration, valves and fittings. The powders can be mixed with Fused Tungsten Carbide DURMAT® FTC and/or Spherical Fused Tungsten Carbide DURMAT® SFTC to provide maximum wear resistance.

DURMAT®	Type	Grain size	Carbide Content**	Matrix Hardness
875 LAS	NiCrMoNb	LS / LM / LH	-	≈ 250 HV
876 LAS	NiCrMo	LS / LM / LH	-	≈ 250 HV
841 LAS	NiCrMoNb + FTC	LS / LM / LH	50 %	≈ 55 HRC
842 LAS	NiCrMoNb + SFTC	LS / LM / LH	50 %	≈ 58 HRC

** by weight %

DURMAT® FeCrMn - Alloys

Laser metal powder for high adhesive strength and Resistant Hard-facings.

General characteristics*:
DURMAT® Fe - Laser powders have a high ductility and crack resistance. CrNiMo-alloys with less carbon or impact-resistant austenitic alloys with Mn and Cr are also suitable as a buffer layer.

DURMAT®	Type	Grain Size	Structure	Hardness
816 LAS	FeCrMn	LS / LM / LH	CrNiMo-Alloy	215 HB
820 LAS	FeCrMn	LS / LM / LH	CrMn-austenitic	170 / 400* HB
825 LAS	FeCrMn	LS / LM / LH	CrMn-austenitic	250 / 500* HB

* after work hardening

DURMAT® FeCrVC - Alloys

Laser metal powder for high adhesive strength and Resistant Hard-facings.

General characteristics*:
DURMAT® FeCrVC - Laser powders are highly resistant to fine abrasion and impact. The iron based matrix alloy can be martensitic, chromium-martensitic according to the requirements. FeCrVC-coatings show a homogeneous and fine distribution of vanadium carbide (≈ 2,900 $HV_{0.1}$) in a martensitic matrix. To provide maximum wear resistance DURMAT® 846 and 847 contain additional VC particles.

DURMAT®	Type	Grain Size	Structure	Hardness
845 LAS	FeCrVC	LS / LM / LH	Martensitic	55 - 60 HRC
846 LAS	FeCrVC	LS / LM / LH	Martensitic, blend	58 - 62 HRC
847 LAS	FeCrVC	LS / LM / LH	Martensitic, blend	60 - 65 HRC
818 LAS	FeCrVC	LS / LM / LH	Martensitic, free Cr	58 - 60 HRC

Hard-facing Co-Alloys and Co-TC Blends

DURMAT® Co - Alloys

Cobalt based alloys for laser hard-facing.

General characteristics*:

DURMAT® cobalt base alloys contain the elements of cobalt, chromium and carbon as main parts. Additives of molybdenum, tungsten and nickel are added to these depending on alloy type and application. DURMAT® Cobalt-base hard alloys have a high resistance to adhesion, abrasion, erosion, thermal shock, cavitation, gliding etc. They are preferably used at higher temperatures because they retain their hardness and wear-resistance. Overlays are additionally resistant against oxidation, corrosion and tindering.

DURMAT®	Grain Size	Structure	Hardness
S1 LAS	LS / LM / LH	Co-Cr-W	51 - 60 HRC
S6 LAS	LS / LM / LH	Co-Cr-W	40 - 46 HRC
S12 LAS	LS / LM / LH	Co-Cr-W	43 - 53 HRC
S21 LAS	LS / LM / LH	Co-Cr-Mo-Ni	27 - 40 HRC
S190 LAS	LS / LM / LH	Co-Cr-W-Ni	55 - 60 HRC

DURMAT® Co-TC - Alloys

Cobalt based alloys with hard alloying elements for laser hard-facing.

General characteristics*:

DURMAT® Co-TC Alloys were developed for applications, in which extreme wear is combined with high temperatures and corrosive media. Their chemical composition accounts for the excellent dry-running properties of DURMAT® Co-TC Alloys and makes them very suitable for use in adhesive wear situations. The powders are mixed with Fused Tungsten Carbide DURMAT® FTC, Spherical Fused Tungsten Carbide DURMAT® SFTC and DURMAT® RF 13 to provide maximum wear resistance.

DURMAT®	Type	Grain Size	Carbide Content**	Matrix Hardness
921 LAS	Co-Cr-W + SC	LS / LM / LH	20 %	43 - 53 HRC
922 LAS	Co-Cr-W + FTC	LS / LM / LH	60 %	43 - 53 HRC
923 LAS	Co-Cr-W + SFTC	LS / LM / LH	60 %	43 - 53 HRC
924 LAS	Co-Cr-W + RF13	LS / LM / LH	60 %	43 - 53 HRC
961 LAS	Co-Cr-W + SC	LS / LM / LH	20 %	40 - 46 HRC
962 LAS	Co-Cr-W + FTC	LS / LM / LH	60 %	40 - 46 HRC
963 LAS	Co-Cr-W + SFTC	LS / LM / LH	60 %	40 - 46 HRC
964 LAS	Co-Cr-W + RF13	LS / LM / LH	60 %	40 - 46 HRC

** by weight %

DURMAT®	Typical cemical composition of weld metal* (Wt.-%)								
	C [%]	Si [%]	Mn [%]	Cr [%]	W [%]	Mo [%]	Ni [%]	Fe [%]	Co [%]
S1 LAS	2.5	< 2	< 0.5	30	13	< 1	< 2	< 3	bal.
S6 LAS	1 - 1.2	< 2	< 0.5	28	4.5	< 1	< 2	< 3	bal.
S12 LAS	1.4	< 2	< 0.5	30	8	< 1	< 2	< 3	bal.
S21 LAS	0.25	< 2	< 0.5	27.5	-	5.4	< 3	< 3	bal.
S190 LAS	3 - 3.4	< 2	1	26	14	< 1	< 2	< 3	bal.

Basics: Laser-Wire Hard-facing

Laser Wire Welding

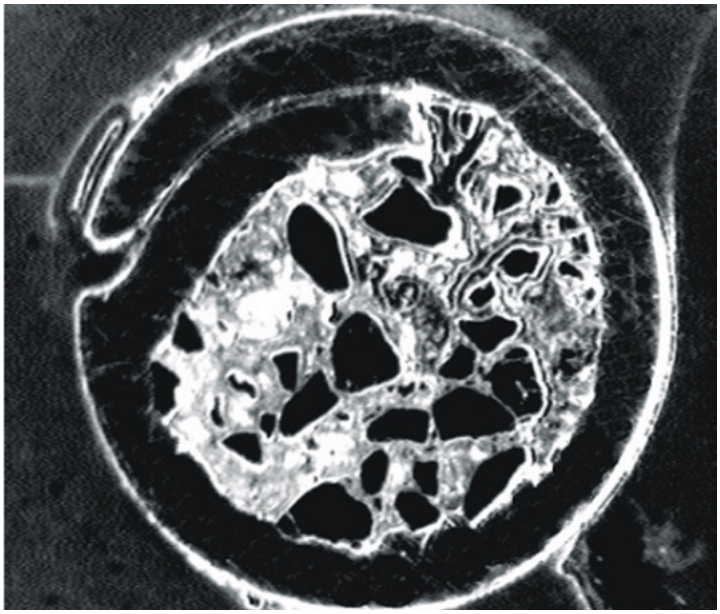
Laser hard-facing with cold wire or hot wire is used for hard-facing and repair of components and functionalization of surfaces. In this process, the laser beam melts the wire and the base metal, the melt bonds permanently and resolidifies until a small rise remains. Laser hot wire cladding is a welding process that combines a preheated wire with a laser beam, and offers many benefits, e.g. less dilution (< 5 %) and higher deposition rate at less laser power. Already in the 90s the laser wire cladding was investigated, in this case a CO_2-laser with lateral wire feeding, even hot wire technology, was used. Due to the limited performance of the CO_2-laser and the directionality an industrial application was rarely implemented. Because of the progress of diode lasers first direction-independent laser welding heads with axial wire feed have been designed and industrially implemented succesfully in the field of additive manufacturing, and as well for conventional cladding and hard-facing processes. This process is particularly economical, clean, and rework is limited to a minimum.

Various Flux-Cored Wires are available as filler materials. This enables the creation of functional layers according to the requirements for the coating. Compared to laser cladding by powder, the laser cladding by wire has some special advantages. Metal wires are cheaper than metal powders and wire feeding wastes less material than powder feeding.

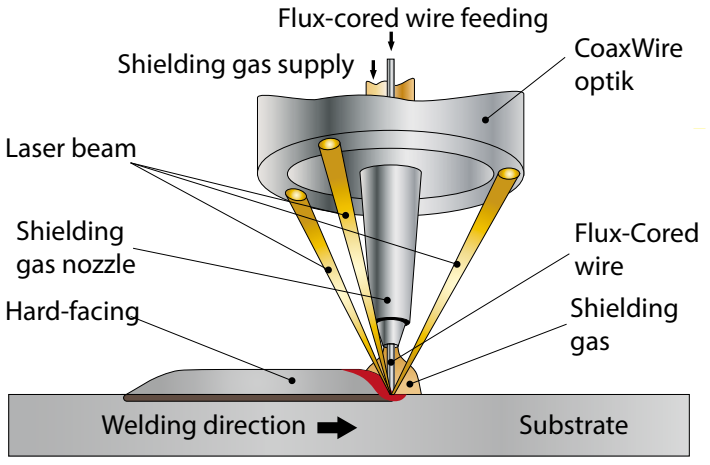
Flux-Cored Wire

Flux-Cored Wires largely increase the available material range. Flux-Cored Wires can be highly alloyed due to the variable powder filling. Flux-Cored Wires are not limited to alloys that can be homogeneously molten. Unique material and property combinations are possible by the use of different strip materials such as Fe-, Co-, Ni-strips and pre-alloyed strips. This includes Flux-Cored Wires combinations with normal metal powder filling, carbide filling or even oxide powder filling.

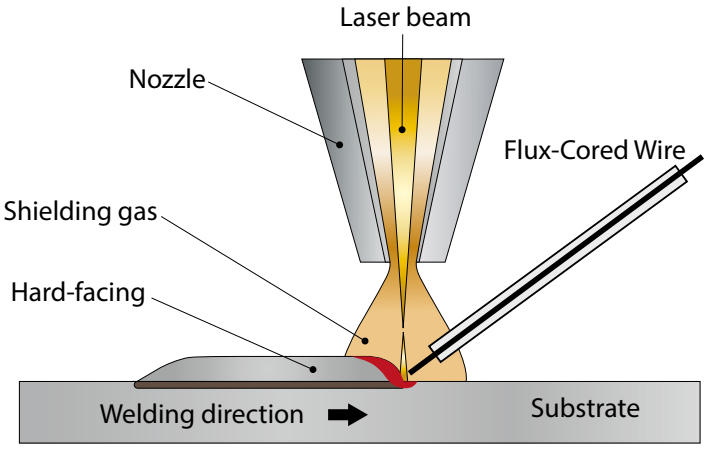
The flexibility of Flux-Cored Wires is nearly unlimited.



Coaxial Laser Wire Cladding

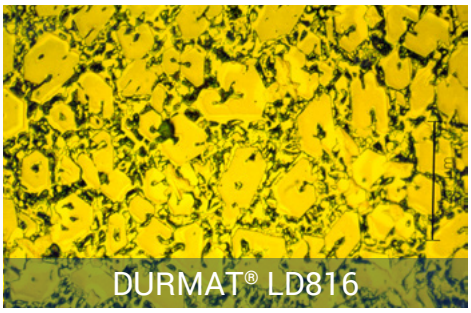


Laser Cladding with lateral wire feeding



Iron-based Flux-Cored Wires

Iron-based Flux-Cored Wires are combining very good functional properties with high productivity. They provide an excellent price-performance ratio and often offer the best solution for a variety of applications. Coatings can provide superior erosion/abrasion resistance even up to high temperatures and are readily used in several different industrial sectors.


DURMAT® LD816

Wear Resistant Alloys*

DURMAT® LD 816
DURMAT® LD 816 is a Nb-B alloyed iron-based Flux-Cored Wire with high content of carbon and chrome for abrasion and erosion protection. Hardness: 57 - 61 HRC

DURMAT® LD 868
DURMAT® LD 868 is an iron-based Flux-Cored Wire for abrasion and erosion protection. High amounts of chromium and chromium carbides provide good wear and oxidation protection. Hardness: 64 - 68 HRC

DURMAT® LD 839
DURMAT® LD 839 is an iron-based Flux-Cored Wire for abrasion and erosion protection. The high amount of complex carbide- and boride-phases increase the hardness and wear resistance in comparison to conventional hard-facing alloys. Hardness: 57 - 61 HRC

DURMAT® LD 850
DURMAT® LD 850 is an iron-based Flux-Cored Wire with a very high content of Fused Tungsten Carbide (FTC). It provides excellent abrasion and erosion resistance up to 540 °C.

Corrosion Resistant Alloys*

DURMAT® LD 813
DURMAT® LD 813 is an austenitic CrNiMo-stainless steel grade similar to Type 316. Coatings offer good resistance against organic and non-oxidizing acids and can be used for marine environments. Coatings have good machining properties.

DURMAT® LD 814
DURMAT® LD 814 is an low-shrinkage austenitic CrMn-Ni-stainless steel. Coatings offer good resistance against general corrosion and can be used for functional coatings and repairs. Coatings have good machining properties.

Special Alloys*

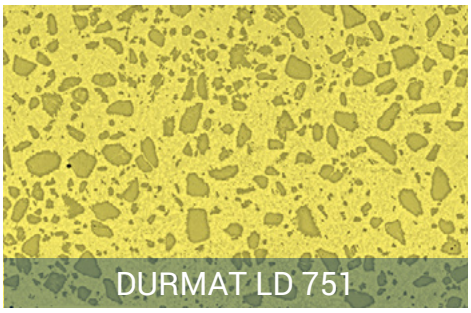
DURMAT® LD 836Ni
DURMAT® LD 836Ni is a Ni-, Fe-alloyed Flux-Cored Wire for welding and repair of cast iron. This alloy has an extremely low coefficient of thermal expansion. It can also be used for Additive Manufacturing.

DURMAT® LD 809
DURMAT® LD 809 is a Cr-alloyed Flux-Ccored-Wire for wear resistant hardfacing with a ferritic – martensitic micro structure. The welding deposit is high resistant against impact stress and medium abrasion. The deposit is despite the high hardness crack free also in multiple layers and can be used up to 700 °C. It can also be used for Additive Manufacturing. Hardness: 55 - 57 HRC

Nickel-based Flux-Cored Wires

Nickel-based Flux-Cored Wires are available for a broad range of applications. Coatings show a dense structural integrity and can provide very good resistance against corrosive attack. Most coatings tolerate elevated temperatures and are able to withstand oxidizing conditions.

Applications vary from self-fluxing coatings for combined abrasion and corrosion resistance to highly corrosion resistant alloys for the chemical or energy industry.


DURMAT LD 751

Corrosion Resistant Alloys*

DURMAT® LD 754
DURMAT® LD 754 is a NiCrMoW-Alloy for high corrosion protection, e.g. in acids with chloride content. Typical applications are the chemical industry, petrol chemistry and offshore industry.

DURMAT® LD 755
DURMAT® LD 755 is a nickel-based Flux-Cored Wire with high chromium, molybdenum and niobium content and is similar to alloy 625. Coatings offer good corrosion protection while also providing basic abrasion and erosion protection.

NiSF-Wear Resistant Alloys*

DURMAT® LD 752
DURMAT® LD 752 is a NiCrBSi Flux-Cored Wire. Coatings offer a high hardness and a combination of good abrasion/erosion and corrosion protection. Hardness: 55 - 60 HRC.

DURMAT® LD 753
DURMAT® LD 753 is a NiCrBSi Flux-Cored Wire. Coatings offer a high hardness and a combination of good abrasion/erosion and corrosion protection. Hardness: 50 - 52 HRC.

NiSF-Carbide Wear Resistant Alloys*

DURMAT® LD 751
DURMAT® LD 751 is a nickel-based Flux-Cored Wire with a very high content of Fused Tungsten Carbide (FTC). It provides excellent abrasion and erosion resistance up to 540 °C.

DURMAT® LD 761
DURMAT® LD 761 is a nickel-based Flux-Cored Wire with a very high content of Fused Tungsten Carbide (FTC), a high chromium content and is similar to DURMAT® LD 751. It provides excellent abrasion and erosion resistance up to 540 °C and moderate corrosion protection.

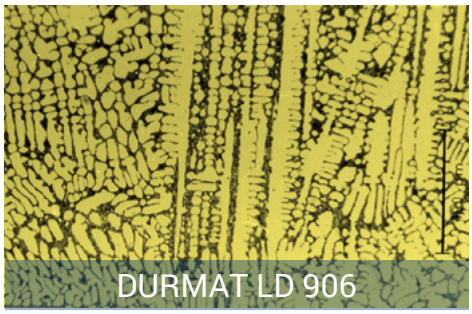
DURMAT® LD 762
DURMAT® LD 762 is a nickel-based Flux-Cored Wire with a very high content of Spherical Fused Tungsten Carbide (SFTC) and a high chromium content and is similar to DURMAT® LD 751. It provides excellent abrasion and erosion resistance up to 540 °C and moderate corrosion protection.

DURMAT® LD 760
DURMAT® LD 760 is a nickel-based Flux-Cored Wire with a high content of special carbides which are embedded in a NiCrBSi matrix which offers good abrasion resistance.

Cobalt-based Flux-Cored-Wires

Cobalt-based Flux-Cored Wires provide unique properties for selected applications where abrasion resistance, temperature resistance and structural integrity are of upmost importance. The structure is dense and exhibits dispersed hard chromium and tungsten carbides within a CoCr-Matrix. They are used for abrasion/erosion protection and can also be applied on parts exposed to sliding wear.

Coatings can provide very good performance under high-temperature conditions.


DURMAT LD 906

Abrasion and Heat Resistant Alloys*

DURMAT® LD 901
DURMAT® LD 901 is a cobalt-based Flux-Cored Wire for abrasion and erosion protection. While having similar properties compared to DURMAT® LD 906 it is higher alloyed and provides improved wear resistance. Coatings are heat resistant up to 760 °C.

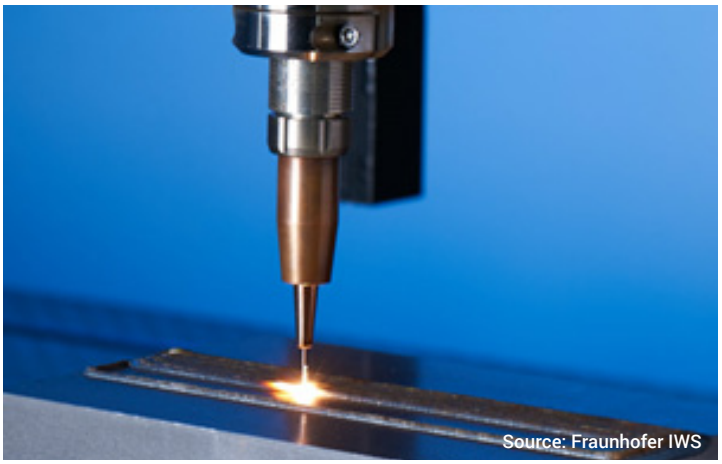
DURMAT® LD 906
DURMAT® LD 906 is a high-performance cobalt-based Flux-Cored Wire. Coatings are resistant to wear and corrosion and retain these properties at high temperatures. Coatings remain their properties over a wide temperature range and can be used up to 750 °C.

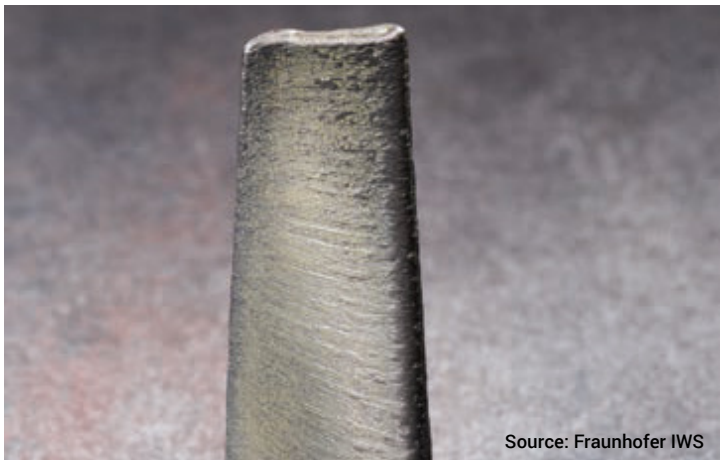
DURMAT® LD 912
DURMAT® LD 912 is a cobalt-based Flux-Cored Wire for abrasion and erosion protection. While having similar properties compared to DURMAT® LD 906 it is higher alloyed and provides improved wear resistance. Coatings are heat resistant up to 700 °C.

DURMAT® LD 921
DURMAT® LD 921 is a cobalt-based Flux-Cored Wire for cavitation, galling and metal-to-metal sliding wear protection. Coatings are work-hardening and provide resistance to thermal and mechanical shock.

DURMAT® LD 951
DURMAT® LD 951 is a cobalt-based Flux-Cored Wire for abrasion and erosion protection with a very high content of FTC tungsten carbide particles. Coatings are heat resistant up to 500 °C.

DURMAT® LD 961
DURMAT® LD 961 is a cobalt-based Flux-Cored Wire for abrasion and erosion protection with a very high content of SFTC tungsten carbide particles. Coatings are heat resistant up to 500 °C.


Source: Fraunhofer IWS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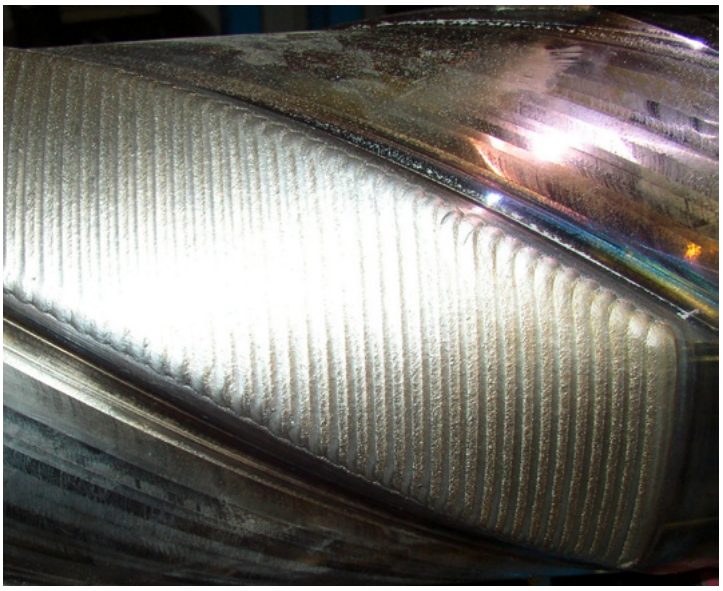

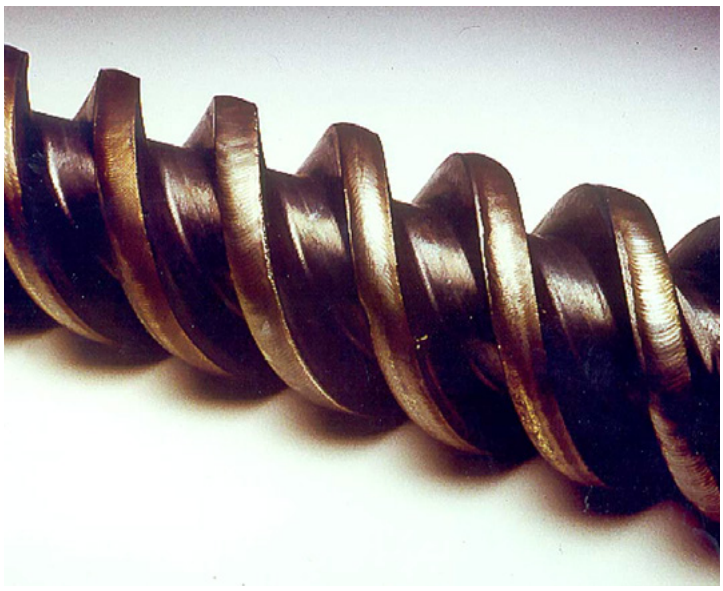

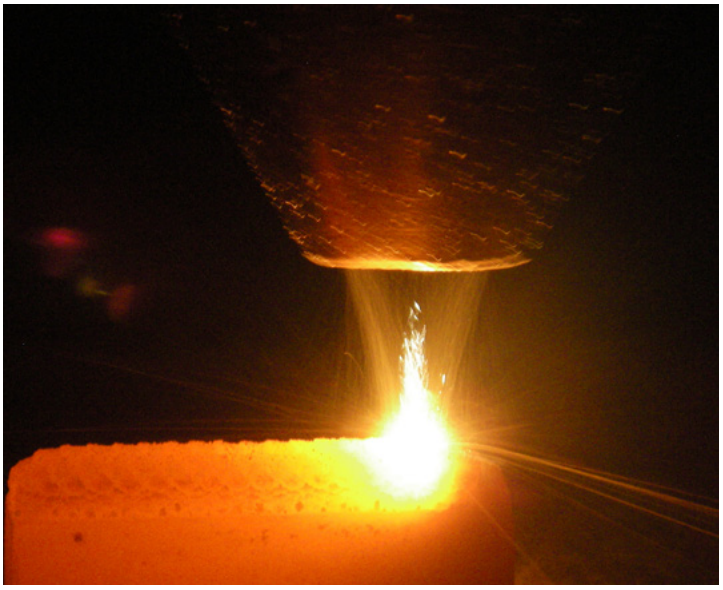

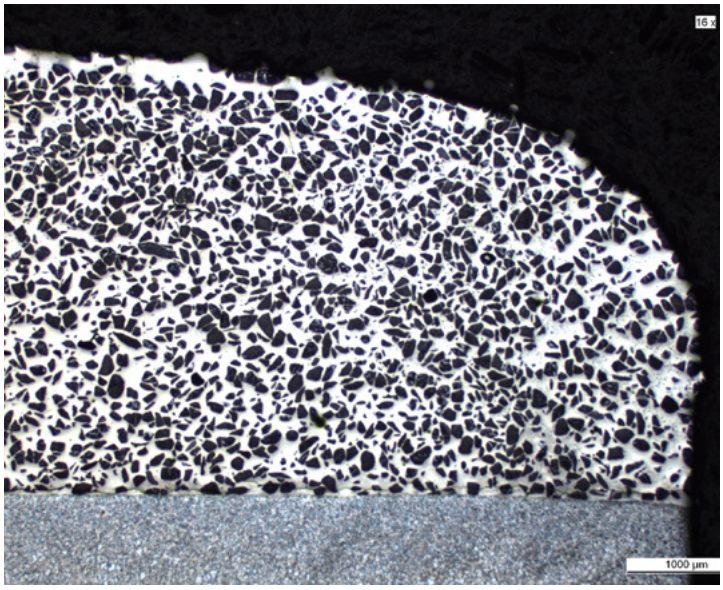

Notes

DURUM
VERSCHLEISS-SCHUTZ GMBH

We understand Wear Protection

- Tungsten Carbide Rods for Oxy-acetylene Welding
- Stellite* - Flux-Cored Wires
- Nickel-, and Iron-based Flux-Cored Wires
- FCAW wires with Tungsten Carbide
- Tungsten Carbides, Complex Carbides and Chromium Carbides for manual Arc Welding
- PTA Welding Powders, Fe-Ni-Co based Powders and special qualities

** Stellite is a registered trademark of Kennametal Stellite*

- PTA machines, torches and powder feeders
- Powders and Wires for Laser Cladding
- Powders for Oxy-acetylene Welding and Spraying
- Fused Crushed and Spherical Fused Tungsten Carbides
- Pre-manufactured replacement wear parts
- Tungsten Carbide Wear Plates
- Wear Plates with Chromium Carbides and Complex Carbides
- Thermal Spray Powders (conforming to DIN EN 1274)
- Thermal Spray Wires (conforming to DIN EN 14919)

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