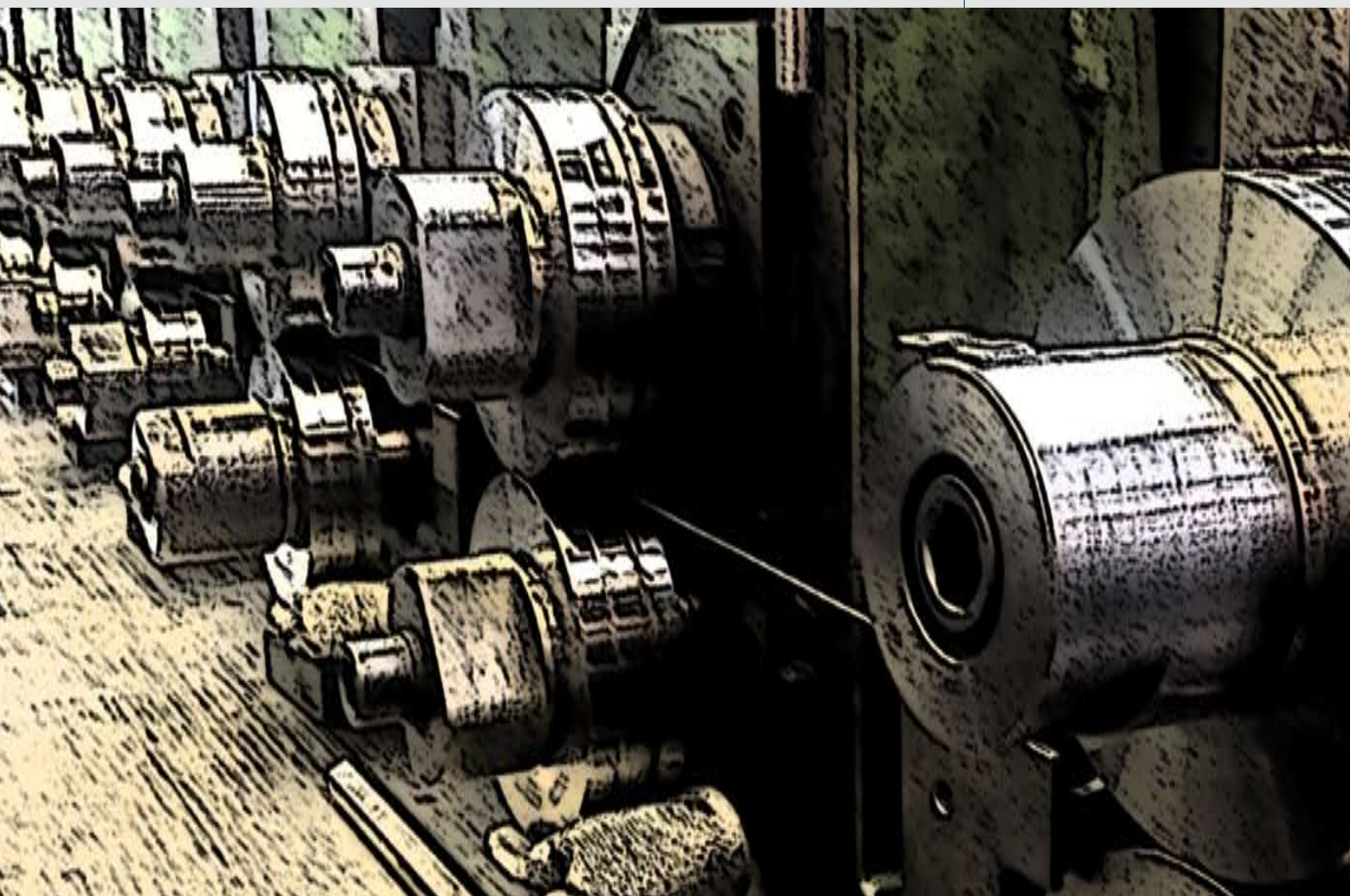




PRODUCTS FOR
THERMAL SPRAYING
AND PTA CLADDING



QUALITY • KNOWLEDGE • SUCCESS

The main focus of the company is the production of high-quality welding consumables (flux-cored wires) for hardfacing and thermal spraying.

The product range includes flux-cored wires for OPEN ARC (FCAW), MIG (MGAW) and submerged arc (SAW) welding.

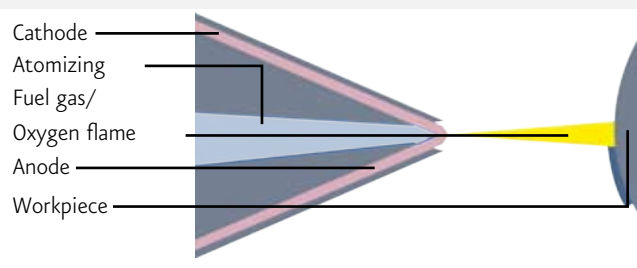
Corodur® supplies complementary a wide range of stick electrodes for wear protection and high-alloyed materials, up to tungsten carbide products for most extreme wear conditions. Our products are used very successfully worldwide.

Benefit from our many years of experience and our know-how! Customer-oriented support and just-in-time service are a part of our strengths.

A selection of our products and services, for thermal spraying and PTA cladding, can be found on the following pages.

**WE SOLVE
YOUR WEAR
PROBLEMS!**





FLUX-CORED WIRES for ARC SPRAYING

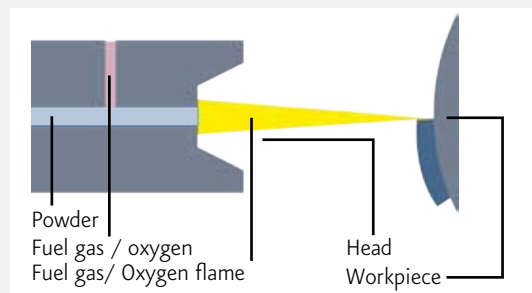
Arc spraying with flux-cored wires is a very powerful thermal spraying process. A DC arc melts two flux-cored wires, which are applied to the substrate in molten form by means of compressed air. The bond is non-metallurgical as the substrate surface remains un-molten in the process.

From Page 4

POWDERS for FLAME SPRAYING

Powder flame spraying is a commonly-used thermal coating process whereby a powdered additive material is fed into an oxy-fuel flame. This heat source creates a gas stream with a temperature in excess of 3,000°C and the thermal expansion of the combustion is then used to atomize and accelerate the additive particles onto the substrate. Like powder spraying, the substrate surface is generally un-molten during the process.

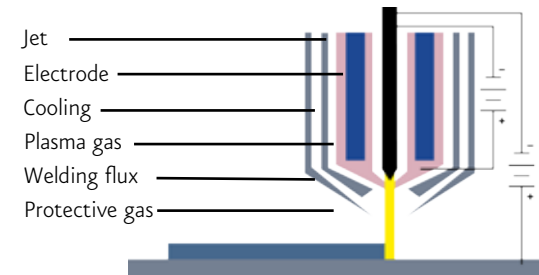
From Page 8



POWDERS for PLASMA TRANSFERRED ARC (PTA)

Plasma Transferred Arc (PTA) Welding is a thermal arc process for applying wear and corrosion resistant overlays on surfaces of metallic components. PTA uses a constricted high-energy plasma arc to transfer the overlay to the base metal, thus forming a molten weld pool. Powder filler material is fed through the torch and introduced to the welding arc above the weld pool. The result is a strong, metallurgically bonded overlay that has better fusion and corrosion properties than a mechanically-bonded process.

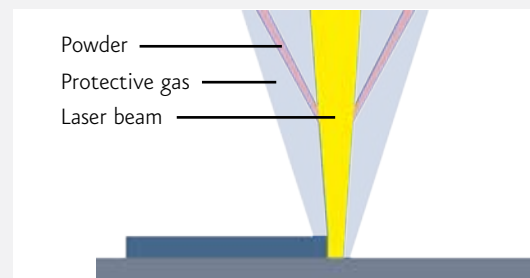
From Page 12



POWDERS for LASER CLADDING

Laser Cladding employs the high energy output of a laser to metallurgically bond a powder filler of wear or corrosion-resistant material to a wide variety of metallic substrates in a highly accurate pattern. This results in an overlay which is free of porosity and cracks. Penetration into the substrate is minimized and there is consequently a very low heat-affected zone. Resulting minimal dilution enhances single-layer properties of the cladding.

From Page 16



ARC-SPRAYING

Iron-base Flux-cored Wires



product	chemical composition										
	Cr %	Ni %	Si %	B %	Mo %	Nb %	Al %	W %	Mn %	C %	andere
Fe-Basis											
SP 100	17									0,1	
SP 101	22	0,5		4,5	4,0	3,5		6,5		1,2	
SP 102	20		1,5	1,5					1,0	0,6	3,5 Ti
SP 103	25	10	1,2	2	4				1,2	0,5	2 Cu
SP 104	21	8	1,1	2,3	3,2				1,2	0,2	2 Cu
SP 105 HY	20		2,8						11	0,25	11 Co
SP 106	14	4,5	1,3	1,9				26 WC	0,6		6 TiC
SP 107	19	8,5	0,4						6	0,1	
SP 108	26	3	1,6		0,8				1,6	1,7	
SP 111	30		1,3	2,8					1,0	0,9	
SP 112	29		1,5	3,8					1,5	0,1	
SP 113	18	12	0,8		2,7				1,7	0,12	
SP 115	28		1,2						1	5	
SP 118Y	22						5				1 Y
SP 120	14	0,4	0,5						0,8	0,35	
SP 121							5,5		1	0,2	
SP 124		2	1	4,5					2	0,7	
SP 126	14	5,5	1,0	4,5	9,0	5,8	+				
SP 129	38	35		2		1,5				0,1	
SP 132	15		0,7		3,2				0,4	0,1	14 Co
SP 155	29		1,2						0,6	4,8	
FeBSi-Basis											
SP 402			4,5	2,5						0,4	62 WSC



hardness	general characteristics
30-35 HRC	Repair of machine components
68-70 HRC	Metal-metal friction, screws, mixers, hot sieves
850 HV _{0,3}	Abrasion resistant and erosion resistant up to 650 ° C, high adhesion resistance
45 HRC	Polishable, good wear resistance at temperature up to 870 ° C, for repair layer
53 HRC	Self-compacting up to 1000 HV, easy to grind, high elasticity, for intermediate and top layers
350 HB	Cavitation resistant, erosion resistant, water turbine, hydraulics
64-69 HRC	Good abrasion resistance, anti-slip treads in industry and ship decks
400 HB	Good corrosion resistance, cold hardening, good workability, for repair layers
40-42 HRC	Resistant to abrasion, corrosion, easily machinable
40-45 HRC	Low friction coefficient, chrome replacement layers, valve stem, plunger, bearing seat
1000-1150 HV _{0,1}	Boiler erosion protection, temperature up to 650 ° C
200-240 HV	Comparable to 316L, good corrosion resistance
50-55 HRC	High oxidation resistance and corrosion resistance, high strength, chrome substitute layer, high hardness
170-270 HV _{0,3}	Good corrosion protection in gas atmosphere against sulfur and carbon, temperature-resistant up to 500 ° C, machinable, adhesion, boiler tubes
30-45 HRC	Good corrosion and wear resistance, hard, repair and processing of machine parts, pump pistons, shaft surfaces, rollers, low shrinkage, relatively high layer thicknesses
approx. 30 HRC	High carbon content, especially as a slip-resistant coating for the coating of walk paths in industry and on ships
60-65 HRC	Can be used as a layer in cylinder liners
64-69 HRC	Highly wear-resistant, very good corrosion resistance. Temperature up to approx. 1000 ° C
1000-1150 HV _{0,1}	Excellent erosion protection on boiler pipe walls and superheater pipes. Also suitable for press pistons, valve shafts, components from chemical plants, shaft protection sleeves, bearings for motors, plungers and components which have been chromed so far.
45 - 50 HRC	Tools for hot pressing of sheet metal parts, valve cones, seat rings in fittings
55 - 59 HRC	Pumps, mixers, agitators, concrete pumps, transport augers, transport trolleys on coke ovens.
Härte WSC: 2400 HV _{0,1}	COROCARB SP 402 is a flux-cored wire based on FeBSi with embedded highly wear-resistant carbides. In addition to excellent heat and corrosion resistance, the alloy also has excellent abrasion resistance. The deposit is only limited grindable.

ARC-SPRAYING

Nickel-base Flux-cored Wires



product	chemical composition									hardness
	Cr %	Si%	B %	W %	Mo %	Nb %	C %	Al %	andere	
Ni-Basis										
SP 201	20	4,7	3,2				0,7			700-800 HV0,1
SP 206	20	4,5	1,6	2		0,35				700-800 HV0,1
SP 221	20	4,5	0,7		2		0,4			700-800 HV0,1
Sp 222	20									100 HB
SP 223	50									250-280 HV0,1
SP 224	45								1 Ti	32 HRC
SP 225	22				9	3,5	0,05			240-300 HV0,1
SP 226	16			5	17		0,1			200-240 HB
SP 227	15			3,5	15		0,1			200-240 HB
SP 228	25	<4,5	2				0,4		15 SC	800-1000 HV0,1
SP 229								20		200 HV
SP 230								5		200 HV
SP 231					6			5		240 HV
SP 232	8				5			7	5 Fe	250 HV
SP 233								10		200 HV
SP 234	21							7		75-85 HB
SP 241	21	4	4		6				<2 Fe	700-800 HV0,1
SP 275	22				9					190 – 230 HV0,3
SP 277	22				13				<3 Fe, <2,5 Co, 3 W, <0,35 V, <0,5 Mn	240 – 300 HV0,1
SP 278	27		1,5		17	2			<3 Fe, 1 W, 1 V	240 – 300 HV0,1

NiBSi-Basis

SP 400		5	2				0,7		62 WSC	Härte WSC: 2400 HV _{0,1} Härte Matrix: 540 HV _{0,1}
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general characteristics

Self-flowing alloy, subsequently fusible, chemical apparatus construction, food industry, plunger, piston

Self-flowing alloy, subsequently fusible, chemical apparatus construction, food industry, plunger, piston

Boiler biomass

Adhesive layer in aggressive environment

Good resistance to sulfur at temperatures up to 650 ° C, coal firing power plants, black liquor boilers

Good resistance to sulfur, vanadium in boiler atmosphere at temperatures up to 650 ° C, coal firing power stations, pipes, boiler walls

Corrosion resistant to acids with chlorides, resistant to oxidation and hot gas corrosion, adhesive layer and repair, chemical industry

High acid resistance in chlorine, resistant to oxidation and hot gas corrosion, chemicals, petrochemical, offshore

High acid resistance in chlorine, resistant to oxidation and hot gas corrosion, chemicals, petrochemical, offshore

Adhesive layer

Dense layers with better oxidation and HT corrosion resistance up to 650 ° C, self-adhesive adhesive layer

Adhesive layer

Exceptional adhesion as an adhesive layer for the repair of chipable C-steels and corrosion-resistant steels, Wear resistance by Mo, repairs, bearings, good resistance to particle erosion

For repairs, good machinable, corrosion resistant

Adhesive layer

Adhesive layer for the repair of machine components, resistant to oxidation and hot gas corrosion, easy machinable

On evaporator walls and pipes in combustion plants.

Typical applications as adhesive layer and for repairs in the chemical industry, petrochemical industry and the offshore industry.

Typical applications as an adhesive layer and for repair in the chemical industry, petrochemical and offshore industry, but also as corrosion protection in boilers.

Typical applications as an adhesive layer and for repair in the chemical industry, petrochemical and offshore industry, but also as corrosion protection in boilers.

COROCARB SP 400 is a flux-cored wire based on NiBSi with embedded highly wear resistant carbides. In addition to excellent heat and corrosion resistance, the alloy also has excellent abrasion resistance. The deposit is only limited grindable.

FLAME SPRAYING



product	grain size	chemical composition							hardness
		Ni %	Cr %	B %	Si %	C %	Mo %	andere	
nickel base alloys, gas atomized									
COROLOY FS 40	-106+38µm	bal.	8	1,9	3,1	0,5	-	-	38 HRC
COROLOY FS 60	-106+38µm	bal.	17	3,3	4,3	1	-	-	62 HRC
COROLOY FS 286	-106+38µm	bal.	14	3	4	0,8	3	Cu=2,5	58 HRC
COROLOY FS 288	-106+38µm	bal.	17	3	4	0,8	-	W=17	58 HRC

product	grain size	chemical composition		hardness	
		COROLOY FS 6o	FTC	matrix	FTC
NiBSi-matrix, blended with Fused Tungsten Carbide					
CORCARB FS 3o	-1o6+38µm	7o %	3o %	62 HRC	2.3oo HV±2ooHV
CORCARB FS 4o	-1o6+38µm	6o %	4o %	62 HRC	2.3oo HV±2ooHV
CORCARB FS 5o	-1o6+38µm	5o %	5o %	62 HRC	2.3oo HV±2ooHV
CORCARB FS 6o	-1o6+38µm	4o %	6o %	62 HRC	2.3oo HV±2ooHV
CORCARB FS 7o	-1o6+38µm	3o %	7o %	62 HRC	2.3oo HV±2ooHV
CORCARB FS 8o	-1o6+38µm	2o %	8o %	62 HRC	2.3oo HV±2ooHV



general characteristics

Rust and acid resistant, resistant to strong abrasion and heat.
Application on small surfaces or matrices; Mold casting in the glass industry, fittings, pistons & guides.

Rust and acid resistant, resistant to strong abrasion and heat.
Application on small surfaces or matrices; Mold casting in the glass industry, fittings, pistons & guides.

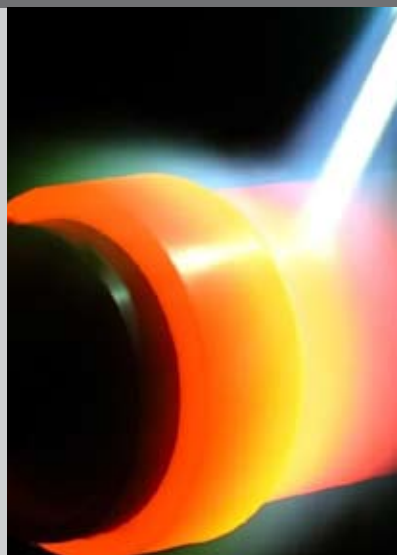
High corrosion resistance as well as good heat and abrasion resistance.
Bearings of transport augers, etc.

Moderate corrosion resistance but good erosion and abrasion resistance.
Extrusion bins, hydropulipers, valves, mud pumps, etc.

general characteristics

„Rust and acid resistant, resistant to strong abrasion and heat.
Mechanical engineering, pump and mill construction, petrochemical, etc.“

FLAME SPRAYING



product	grain size	chemical composition		hardness	
		COROLOY FS 60	FTC	matrix	SFTC
NiBSi-matrix, blended with Spherical Fused Tungsten Carbide					
CORCARB FS 35 WC	-106+38µm	65 %	35 %	62 HRC	2.300 HV±200HV
CORCARB FS 40 WC	-106+38µm	60 %	40 %	62 HRC	2.300 HV±200HV
CORCARB FS 50 WC	-106+38µm	50 %	50 %	62 HRC	2.300 HV±200HV
CORCARB FS 80 WC	-106+38µm	20 %	80 %	62 HRC	2.300 HV±200HV



general characteristics

„Rust and acid resistant, resistant to strong abrasion and heat.
Mechanical engineering, pump and mill construction, petrochemical, etc.“

PTA CLADDING



product	grain size	chemical composition		hard
		COROLOY 6o PTA	FTC	matrix
NiBSi-matrix, blended with FTC				
COROCARB 61o PTA	-18o+53µm	38-4o %	6o-62 %	53 HRC
COROCARB 611 PTA	-18o+53µm	38-4o %	6o-62 %	4o HRC
COROCARB 616 PTA	-18o+53µm	38-4o %	6o-62 %	53 HRC
COROCARB 62o PTA	-18o+53µm	38-4o %	6o-62 %	53 HRC

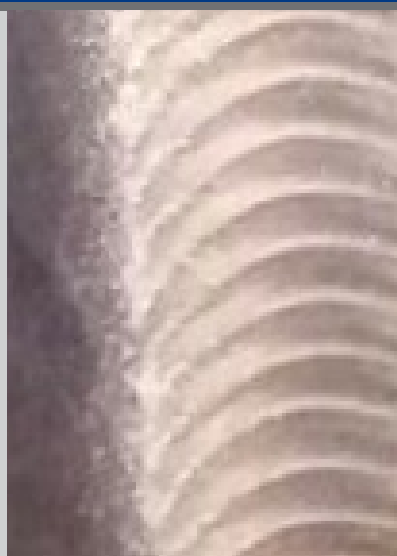
product	grain size	chemical composition							hardness
		Fe %	Cr %	C %	Si %	Mn %	V %	Ni %	matrix
Iron-base (gas-atomized) powders with Vanadium Carbide									
CORODUR 670 PTA	-180+38µm	bal.	6	3,5	1	1	12	-	58 HRC
Corodur 671 PTA (corrosion resistance)	-180+38µm	bal.	17,5	4,3	1	1	12	+	58 HRC



ness	general characteristics
FTC	
2.300 HV±200HV	Particularly high content of highly wear-resistant fused tungsten carbides (FTC). Tools for deep drilling and mining, excavator parts, scrap presses, extremely wear-resistant cutting edges in recycling technology, screw bars as well as components from agricultural engineering.
2.300 HV ± 200HV	Crack-resistant alloy with a high proportion of wear-resistant fused tungsten carbides (FTC). Tools for deep drilling and mining, excavator parts, scrap presses, extremely wear-resistant cutting edges in recycling technology, screw bars as well as components from agricultural engineering.
2.300 HV±200HV	The alloy has a high content of thermodynamically stabilized FTC, which is characterized by a very high hardness, with comparatively high toughness. Tools for deep drilling and petroleum industry.
≥3.00 HV	The alloy has a particularly high content of fused tungsten carbides (sFTC). Tools for deep drilling and mining, excavator parts, scrap presses, extremely wear-resistant cutting edges in recycling technology, screw flights and components from agricultural engineering as well as pumps and mills.

general characteristics
The alloy has a particularly high content of highly wear-resistant vanadium carbides and can be cracked without cracking. Tools for mining, excavator parts, scrap presses, extremely wear-resistant cutting edges in recycling technology, cutting edges, etc.
The alloy has a high proportion of wear-resistant vanadium carbides and can be crack-free processed. Technical knives, recycling industry, agricultural engineering.

PTA CLADDING



product	grain size	chemical composition								
		Co %	Cr %	W %	Mo %	C %	Ni %	Si %	Mn %	Fe %
. Cobalt-base (gas-atomized) powders										
COROLIT 1 PTA	-150+53µm	bal.	30	12,5	-	2,5	+	1,8	1	≤3,5
COROLIT 6 PTA	-150+53µm	bal.	30	4,5	-	1,2	+	1,2	0,5	≤3,5
COROLIT F PTA	-150+53µm	bal.	25	12,0	-	1,8	24	0,5	0,5	≤3,5
COROLIT 12 PTA	-150+53µm	bal.	29	8,0	-	1,5		1,7	0,5	≤3,5
COROLIT 21 PTA	-150+53µm	bal.	27	-	5,5	0,3	2,5	0,5	0,5	≤3,5

product	grain size	chemical composition							
		Ni %	Cr %	B %	Si %	C %	Mo %	Nb %	andere
Nickel-base (gas atomized) powders									
COROLOY 201 PTA	-150+53µm	bal.	15	3	4,6	0,7	-	-	1
COROLOY 255 PTA	-150+53µm	bal.	17	2	5	1	-	-	0,5
COROLOY 256 PTA	-150+53µm	bal.	17	2	5	1	-	-	-
COROLOY 260 PTA	-150+53µm	bal.	-	3	3	-	-	-	0,5
COROLOY 625 PTA	-150+53µm	bal.	22	-	0,4	-	9,1	3,5	Fe<0,8



hardness	general characteristics
54 HRC	Abrasion, erosion, corrosion, cavitation at high temperatures. Valves, grinding and crumbs, wear rings, wear elements in the chemical industry, etc.
42 HRC	Abrasion, erosion, corrosion, cavitation at high temperatures. Valves, grinding and crumbs, wear rings, wear elements in the chemical industry, etc.
42 HRC	Cavitation, corrosion, erosion and abrasion. Marine diesel engines, engine technology, etc.
50 HRC	Abrasion, erosion, corrosion, cavitation at high temperatures. Processing tools of the hardwood, paper and plastic industry, extruder screws as well as for valve spindles and earth drills, etc.
300 HB	Corrosion, impact load at high temperatures or even extreme temperature changes (thermal shock resistance). Hot punching tools, exhaust valves, steam and acid fittings, seawater desalination plants, etc.

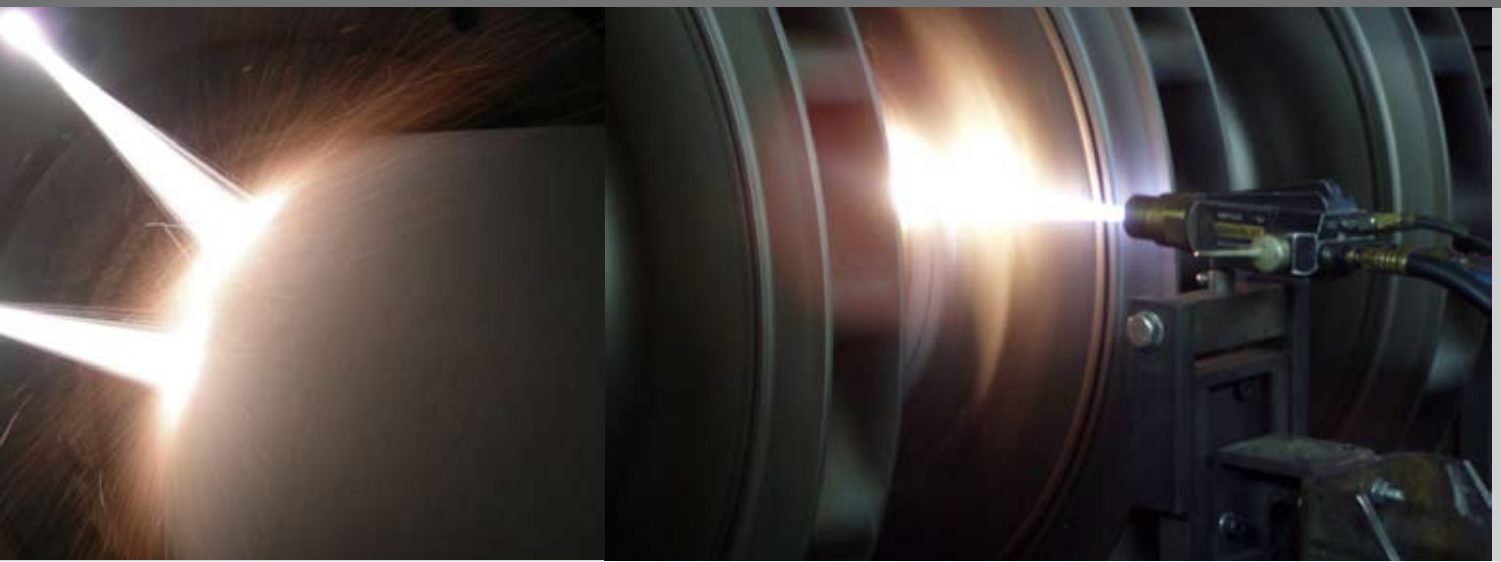
hardness	general characteristics
58 HRC	High hot hardness, corrosion resistance, thermal shock resistance and high wear resistance. Chemical apparatus manufacturing, food industry, nuclear technology, fittings, oil press, paper industry, press augers, etc.
53 HRC	Abrasion and corrosion resistant. Plastic industry, extruder screws, etc.
53 HRC	Abrasion and corrosion resistant. Plastic industry, extruder screws, etc.
42 HRC	Self-flowing nickel alloy with high hardness.
220 HB	High corrosion resistance to a variety of chemical substances, against intercrystalline corrosion and is sea water resistant. Chemical industry, waste incineration plants, flue gas desulphurization plants, seawater desalination plants, etc.

LASER CLADDING



product	grain size	chemical composition							hardness
		Ni %	Cr %	B %	Si %	C %	Mo %	Nb %	
Nickel-base (gas atomized) powders									
COROLOY 260 LS	-90+45µm	bal.	-	3	3	-	-	-	53 HRC

product	grain size	chemical composition		hardness	
		COROLOY 6o PTA	FTC	matrix	FTC
NiBSi-matrix, blended with Fused Tungsten Carbide					
COROCARB 61o LS	-9o+45µm	38-4o %	6o-62 %	53 HRC	2.3oo HV±2ooHV



general characteristics

Self-flowing nickel alloy with high hardness.

general characteristics

Particularly high content of highly wear-resistant tungsten melt carbide (WSC).

Tools for deep drilling and mining, excavator parts, scrap presses, extremely wear-resistant cutting edges in recycling technology, screw flights and components from agricultural engineering as well as pumps and mills.



YOUR NEED IS OUR CHALLENGE



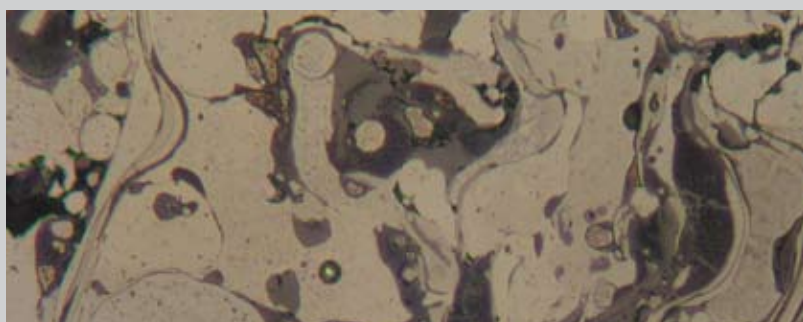
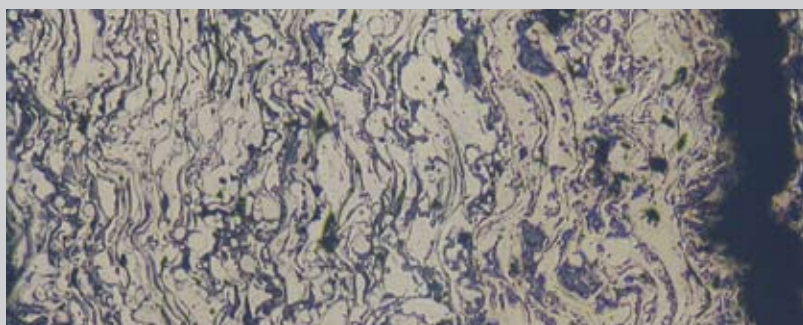
CORODUR® Wear Protection Solutions

No matter what your industry focus or wear challenge, CORODUR® is there to help you with off-the-shelf and tailor-made wear solutions you can trust. From the known to the unknown, CORODUR® maintains and shares a wealth of knowledge and data collected over almost 40 years from established process industries operating across all continents. Research and Development is central to our advanced production site in Willich, Germany and we also maintain links with centres of excellence around the world to provide the most rapid and flexible response to customer demand.

CORODUR's highly qualified and experienced sales team can be relied upon to provide accurate and timely advice regarding both the right product and the correct application method.

Our customer-centric ethos ensures delivery of only the highest-quality products, combined with state-of-the-art solutions.

MICROSCOPIC THIN-SECTION TAKEN FROM CLAD SURFACES



CLAD WITH CORODUR® SP 112

FORMS OF PACKAGING

WIRE BASKET SPOOL

Net weight: 15 kg
External diameter: 300 mm
Diameter (inside): 51.5 mm
Width: 103 mm
 EN 759/BS 300

Net weight: 25 kg
External diameter: 435 mm
Diameter (inside): 300 mm
Width: 105 mm
 EN 759/BS 450

PLASTIC BOTTLE

Net weight: 5 kg

WIRE DRUM

Net weight: 100-150 kg
Diameter: 550 mm
Height: 400 mm

Net weight: 150/300 kg
Diameter: 550 mm
Height: 800 mm

PLASTIC SPOOL

Net weight: 25 kg
External diameter: 435 mm
Diameter (inside): 300 mm
Width: 90 mm
 R 435





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