



Surface welding and spray & fuse powders

Material Guide

Höganäs – a leading provider surface coating needs

Are you looking for the perfect surface coating solution that fits your needs? – Welcome to Höganäs, we are looking forward to collaborating with you.

In 2018, we have gone one big step further to expand our offering to you, as our customer, and acquired, H.C. Starck's surface technology division. Together, we are stronger than ever before. As one Höganäs organization, we utilize our joined forces to invent better solutions for your existing needs and to keep you ahead of future challenges. Developing tomorrow's solutions in close cooperation with you has always been our passion. With innovativeness, a clear commitment to quality and an extensive technological expertise, we work side by side with you along the entire value chain.

Discover how we now can be an even stronger partner for you:



A more complete product portfolio

Our consistent high-quality powders are designed to extend the lifetime of your components operating in the harshest environments. Discover our broad joint portfolio, including an expansive selection of metals & alloys, carbides, oxides, MCrAlYs and abrasives. As a strong, joint Höganäs organization, we provide solutions for the following surface coating technologies:

- **Plasma transferred arc (PTA) welding**
- **Laser Cladding**
- **Powder Welding**
- **Flame Spraying**
- **HVOF**
- **Plasma Spraying**

Near you wherever you are



We are where you are and know about the markets in which you play. Collaboration with us has never been easier, as our sales staff is strategically located all over the world, including APAC, EMEA and Americas. Our ArcX centers, located in Germany, Sweden, USA, Brazil and China are committed to supplying the best technical surface coating services to you. Wherever and whenever you need it, you can find help from us.

for your



More innovation opportunities

In close cooperation with you, we are working on solutions for tomorrow. By combining our vast knowledge and expertise with our state-of-the-art equipment, our ArcX network, the powerhouse of surface coating expertise, solves your challenges. Discover the huge capabilities of our ArcX centers ranging from powder material innovation, application development and technical support to sample production. Continuous development aims at extending properties and application techniques to drive new solutions for you.



Deeper and broader expertise

Benefit from our knowledge and experience of different industries, applications and local market requirements. Our powder solutions are designed to meet the needs of the most demanding industries: automotive, oil and gas, mining and construction, power generation, aviation and steel.



Global production and distribution

We are truly committed to develop the industry and continuously invest in our production facilities. In our combined production facilities, we satisfy your needs for large scale production as well as for customized high specified solutions. Our own warehouses, spread strategically across the globe and enable us to timely deliver products world-wide.

**Please visit us on our website at
www.hoganas.com for further information**

**Together we are stronger for
surface coating. We can and
will make a difference for you.**



ArcX – Our powerhouse for surface coating expertise

Höganäs' surface coating technology centres are committed to supplying the best technical services achievable to the surface coating industry.

Driving your business

Expert know-how in materials and customer applications as well as in all surface welding, thermal spraying and spray&fuse processes make our four technology centres an exclusive resource in your work. We support you in optimizing existing applications and develop new business opportunities – at the lowest total cost for you.

Services offered at ArcX

Material innovation

- Joint development projects
- Customised material solutions

Application development

- Solutions for new business opportunities
- Process data generation
- Coating evaluations

Deposition process support

- Process optimization
- Failure analysis and improvement suggestions
- Onsite customer support
- Training and education
- Consulting

Sample production

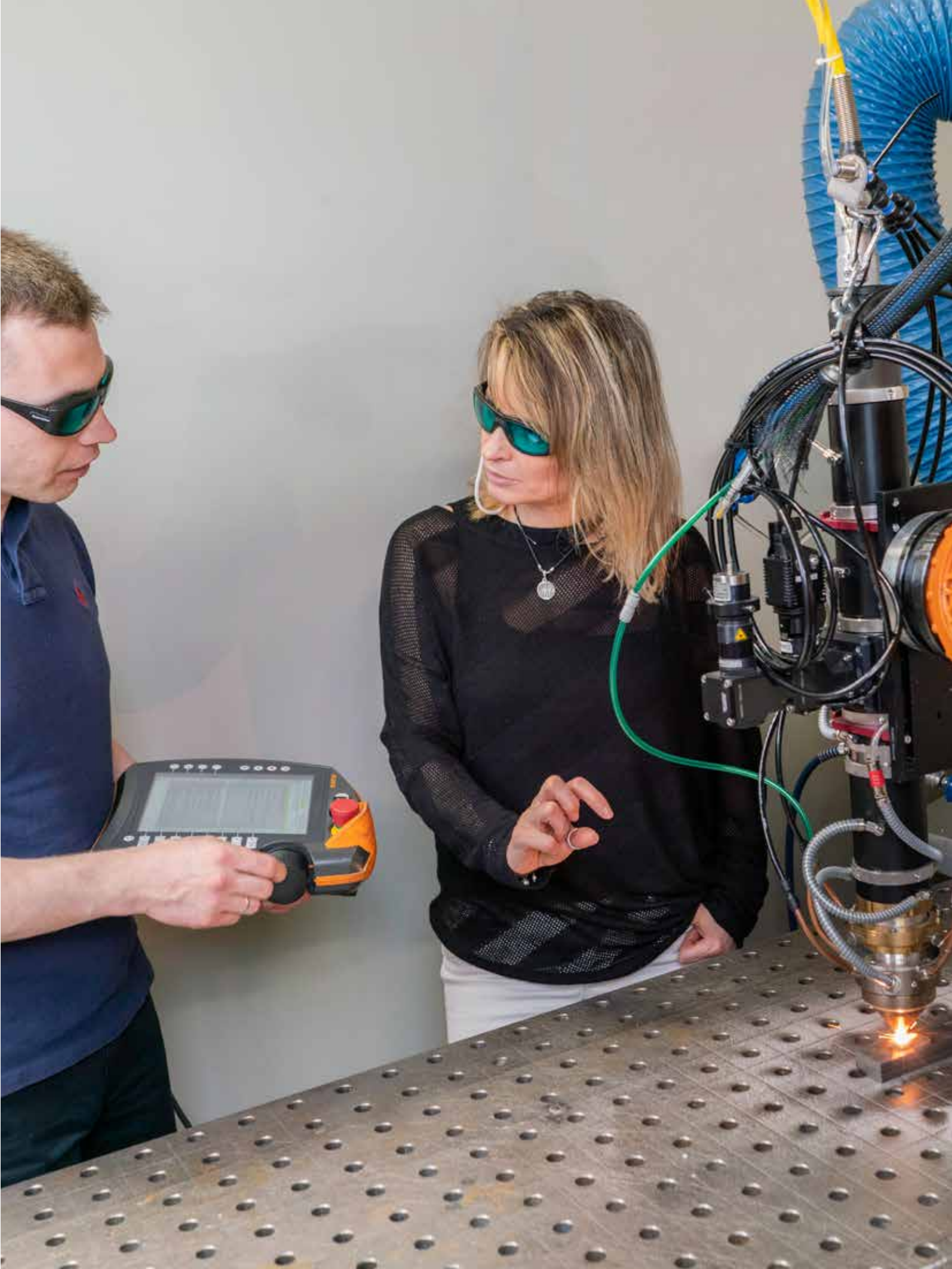
- Prototyping
- Coatings
- Small series production

At your service

At the forefront are our five technology centres, strategically located and able to serve customers all over the world. This is where we are setup to support you, in close cooperation and on a global scale. We share our expert know-how in materials, processes and customer applications.

- ArcX Europe in Germany and Sweden
- ArcX Asia
- ArcX North America
- HRC South America

We strongly believe in the power of inspiration and learning from each other as a driving force in creating new business opportunities. So, the stage has been set. Why wait any longer? Let's start working together.



Expansive product portfolio for all surface welding and spray & fuse processes



Plasma Transferred Arc (PTA)

PTA welding is a welding method for applying wear & corrosion resistant layers on metallic surfaces. It is ideal for high unit volume automated applications, such as exhaust valves. The technique offers low base metal dilution and can be used together with a wide range of powder consumables. Deposition rates up to 20kg/hour are achievable.



Laser Cladding

Laser cladding is a technique that bonds alloys to the surface with a low degree of dilution. The automated process that is characterized by an excellent consistency is particularly suited for use in high volume automated applications. Material costs are reduced through the thinner layers being achieved with laser cladding. A deposition rate of >95% can be realized with a material utilization up to 98%.



Powder Welding

Powder welding is a manual method using a standard oxy-acetylene torch. The self-fluxing powder is fed into the flame from an attached hopper. Typically, deposition rates from 0,5-2,5kg/hour are possible. Smooth and dense coatings are achieved. The process is particularly suitable for the surface coating of cast iron glass molds and the repair of different machined parts.



Flame Spraying

Flame spraying is a two-step method using so called self-fluxing powders. The powder is fed into the flame forming semi-molten particles and are accelerated towards the substrate surface. The particles form a mechanical bond which has to be fused in order to get a good bonding and a dense coating up to 99% density. For the fusing, a standard Oxy-Acetylene torch or induction can be used. Flame-spraying is ideal for coating cylindrical parts like bottle neck plungers and steel transport rollers. Deposition rates are from 1-9kg/hour.

Examples of applications

Our products extend the lifetime of your components operating in the harshest environments.

Oil & Gas

The demand for high quality consistent materials for asset protection against severe wear, corrosion and impact wear has been the reason Höganäs Surface Welding and flame spray grades of materials have been a bench mark in the oil & gas industry. Our materials such as 74M60, 1360-00, IN625, 1362-10, & MMCs have stood the test of time with applications such as risers, stabilizers, kick pads on bent housings, mud motor bearings for exploration to frack pump plungers, sucker rod couplings, polished rods and polished rod liners for production. Our patented material AMPERWELD® Macroline is designed for high sophisticated demands on tungsten carbide containing overlays. Combining the advantages of CTC and WC, Macroline® offers superior wear resistance for applications operating in the harsh oil & gas environment. No matter the value stream of the oil & gas industry Höganäs has a viable and sustainable solution to fit your need.

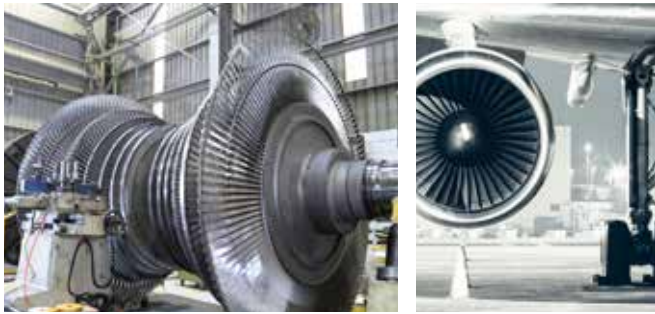
Mining & Construction

Höganäs has a strong global presence in the mining industry providing solutions for abrasion and impact wear resistance as well as meeting the need for hard chrome replacement in many applications. Solutions for protection on equipment such as bucket teeth, ripper hooks, grader blades, asphalt picks, crushing cones & segments, & sizing screens have been field proven. The use of our Rockit® 401 is quickly becoming a standard for hard chrome replacement on long wall roof support cylinders, suspension and steering components for high capacity mining trucks.

Automotive

Höganäs has established itself as the leader of durable surface coating technology for engine valves, offering process expertise, stable products and optimum functionality. A high standard in abrasive wear resistance is one of the main reasons why Höganäs' iron and cobalt base alloys are widely applied in the automotive industry. Engine valve parts are continuously exposed to wear at high temperatures and require a durable surface coating to withstand these conditions. Superior quality powders applied to combustion engine valves for light and heavy commercial vehicles and ships is proven praxis. By surface coating with cobalt-based alloys, we can ensure excellent functionality. Iron-based powder for cost-effective wear at high temperatures in engine applications is also a possibility. The majority of our coatings are currently applied using the PTA welding technique.





Steel

Steel manufacturing offers huge potentials to improve operation and efficiencies by cladding components with surface welding or spray & fuse. Some successful examples are transport rollers spray and fused with self-fluxing Ni powder (60 HRC), continuous casting rollers laser cladded or PTA welded with martensitic stainless steel powder, metal forming rollers laser cladded with high speed steel powders and guide rollers spray and fused with self-fluxing cobalt powders.

Agriculture

A high standard in abrasive wear resistance is one of the main reasons why Höganäs' iron base alloys and carbide mixes are widely applied in the agriculture industry. Due to their valuable characteristics, our powders are valued in different agriculture machinery components ranging from ground preparation components, to harvesting and seedbed preparation applications. Höganäs' portfolio includes powder consumables for all soil conditions.

Product catalogue

In the following, you will find more information on our comprehensive product portfolio for your surface welding and spray&fuse needs.

Laser Cladding

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Plasma Transferred Arc

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Powder Welding

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Flame Spraying

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Product codes

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You have not found what you are looking for? Please contact us!

Discover our thermal spray powders product range at

www.hoganas.com/thermalspray

Laser Cladding | Powder Selection

Product name	Chemistry (wt%)	Hardness*	Typical properties and applications
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Ni-based powders

	Ni	C	Si	B	Fe	Cr	Mo	Others	Typical HRC	Typical HV	
1520-00	Bal.	0,03	2,4	1,4	0,4	-	-	-	20	230	<ul style="list-style-type: none"> For surface welding on cast iron and bronze Ideal for glas moulds
1535-30	Bal.	0,25	3,0	1,0	2,4	5,6	-	Al=1,0	32	310	<ul style="list-style-type: none"> For surface welding on cast iron and bronze Ideal for glas moulds and oil & gas mud motor bearings
1538-40	Bal.	Max 0,07	3,0	2,1	Max 0,8	-	-	-	38	380	<ul style="list-style-type: none"> Used as buffer layer/build up alloy Matrix material for composites Ideal for oil & gas stabilizers
1540-00	Bal.	0,25	3,5	1,6	2,5	7,5	-	-	42	425	<ul style="list-style-type: none"> For wear resistant coatings Medium to hard welds achievable Used as matrix material for composites Ideal for oil & gas and mining & construction applications
1550-00	Bal.	0,45	3,9	2,3	2,9	11,0	-	-	52	550	
1.53 53-180µm	Bal.	0,90	5,3	2,05	5,4	17,8	-	-	54	590	
1559-40	Bal.	Max 0,06	3,0	2,9	0,2	-	-	-	49	510	
1560-00	Bal.	0,75	4,3	3,1	3,7	14,8	-	-	62	810	
1562-10	Bal.	0,60	3,7	2,8	3,5	14,2	-	W=9,5	60	720	
In 625	Bal.	Max 0,03	0,40	-	1,4	21,5	9,0	Nb=3,8	-	200	
Amperweld® NiSA 625	Bal.	Max 0,03	Max 0,15	-	Max. 1,5	21,5	9,0	Nb = 3,65	-	200	<ul style="list-style-type: none"> Resistant to aqueous environments Good oxidation resistance Typical applications in aerospace, chemical process, marine and automotive industries Used as buffer layer
Amperweld® NiSA 718	Bal.	0,05	Max 0,35	Max 0,006	Max 1,5	19,0	3,05	Nb=5,15 Ti=0,9 Al=0,5 Co=0,5	-	Depending on post heat treatment	<ul style="list-style-type: none"> Age hardenable, high-temperature and corrosion resistance Ideal for aerospace and stationary gas turbines, oilfield applications
C276-m	Bal.	0,12	0,5	-	3	15,5	16	W=4,5 Mn=1,2 V=0,5	-	230	<ul style="list-style-type: none"> Excellent corrosion protection Used as buffer layer Ideal for boiler tubes
Amperweld® NiSA C276	Bal.	Max 0,01	Max 0,08	-	5,0	15,5	16	W=3,75 Co=1,25	-	230	<ul style="list-style-type: none"> Resists highly aggressive aqueous environments and localized corrosion Used for chemical process, pollution control, oil and gas recovery Used as buffer layer of metal matrix composites

Product name	Chemistry (wt%)	Hardness*	Typical properties and applications
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Co-based powders

	Co	C	Si	Fe	Cr	Ni	Mo	W	Typical HRC	Typical HV	
2528-00	Bal.	0,25	1,0	1,5	27,0	2,8	5,5		35	340	<ul style="list-style-type: none"> • Similar to Stellite™ alloy 21** forming dies • Used as buffer layer • Work hardening alloy
2537-00	Bal.	1,1	1,0	1,5	28,5	1,5	-	4,4	41	400	<ul style="list-style-type: none"> • Similar to Stellite™ alloy 6** • All-rounder to combat corrosion, galling, erosion, cavitation or mechanical wear
2537-10	Bal.	1,3	1,0	1,5	28,5	1,5	-	4,4	43	440	<ul style="list-style-type: none"> • Similar to Stellite™ alloy 6** with higher hardness
2541-00	Bal.	1,4	1,1	1,0	28,5	1,5	-	8,0	44	440	<ul style="list-style-type: none"> • Similar to Stellite™ alloy 12** • Increased abrasion, corrosion and sliding wear resistance, higher high-temperature hardness
2541-10	Bal.	1,85	1,0	Max 1,5	30,0	Max 1,0	-	8,5	46	480	<ul style="list-style-type: none"> • Similar to Stellite™ alloy 12** with higher hardness
2548-00	Bal.	2,4	1,1	--	30,0	--	-	12,5	56	620	<ul style="list-style-type: none"> • Similar to Stellite™ alloy 1** • High abrasion and corrosion resistance • Ideal for pump sleeves, rotary seal rings, wear pads, expeller screws and bearing sleeves • Thermal stability of hardness up to 760°C
HB400	Bal.	Max 0,05	2,8	0,5	9,7	0,5	29,5	-	53	560	<ul style="list-style-type: none"> • Similar to Tribaloy™ T-400 ** • Excellent high temperature, oxidation and wear resistance • Ideal for marine valves
HG met	Bal.	Max 0,10	0,3	0,7	26,0	9,5	5,0	W=2,0 Mn=0,8	-	320	<ul style="list-style-type: none"> • Similar to Ultimet®*** • Excellent corrosion resistance • Work hardening alloy • Ideal for oil & gas applications, such as oil & gas tensioner rods

Product name	Chemistry (wt%)	Hardness*	Typical properties and applications
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Fe-based powders

	Fe	C	Si	Cr	Ni	Mo	Mn	Others	Typical HRC	Typical HV	
3.33 LC	Bal.	0,2	1,2	28	16	4,5	1	-	26	270	<ul style="list-style-type: none"> • Abrasive wear and corrosion at elevated temperatures • Ideal for engine valves
3533-00	Bal.	1,75	1,3	28,0	16,0	4,5	0,8	-	38	330	
3533-10	Bal.	2,1	1,2	28,0	11,5	5,5	1,0	-	43	415	
316L	Bal.	Max 0,03	0,8	17,0	12,0	2,5	1,5	-	-	180	<ul style="list-style-type: none"> • Used as buffer layer/build up alloy • Good corrosion protection • Austenitic stainless steel
316HSi	Bal.	Max 0,03	1,6	17,0	12,0	2,5	1,5	-	-	180	
410L	Bal.	Max 0,03	0,5	12,5	-	-	0,1	-	17	230	<ul style="list-style-type: none"> • Applied for corrosion resistant coatings
420S	Bal.	0,25	0,5	13	<1	-	1,2	-	55	590	<ul style="list-style-type: none"> • Reasonable wear resistance • Martensitic stainless steel • Ideal for rollers and flanges
431HC	Bal.	0,2	0,75	16	1,8	-	<1	-	53	560	
Rockit® 401	Bal.	0,15	-	18,0	2,5	0,5	-	Max 4,0	56	610	<ul style="list-style-type: none"> • Excellent for hard chrome replacement • Patent filed
H13	Bal.	0,35	1	5,0	-	1,5	0,3	V=1	53	560	<ul style="list-style-type: none"> • Tool steel
Rockit® 606	Bal.	2,0	0,9	5,0	-	-	-	V=6,0 Others = Max 4,0	64	980	<ul style="list-style-type: none"> • High hardness and good abrasive wear resistance • Ideal for mining& construction applications • Patent filed

Product name	Chemistry (wt%)	Standard particle sizes ($\mu\text{m}/\mu\text{m}$)	Hardness in HV _{0,1}	Typical properties and applications
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Hard phase powders (carbides and cermets, blend components)

	C (%)	Co (%)	Others (%)			
Amperweld® CTC	4	-	W bal.	150/53	2300-2700	<ul style="list-style-type: none"> Equivalent to Höganäs material 4570 Cast and crushed eutectic tungsten carbide Irregular particle form Blend component For highly wear resistant surface weldings and overlays
4590	4	-	-	150/53	2700 – 3100	<ul style="list-style-type: none"> Spherodized eutectic tungsten carbide (sCTC) Spherical particles with higher hardness Blend component
Amperweld® Macroline®	4,3 – 6,2 (depending on particle size)	-	-	From 425/200 to 45/15	2300-2700	<ul style="list-style-type: none"> Cast and crushed eutectic tungsten carbide, coated with pure tungsten carbide Combines the advantages of WC with those of CTC Patents granted Blend component
4580	6,1	-	-	150/53	2000 – 2200	<ul style="list-style-type: none"> Macrocrystalline tungsten carbide (WC) Compared to CTC, reduced dissolution in NiSF, but lower wear resistance
Amperweld® VC	18	-	-	160/63 90/45 45/5	1800-2400	<ul style="list-style-type: none"> Pure vanadium carbide For advanced compositions Ideal for filled wires, electrodes and meltpool doping
Amperweld® TiC	19	-	-	From 200/106 to 45/5	>3000	<ul style="list-style-type: none"> Pure titanium carbide For advanced compositions Ideal for filled wires, electrodes and meltpool doping
Amperweld® CrB and CrB₂	-	-	17 resp. 29% B	400/63	CrB ₂ 1900-2300	<ul style="list-style-type: none"> Pure chromium borides For advanced compositions Ideal for filled wires, electrodes and meltpool doping

Blends

Product name	Blend composition (wt%)	Matrix	Hard particle
1540-00-60% 4590	40% NiSF 60% sCTC	1540-00	4590
1559-40-65% 4590	35% NiSF 65% sCTC	1559-40	4590
1559-40-60% 4570	40% NiSF 60% CTC	1559-40	Amperweld® CTC (4570)
1559-40-40% 4570	60% NiSF 40% CTC	1559-40	Amperweld® CTC (4570)

Plasma Transferred Arc (PTA) | Powder Selection

Product name	Chemistry (wt%)	Hardness*	Typical properties and applications
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Ni-based powders

	Ni	C	Si	B	Fe	Cr	Mo	Others	Typical HRC	Typical HV	
1525-30	Bal.	0,13	2,55	1,0	1,9	3,3	-	Al=0,4	24	250	<ul style="list-style-type: none"> For surfacing on cast iron and bronze Ideal for glas molds
1535-30	Bal.	0,25	3,0	1,0	2,4	5,6	-	Al=1,0	32	310	<ul style="list-style-type: none"> For surfacing on cast iron and bronze Ideal for glas moulds and oil and gas applications, e.g. mud motor bearings
1538-40	Bal.	Max 0,07	3,0	2,1	Max 0,8	-	-	-	38	380	<ul style="list-style-type: none"> Used as buffer layer and build up alloy Matrix material for composites Suitable for oil and gas stabi
1540-00	Bal.	0,25	3,5	1,6	2,5	7,5	-	-	40	425	<ul style="list-style-type: none"> Wear resistant coatings
1550-00	Bal.	0,45	3,9	2,3	2,9	11,0	-	-	52	580	<ul style="list-style-type: none"> Medium to hard welds are achievable Matrix material for composites Used for applications in oil & gas, mining & construction and plastic industry
1.53 53 - 180 µm	Bal.	0,90	5,3	2,05	5,4	18,0	-	-	54	590	
1555-20	Bal.	0,55	4,0	3,4	2,7	16,0	3,0	Cu=3,0	58	730	
1559-40	Bal.	Max 0,06	3,0	2,9	0,2	-	-	-	49	510	
1560-00	Bal.	0,75	4,3	3,1	3,7	14,8	-	-	62	810	
1562-10	Bal.	0,60	3,7	2,8	3,5	14,2	-	W=9,5	60	720	
In 625	Bal.	Max 0,03	0,40	--	1,4	21,5	9,0	Nb=3,8	-	200	<ul style="list-style-type: none"> Excellent corrosion protection Used as buffer layer
Amperweld® NiSA 625	Bal.	Max 0,03	Max 0,15	--	Max. 1,5	21,5	9,0	Nb = 3,65	-	200	<ul style="list-style-type: none"> Resistant to aqueous environments, such as high temperatures Typical applications in aerospace, chemical process, marine and automotive industries Used as buffer layer
Amperweld® NiSA 718	Bal.	0,05	Max 0,35	Max 0,006	Max 1,5	19,0	3,05	Nb=5,15 Ti=0,9 Al=0,5 Co=0,5	-	Depending on post heat treatment	<ul style="list-style-type: none"> Age hardened, high-temperature and corrosion resistance Ideal for aerospace and stationary gas turbines, oilfield applications
C276-m	Bal.	0,12	0,5	-	3,0	15,5	16	W=4,5 Mn=1,2 V=0,5	-	230	<ul style="list-style-type: none"> Excellent corrosion protection Used as buffer layer
Amperweld® NiSA C276	Bal.	Max 0,01	Max 0,08	--	5,0	15,5	16	Co=1,2 W=3,7	-	230	<ul style="list-style-type: none"> Resists highly aggressive aqueous environments and localized corrosion Used for chemical process, pollution control, oil and gas recovery Used as buffer layer of metal matrix composites (MMCs)

Product name	Chemistry (wt%)									Hardness*	Typical properties and applications
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Co-based powders

	Co	C	Si	Fe	Cr	Ni	Others	Mo	W	Typical HRC	Typical HV	
2528-00	Bal.	0,25	1,0	1,5	27,0	2,8	-	5,5	-	28	340	<ul style="list-style-type: none"> • Similar to Stellite™ alloy 21* *forming dies • Used as buffer layer • Work hardening alloy
2537-00	Bal.	1,1	1,0	1,5	28,5	1,5	-	-	4,4	41	400	<ul style="list-style-type: none"> • Similar to Stellite™ alloy 6** • All-rounder to combat corrosion, galling, erosion, cavitation or mechanical wear
2537-10	Bal.	1,3	1,0	1,5	28,5	1,5	-	-	4,4	43	440	<ul style="list-style-type: none"> • Stellite™ alloy 6** with higher hardness
2540-00	Bal.	1,7	1,2	1,2	25,7	22,8	-	-	12,5	42	410	<ul style="list-style-type: none"> • Similar to Stellite™ alloy 6** with higher hardness
2541-00	Bal.	1,4	1,1	1,0	28,5	1,5	-	-	8,0	44	440	<ul style="list-style-type: none"> • Similar to Stellite™ alloy 12** • Increased abrasion, corrosion and sliding wear resistance, higher high-temperature hardness
2541-10	Bal.	1,85	1,5	Max 1,5	30,0	Max 1,0	-	-	8,5	46	480	<ul style="list-style-type: none"> • Similar to Stellite™ alloy 12** with higher hardness
2548-00	Bal.	2,4	1,1	-	30,0	-	-	-	12,5	56	620	<ul style="list-style-type: none"> • High abrasion and corrosion resistance • Ideal for pump sleeves, rotary seal rings, wear pads, expeller screws and bearing sleeves • Thermal stability of hardness up to 760°C
HB400	Bal.	Max 0,05	2,8	0,5	9,7	0,5	-	29,5	-	53	560	<ul style="list-style-type: none"> • Similar to Tribaloy™ T-400 ** • Excellent high temperature, oxidation and wear resistance • Ideal for marine valves
HG met	Bal.	Max 0,10	0,3	0,7	26,0	9,5	-	5,0	W=2,0 Mn=0,8	-	320	<ul style="list-style-type: none"> • Similar to Ultimet®*** • Excellent corrosion resistance • Work hardening alloy • Ideal for oil & gas applications, such as off-shore hydraulic cylinders
HB800	Bal.	0,08	3,4	<2	17,5	<2	-	28	-	58	650	<ul style="list-style-type: none"> • Similar to Tribaloy™ T-800** • Outstanding tribological high-temperature properties with high hardness, withstands metal-to-metal adhesion or sliding wear, increased resistance in corrosive media

Product name	Chemistry (wt%)								Hardness*		Typical properties and applications
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Fe-based powders

	Fe	C	Si	Cr	Ni	Mo	Mn	Others	Typical HRC	Typical HV	
3533-00	Bal.	1,75	1,3	28,0	16,0	4,5	0,8	-	33	330	<ul style="list-style-type: none"> • Abrasive wear and corrosion at elevated temperatures • Ideal for engine valves
3533-10	Bal.	2,1	1,2	28,0	11,5	5,5	1,0	-	42	415	
316L	Bal.	Max 0,03	0,8	17,0	12,0	2,5	1,5	-	-	180	<ul style="list-style-type: none"> • Used as build up and buffer layer • Good corrosion resistance • Austenitic stainless steel
410L	Bal.	Max 0,03	0,8	12,5	--	--	0,1	-	-	230	<ul style="list-style-type: none"> • Applied for corrosion resistant coatings
420S	Bal.	0,25	0,5	13	<1	-	1,2	-	55	590	<ul style="list-style-type: none"> • Reasonable wear resistance • Martensitic stainless steel • Ideal for rollers and flanges
431HC	Bal.	0,2	0,75	16	1,8	-	<1	-	53	560	
Rockit® 401	Bal.	0,15	-	18,0	2,5	0,5	-	Max 4,0	56	600	<ul style="list-style-type: none"> • Unique combination of tribological properties and corrosion resistance • Used for hydraulic piston rods • Patent filed
H13	Bal.	0,35	1	5	-	1,5	0,3	V=1,0	53	560	<ul style="list-style-type: none"> • Tool steel
Rockit® 606	Bal.	2,0	0,9	5,0	-	-	-	V=6,0 Others=Max 4,0	64	980	<ul style="list-style-type: none"> • High hardness and good abrasive wear properties • Ideal for applications in mining & construction industry • Patent filed
Rockit® 706	Bal.	2,6	1,0	5,0	-	-	-	V=6,0 Others=Max 4,0	66	910	<ul style="list-style-type: none"> • Ideal for applications in mining & construction industry • Patent filed
M2	Bal.	1,0	0,3	4,0	--	5,0	0,3	V=2,0 W=6,2	63	820	<ul style="list-style-type: none"> • Tool steel • Ideal for wear plates
A11	Bal.	2,45	1,0	5,2	---	1,3	0,50	W=0,5 V=9,8	62	750	<ul style="list-style-type: none"> • Tool steel • Ideal for wear plates

Product name	Chemistry (wt%)	Standard particle sizes ($\mu\text{m}/\mu\text{m}$)	Hardness in HV _{0,1}	Typical properties and applications
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Hard phase powders (Carbides and cermets, blend components)

	C (%)	Co (%)	Others (%)			
Amperweld® CTC	4	-	W bal.	150/53	2300-2700	<ul style="list-style-type: none"> • Equivalent to Höganäs material 4570 • Cast and crushed eutectic tungsten carbide • Irregular particle form • Blend component • For highly wear resistant surface weldings and overlays
4590	4	-	W bal.	150/53	2700 – 3100	<ul style="list-style-type: none"> • Spherodized eutectic tungsten carbide (sCTC) • Spherical particles with higher hardness • Blend component
Amperweld® Macroline®	4,3 – 6,2 (depending on particle size)	-	W bal.	From 425/200 to 45/15	2300-2700	<ul style="list-style-type: none"> • Cast and crushed eutectic tungsten carbide, coated with pure tungsten carbide • Combines the advantages of WC with those of CTC • Patents granted • Blend component
4580	6,1	-	W bal.	150/53	2000 – 2200	<ul style="list-style-type: none"> • Macrocrystalline tungsten carbide (WC) • Compared to CTC, reduced dissolution in NiSF, but lower wear resistance
Amperweld® VC	18	-	V bal.	160/63 90/45 45/5	1800-2400	<ul style="list-style-type: none"> • Pure vanadium carbide • For advanced compositions • Ideal for filled wires, electrodes and meltpool doping
Amperweld® TiC	19	-	Ti bal.	From 200/106 to 45/5	>3000	<ul style="list-style-type: none"> • Pure titanium carbide • For advanced compositions • Ideal for filled wires, electrodes and meltpool doping
Amperweld® CrB and CrB₂	-	-	Cr bal. B 17 resp. 29%	400/63	CrB ₂ 1900-2300	<ul style="list-style-type: none"> • Pure chromium borides • For advanced compositions • Ideal for filled wires, electrodes and meltpool doping

Blends

Product name	Blend composition (wt%)	Matrix	Hard particle
1540-00-60% 4590	40% NiSF 60% sCTC	1540-00	4590
1559-40-65% 4590	35% NiSF 65% sCTC	1559-40	4590
1559-40-60% 4570	40% NiSF 60% CTC	1559-40	Amperweld® CTC (4570)
1559-40-40% 4570	60% NiSF 40% CTC	1559-40	Amperweld® CTC (4570)

Powder Welding | Powder Selection

Product name	Chemistry (wt%)	Hardness*	Typical properties and applications
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Ni-based powders

	Ni	C	Si	B	Fe	Cr	Mo	Others	Typical HRC	Typical HV	
1015-00	Bal.	0,03	2,0	1,1	0,5	-	-	Cu=15	15	210	<ul style="list-style-type: none"> • Ideal for repair of cast iron e.g. engine blocks
1020-00	Bal.	0,03	2,4	1,4	0,4	-	-	-	20	230	<ul style="list-style-type: none"> • Welding on new cast iron surfaces • Repair of machining errors
1021-10	Bal.	0,03	2,0	0,65	0,3	3,0	-	P=2,0	21	250	<ul style="list-style-type: none"> • Lower melting point • Can be filed by hand • Improved fluidity
1623-05	Bal.	0,04	2,5	1,6	0,4	-	-	-	23	270	<ul style="list-style-type: none"> • Used for small repairs • Can be filed by hand
1025-40	Bal.	0,05	2,7	1,8	0,4	-	-	-	28	295	<ul style="list-style-type: none"> • Lower melting point • Can be filed by hand • Improved fluidity
1031-10	Bal.	0,03	2,2	0,9	0,3	3,0		P=2,2	28	290	<ul style="list-style-type: none"> • Improved fluidity
1035-40 1135-40	Bal.	0,32	3,7	1,2	3,0	7,0	-	-	35	360	<ul style="list-style-type: none"> • Ideal for repair and buildup of small plungers and neck rings in the glass bottle manufacturing industry
1036-40	Bal.	0,15	2,8	1,2	0,4	4,5	2,5	P=1,9	36	375	<ul style="list-style-type: none"> • Improved fluidity
1040-00	Bal.	0,25	3,5	1,6	2,5	7,5	-	-	40	425	<ul style="list-style-type: none"> • Ideal for repair and buildup of worn molds, valves, seal rings, splines, etc • Good fluidity
1045-00	Bal.	0,35	3,7	1,8	2,6	8,9	-	-	47	500	<ul style="list-style-type: none"> • Ideal for repair and buildup of worn molds, valves, seal rings, splines, etc • Good fluidity
1050-00	Bal.	0,45	3,9	2,3	2,9	11,0	-	-	52	580	<ul style="list-style-type: none"> • Ideal for all applications with high demand on wear and corrosion properties • Suitable for crusher rolls, conveyor screws, pump shafts, mixer blades
1060-00	Bal.	0,75	4,3	3,1	3,7	14,8	-	-	62	810	<ul style="list-style-type: none"> • Ideal for all applications with high demand on wear and corrosion properties • Suitable for crusher rolls, conveyor screws, pump shafts, mixer blades
602P	Bal.	0,65	4,2	2,9	4,3	13,1	-	-	60	700	<ul style="list-style-type: none"> • Ideal for all applications with high demand on wear and corrosion properties • Suitable for crusher rolls, conveyor screws, pump shafts, mixer blades

Product name	Chemistry (wt%)	Standard particle sizes (µm/µm)	Hardness in HV _{0,1}	Typical properties and applications
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Hard Phase Powders

	C (%)	Co (%)	Others (%)			
Amperweld® CTC	4	-	W bal.	(106/38)	2300-2700	<ul style="list-style-type: none"> • Equivalent to Höganäs material 4070 • Cast and crushed eutectic tungsten carbide • Irregular particle form • Available in 25 particles sizes from 3150/800 to 45/15µm • Blend component for PTA, laser, brazing and spray&fuse • For highly wear resistant surface weldings and overlays

Blends

Product name	Blend composition (wt%)	Matrix	Hard particle
1060-00-60% 4070	40% NiSF 60% CTC	1060-00	Amperweld® CTC (4070)
1060-00-40% 4070	60% NiSF 40% CTC	1060-00	Amperweld® CTC (4070)

Flame Spraying | Powder Selection

Product name	Chemistry (wt%)	Hardness*	Typical properties and applications
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Ni-based powders

	Ni	C	Si	B	Fe	Cr	Mo	Others	Typical HRC	Typical HV	
1240-00 1340-00	Bal.	0,25	3,5	1,6	2,5	7,5	-	-	38	380	<ul style="list-style-type: none"> Used as buildup layer on plungers in glass bottle manufacturing industry where good machinability is required Suitable for bearings, pump rotors, piston heads
1245-00 1345-00	Bal.	0,35	3,7	1,8	2,6	8,9	-	-	44	450	<ul style="list-style-type: none"> Used as buildup layer on plungers in glass bottle manufacturing industry where good machinability is required Ideal for bearings, pump rotors, piston heads
1250-00 1350-00	Bal.	0,45	3,9	2,3	2,9	11,0	-	-	51	570	<ul style="list-style-type: none"> Ideal for bearings, seal rings, mixer blades, chipper knives
1255-20 1355-20	Bal.	0,55	4,0	3,4	2,7	16,0	3,0	Cu=3,0	57	700	<ul style="list-style-type: none"> Ideal for bearings, seal rings, mixer blades, chipper knives
1260-00 1360-00	Bal.	0,75	4,3	3,1	3,7	14,8	-	-	61	790	<ul style="list-style-type: none"> Ideal for oil and gas applications, such as polished rods, rod liners, wash pipes, etc
1360-20	Bal.	0,90	4,3	3,3	4,2	16,3	-	-	62	820	<ul style="list-style-type: none"> Ideal for oil and gas applications, such as polished rods, rod liners, wash pipes, etc
1362-10	Bal.	0,60	3,7	2,8	3,5	14,2	-	W=9,5	59	720	<ul style="list-style-type: none"> Ideal for oil and gas applications, such as pump plungers, sucker rod couplings
72-W-40 72-M-40	Bal.	0,35	3,1	1,7	3,2	9,9	-	-	37	365	<ul style="list-style-type: none"> Ideal for oil and gas applications, such as polished rods, rod liners
74-W-60 74-M-60	Bal.	0,58	4,1	2,9	4,4	13,6	-	-	58	710	<ul style="list-style-type: none"> Ideal for oil and gas applications, such as polished rods, rod liners, wash pipes, etc
76-W-50 76-M-50	Bal.	0,55	3,7	2,4	4,1	13,3	-	-	50	550	<ul style="list-style-type: none"> Ideal for oil and gas applications, such as polished rods, rod liners, wash pipes, etc
80-W-60 80-M-60	Bal.	0,60	4,2	2,9	4,6	14,0	2,5	Cu=2,4	58	710	<ul style="list-style-type: none"> Ideal for oil and gas applications where higher corrosion resistance is required

Product name	Chemistry (wt%)	Standard particle sizes (µm/µm)	Hardness in HV _{0,1}	Typical properties and applications
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Hard Phase Powders (Carbides and Cermets, blend components)

	C (%)	Co (%)	Others (%)			
Amperweld® CTC	4	-	W bal.	(125/45) (53/20)	2300-2700	<ul style="list-style-type: none"> • Equivalent to Höganäs material 4370 and 4670 • Cast and crushed eutectic tungsten carbide • Irregular particle form • Available in 25 particles sizes from 3150/800 to 45/15µm • Blend component for PTA, laser, brazing and spray&fuse • For highly wear resistant surface weldings and overlays
Amperit® 519	5,4	12	W bal.	(106/53)	-	<ul style="list-style-type: none"> • Equivalent to Höganäs material 44712-10 • WC-Co cermet • Agglomerated/sintered • Spherical particles • Blend component

Blends

Product name	Blend composition (wt%)	Matrix	Hard particle
1360-20-35% 44712-10	65% NiSF 35% WC-Co	1360-20	Amperit® 519 .125 (44712-10)
1360-00-35% 4370	65% NiSF 35% CTC	1360-00	Amperweld® CTC (4370)

Product codes

Foot notes

- *±2 HRC and corresponding HV₃₀ values
** Registered trademark of Kennametall Stellite
***Registered trademark of Haynes International

Powder designations

1 6 20 - 1 1

A B C - D E

A: Alloy base
1 = Nickel (Ni)
2 = Cobalt (Co)
3 = Iron (Fe)
4 = Tungsten carbide (WC)

B: Standard particle size range
0 = 20 – 106 µm
1 = 20 – 71 µm
2 = 36 – 106 µm
3 = 45 – 125 µm
5 = 53 – 150 µm
6 = 15 – 53 µm
7 = 63 – 212 µm

C: Average hardness:
Rockwell C

D: Chemical composition
1–9 = modified

E: Particle size range
1–9 = modified

This brochure only includes our standard materials. Other particle sizes are available on request.

We walk the sustainable path!

Höganäs strives to be a catalyst for change and become a truly sustainable business. For us, environmental and social care, and business success are intertwined. Our sustainability strategy, Mount Sustainability, sets the direction.

A great and meaningful place to work means respect, equal treatment, competence and leadership development. For us, people that prosper are the foundation for the timely and efficient delivery of quality products and services to our customers.

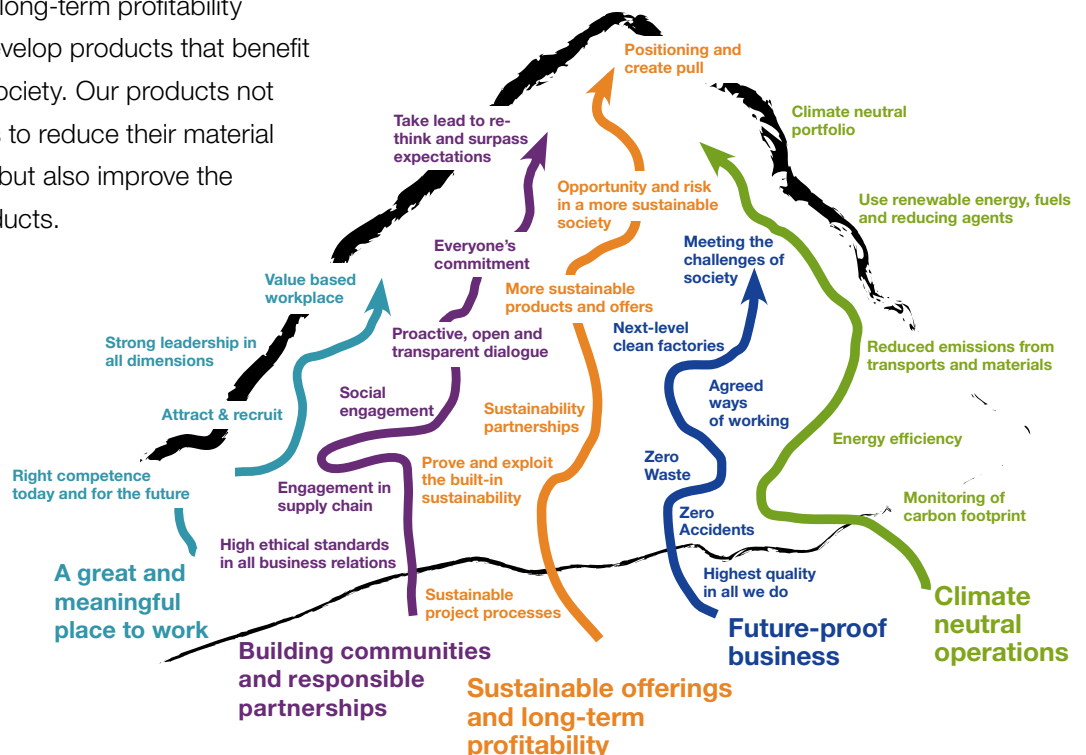
Building communities and responsible partnerships includes amongst other things our extensive work with responsible sourcing, working together with our suppliers to develop and secure high standards concerning human rights, labor rights, anti-corruption and environmental protection.

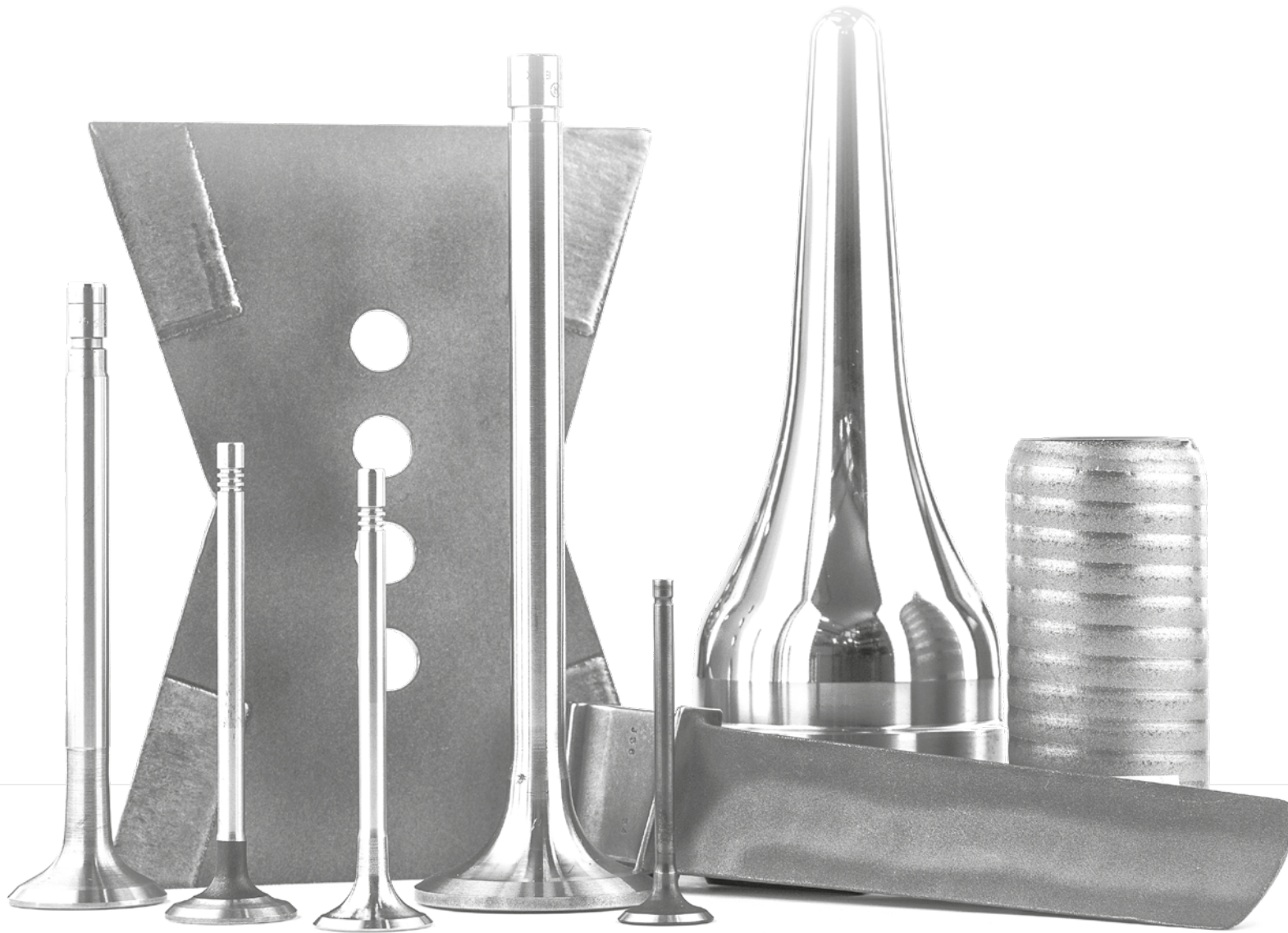
Sustainable products and long-term profitability describes our efforts to develop products that benefit both our customers and society. Our products not only enable our customers to reduce their material and energy consumption, but also improve the efficiency of their final products.

Future-proof business means ensuring high quality in our products through effective work methods, a clean work environment, responsible use of resources, Zero Waste and Zero Accidents.

Climate neutral operations is the guiding vision for our work with careful monitoring of our emissions, efficient use of energy and resources in production and transport, and gradually changing to renewable resources.

Höganäs aims to be the partner that enables sustainability and seeks cooperation with suppliers, end users, academia and communities to meet the expectations and requirements of society.





Inspire industry to make more with less

Höganäs vision is to inspire industry to make more with less. Metal powder technology provides endless opportunities; not only does it enable our customers to reduce their material and energy consumption, but it also helps them use new and better techniques that make final products more efficient and less expensive. In short, metal powders are a resource-efficient alternative, suitable for many industries – that's one of our contributions to a sustainable world.

To find out how you can apply the Power of Powder®, please contact your nearest Höganäs office.



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