Composites

Swiss high-tech abrasives for composite fibre materials

sia ABRASIVES

Finished by sia Abrasives

Many materials hold a secret; they keep their true beauty concealed. Only a precise finish reveals what is inside. For over 130 years, sia Abrasives has championed perfect surfaces.

"finished by sia Abrasives" – the final finish for materials of all kinds is what makes the great difference: wood achieves its expressive colouration, the distinctive colour contrasts or astonishing grain, leather captivates through subtle nuances, contact lenses guarantee optimum visual acuity, metal shines in its utmost perfection, marble develops its robust yet filigree diversity, and synthetics or coatings become the epitome of functionality and aesthetic appeal.

sia ABRASIVES

3 Product overview

		Coarse sanding					Flat grinding								Fine sanding						Microfinishing								Conversion			
		16	24	36	40	50	60	80	100	120	150	180	220	240	280	320	360	400	500	600	800	1000	1200	1500	2000	2500	3000	4000				
1913 **siawat**																																
1950 **siaspeed**																																
1940 **siacar**																																
7940 **siaair**																																
7240 **siacarat**																																
7242 **siacarat cut**																																
7241 **siacarbon**																																
4819 **siaron**																																
4515 **siabite**																																
4700 **siaral**																																
1749 **siaral**																																
1815 **siatop**																																
4924 **siamet**																																
2824 **Spiraband**																																
2848 **siafix**																																
1950 **siaspeed siasoft**																																
6120 **siavlies speed**															very fine	very fine	very fine	very fine	ultra fine	ultra fine	ultra fine	micro fine	micro fine	micro fine								
2275 **flatpad**															medium				fine		extra fine	super fine		micro fine								

Grit range available

Main use

The demands made of materials are increasing. Composite fibre materials are the answer to this. They are used whenever components with unusual combinations of properties are called for. Optimally matched abrasives ensure the perfect sanding finish.

Lighter, stronger, more elastic, more precise, safer, more economical. In these times of rapid technological change, the functionality and properties of composite fibre materials know virtually no bounds, and processing with abrasives makes an important contribution to them.

New applications are continually being discovered: environmentally friendly air travel, safer automobile and boat construction, ecological wind power, ingenious medical technology, high-quality information technologies or reliable mechanical and plant engineering testify to the opportunities opened up by composite fibre materials.

The demands made of abrasives are high, and continually changing. The products are therefore of a modular construction and are adapted to applications: edges are cut or deburred and surfaces are sanded. The best preconditions are created for the force lines, functionality, finishing, coating or appearance of products.

The advantages of composite fibre materials are thus ideally supported by the customised sanding process. They lie in, amongst other things, the largely elastic deformation behaviour, the adaptable stability and rigidity, in highly integrative design options, dynamic resilience, a low coefficient of expansion, a good raw material basis, a low investment requirement and ease of repair.

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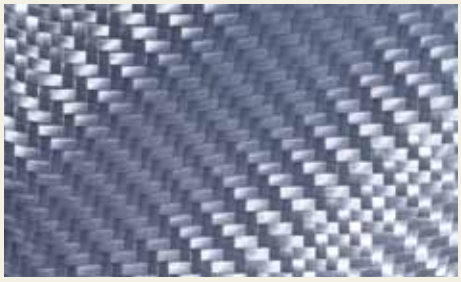
Composites

The 3 most important types of fibre



Glass fibres

Glass fibres are the most frequently used reinforcement material. They are economical, resistant to ageing, weathering and chemicals, and non-flammable. With optimum sanding, further finishing is enabled and the original unique functions are preserved.

Summary of the most important features:
- High tensile and compression strength
- Good rigidity
- Good impact toughness
- Good temperature resistance
- Economical price

Carbon fibres

Carbon fibres are used above all for rigid constructions. They not only help to reduce the weight five-fold compared with conventional materials such as steel, but also minimise deflection. Processing in the sanding process demands the highest precision and care to prevent breaking points.

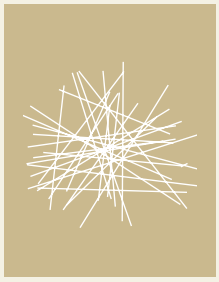
Summary of the most important features:
- Extremely high tensile and compression strength
- Extremely high rigidity
- Very low density
- Low thermal expansion coefficient
- High chemical resistance
- Good temperature resistance
- Good electrical conductivity

Aramide fibres

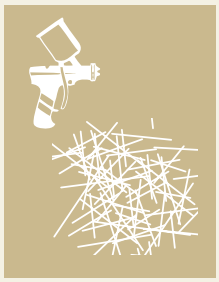
Aramide fibres are non-flammable and chemically stable, and they achieve a further weight saving on glass fibres of 25 to 40 percent, increase stability and rigidity by half, and satisfy the most stringent safety requirements. Optimum sanding solutions enable a combination of functions not previously achieved.

Summary of the most important features:
- Extremely high stability
- Extremely high impact toughness
- Very low density
- Good chemical resistance

Open matrix constructions

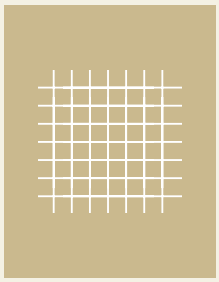


Mats
Fibreglass mats are fibre-reinforced synthetics in which the fibres consist of reinforcement materials and casting resins or thermoplastic polymers, and in which the individual spinning threads or yarns are woven with one another. Fibreglass mats are available off the roll, and are used for example in construction parts.

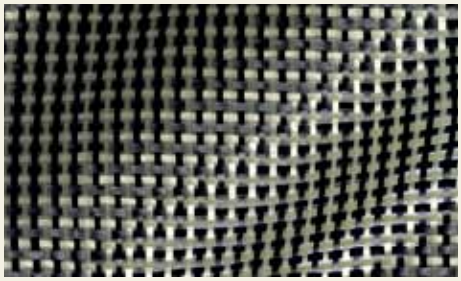


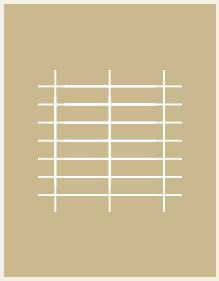
Fibre spraying
In fibre spraying, a cutting tool is used to cut continuous fibres (rovings) to the desired length, and introduced into the mould together with resin and hardening agent by means of a fibre spraying gun. As with manual lamination, a lamination roll is also used in order to compress the laminate. The greatest disadvantage of this variant is the clearly lower strength compared with laminated woven fabric.

Woven matrix constructions

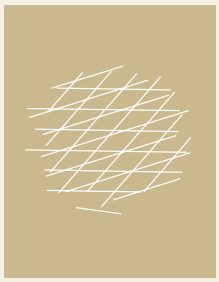


Symmetrical
The simplest weave is plain weave. It is symmetrical and is thus extremely dimensionally stable, slip-proof and fray-proof. Fabrics with plain weave are to be preferred in the production of flat or slightly curved components.





Complex
A more complex matrix enables twill and satin weaves, of which there are numerous variations. In the case of twill weaves, two to three warp threads are skipped. Due to the construction, the strengths of twill weaves are somewhat higher, although their non-slip properties are reduced.



Multiaxial
By placing fibre layers over one another at different angles, reinforcement materials can be produced with fibre orientation that can withstand loading. Due to the extended position of the fibres, for the same wall thickness of the laminate, higher mechanical strengths can be achieved than with woven products.

Transport

Technology with a high degree of utility.

The transport industry counts on new opportunities to reduce energy consumption and optimises costs thanks to lower wind resistance with the targeted sanding finish – finished by sia Abrasives.

Pages 8 – 13

Deburring the edges

Keying

Primer filler sanding

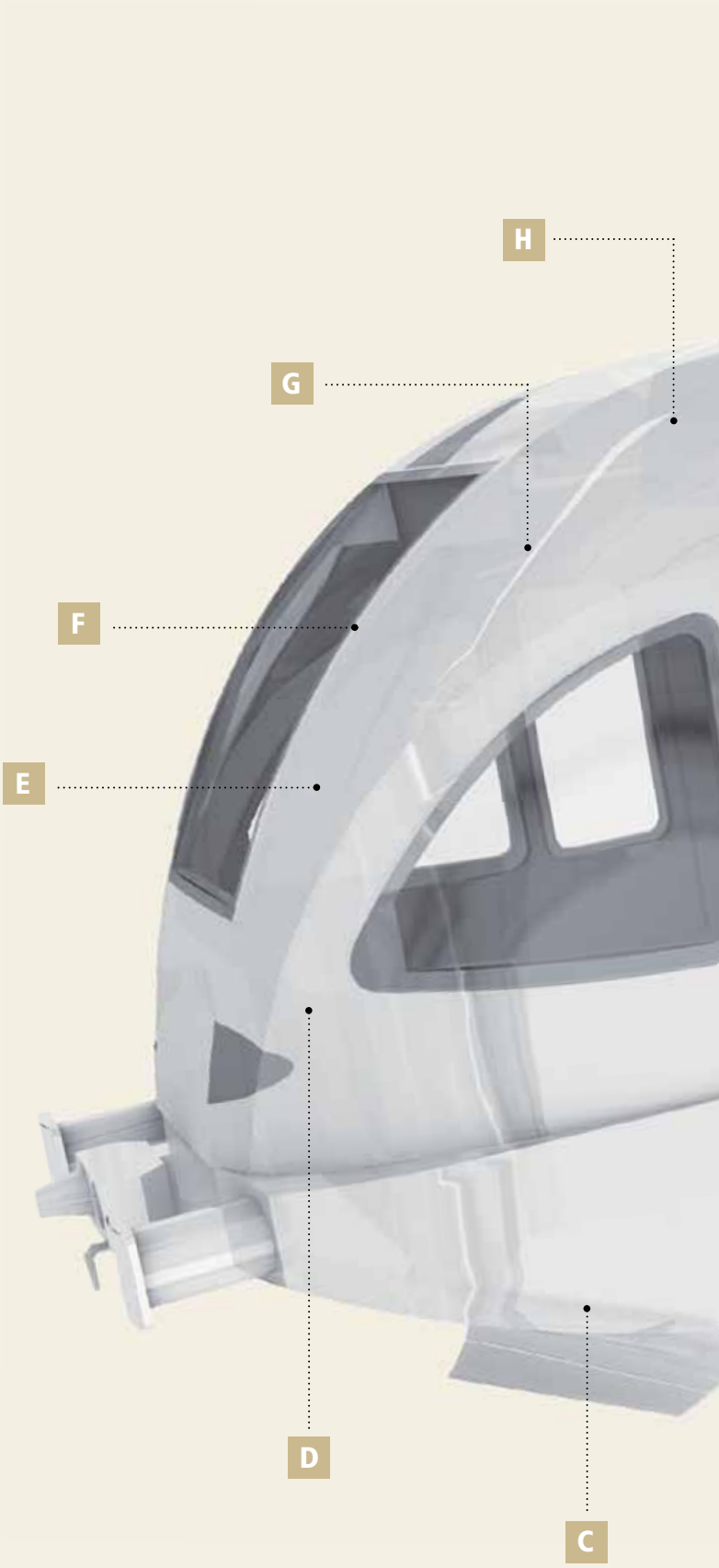
Finish/polishing

Filler sanding

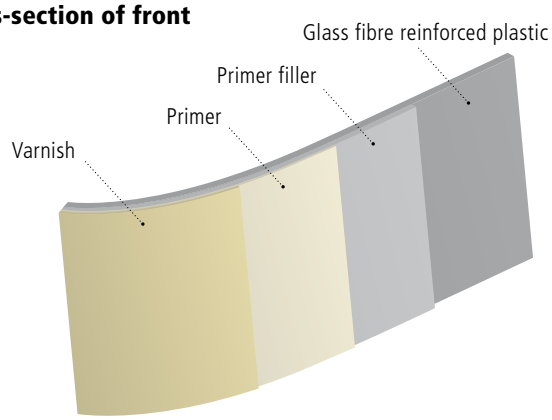
Primer filler sanding

Removing dust inclusions

Microfinishing prior to polishing



Cross-section of front



Deburring the edges

4700 siaral fibre discs	K036 – K060
4819 siaron fibre discs	K036 – K060

Keying

1950 siaspeed discs, strips	K080 – K240
1950 siaspeed siasoft rolls, strips	K180 – K320
1940 siacar discs, strips	K080 – K240

Primer filler sanding

1950 siaspeed discs, strips	K320 – K600
1950 siaspeed siasoft rolls, strips	K320 – K600
6120 siavlies speed discs, strips, rolls	very fine – ultra fine
2275 Flatpad	fine – super fine

Finish/polishing

siashine	Fast cut / Speed / Finish / Magic

Filler sanding

1950 siaspeed discs, strips	K080 – K320
1940 siacar discs, strips	K080 – K320

Primer filler sanding

1950 siaspeed discs, strips	K280 – K600
1950 siaspeed siasoft rolls, strips	K320 – K600
6120 siavlies speed discs, strips, rolls	very fine – ultra fine
2275 Flatpad	fine–super fine

Removing dust inclusions

1913 siawat strips, buds, sheets	K1500 – K2500
7242 siacarat cut buds	K1500 + K2000

Microfinishing prior to polishing

7940 siaair discs	K2000 – K4000
7240 siacarat discs	K1000 – K3000

TIPS

siaspeed siasoft – with practical perforation

The flexible and pressure-equalising foam insulation on the back of the siaspeed siasoft abrasive reduces the risk of sanding through on edges, beads and rounded areas to an absolute minimum. The innovative perforation of the abrasive strips, developed by sia Abrasives, makes tear-off as easy as possible. This way, there are no uneven torn-off edges that can lead to unwanted surface scratches.

Windmill

Power generation paired with ecology.

The wind power industry is built on future-oriented technologies: composite fibre materials with the optimum sanding finish increase energy yield and efficiency – finished by sia Abrasives.

Pages 14 – 19

Grinding edges after cutting

Deburring of drilled holes, adjusting drilled holes to size

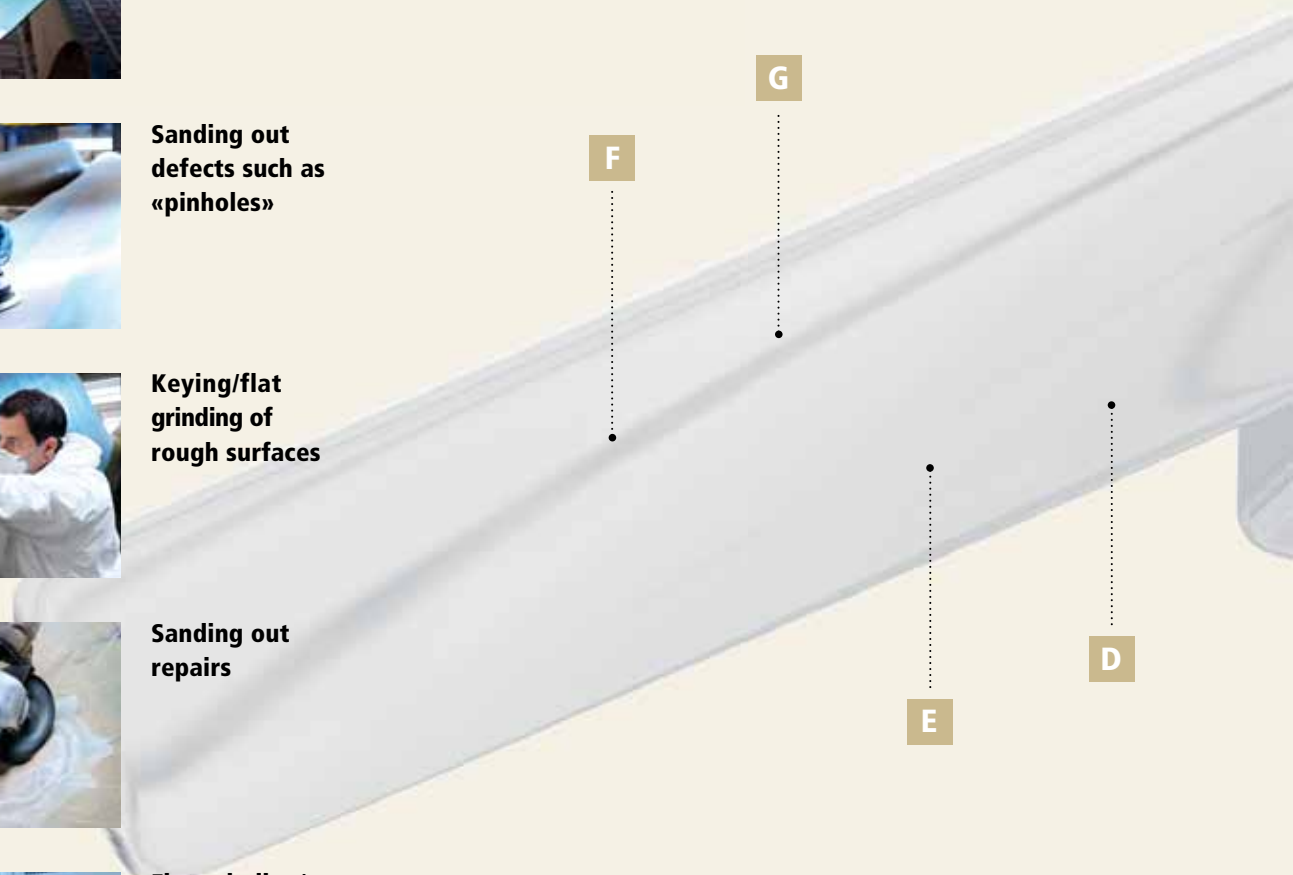
Keying of joints

Sanding out defects such as «pinholes»

Keying/flat grinding of rough surfaces

Sanding out repairs

Flat grinding/ fine sanding of epoxy filler



Cross-section of rotor blade

A 	**Grinding edges after cutting**	**1815 siatop** discs	K040 – K120
B 	**Deburring of drilled holes, adjusting drilled holes to size**	**2824 Spiraband** Spira belts	K050 – K080
C 	**Keying of joints**	**1950 siaspeed** discs	K080 – K150
D 	**Sanding out defects such as «pinholes»**	**1950 siaspeed** discs	K080 – K150
E 	**Keying/flat grinding of rough surfaces**	**1815 siatop** discs **1950 siaspeed** discs	K040 – K120 K040 – K120

F

Sanding out repairs

4924 siamet
discs

K036 – K060

G

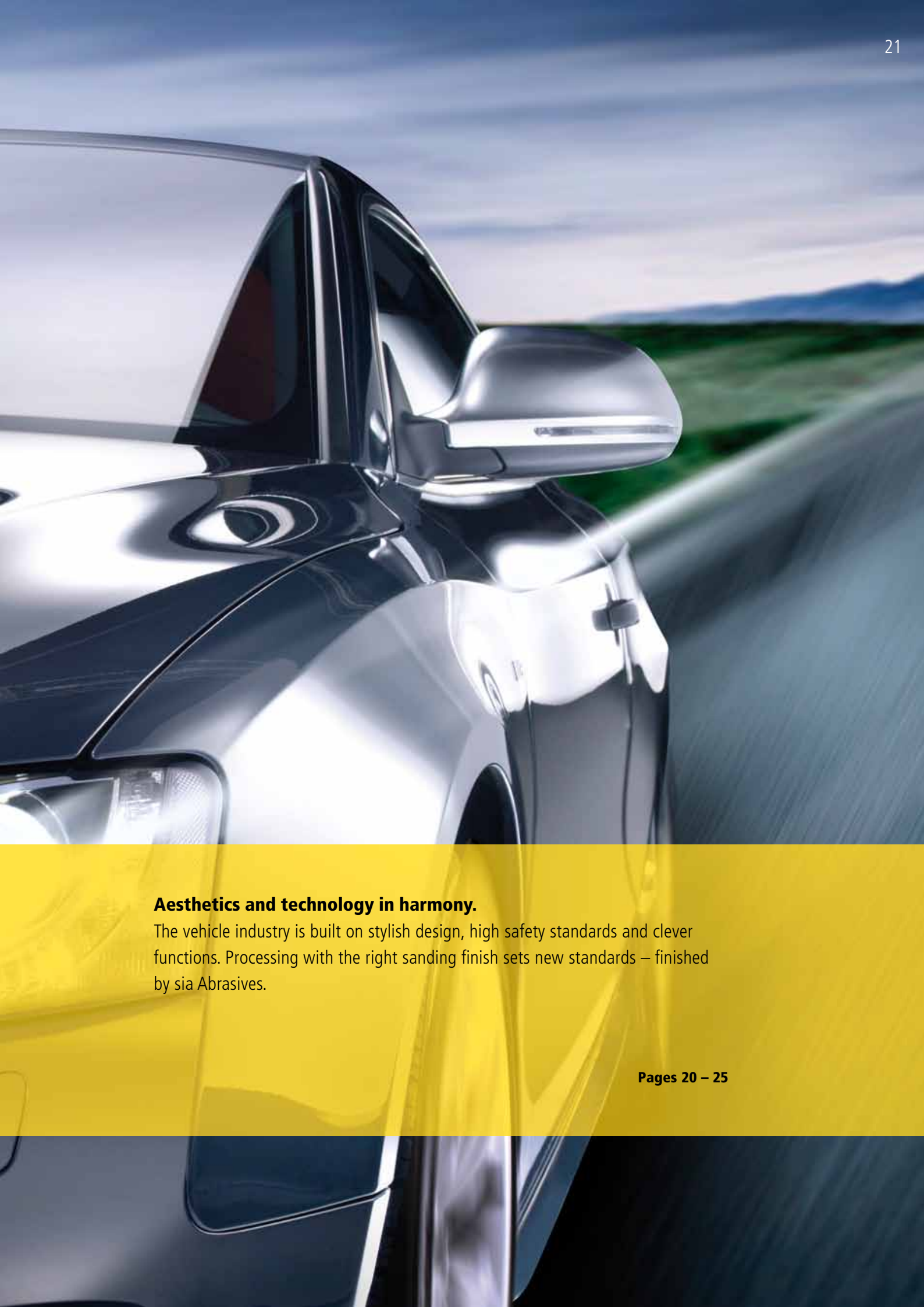
Flat grinding/fine sanding of epoxy filler

1950 siaspeed
discs, strips

K040 – K180

TIPS
siaspeed – full speed ahead to the perfect surface
siaspeed is an abrasive innovation which in the coarse grain area can, depending on the material and the application, achieve up to 20 percent greater material removal compared with the leading products from competitors. The rapid rate of material removal is associated with improved surface quality. This is thanks to the ingenious stearate coating, which also prevents the abrasive from clogging or jamming.

Automotive



Aesthetics and technology in harmony.

The vehicle industry is built on stylish design, high safety standards and clever functions. Processing with the right sanding finish sets new standards – finished by sia Abrasives.

Pages 20 – 25

Deburring

Keying a new part

Primer filler sanding

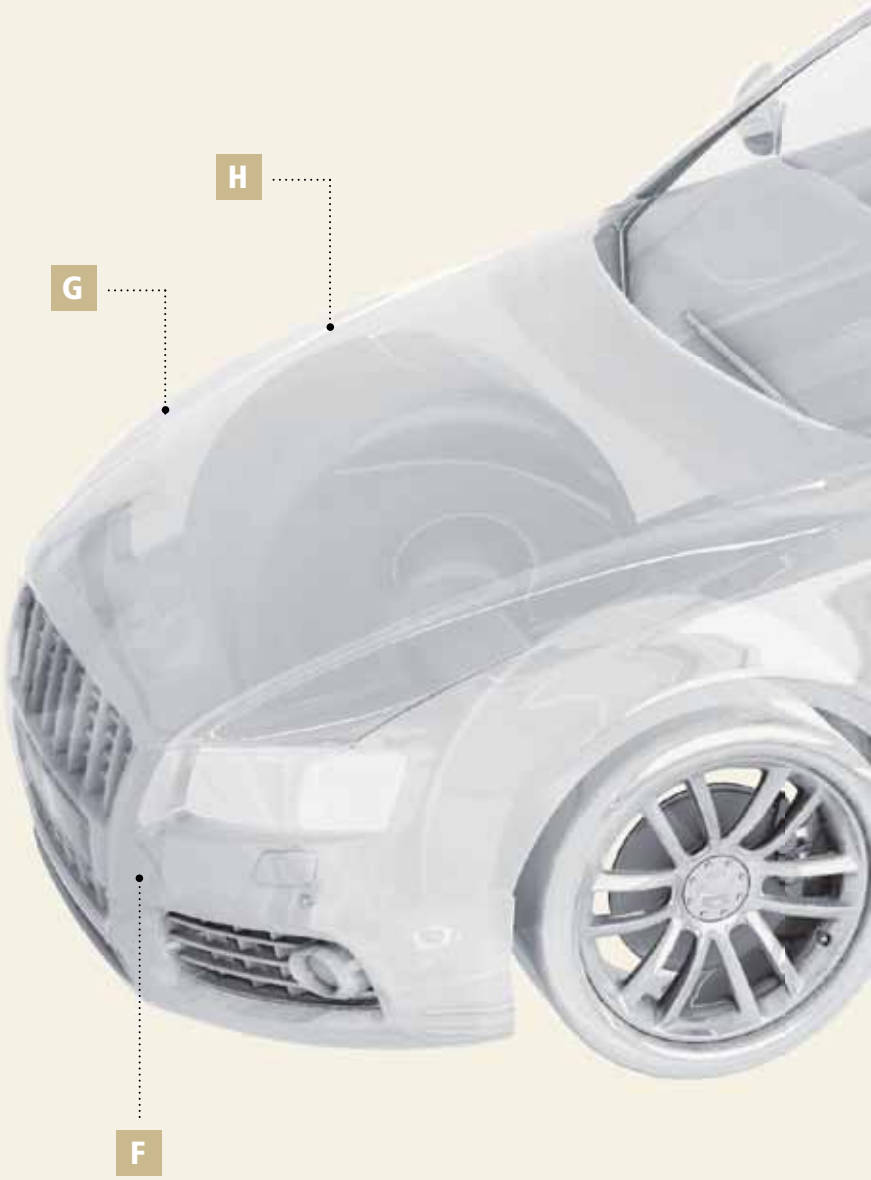
Finish/polishing

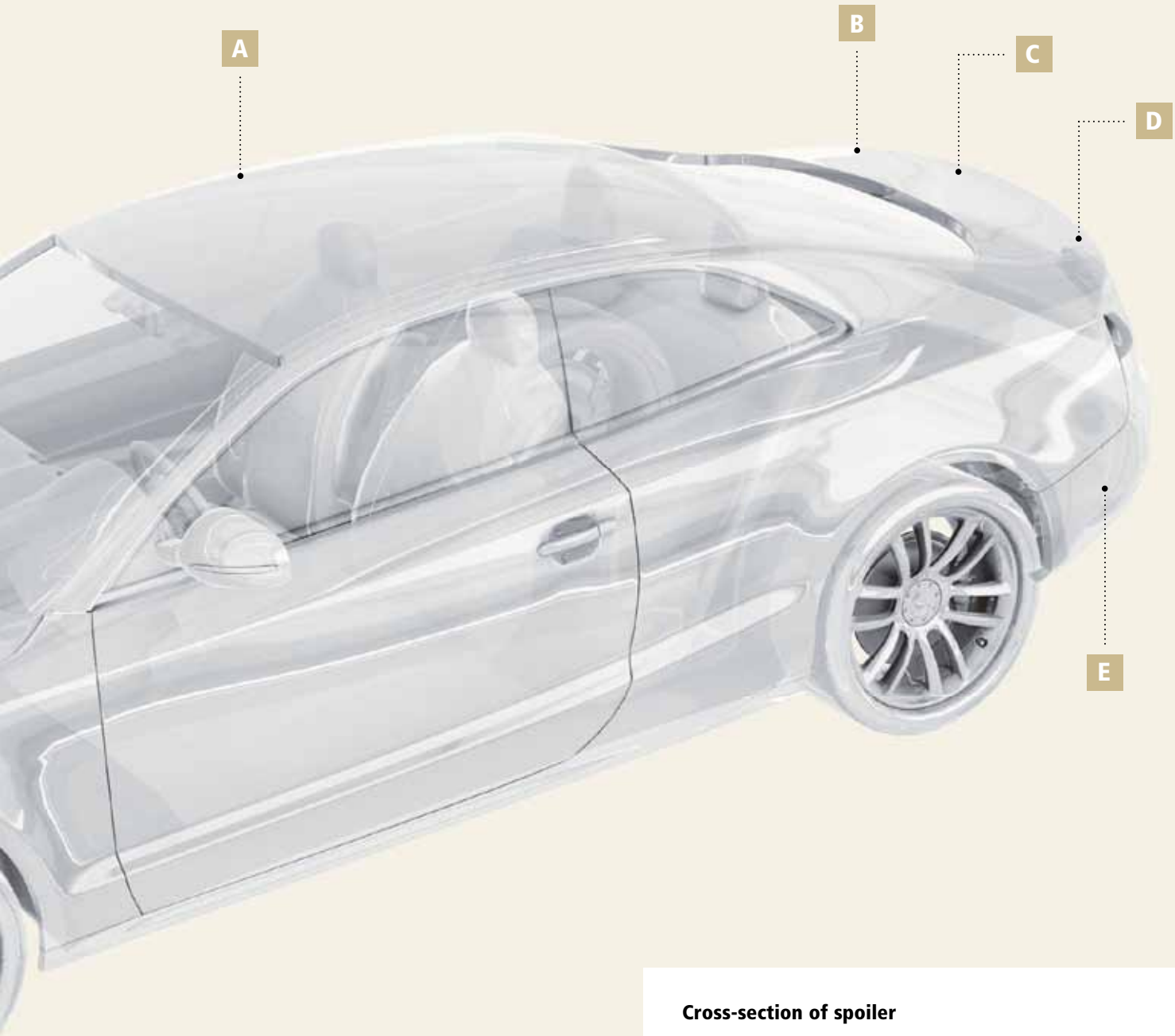
Sanding out

Sanding of filler

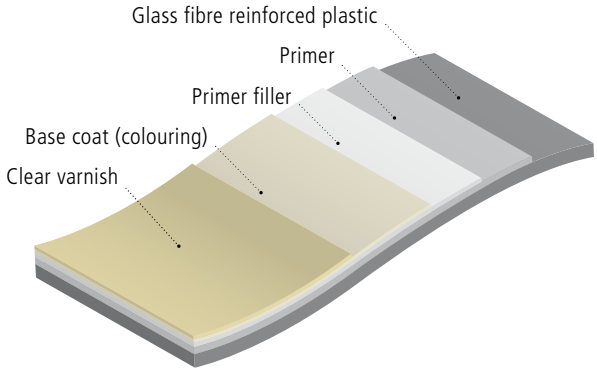
Primer filler sanding

Removal of defects





Cross-section of spoiler



Deburring

2848 siacut siafix discs	K036 – K120
2824 spiraband	K050 – K150

Keying a new part

1950 siaspeed discs, strips	K080 – K240
1950 siaspeed siasoft rolls, strips	K180 – K320
1940 siacar discs, strips	K080 – K240

Primer filler sanding

1950 siaspeed discs, strips	K320 – K600
1950 siaspeed siasoft rolls, strips	K400 – K600
6120 siavlies speed discs, strips, rolls	ultra fine – micro fine
2275 Flatpad	fine – super fine

Finish/polishing

siashine	Fast cut/ Speed / Finish / Magic

Sanding out

1950 siaspeed discs, strips	K080 – K240
1950 siaspeed siasoft rolls, strips	K180 – K320
1940 siacar discs, strips	K080 – K240

Sanding of filler

1950 siaspeed discs, strips	K080 – K280
1940 siacar discs, strips	K080 – K280

Primer filler sanding

1950 siaspeed discs, strips	K320 – K600
1950 siaspeed siasoft rolls, strips	K320 – K600
6120 siavlies speed discs, strips, rolls	ultra fine – micro fine
2275 Flatpad	fine – super fine

Removal of defects

1913 siawat strips, buds, sheets	K1500 – K2500
7242 siacarat cut buds	K1500 – K2000

TIPS

siacarat – for when the going gets tough

Thanks to the coating of the abrasive with diamond abrasive minerals combined with the pressure-damping foam backing, siacarat velvet is an excellent solution for the efficient processing of scratch-resistant automobile lacquers, as well as for use in the sanding of hard materials such as mineral working materials (e.g. Corian) and gelcoat. siacarat velvet has a product life that is up to 40 times longer than that of a conventional abrasive without diamond coating.

Marine

Fun and safety on the water.

Modern boat building is characterised by increased safety, improved efficiency, elegant shapes and perfect surfaces for reduced water displacement – finished by sia Abrasives.

Pages 26 – 31

Deburring the casting mould edge

Deburring of edges in hard-to-reach places

Coarse sanding of primer filler/gelcoat

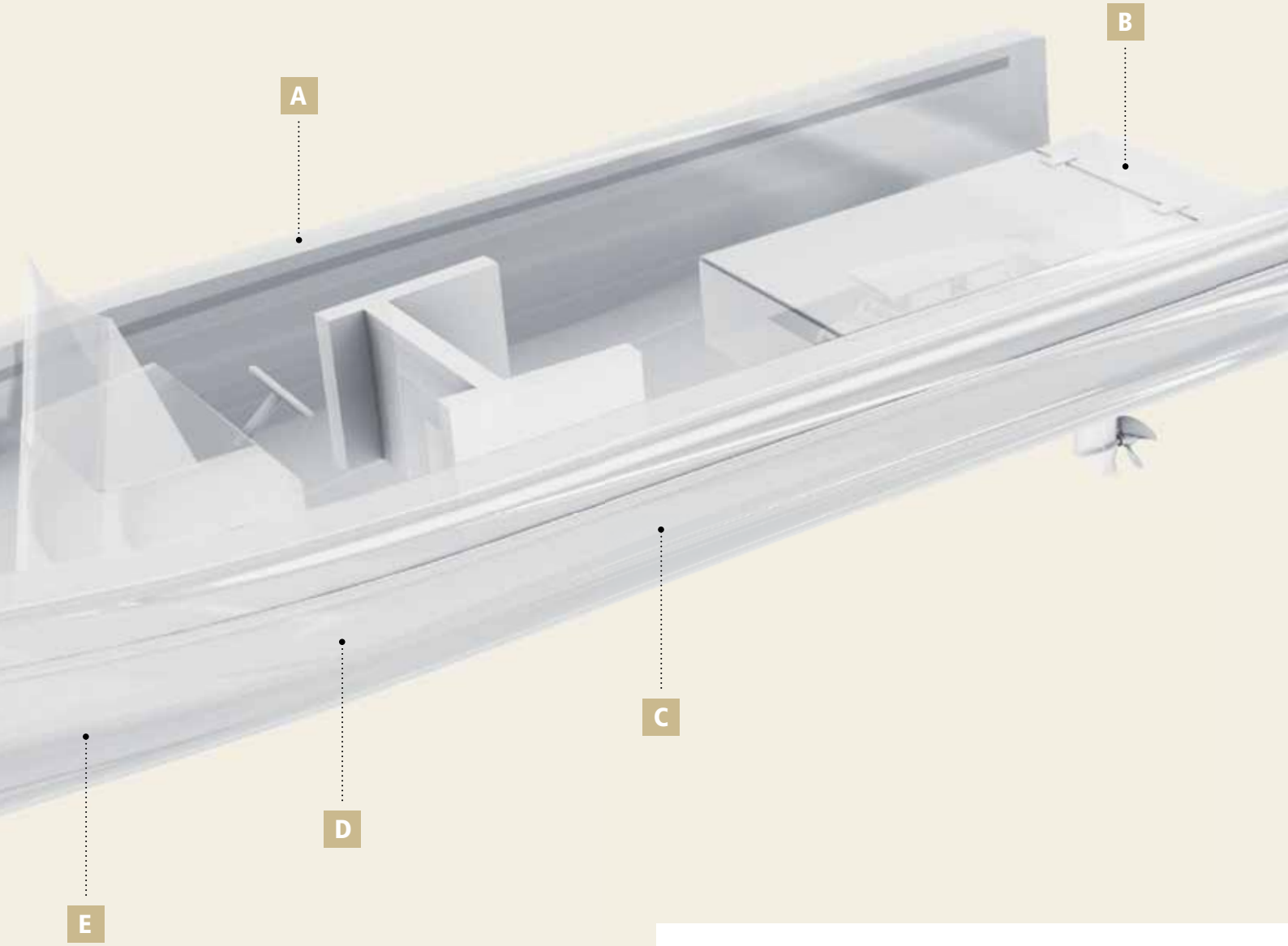
Fine sanding of primer filler/gelcoat

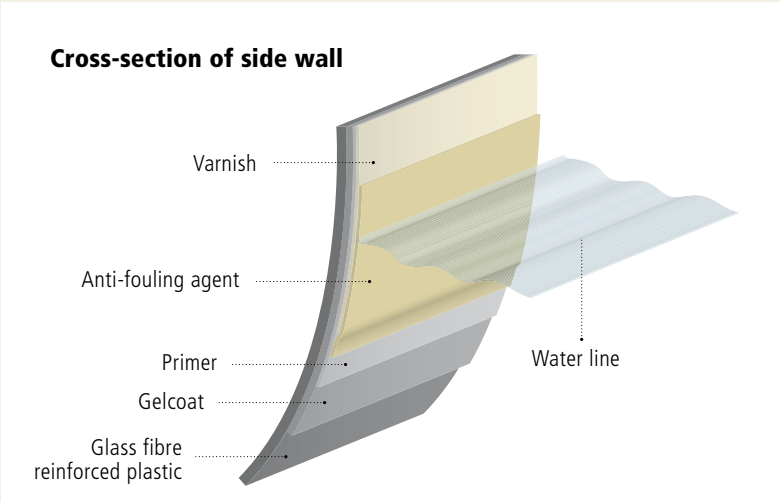
Removing osmosis

Flat grinding of large areas

Microfinishing prior to polishing

Polishing/finish for a high-gloss finish


A
B
C
D
E


Cross-section of side wall
Varnish
Anti-fouling agent
Primer
Gelcoat
Glass fibre reinforced plastic
Water line

Deburring the casting mould edge

4819 siaron fibre discs	K036 – K060
4515 siabite fibre discs	K036 – K060

Deburring of edges in hard-to-reach places

2824 spiraband Spira belts	K036 – K150
2848 siacut x siafix discs	K060 – K120

Coarse sanding of primer filler/gelcoat

1950 siaspeed discs, strips	K040 – K240
1940 siacar discs, strips	K040 – K240

Fine sanding of primer filler/gelcoat

1950 siaspeed discs, strips	K280 – K600
1940 siacar discs, strips	K280 – K600
7241 siacarbon discs	K240 – K500

Preparation/repair of the negative mould

2275 Flatpad strips	medium / microfine
7242 siacarat cut buds	K1500 – K2000
7940 siaair discs, strips	K800 – K4000
7240 siacarat discs	K500 – K3000

Polishing the basic mould

siashine Polishing Material polishing pad range, lambskin, microfibre cloth	Fast cut/ Speed / Finish / Magic

Removing osmosis

4819 siaron fibre discs	K024 – K120
4515 siabite fibre discs	K024 – K120

Flat grinding of large areas

1950 siaspeed discs, strips, rolls	K040 – K600
1940 siacar discs, strips, rolls	K040 – K600

Microfinishing prior to polishing

1950 siaspeed discs	K800 – K1500
7242 siacarat cut buds	K1500 – K2000
7940 siaair discs, strips	K800 – K4000
7240 siacarat discs, strips	K500 – K3000

Polishing/finish for a high-gloss finish

siashine Polishing Material polishing pad range, lambskin, microfibre cloth	speed / finish / magic

TIPS

siabite – high-performance fibre disc with ceramic aluminium oxide

Thanks to the new ceramic aluminium oxide, the more aggressive and powerful 4515 siabite fibre disc, which is produced with the new production method, offers increased material removal in a shorter time, protects the work piece from heat deformation, and has a longer product life. The result: very aggressive and powerful, for absolute efficiency.

Commitment

Company
The sia Group is based in Frauenfeld, Switzerland, and is one of the world's top three suppliers of innovative abrasives. sia develops, manufactures and sells complete sanding systems tailored to specific requirements and applications of all kinds, transforming sanding into surface technology.

sia Abrasives employs about 1250 people and is represented in more than 80 countries.

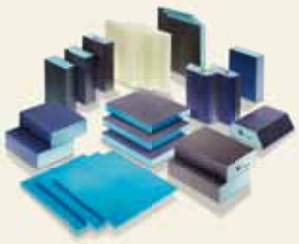
Top-quality products from Switzerland
Our careful choice of premium materials, the latest production and manufacturing equipment and sophisticated production technologies enable us to provide sanding products of the highest level. Abrasive materials from sia undergo continuous development based on demanding customer requirements and our detailed analysis of production materials. They thus represent the finest examples of Swiss precision and quality with one goal: a commitment to the perfect surface.

Innovative abrasives

Coated abrasives
Classic flexible abrasives and systems for conventional surface treatment on all types of material.

Nonwoven abrasives
Nonwoven products for preparation and cleaning tasks and for structuring, especially on metal.

Microabrasives
Products on special polyester film to give defined surface structures in the areas of graphics, optics and the auto industry.



Foam abrasives
Foam sanding pads in the widest possible range of shapes and grades for precision sanding on wood, fillers, paintwork and varnish.

Environment

Environmental-friendly production, competent and ethical waste disposal

For many years we have concerned ourselves with the efficient use of energy and committed ourselves to protecting the environment. We have implemented many measures within our production processes to protect the air, earth and water. We use our energy and raw-material resources efficiently and carefully.

We care.
By joining the EnAW (Energy Agency for Industry) programme, we have voluntarily made a commitment to improve energy efficiency and limit our CO2 emissions as part of our day-to-day operations.

We take responsibility.
As a «dry factory», we protect nature by not putting untreated industrial wastewater back into the water system (i.e. public drains). Weekly testing of additional industrial wastewater for compliance with regulations demonstrates that our wastewater is clean.

Quality

Choosing raw materials, setting quality standards

The comprehensive inspection programme in place in our manufacturing operations enables us to produce premium-quality products. The superior properties of sia products represent excellent value for our customers.

We verify.
We select our raw materials and their suppliers in accordance with strict criteria on quality, environmental impact and safety. Long-standing partnerships and continuous testing of raw materials ensure good-quality, reliable and fault-free materials.

We continually optimise.
Our internal process management system (PMS) records and improves important procedures and allows direct intervention in the production process where necessary. In this we can operate an active, committed opportunity-management programme.

People

A safe, healthy workplace

We set the standard for an accident- and hazard-free workplace. The well-being of people is an integral part of our culture and is based on OHSAS 18001 (Occupational Health and Safety Management Systems).

We are clean.
We develop products that also effectively help our customers remain healthy. We have had our finishing products tested for dust formation by the Swiss Accident Insurance Fund (SUVA). The results are impressive: the lowest dust emissions compared with our competitors' products.

We set an example.
sia Abrasives is one of the first companies in the world to comply with the new OHSAS 18001:2007 standard. We also comply strictly with the recommendations of the FEPA safety standards and publish this, together with other safety information, at www.sia-abrasives.com.

«REACH»
Regulations for chemicals
REACH (Registration, Evaluation and Authorisation of Chemicals) concerns a European Community regulation dealing with chemicals and has been in force since June 2007. Its purpose is to gather all necessary information regarding the properties of chemical substances and to examine their use and the associated risks to humans and the environment. We ensure compliance with REACH by keeping up-to-date records of all chemical materials and substances and by taking all necessary steps to meet our REACH obligations.

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Art. ID: 0020.5734.01
04.172.en.102009

www.sia-abrasives.com

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