isovolta GROUP

COMPOSITE MATERIALS MACHINING

CUSTOM-MADE SOLUTIONS
FOR INDIVIDUAL PRODUCTS

In accordance with customer demands and wishes, ISOVOLTA – in addition to manufacturing high-quality laminates in the form of sheets, tubes and rods – also offers processing of thermoset materials. Different materials are shaped by processes such as cutting, grinding, drilling, turning, milling, gluing, mounting, punching, jet cutting or painting according to individual customer specifications. Based on our expertise in material-specific selection and production-technical implementation as well as our years of experience in job shop, serial, and mass production, we are able to develop the best possible process for each product.

VARIED
SOURCE MATERIALS

As a specialist in the production and processing of laminates, ISOVOLTA fashions these high-quality, innovative materials into customised products, either as one-of-a-kind items or as small-scale series or complex assembly groups, depending on customer requirements.

Laminates of all types can be found in many different applications thanks to their excellent materials properties. Their main field of application is in electrical industry, from energy production to energy distribution to drive engineering. Laminates have also become indispensable in medical engineering, the chemical industry, applications related to wind energy, shipping, railway and aviation, as well as in machinery and plant engineering.

The Right Material for Every Application

RANGE OF MATERIALS

Phenolic Cellulosic Paper / PFCP

Phenolic cellulosic paper is one of the classical insulating materials and consists of a high-quality paper substrate and a thermosetting bonding agent. Phenolic cellulosic paper, or PFCP, is an inexpensive construction material that is lightweight and easy to work with. Since it also has excellent electrical and mechanical properties the material is used in the electronics industry both for simple sheets and for complex precision components.

Phenolic Cotton Cloth / PFCC

Phenolic cotton cloth is a thermoset material based on layers of cotton cloth as a substrate and phenolic resins as a bonding agent. Processing methods developed specifically for laminates offer a high degree of moulding accuracy at low cost, especially for components with a high degree of difficulty.

Phenolic Glass Cloth / PFGC

Phenolic glass cloth is a glass fibre or glass roving cloth made of non-alkaline E glass as a substrate combined with high-quality phenolic resin. Exceptionally good values even at high temperatures, excellent chemical resistance and a neutral environmental impact characterise the high quality of the material and its wide range of application.

Melamine Cotton Cloth / MFCC

Melamine cotton cloth is a duroplastic laminate that consists of a cotton cloth substrate with a high-quality melamine epoxy bonding agent. An added bonus in terms of quality is the material's food safety and high compressive strength.

Melamine Hard Glass Cloth / MFGC

Melamine hard glass cloth consists of a glass filament substrate with high-quality melamine resin.

Epoxy Glass or Glass Roving Cloth / EPGC

Epoxy glass cloth and glass roving cloth are special laminates with a glass roving cloth substrate on an epoxy resin base. They are characterised by high mechanical strength, which also makes them an excellent value for the money.

Epoxy Glass Mat / Polyester Glass Mat / EPGM / UPGM

Epoxy glass mats and polyester glass mats consist of glass filament mat substrates with high-quality epoxy or polyester resin. They offer an alternative to the known laminates for high requirements and a wide range of possible applications.

Melamine-Lined Hard Paper / MKHP

Melamine-lined hard paper is a classical insulating material for components in medium-voltage switching stations to 30 kV. The surface coating is arc resistant, resistant to glow heat, infusible, halogen-free and largely insensitive to damage.

Silicone Glass Cloth / SIGC

Silicone glass cloth is a glass filament cloth made of non-alkaline E glass as a substrate and joined with high-quality silicone epoxy. Exceptionally good values even at high temperatures, excellent chemical resistance and a neutral environmental impact characterise the high quality of the material and its wide range of possible applications.

Special Laminates / Special Materials / CFRP, KP, PIGC

In addition to the materials specified and standardised in EN 60893 there are also special materials. Their matrix is determined by the specific requirements. For example, CFRP is particularly well suited for high-strength requirements in lightweight construction, PIGC for applications with high thermal loads, and Micanite for high voltage applications.

MAGNOVAL®

MAGNOVAL®, which consists of glass cloth and glass roving, iron powder, and modified epoxy resin, is used whenever magnetic properties are needed.

CONTAVAL®

CONTAVAL®, which consists of epoxy glass cloth, graphite and cured epoxy resin, is characterised by its antistatic properties, which makes it perfect for soldering frames, masks, and systems.

GX_11.3309 GWS

GX_11.33 09 GWS is a laminate that consists of glass filament cloth impregnated with a highly functional epoxy resin. It is used wherever high mechanical strength is required, such as for structural parts in the construction industry, in shipbuilding, and for connecting elements such as threaded rods and connecting rods in the automobile industry. Thanks to its excellent dielectric properties this special laminate is also used in the electrical industry.

GRP High-Performance Rings GF-UP / GF-EP

GRP high-performance rings for the trade offer good stability and stiffening effects combined with excellent thermal, electrical and chemical properties.

CFRP Materials

CRP materials guarantee high mechanical strength at a low density, which makes them universally usable. They also feature high corrosion and vibration resistance and low thermal expansion. These properties make the material particularly interesting for constructional engineering.

ISOVAL® R-AL

This epoxy laminate of type EP GC 205 in accordance with IEC 60893 has excellent mechanical properties at increased temperatures and was developed for general use in foundries, especially for aluminium processing.

It is made of glass roving that is impregnated with heat-resistant resin and then subjected to special treatment. In addition to mechanical strength at high temperatures the laminate also features excellent heat resistance to 330° C for short periods of time, as well as increased chemical resistance – especially to fluoride.

ISOVAL® R-AL is used as a high-end construction material or for electrical or thermal insulation in large components or superstructures in various machines and devices.

GX_11.9301.601067 / PI GC 301

This laminate consists of non-alkaline glass cloth that is impregnated and bonded with a polyimide thermosetting resin and coated under pressure and at high temperatures. GX_11.9301.601067 / PI GC 301 features high dimensional stability under heat, excellent physical characteristics and mechanical strength to 250° C. It is used in Class H (180° C) electric motors and in electrical fittings such as insulating parts or components.

Micanite GX_61.5008

Micanite GX_61.5008 is a mica laminate impregnated with silicone resin, in conformity with ROHS 2002/95/CE. It is characterised by its excellent mechanical and electrical resistance as well as its thermal resistance to 500° C at continuous operation. This asbestos-free, easy to punch mica laminate is used to reinforce the insulation of wire heaters in electrical toasters, hair dryers, irons, electric curlers, honeycomb heaters, heating tape, floor heating and for gaskets. It is also used wherever there is a need for excellent thermal, electrical and mechanical properties in addition to outstanding moisture resistance.

Micanite GX_61.5009

This is a mica laminate impregnated with silicone resin, in conformity with ROHS 2002/95/CE. This laminate has excellent electrical and thermal insulation properties and is asbestos-free.

Its main features are:

- fire / smoke rating MO FO
- excellent resistance to heat and open fire to 1000° C
- low thermal conductivity
- optimal electrical insulation
- high compressive strength
- impervious to most chemicals, especially to oil and grease

As thermal insulation with a low compressive strength, Micanite GX_61.5009 is used for high-temperature applications in metal production and in the glass industry. Thanks to its resistance to high temperatures and its excellent arc and creep resistance it is also used for electrical insulation. Since it can be sealed, Micanite GX_61.5009 also offers excellent safety in the event of a fire hazard.

INBORD®

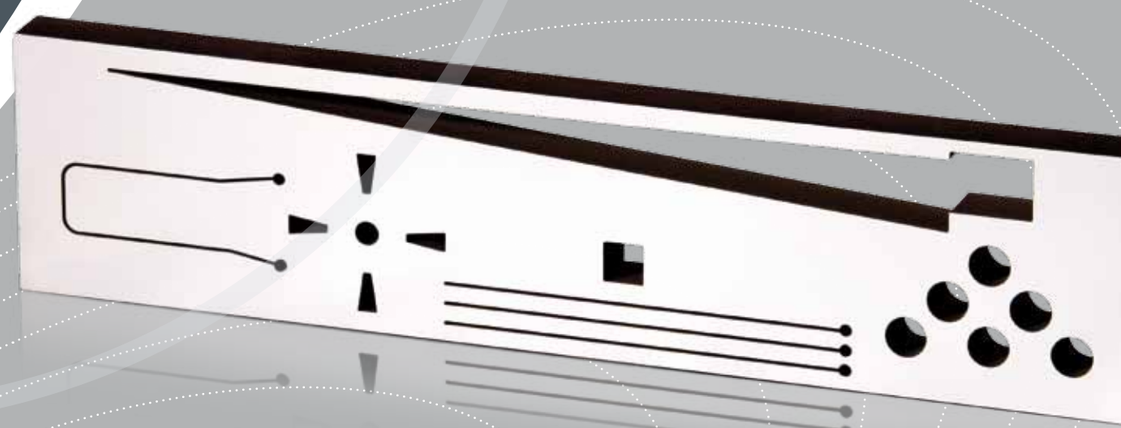
INBORD® is a classic, melamine-lined, decorative hard paper that has been used as insulating material for components in medium voltage switching stations to 30kV for over 20 years. Preferred areas of application are partition walls, back walls, covers, and to a particular extent, fuse and plug-in boards. Well over 20,000 switching stations have been equipped with INBORD® since 1969. The material has proven itself in both tropical and Arctic areas. Its excellent insulating qualities, high mechanical strength and chemical resistance as well as an outstanding creep resistance of CTI 600 offer the user a high degree of safety. The surface coating is arc resistant, resistant to glow heat, and largely damage-proof.

As a duroplast, INBORD® is infusible and halogen-free, which means there is no spreading, corrosion or dripping in the event of a fire.

Switchboard cells constructed with INBORD® pass the accidental arcing resistance test according to PHELA guideline No 2, 1974 issue.

INBORD® S is an insulating material that is similar in composition to INBORD® but offers the user higher electrical and mechanical strength thanks to its reinforced cloth inserts, which are particularly essential in compact series switching stations with high short-circuit levels.

INBORD® offers an excellent alternative to glass mat base laminates mainly due to its low weight and markedly lower price for approximately identical technical properties. INBORD® V0 and INBORD® S-V0 use self-extinguishing modified resin or carrier systems and correspond to grade V-0 according to UL Subject 94. INBORD® materials are ecologically harmless and can be adapted to the local conditions at construction sites with conventional tools.



WIDE RANGE
OF PROCESSING OPTIONS

Individual Processes For individual Products

From knowledgeable consulting, to precise design and development, to a wide range of processing options for technical and decorative laminates and different special materials: at ISOVOLTA, a high degree of flexibility goes hand in hand with first-rate quality – even for complicated problems.

Cutting
- Automatic panel dividers, cutting thickness to 250 mm
- Panel sizing saws
- Circular saw benches

Grinding
- Grinding machine for one-sided processing
- Grinding machine for two-sided processing
- Centreless cylindrical grinding machines

Drilling
- Bench drills
- Radial arm drills
- Threading machines

Turning
- Conventional lathes
- Vertical turning and boring mill
- CNC lathe

Milling
- Conventional milling machines
- 3-axis, 4-axis and 5-axis machines

Machining Centres
- Turning centre with C-axis
- Turning centre with bar loader
- Machining widths to 4500 mm

Gluing / Mounting
- Heated veneer presses

Punching
- Machines for punching of flat components made of a variety of duroplastic materials

Jet Cutting
- Cutting of complex contours for small and large parts
- Maximum dimensions: 2,800 x 1,300 mm

Painting
- Spray booth with dryer, 6,000 mm x 4,000 mm x 2,750 mm in temperatures up to 90° C
- Wet painting stand

OPTIMISED SOLUTIONS

Products with Unlimited Possibilities

ISOVOLTA products are perfect for any specific application, from prototypes to serial production, and are optimised for their future tasks. In addition to material selection and processing in accordance with individual customer wishes the ISOVOLTA service portfolio also includes assembly of parts provided by the customer in order to finish a product. Additional product applications are limited only by the imagination of ISOVOLTA's customers.

PRODUCT RANGE

Soldering Masks and Soldering Mask Systems

Soldering frames are mainly used to transfer printed boards to the soldering bath and at the same time attach capacitors using a cover plate system. To be able to withstand thousands of soldering cycles the material used must withstand the high temperatures used in the process while at the same time preventing static charging of the frame. Based on customer information and drawings, ISOVOLTA creates a preliminary soldering frame which is then used by a specially designed milling programme to cut the soldering masks from the antistatic special laminate CONTAVAL®. The frames are adjusted individually and precisely down to the smallest detail in a manual process, parts of which are very labour-intensive. ISOVOLTA's manufacturing competence and experience guarantee innovative, custom-made soldering systems that offer optimal fit and convenient handling.

Threaded Rods and Threaded Nuts

ISOVOLTA's threaded rods and nuts are made from special duroplastic materials. They feature high mechanical strength at a low density and are therefore universally usable, however, they are mainly used in transformer construction.

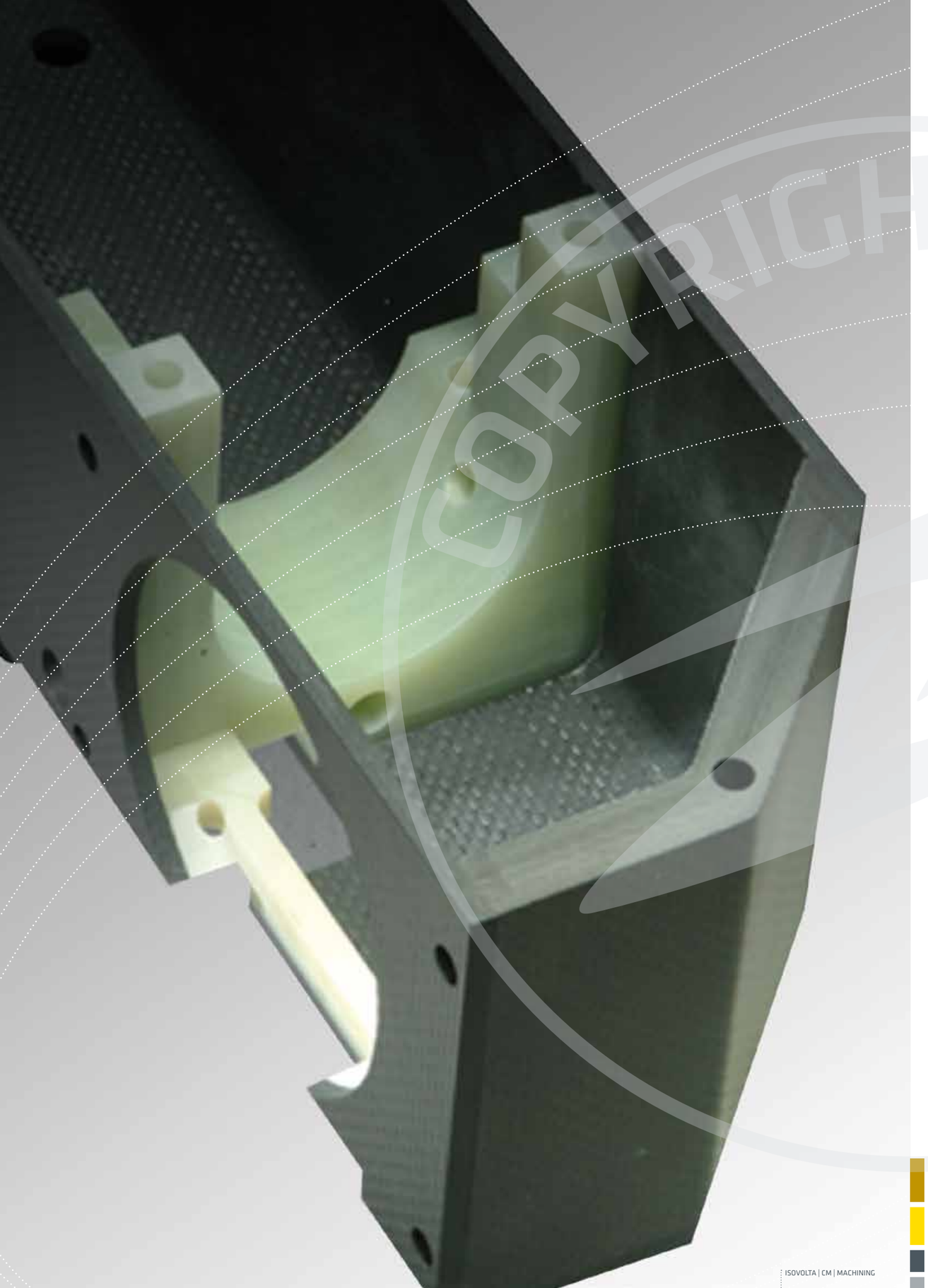
Other advantages:

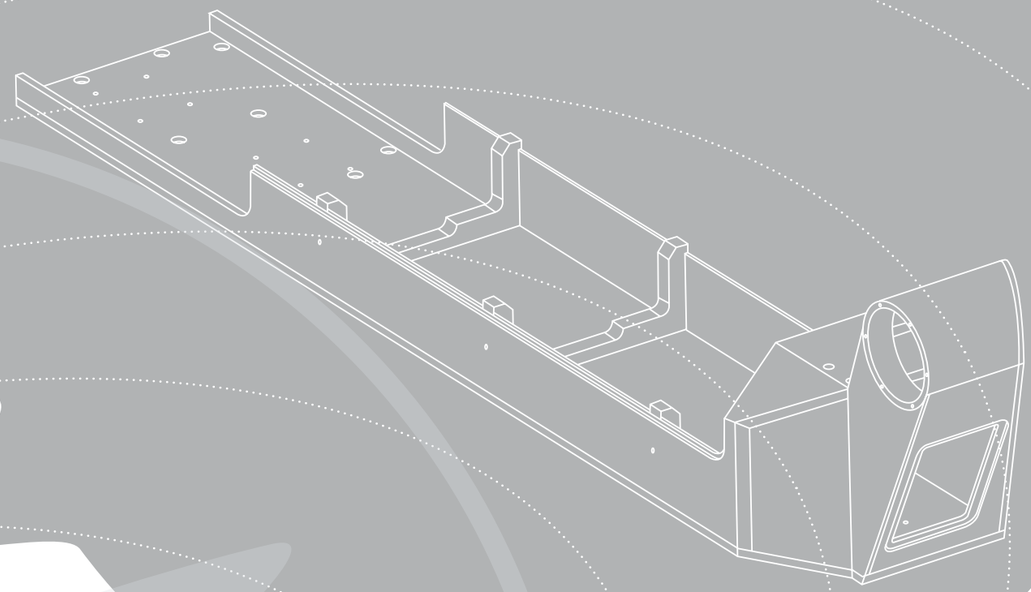
- neither fusible nor soluble
- thermal conductivity is about 300 to 1,000 times lower than that of metal
- high dimensional stability thanks to low thermal expansion
- high corrosion and chemical resistance
- available in all standard threads and standard sizes valid worldwide

Decorative Laminates

Going beyond its extensive range of insulating and heat-resistant duroplastic or thermosetting materials for use in electrical engineering, ISOVOLTA has also specialised in the processing of decorative laminates, specifically, high pressure laminates (HPL) according to DIN EN 438. The melamine coated surfaces of these laminate flats joined under high pressure excel not only with their attractive looks and large number of available finishes, but also with their excellent technical advantages. At the customer's request HPL flats are also available in F quality. This quality contains halogen-free fire protection agents, thus fulfilling building material class B1 (DIN 4102) requirements. That means the HPL flats are flame retardant and difficult to ignite. The surface is non-fading (class 6 - 8) and can be used for highly stressed interiors, such as in wet rooms, office equipment and medical engineering products, as well as outside.

HP laminates are highly popular due to their many possible uses, including in the food industry. With their chemically resistant, easy to wash surfaces and customisable looks they are especially well suited for areas that are close to the customer. Thanks to their rugged surface, HP laminates also serve reliably in hospital technology environments where looks are far less important than physical and chemical resistance and easy cleaning.





SPECIAL ORDERS

The production of the radial arms depicted here, which are used as painting arms in a „radial machine", required comprehensive manufacturing knowledge. To create the component drawings required to program the CNC machines, state-of-the-art CAD software had to be used to first create a 3D drawing of the radial arms after receipt of the 2D plans. A versatile, highly mechanically durable material made from epoxy glass, EPGC 203 and CFRP was used to manufacture the required components. All machines in the milling shop were used in the process, from conventional equipment to the high-tech 5-axis CNC milling machine that allows parts to be manufactured with maximum precision. To ensure the highest accuracy, support and stability of the finished part the manufactured components were then dowelled and glued together by hand in the custom manufacturing department.

If a customer requests, the ISOVOLTA paint shop can also paint or seal surfaces.

APPLICATION RANGE

Medical Technology

The diagnostic equipment used in modern medicine, such as CAT and MRI machines, medical hand grips and headrests, operating lamps and cradles, contains a number of materials with special material properties that often have very little in common with more traditional materials.

Research and Development

Research facilities, institutes and universities are able to draw on ISOVOLTA's many years of experience and proven familiarity with material properties and the suitability of technical plastics. The company's equipment also allows processing of complex components, such as spacers for particle accelerators and high-field coils for magnetic field research.

Other Applications:

- Electrical engineering, e.g., stator insulation, stator rings
- Mechanical engineering
- Transformer construction, e.g., ring coils, chokes
- Generator construction, e.g., blocks, rings
- Wind energy plants, e.g., clamping rings, chokes
- Chemical industry, e.g., gaskets for gas pipelines
- Automotive and motor sports industry, e.g., brake disks
- Aeronautical engineering and space technology, e.g., CFRP containers for space flights
- Railway technology, e.g., brake disks and folding tables for ICEs, operator's compartments for trams
- Shipping technology, e.g., radomes
- Sports and recreation industry, e.g., skating facilities

MORE THAN „JUST“ SERVICE

Optimal Products As a Result of a Joint Process

Part of ISOVOLTA‘s company philosophy is to turn every product visualised by the customer into reality through dedicated service. Understanding the specific requirements and individual wishes is the most important step towards the finished product. This is why each process begins with a thorough consultation or requirement analysis that is of equal importance whether processing individual components and prototypes or manufacturing complex components on a large scale.

At ISOVOLTA, our comprehensive offering is based on an excellent knowledge of materials, implemented by a highly motivated, qualified team. Almost 40 years of processing experience also entail a high degree of continuity and professionalism, which are reflected in each product. Thanks to our customer-oriented approach and flexibility individual orders or modifications can even be implemented and delivered within one workday, if necessary.

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