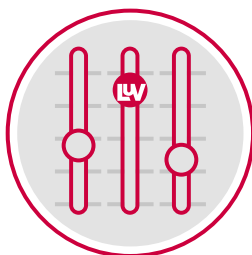


LUVOCOM[®]

High-performance compounds

Solutions -
Individually
Engineered



**CUSTOMIZED
POLYMER MATERIALS**

Lehmann&Voss&Co. 

Broad product range

We supply tailor-made high-performance compounds with a large selection of functionalities

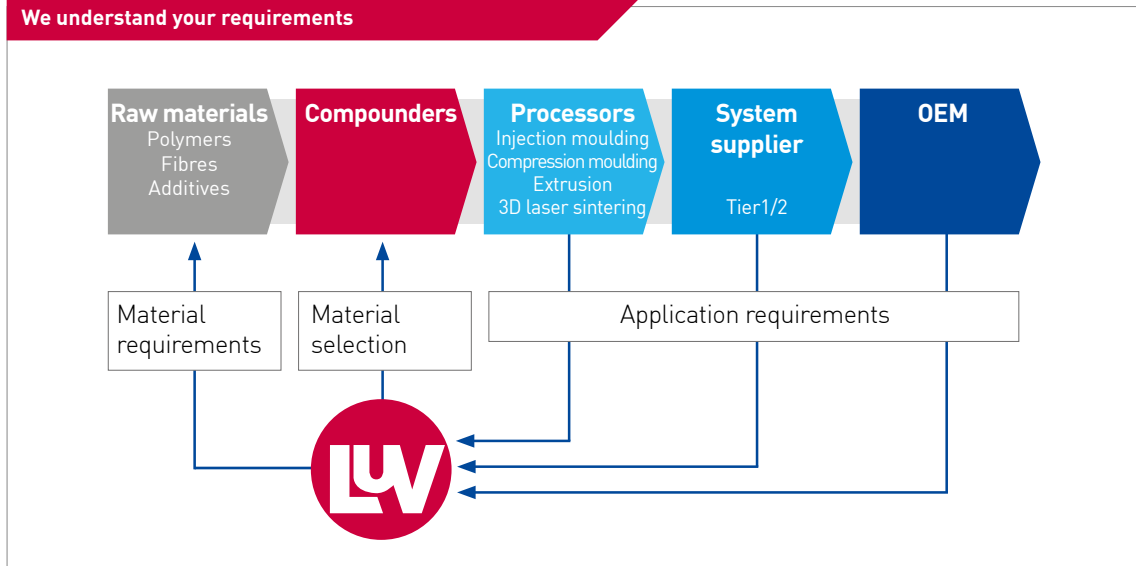
Made-to-measure materials for maximum technical performance

More powerful components with reduced system costs – our thermoplastic high-performance compounds make it possible. At the same time, we match the material properties precisely to the applications and the processing technique. Under the brand name LUVOCOM®, our products stand for quality and reliability all over the world. With the business unit of Customized Polymer Materials, Lehmann&Voss&Co. has been supporting industry since 1984 through material selection, development and production together with advice on applications technology. We are partners for our customers from the idea phase, via engineering design, through to production.

Partners of industry and research

In close cooperation with our customers, system suppliers and original equipment manufacturers (OEMs), we provide advice on selection of the suitable material and component design. Our expertise is also at your disposal for authorization procedures and tests. The intensity with which we maintain the partnerships and dialogue with our customers is matched equally by the thorough exchange we pursue with our partners and experts from all relevant institutions. This ensures that we are always up to date: from basic research in universities and research establishments, via new developments by producers of polymers and additives, to the challenges of the plastics processing industry. We are globally connected and force the pace of development for high-performance compounds and their application.

In close contact with our customers –
We understand your requirements



Our service portfolio

- Made-to-measure materials with application-specific modifications for sophisticated areas of application
- Selection of polymer, reinforcement and additives according to the demands of the application
- Short material development time and implementation in series production
- A market leader for
 - thermoplastics with carbon-fibre reinforcement
 - compounds based on PAEK (polyaryletherketone) – e.g. more than 400 different PEEK compounds
 - thermoplastics with tribological modification
- Extensive experience with more than 2,500 high-performance compounds already developed

Global presence

We are represented around the world. To help us react better to individual client and market requirements as well as to shorten routes and processing times, we produce on three continents. Apart from our main plant in Hamburg, Germany, we also have production sites in the USA and China. Our local market development staff provide on-site support.



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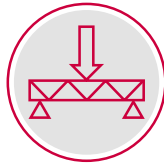
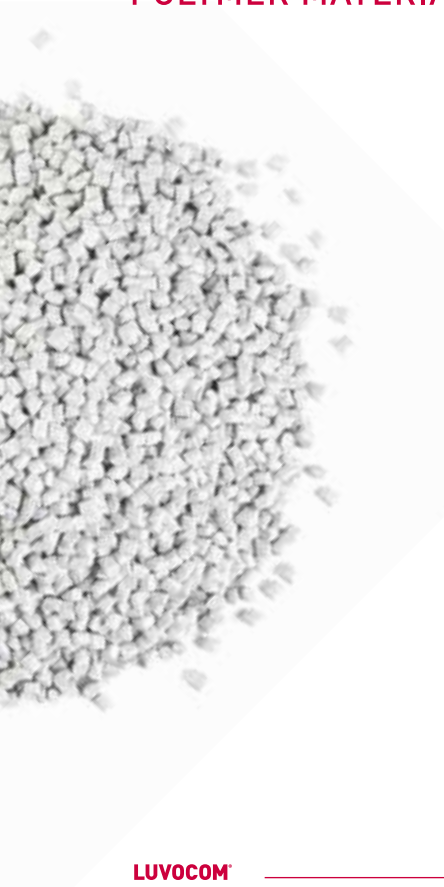
LUVOCOM[®]

High-performance compounds

Materials expertise and product highlights



CUSTOMIZED POLYMER MATERIALS



STRUCTURAL

- Stiffness 52 GPa
- Strength 530 MPa
- Dimensional stability



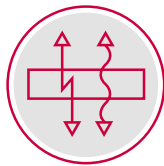
RESISTANT

- Withstands > 500 sterilization cycles
- Continuous operating temperature 320 °C



TRIBOLOGICAL

- Wear $< 1 \times 10^{-8}$ mm³/Nm (28 m/s, 30 MPa)
- Coefficient of friction 0.04



CONDUCTIVE

- Thermal conductivity 40 W/mK
- Electrical resistance $10^{-0.5} \Omega$



WEIGHT

- Heavy 5.0 g/cm³
- Light 0.9 g/cm³



PROTECTION

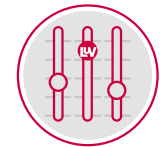
- Detection of 1 mm particles
- Shielding effectiveness 76 dB at 500 MHz



SURFACE

- Broad colour range in PEEK compounds
- Laser-markable materials
- Attractive surfaces in high-strength materials

Tailor-made polymeric materials



CUSTOMIZED POLYMER MATERIALS

Polymers (examples)	Reinforcement	Additives									
<table border="1"> <tr> <td>High-performance polymers</td> <td>PES, PEI, PSU, PPSU</td> <td>PAEK, PEEK, PA46, PPA, PA9T, PPS, LCP</td> </tr> <tr> <td></td> <td></td> <td>TPI</td> </tr> <tr> <td></td> <td></td> <td>Fluoropolymers</td> </tr> </table>	High-performance polymers	PES, PEI, PSU, PPSU	PAEK, PEEK, PA46, PPA, PA9T, PPS, LCP			TPI			Fluoropolymers	Carbon fibres X carbon fibres Glass fibres Glass flakes Glass beads Aramid fibres Mineral fibres Minerals	PTFE Graphite Silicone oil Nano-additives CNT Metals Pigments Flame retardant Ceramic UV stabilizers Flow agents
High-performance polymers	PES, PEI, PSU, PPSU	PAEK, PEEK, PA46, PPA, PA9T, PPS, LCP									
		TPI									
		Fluoropolymers									
<table border="1"> <tr> <td>Technical polymers</td> <td>PC, PPE-PS, PPE-PA</td> <td>PA 6, PA 66, PA 12, PA 6.10, PET, PBT, POM, PK</td> </tr> <tr> <td></td> <td></td> <td>TPU, TPE</td> </tr> </table>	Technical polymers	PC, PPE-PS, PPE-PA	PA 6, PA 66, PA 12, PA 6.10, PET, PBT, POM, PK			TPU, TPE	Others	Others			
Technical polymers	PC, PPE-PS, PPE-PA	PA 6, PA 66, PA 12, PA 6.10, PET, PBT, POM, PK									
		TPU, TPE									
<table border="1"> <tr> <td>Standard polymers</td> <td>ABS</td> <td>PP, PE-LD, PE-HD</td> </tr> <tr> <td></td> <td>Amorphous</td> <td>Partially crystalline</td> </tr> </table>	Standard polymers	ABS	PP, PE-LD, PE-HD		Amorphous	Partially crystalline					
Standard polymers	ABS	PP, PE-LD, PE-HD									
	Amorphous	Partially crystalline									



- Injection moulding
- Extrusion
- Compression moulding
- Powder coating
- 3D printing



Experience with the new

Every week we develop new materials, usually as a customized solution for our clients. This tremendous development speed is made possible by the knowledge and great experience of our employees combined with the good collaboration and coordination between our market development, product development department and ultimately our production unit. Our laboratory and our applications technology are also specially equipped for new developments and contribute to the optimization of the formulations.

Optimum raw materials and near-production-ready samples

When we develop a new formulation, it is precisely adjusted to the projected application. To achieve this, we select the most suitable raw materials for the application. We are independent of the polymer manufacturers and raw material suppliers and prepare samples in the quantity you require on series production equipment.

A glimpse of the future

Our development department is involved in a permanent exchange with research establishments and the development departments of polymer and additive producers. This is because, in addition to the manufacture of individual formulations on behalf our clients, we also anticipate technological developments and trends so that we can adopt a proactive approach by offering solutions for new applications.



Expertise in mechanics

Replacement of metals and composites

Many applications call for materials with high strengths, while at the same time they have to be light – especially in the case of components subject to dynamic stress. Generally, properties such as low thermal expansion, high dimensional accuracy and long-term dimensional stability are additionally required. We meet these demands with specially fibre-reinforced compounds – particularly through the use of carbon-fibre reinforcement. Of particular importance amongst these compounds are the product ranges LUVOCOM® XCF – high-strength materials – and LUVOCOM® LW – lightweight materials.

Carbon-fibre reinforced thermoplastics

Typical applications for carbon-fibre reinforced compounds are fast-moving components in the construction of machinery and apparatus – for example thread carriers, pump impellers, gear wheels, cams and connecting rods.

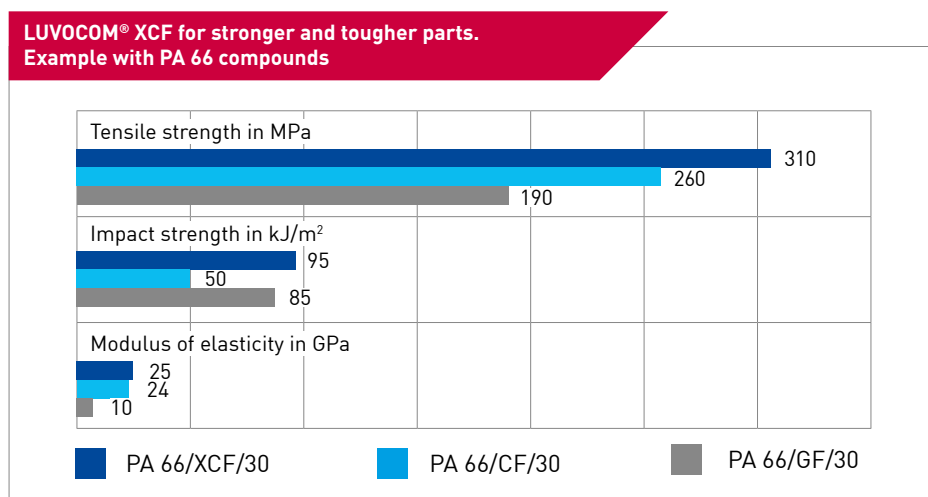
In the automotive sector, these materials are used in air and exhaust management, in vacuum pumps, steering units as well as in the drive train. In aviation, the low weight and the stiffness of carbon-fibre-reinforced compounds open up countless opportunities in lightweight construction – examples include use for luggage racks and structural elements. As an alternative to aluminium in the fabrication of casings, too, carbon fibre-reinforced materials have proven their worth – with applications also including electromagnetic shielding (EMC).

LUVOCOM® XCF - Outstanding mechanical properties

LUVOCOM® XCF offers flexural strengths of up to 530 MPa and tensile moduli of up to 52 GPa, as well as low thermal extension, improved thermal conductivity and high dimensional accuracy. As a result, it provides even greater scope for replacing metals and composite materials (CFRP and GFRP).

LUVOCOM® XCF compounds are used for components subject to high mechanical requirements. The motivation for this is the reduction in weight and costs. Another approach is to substitute plastics with short and long glass-fibre reinforcement in applications where additional weight savings are required. Examples of such applications are lifts with high-performance motors or electric drive systems.

Additional weight savings of up to 30% are possible with LUVOCOM® XCF compounds. Lower filler levels mean better processing characteristics and hence greater freedom in design. The materials can be processed in conventional injection moulding procedures without the need for special machines or techniques.





RESISTANT

Expertise in resistance

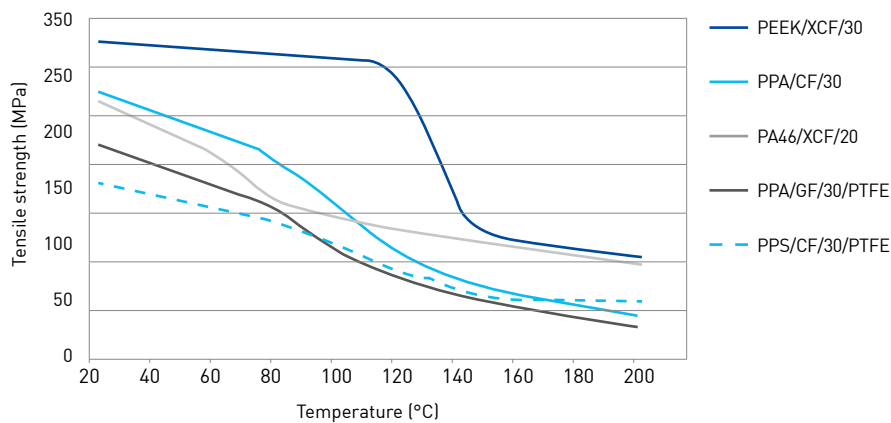
High-temperature resistant compounds

Through the use of high-temperature resistant polymers and with the addition of suitable reinforcing materials, our compounds also exhibit high mechanical strengths at elevated temperatures. Temperatures of up to 320 °C are possible in continuous operation. For brief periods, individual materials even withstand higher temperatures.

Continuous operating temperatures of various polymers:

- PA 46 up to 150 °C
- PPA up to 160 °C
- PEI and PES up to 180 °C
- PPS up to 220 °C
- PEEK* and PEK* up to 260 °C
- TPI up to 320 °C

Comparison of tensile strength for various LUVOCOM® compounds based on different high-temperature resistant polymers.



High chemical resistance

Resistance to chemicals is a basic requirement for all applications. We therefore supply materials adapted to the application that exhibit the necessary resistance. In medical technology, for example, we have compounds that withstand more than 500 sterilization cycles. In the field of oil and gas production, our compounds withstand high temperatures of up to 240 °C at the same time as acidic sulphur gases. In the automotive sector resistance to fuels is demanded, and in food technology the materials have to withstand a large number of substances.

Good fire characteristics

Another important material property is flame resistance, ideally without the addition of flame retardants, as they generally have an adverse effect on other properties. This can be achieved with a number of high-performance polymers such as PPS, PEI and PEEK. It is not necessary to use halogen-containing additives. Support for the development of flame-resistant compounds here comes from the use of our fire test chamber in the in-house laboratory.

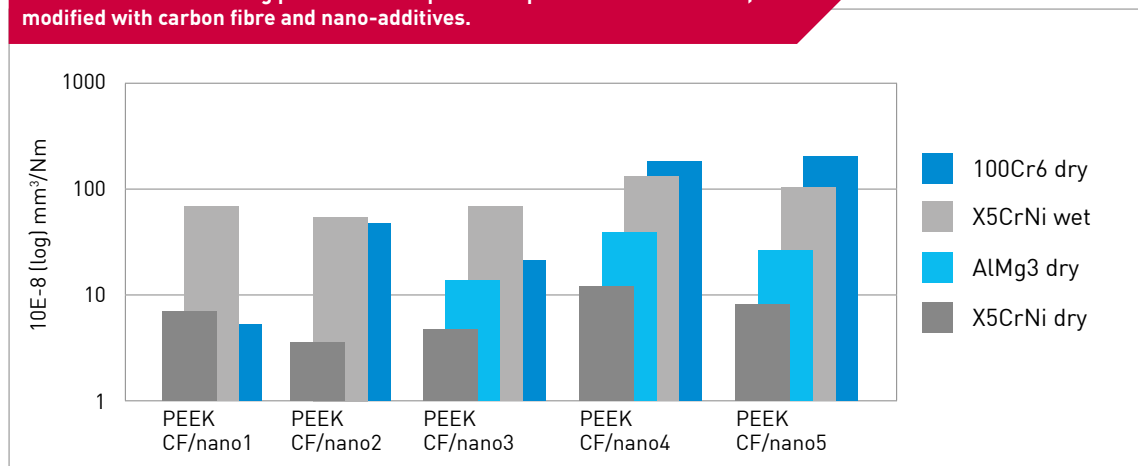
Expertise in tribology

Materials tailored to the tribological system

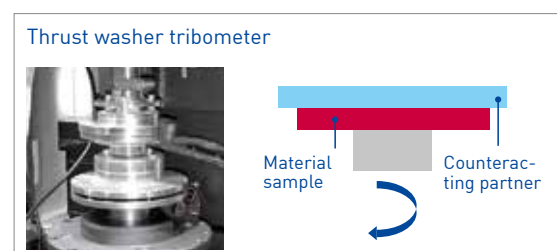
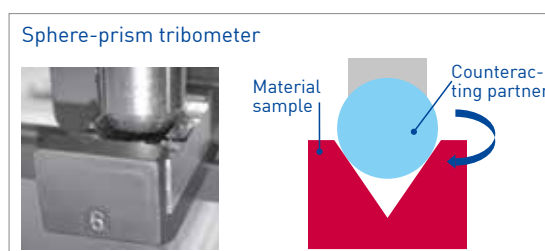
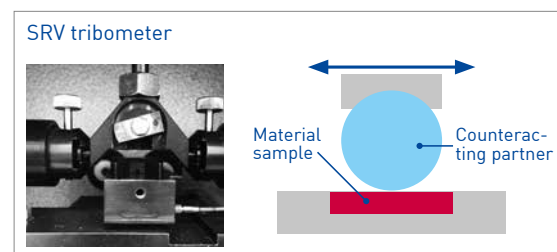
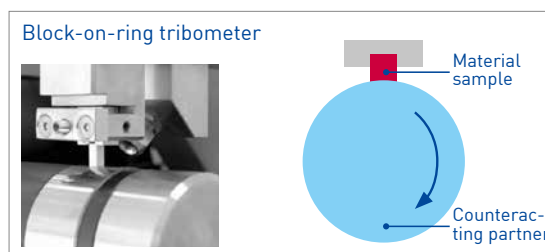
Tribologically optimized LUVOCOM® compounds and LUVOCOM® P powder materials for moving parts, such as friction bearings, gear wheels, rollers and sliders, in countless applications. Through the incorporation of lubricants and reinforcing materials, we improve the wear, friction and running-in characteristics of polymers and hence of the tribological system. The result is systems requiring little or no maintenance that function without additional lubrication. In lubricated assemblies, the dry-running properties of these materials come to the fore and thus increase the safety level for designer and user alike.

Among the lubricants used are PTFE, graphite and silicone oil, while wear-reducing and reinforcing additives include fibres of carbon, glass, aramid and minerals as well as ceramic materials. In this field, we have long been relying on nanotechnology and are able to offer especially low-wear materials, also without PTFE.

Wear of tribologically modified LUVOCOM® under dry running conditions / with grease and various counteracting partners. Example of compounds based on PEEK, modified with carbon fibre and nano-additives.



In selecting the suitable material, we make use of our extensive know-how, our own test rigs and a wealth of experience. The various factors influencing the tribological system have to be taken into account. Examples of these include: material of the counteracting partner, pressure, speed, sequence of movements, time, temperature, surface design, influence of chemicals. The large number of tribological applications and the different requirements demand tailor-made solutions. It is therefore also possible to set certain coefficients of friction, adapted to the tribological system.

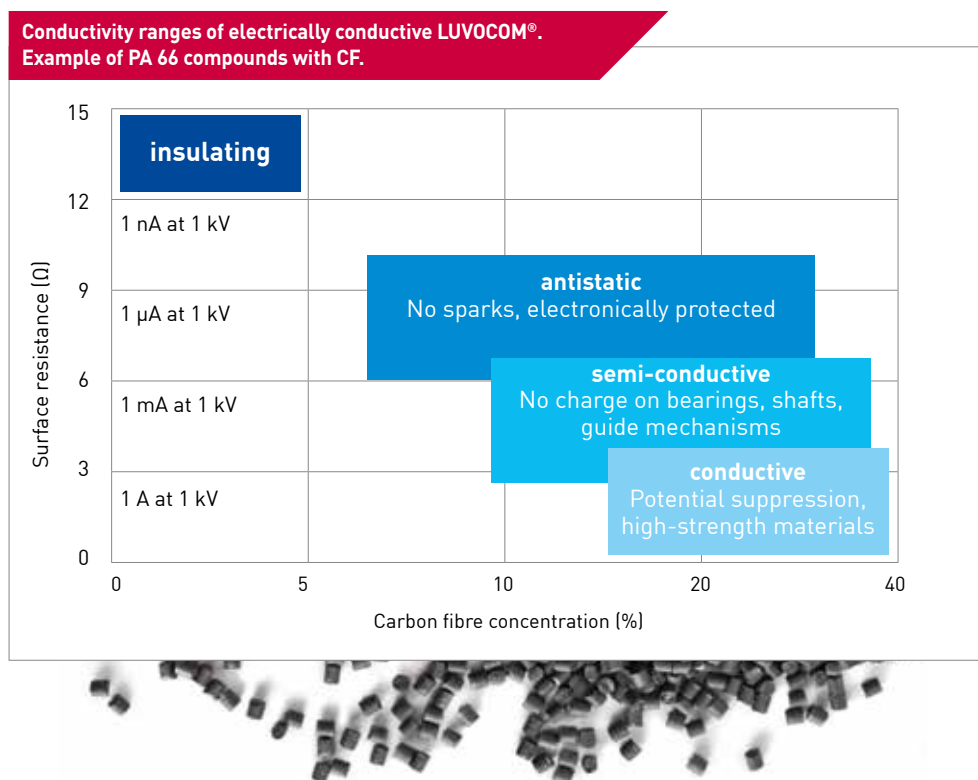


Expertise in conductivity

Electrically conductive compounds

Conductive compounds have decisive advantages over metals or coatings: they offer a great degree of freedom in design; the finished parts have a lower weight, are easier and more cost-effective to manufacture and are also tougher.

Electrically conductive polymeric materials are produced by adding conductive substances such as carbon fibres, carbon nanotubes (CNTs), steel fibres or graphites. The desired electrical resistance can be adjusted during the process: from 10^9 ohm (antistatic formulation) to less than $10^{-0.5}$ ohm (conductive materials). The chart below shows examples of PA compounds with different concentrations of carbon fibres.



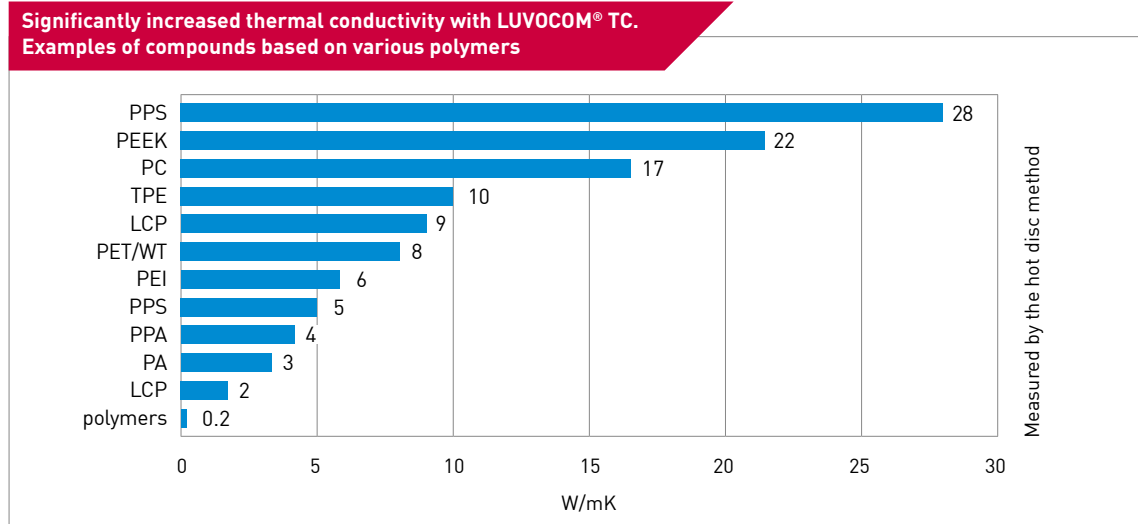
The typical fields of application for electrically conductive compounds are many and varied. In addition to covers and machine parts for explosion-protected areas, electrical and electronic components, the range also includes casings and functional parts for paper transport (examples include office machinery and cash dispensers). Conductive compounds are additionally used in carriers for electrically sensitive products (electronic components, explosive substances), where statically generated electricity has to be carried away immediately in order to avoid disruption or explosions resulting from spark discharge.

Expertise in conductivity

Thermally conductive compounds

Plastics are poor heat conductors. The thermal conductivity of polymers, including those with glass-fibre and carbon-fibre additives, lies between 0.1 and 0.4 W/mK. By including special additives, we are able to supply materials with more than 40 W/mK. Electrically conductive and electrically insulating products are also available.

An up to 200-fold increase in thermal conductivity with LUVOCOM® TC



Highly sought-after in many industries

Wherever it is necessary to avoid overheating, thermally conductive materials are in demand. In the electrical and electronics industries, the heat dissipation from casings used for coils or housings for hard discs and other mass data storage devices can be increased through the use of thermally conductive LUVOCOM® TC. The geometric design here is extremely flexible: during injection moulding cooling fin structures can be achieved to allow even components with complex shapes to be completely enclosed.

In mechanical engineering LUVOCOM® TC is suitable for friction bearings and motor housings. And in the automotive sector, too, there are numerous possible applications for electronics components and lighting.

Thermally conductive plastics bring a shine to LEDs

All over the world the use of lighting systems with LED (light emitting diodes) technology is on the increase. They can be found in applications such as automobiles and living areas. With the requirements of LED lamp manufacturers particularly in mind, Lehmann&Voss&Co. has developed new thermally conductive plastics, which are used here as heat sinks and enclosures.

The materials are characterized by a specially adjusted thermal conductivity ranging from 0.6 to 8.0 W/mK, good strength figures, electrical insulation, a white coloration and optional flame retardation, tested to UL94 V0. PET, PA 6 and PC are often the base polymers. Thanks to the customized properties of the materials, the lamps achieve a higher performance and service life, while the good processing characteristics permit freedom in design and allow cost savings compared with other materials such as metals and ceramics.

Highly heat-conductive LUVOCOM® TC based on PET for a high-performance LED flashlight with integrated PCB and LED



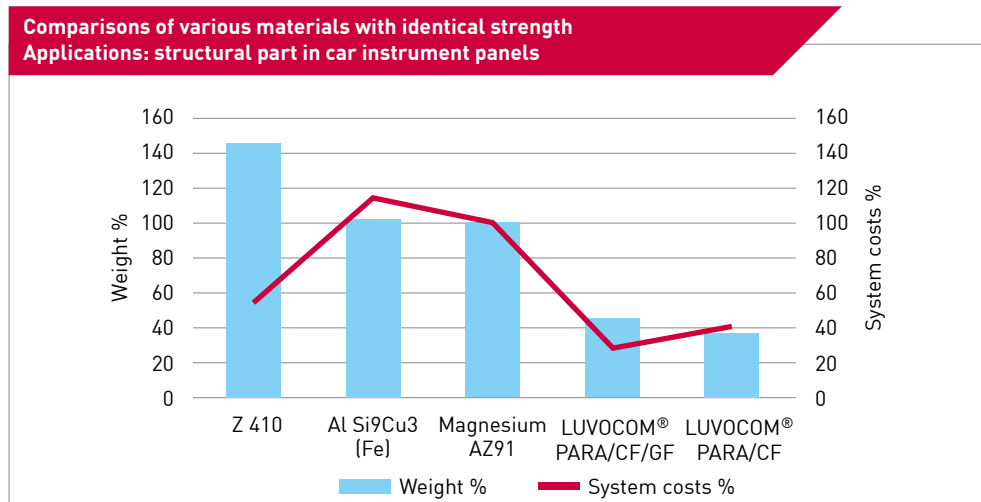


WEIGHT

Expertise in weight

LUVOCOM® LW compounds with low weight combined with high strength

Products with high mechanical values that make especially strong and stiff yet lightweight components possible. Through LUVOCOM® LW, for example, we supply innovative construction materials with carbon fibres and glass fibres that offer an additional saving in weight and possess exceptional mechanical properties. A value of 52 GPa is attained for the tensile modulus and a figure of 530 MPa is possible for flexural strength. By designing the components to suit the material and using the design freedoms open to plastics, it is also possible to achieve a significant reduction in the system costs of up to 70% and a reduction in weight of up to 62% compared with other reinforced thermoplastics. With these properties, the materials also offer advantages over other systems such as composites (CFRP and GFRP) and nylon composite sheets.



* Comparisons refer to magnesium

LUVOCOM® HW – Heavy compounds

Generally the use of plastics involves a saving in weight. There are applications in which the opposite is required, with one example being bottle closures for high-value spirits. The weight conveys quality, but at the same time the costs for the closure should remain within reasonable bounds and innovative designs should be possible. This can also be implemented with plastic compounds. In LUVOCOM® HW, we are offering high-density materials of up to 5.0 g/cm³. They are characterized by the following properties:

- Good processing characteristics
- Design freedom
- Cost savings compared with solutions using metals
- Printable
- Metallizable
- Pigmentable



High-quality and heavy closures with LUVOCOM® HW.

Further examples of applications for LUVOCOM® HW can be found in sports (weights) and in the consumer goods sector (casings, closures, decorative articles) and the field of technology (vibration absorption, weights, shielding)



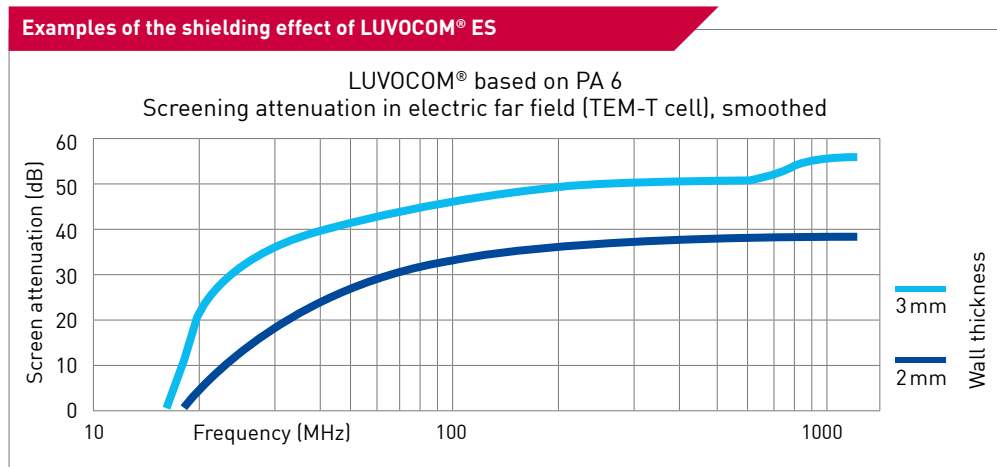
PROTECTION

Expertise in protection

LUVOCOM® ES – Electromagnetically shielding

Being non-conductors (insulators), plastics are permeable to electromagnetic waves of up to approx. 100 GHz. A shielding effect is achieved by using conductive additives or coatings. This prevents electromagnetic emissions and thus rules out any influence on sensitive electronic devices. LUVOCOM® ES products are shielding thermoplastic compounds. The special combination of additives results in a unique properties profile. As a substitute for conductive coatings or metal inlays, LUVOCOM® ES compounds enable considerable cost savings to be made. LUVOCOM® ES compounds are ready-to-use full compounds with rheology that has been optimized for ease of processing and for injecting thin wall thicknesses.

The LUVOCOM® ES compounds offer effective screening attenuation, while their high electrical conductivity means that smaller contact surfaces are possible for the required electrical earthing. The innovative additive system also enables attractive surface finishes and tough materials. Flame-retardant LUVOCOM® ES compounds are also available.



LUVOCOM® D – Detectable compounds – so that nothing escapes you

The food industry uses plastic for containers, moulds, housings, machinery parts, wipers, tools and other parts. In the event of damage, these components may contaminate the food with fragments of various sizes. Consequently, any plastics deployed should be detectable. Conformity to the valid regulations for materials and articles in the food sector is also necessary, with examples including EU Regulation No. 10/2011/EEC or FDA. Migration limits in accordance with EN 1186 also have to be observed.

We offer made-to-measure solutions for these special requirements. The materials can be readily processed and the finished parts exhibit attractive surfaces. Segregation of the additives is ruled out. Pigmentation in numerous colour shades makes it possible to ensure a clear visual distinction from the foodstuffs being processed. The range of polymers for LUVOCOM® D is wide: from PE, PP, PA and POM, via PES, to PEEK, practically all thermoplastic materials can be supplied with this characteristic. To help in material selection, we provide test rods and cards, which contain test specimens of various sizes made of different LUVOCOM® D materials. This enables suitable formulations to be specified for the particular application.



Test specimens for selecting the appropriate material



Particles detectable by X-rays made of LUVOCOM® D



SURFACE

Expertise in surfaces

Pigmented high-temperature polymers

For high-temperature polymers such as PEEK, PEK, PEI, PPS and PPSU, we are specialists in ready-to-use pigmented compounds. We have special know-how in this field and are able to offer a large and unusual range of colours as a result. This enables the risky procedure of pigmentation using colour masterbatches to be eliminated. In addition, the materials may obtain additional functionalities, such as laser-markability, and can also be fibre-reinforced.



1. Pigmented high-temperature polymers (here PEEK and PES)



2. Laser-markable compounds (here PEI)



3. Pigmented PEEK with glass-fibre reinforcement for a component in medical technology

High-strength components – with an elegant surface finish

Thermoplastic compounds with high mechanical values can be obtained by adding reinforcing materials, mainly glass and carbon fibres. They may account for up to 60 per cent of the weight. This normally results in poorer surface finishes in the component. By selecting suitable raw materials and adapting the compounding, we offer materials that have both high strengths and attractive surface finishes.



Plate with CFRP look, made of high-strength carbon-fibre reinforced LUVOCOM®



Experienced employees for demanding materials.



Gear wheels made of high-temperature resistant LUVOCOM®, reinforced with carbon fibres and modified with lubricants

Materials solutions for the automotive industry

As a driver of technological innovation, the automotive industry places high demands on new materials and their quality. In almost all of the systems in today's automobiles, compounds increase the performance of components or help to reduce weight and save fuel. Thanks to decades of experience with materials for functional parts and components, we are able to support you with advice in all issues of material selection. Consequently, using high-temperature resistant, high-strength and tribologically optimized compounds, we are able to produce components in plastic for very heavy-duty use. We have reference clients for all relevant assemblies and support you from development through to series production.

Main fields of application for LUVOCOM®



1. Roof systems on convertibles
Sun roofs / sliding roofs

2. Electronics
Brakes / filters
Engine compartment
Headlights
Pumps

3. Steering
Interior
Climate control
Seats
Door locks

4. Drive train
Axles / chassis
Fuel management



Ball cup made of LUVOCOM®, fibre-reinforced and lubricant-modified



Structural components in insert and outsert moulding made of carbon-fibre reinforced and lubricant-modified LUVOCOM®



Steel belt deflector, coated with LUVOCOM® P

Materials solutions for machinery and plant construction

High demands are placed on machine elements. When in service, they must function absolutely reliably for the longest possible time. Production loss due to maintenance work should be minimized as far as possible. Consequently, the materials used must have a large number of properties. One demand, for example, might involve a combination of good slip characteristics, low wear and high heat resistance while at the same time requiring high strength.

LUVOCOM® high-performance compounds offer many advantages over traditional materials such as metals. Carbon-fibre reinforced LUVOCOM® high-performance compounds combine low weight with good mechanical properties such as strength and rigidity. Lubricant-modified compounds reduce wear and guarantee better slippage. Thermally conductive and electrically conductive compounds dissipate heat and electrostatic charges and thus help to ensure greater safety and better performance. Detectable compounds raise safety in food production and avoid damage – for the consumer as well. Coating powders protect components against corrosion and wear.



Lens holder for microscopes and gear wheel made of carbon-fibre reinforced LUVOCOM®



Friction bearings made of various LUVOCOM® compounds, modified with nano-additives



Semi-finished goods (sheets, tubes and rods) made of various specially developed LUVOCOM® compounds for a diverse range of applications in industry



Metal substitutes: lever for machines made of carbon-reinforced LUVOCOM®

Materials solutions for the food industry

There are many applications for plastics in the food processing industry. They involve objects for single and multiple use, such as transport containers, tools, scrapers, conveyor belts, casings and machine elements. The requirements on such parts are rising continuously. The cause for this is intensified health and safety regulations coupled with increasing technical requirements on components.

In this area, we offer a variety of solutions and are working continuously on the development of new tailor-made materials for this market. One example is carbon-fibre compounds compliant with Commission Regulation (EU) No. 10/2011 (plastic materials and articles intended to come into contact with food). This means that materials are available for applications in the food sector with a high mechanical strength and antistatic properties and in different colours as well. Another example is detectable compounds. Their use enables even smaller particles or fragments to be readily located using metal or X-ray detectors.



Spatula made of LUVOCOM®, antistatic, carbon-fibre reinforced



Conveyor bucket for food production made of detectable LUVOCOM®



Knife handle made of detectable LUVOCOM®

Materials solutions for the aviation industry

Aviation demands extremely strong yet lightweight materials. The megatrend towards lightweight construction with composites and carbon-fibre reinforced plastics allows tremendous savings to be made in weight and hence in fuel consumption.

LUVOCOM® XCF compounds are outstandingly suited for parts with high mechanical requirements. Compared with composites and metals, they thus achieve significant savings on costs and weight. LUVOCOM® XCF compounds are even able to achieve an additional saving in weight of up to 30% over plastics with short and long glass-fibre reinforcement. Lower filler levels mean better processing characteristics and hence greater freedom in design. LUVOCOM® XCF compounds can be processed in conventional injection moulding procedures without the need for special machines or techniques.



Structural element for airliners made of carbon-fibre reinforced LUVOCOM®

Materials solutions for medical technology

Devices, instruments and systems in medical technology are increasingly making use of innovative compounds. Most of them are based on amorphous and partially crystalline plastics with resistance to high temperature and chemicals, such as PEEK, PPS, PPSU and PEI. Our compounds based on these polymers meet the special requirements relating to biocompatibility, sterilizability by different procedures, good resistance to media and radiation, transparency to X-rays and NMR as well as good mechanical properties at high temperatures.

We offer made-to-measure solutions for medical technology. This means that it is not only possible to adjust the mechanical properties, colour and laser marking qualities to meet specific client requirements but also parameters such as the flow characteristics. As a result, it becomes possible to implement innovative and sophisticated designs and shapes. One approach is to provide substitute materials for metals – primarily for reasons of design, function, weight and cost. The miniaturization of parts and components also plays a major role because it can generally only be achieved with special compounds.

Support in authorization procedures

Devices and parts that come into contact with skin, tissue or body fluids are subject to special provisions. We support you during authorization. Individual material tests are possible, such as in compliance with EN ISO 10993-5 (cytotoxicity assessment). We also offer this on an individual batch basis.

Materials solutions for the consumer goods industry

In both professional and amateur sport, high-performance compounds are important for producing efficient equipment. They help to save weight and thus assist athletes in achieving greater speeds and distances. They increase the amount of fun derived thanks to enhanced component properties and hence product properties, too. Examples of such applications can be found in bicycles (brakes, gear changing mechanisms, pedals), sailing boats (fastenings, rollers) and in running shoes (soles and reinforcing elements). In domestic applications these materials can be found in furniture, lighting and electrical appliances, where they are used specifically for hinges, slides, heat-conducting plates and safety switches.



Handles for surgical instruments made of high-temperature and chemically resistant LUVOCOM®, suitable for repeated sterilization



Lamp holder for operating theatre light made of thermally conductive and high-temperature resistant LUVOCOM®



Ball-point pen with touchscreen function made of electrically conductive LUVOCOM®



Carrier for inline skates made of carbon-fibre reinforced LUVOCOM®



1. Lamp housing for LED traffic light made of thermally conductive LUVOCOM®
2. Coil former with integrated contact pins made of LUVOCOM®, good flow properties, outstanding electrical insulation
3. Connector made of LUVOCOM®, high temperature resistance
4. Switch component made of LUVOCOM®, especially resistant to wear
5. Tray made of LUVOCOM® for transporting electronic components, chemically resistant, electrically and thermally conductive

Materials solutions for the electrical and electronics industry

The use of plastics has a long tradition in electrical and electronic applications. Polymers are available here with special material properties for use as insulators, electrical conductors, thermal conductors or antistatic and shielding covers. Good processing characteristics, the low weight and corrosion resistance are also good arguments for their use. LUVOCOM® high-performance compounds can also meet the strictest of requirements. High electrical conductivity or insulation, a certain flammability rating and approval as well as adjusted mechanical properties are just a few examples of the features that can be developed in tailor-made compounds to meet your requirements.

Material solutions for the energy, oil and gas industry

High-performance compounds are used in the field of energy generation as well as in oil and gas production because of their unique properties. They have proven their worth through many years of practical experience. With their high resistance to temperature, chemicals, wear and gap extrusion as well as their electrical properties, LUVOCOM® compounds supply the required characteristics in applications such as seals, bearing rings, connectors and valve seats. They offer users high reliability and hence less maintenance expense compared with traditional materials. With LUVOCOM® EOG, we are offering further enhanced materials of the latest generation. They are tested to Norsok M710 and offer processing benefits, isotropic properties and are more resistant.



Connectors made of high-temperature resistant LUVOCOM®



Semi-finished product made of LUVOCOM® EOG for the machining of seals, highly wear-resistant and thermally stable

High-performance compounds with comprehensive quality control

A broad spectrum of inspection and analysis methods is at our disposal for testing the quality of incoming goods, for the development of products and for process monitoring. This enables us to inspect the quality of the raw materials used. Every product batch is tested and supplied with a test certificate. Constant quality of our materials in the long term is important for us and is guaranteed by our comprehensive quality management system. Our certification to ISO 9001 gives you security and helps you to cut costs – from goods-in inspection through to your own quality assurance.

Services you can rely on:

- Specification and testing of raw materials
- Close contact to raw material suppliers
- Every batch is tested
- Quality management system
- State-of-the-art production

A summary of our test methods

In addition to the standardized mechanical tests with our universal testing machines (which are calibrated and also form the basis for the works certificates to DIN EN 10204 3.1) as well as chemical and physical test methods such as Karl Fischer or density determination by means of helium pycnometer, our own laboratory has many other methods and analytical facilities at its disposal. These techniques are essential in enabling us to guarantee constant quality.

They include:

- Mechanical tests
- Thermogravimetric analyses (TGA)
- Differential scanning calorimetry (DSC)
- Thermomechanical analyses (TMA)
- Tribological tests (including block on ring)
- MFR and MVR measurements
- Flow distance determination
- Viscosity number determination
- Particle size distribution by means of laser diffraction
- FT-IR spectrometer
- Scanning electron microscope
- CIELAB system
- Fire test chamber
- Hot disc
- Electrical resistance measurements

We are compliant

As our customer, you can rest assured that you are working with a responsible partner.

Examples of what this means for us are:

- Processes in keeping with standards for occupational health and safety as well as environmental protection (reviewed as exemplary by German authorities)
- Participation in the Responsible Care initiative of the German Chemical Industry Association (VCI)
- Provision of relevant safety information to accompany products (e.g. declarations of conformity, safety data sheets)
- Implementation of the REACH process (in accordance with Regulation 1907/2006/EC (REACH))



DSC



TGA



Hot disc method

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Further information, brochures and data sheets are available from: www.luvocom.de

Other solutions for the plastics processing industry from our company:

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www.luvobatch.com
www.wmk-plastics.de