

A key enabler of your success.



ZEISS OEM Solutions

zeiss.com/oem-solutions



Seeing beyond

ZEISS OEM Solutions

One source for optical components, modules and systems

Innovative technologies create new possibilities for designing complex instruments that are even more compact but also more powerful. With ZEISS OEM Solutions, you have a reliable specialist for optical components at your side. We focus on your individual requirements and what would benefit you. With our expert knowledge, we provide efficient support for sophisticated opto-electronic modules and systems. We are your one-stop shop for producing the relevant optical and mechanical components, including suitable auxiliary materials. We see ourselves as a system partner who designs and manages the entire product development process according to your wishes, from the first idea to series production.

Your all-in-one provider

From the first sketch to series production – we are at your side. Our manufacturing portfolio comprises optical components such as spheres and free-form optics as well as precise mechanical parts and the assembly of optical OEM modules and systems.

Experience and innovation

We supply optical modules and systems to our ZEISS business units as well as to external customers. This enables us to participate in current market developments and technological innovations in a wide range of industries.

Our production network

We combine know-how, technologies and experts under one roof. You will benefit from the collaboration with ZEISS development units and several production units, as well as external partners and service providers.



From the idea to series production

We are your OEM partner – from day one

The development and creation of precise optical systems is our passion. All departments at ZEISS OEM Solutions – from development, design and prototyping to series production – work hand in hand to offer the best possible solution for you. You can count on ZEISS know-how from the very start of your project. We will support you with our technical expertise and show you the range of possibilities provided by our network.

Focus on the customer's application

Once the idea has emerged, we work together to determine the best solution for its realisation. We look at the possible risks and assess potential so that your project can be launched under clear conditions.

Based on the feasibility check, you will receive a basic concept from us with information on development and manufacturing costs, delivery time and technical risks. We also point out cost drivers and potentials.

Your project is in expert hands, no matter at which point in the value stream we can support you: from optical design to technology development, and from optical components to complex optomechatronic systems.

Modern equipment, testing devices and manufacturing technologies as well as the know-how of our employees ensure that we meet your requirements.





Development services

Tailor-made solutions by experts, for experts

Optical design

Optical design is the result of science, creativity, technical understanding and interdisciplinary cooperation. Close cooperation between our customers and our development, design and manufacturing units is the prerequisite for innovations that can truly be realized.

- Design of optical systems
- Simulations: Scattered light, stray light, thermal behavior, virtual prototyping
- Tolerance analysis – as-built tolerance optimization for manufacturing and design-to-cost
- Use of innovative elements – freeform surfaces, diffractive and holographic elements
- Excellent ZEISS design tools, supplemented with all standard software tools



Mechanical design

When we design optical, mechanical and opto-mechatronic assemblies and systems, we simulate mechanical and thermal stresses to find the optimal design. Cost analysis is directly integrated into the design process.

Project management and system engineering

With our technical expertise, we develop individual and customized optical modules and systems. In system engineering, our developers provide expertise in all relevant technologies, over a wide range of products. We offer you professional support to define, document and maintain requirements.

Excellent images at a working depth of up to 6000 m are the result of the perfectly adjusted optical and mechanical design that the ZEISS DUW Distagon offer.

Development services

Competence in optics throughout the entire manufacturing process

Optical coatings

Our know-how covers the design and development of customer-specific coatings and coating systems. In the spectrum from DUV to NIR we have different standard coatings, which can be modified depending on your application.

We use software designed in-house for the development and simulation of complex coatings and the necessary process development.

From filters and beam splitters to mirrors and anti-reflection coatings, we coat a wide range of optical surfaces with different geometries and dimensions.



Technologies:

- Thermal evaporation
- Electron beam evaporation
- Ion beam – and plasmaassisted evaporation
- Magnetron sputtering

Chemical, material and optics auxiliary materials service

Does your preferred material meet all necessary requirements and can it withstand extreme conditions?

We support you with:

- Instrumental analytics
- Process-related analytics
- Contamination testing
- Testing tools
- Investigating accidents and damages
- Environmental monitoring
- Surface analysis and much more



Our materials laboratory has a comprehensive service portfolio, including materials analysis, heat treatment, materials and process consulting and chemical surface treatments.

We offer customized chemical and material service, e.g. adhesives, fine cements for optical systems, top-of-the-line tool lubricants, cleaning solutions, oils and greases.

Technology development

We develop the ideal manufacturing technologies for your products. Thereby we can use a wide range of optical and mechanical manufacturing processes.

- Innovative assembly and alignment technologies
- Integrated automation
- Ultraprecision machining
- Additive manufacturing

Optical modules and systems

Customized OEM solutions

From precision optics and mechanics, electronics and software, we create optical modules and systems. Depending on your requirements – according to your specifications – these can even be waterproof, pressure resistant, shockproof or heat and cold resistant. The impact of manufacturing tolerances and the costs of the entire process chain are already taken into account in the optical design and construction. Combined with innovative technology development, this is the key to your success. We have solid and reproducible processes for manufacturing highquality optical systems. We deliver on time and according to high quality standards.



With our digital alignment and the direct interface to the optical design we create outstanding optical modules and systems. Our measuring devices automatically determine the current performance of the system with regard to the compensation of image errors. Through the integration of system metrology into the alignment process we ensure the required imaging quality and deliver the corresponding reports upon customer request.

As a technologically leading production company, we are continuously developing our production technologies and working methods. We are happy to share our enthusiasm with you, for example in an individual consultation on new opportunities for manufacturing.

We schedule, manage and record a manufacturing process that is based on your individual specifications and needs.

What our customers appreciate about us is the optimal coordination of processes across the entire value chain. From material procurement and production to packing and delivery.

Our capabilities for your success

We provide the right technology



Optical modules with complex functions

Implementing complex requirements in tailor-made solutions – this is what drives us in the development of optical modules and systems. Optical elements and electronic functions are linked in such a way that they act as a powerful unit and meet even the most demanding requirements.

Optics manufacturer with system expertise

We have developed many methods and processes for optical production ourselves or played a decisive role in shaping them. With this knowledge, we manufacture complex systems that are optimized down to the last nanometer. Interfaces are matched to ZEISS optical components in the best possible manner to achieve excellent results.

Spectrometer modules and spectrometer systems

Our spectrometers offer the performance, quality and robustness to deliver accurate data even in critical process environments. From ingredient analysis in the agri-food area, layer analysis and endpoint control in semiconductor production or large area coating, to water analysis in wastewater treatment and color measurement in the printing industry – our reliable solutions are used in a wide range of applications.

Key information

Dimensions	Modules up to lens diameter 500 mm, systems as per requirements
Weight	< 1kg up to a maximum of 400 kg
Wavelength range	1 93 n m up to 1.7 μ m (spectrometer modules up to 2.5 μ m)
Cleanliness	ISO 5 Cleanroom
Monitoring	Humidity and temperature, up to ISO 4
Applications	Inspection modules, microscopy objectives, illumination modules, detection modules, relay optics, spectrometers and many more



High-tech components

Excellent optical and mechanical components

Your idea inspires us and we ensure its realisation! At the same time, we respond personally and individually to your wishes, take all facets into account and focus on the benefits for you. We support you with highly demanding optical and mechanical components and contribute our expert knowledge during the product development process. You also benefit from the experience of the internal ZEISS tool and measurement technology development.

You know exactly what you need? Then we can already start manufacturing.

Optical high-tech components

No matter what you need – aspheres, freeform optics, high-performance spheres or special components – we continue to develop and outperform our competitors in every discipline and exceed our competitors with the well-known ZEISS quality.

Mechanical high-tech components

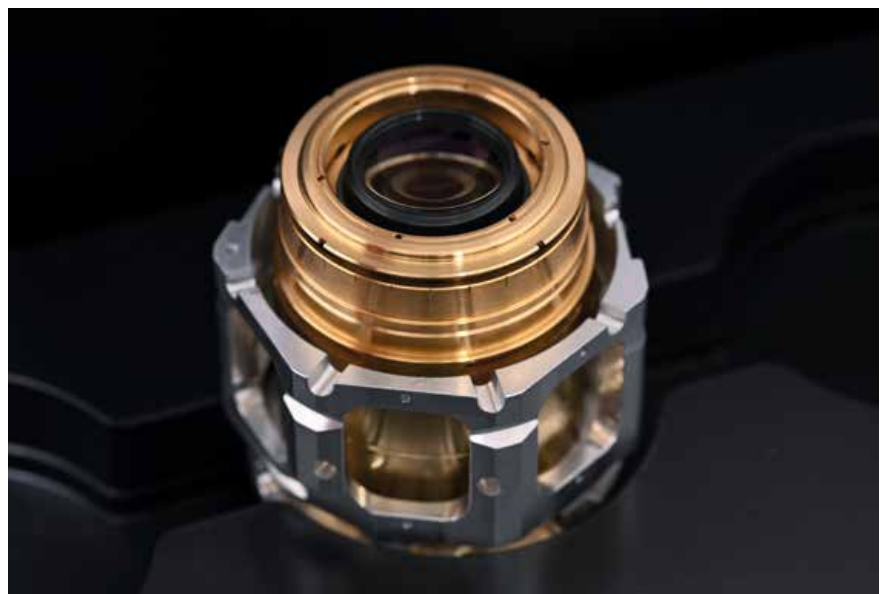
Turned, milled, ground – impress your customers with precision parts and components. Experience how ZEISS high-tech components are produced at competitive prices – with lean processes using the state-of-the-art technology and smart automation.

Production of prototypes and equipment

Do you need a prototype for your individual parts, assemblies or modules? We manufacture according to your specifications and also design jigs and tools, adjustment and testing equipment for mechanical and optical production. We can simulate or calculate special attributes in advance on request.

Surface finishing

We develop the appropriate coating concept for your product that meets the highest expectations for decorative and technical surfaces – whether for a single item or series production.



Optical high-tech components

Innovative processes suited to your application



Whatever the surface shape, cleanliness, roughness or overall performance – you decide where the focus should be. We harmonize all machining variants to your wishes and deploy a suitable modular manufacturing chain.

Leading-edge technologies

We create leading-edge technologies in optics to push the limits of feasibility. Our aim is to make optics even more precise and create a piece of perfection – to benefit our customers.

Novel process and measurement technologies enables the production of high-end precision aspheres and freeform surfaces.

In particular, the competence for the design and production of freeform surfaces has been continuously expanded over the last few years by combining in-house technological developments with the most recent measuring and machining technology.

Microstructured optics

With the high-end technology and the extraordinary know-how of our employees we are able to produce ultra-high precision optics with small size in large quantities. The optical functionalization of transparent surfaces opens the door for new and disruptive applications for example in the automotive sector, in consumer products or in the industrial use of micro-structured optics.

Our manufacturing portfolio

High-end spheres	Diameter 20 to 250 mm ; up to $\lambda/100$
Front lenses	Lens radii up to -0.5 mm, aperture angle up to 178°
Aspheres	Diameter 15 to 300 mm ; rise error < 0.1 μm
Freeform optics	Various materials and functions ; up to $\lambda/10$
Flat optic	Angle tolerance ± 0.5 angular seconds ; up to $\lambda/100$
Optical flats	Up to 400 mm edge length
Prisms	Up to 200 mm edge length
Optical coatings	Spectral range 193 to 1700 nm

These values are technical possible specifications. The feasibility must be checked on an individual basis.



Optical assemblies

Geared processes for the best results

We manufacture optical assemblies with complex optical properties and maximum transmission for you. We provide modular production chains at the highest technical level and powerful metrology in-house. Even in the case of multiple medium transitions in optical assemblies, we will find the proper solution that ensures the best result. We reduce stray light and achieve the highest transmission for components such as deflection prisms, beam traps, projection solutions, beam splitters and much more.

Customized optical assemblies

We also adjust the properties of the cement individually for each component. For this purpose, we combine flat optical and spherical as well as aspherical components with specific cements to form subgroups with multiple optical functions. In this way, we achieve an optimal beam path with maximum performance for each assembly.

Optical standard coatings and individual solutions

Our series production reliably guarantees that the requirements for the highest specifications of optical coatings and the associated precision demands are met. Our high-end coating systems are manufactured using modern processes which are subject to continuous further development and optimization. This ensures that our customers have the technological edge on the market.



Mechanical high-tech components

Pinpoint precision

Turned, milled, ground

Impress your customers with precision parts and components from ZEISS. We are continuously developing new, efficient manufacturing processes to machine a wide range of materials with the highest level of accuracy. Together, we plan the optimal manufacturing process, tailored to the requirements of your application and across the entire value chain.



Production of prototypes and equipment

Besides the production of prototypes and small series, we can offer you the design, development and manufacture of equipment, jigs and tools. We use innovative processes, such as rapid prototyping or flexible 5-axis CNC manufacturing technology.



Milling

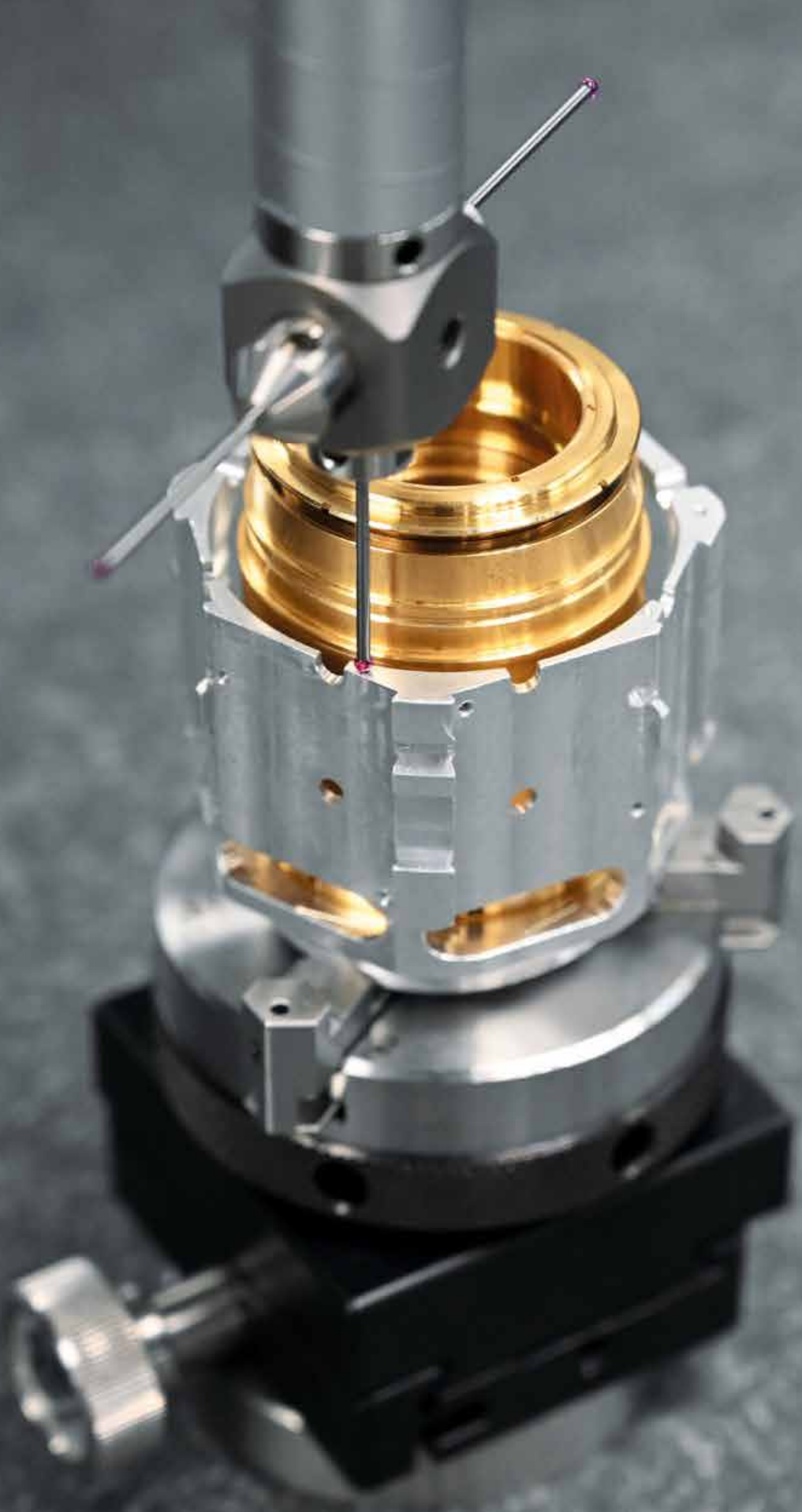
Dimensions	Cubic components with up to 1600 mm edge length
Machinery	4-axis and 5-axis milling, ultra-precision CNC machining
Materials	Steel alloys, light metals, magnesium, plastics, special alloys, castings
Accuracy	Up to IT5
Surface quality	Up to Ra 0,2

Turning

Dimensions	3 to 750 mm, bar machining up to 100 mm
Machinery	Ultra-precision turning machines, 10-axis turning-milling stations, process automation, standard processes
Materials	Steel alloys, light metals, non-ferrous metals, plastics, castings
Accuracy	Up to IT4
Surface quality	Up to Ra 0.1

Ultra-precision machining

Dimensions	Maximum diameter 500 mm, upon request
Machinery	Plane grinding, inside cylindrical grinding, outside cylindrical grinding, ultra precision turning, wire eroding, diamond milling, machine lapping and hand lapping
Materials	Steel alloys, light metals, special alloys, castings
Accuracy	Up to IT2
Surface quality	< Ra 0.1



Surface finishing

Sophisticated, technical and decorative surfaces

In many areas of applications, mechanical components are often exposed to major environmental influences. Their surfaces level of resistance is crucial. The better the protection, the more durable the component. The higher the quality of the coating, the greater the range of applications.

Anodization processes

With a galvanic or chemical treatment, you increase the durability and resistance of your products. We can tell you which is the right process. Our electroplating department uses ultra-modern machinery and can anodize part sizes up to 1700 mm using various processes.

- Anodizing
- Bilateral
- Hard coat anodizing
- Ematal / ematal, black
- Anodizing, multicolored

Precision cleaning

By using the latest cleaning processes we fulfill your requirements regarding cleanliness of precision-engineered components. All the cleaning systems we use are optimally matched to precision mechanical component cleanliness. Upon request, we clean and pack your individual parts in clean rooms with up to ISO class 5.

- Cleaning of workpieces
- Cyanide electrolytic degreasing
- Precision cleaning
- Inner pipe cleaning
- Teflon degreasing (HFE cleaning)



Nickel plating process

Nickel can be used universally in surface finishing and offers a wide range of properties that enhance any workpiece. It increases chemical resistance, protects against corrosion and wear, and increases lubricity – to name just a few benefits. We are proficient in all the necessary processes for this and can advise on the possible applications of nickel coating.

- Chemical nickel medium phosphorus
- Chemical blackening of nickel medium phosphorus
- Chemical nickel high phosphorus
- Chemical nickel high phosphorus for plastics and ceramics
- Gloss nickel
- Sulfamate nickel
- Electroforming nickel



Reprographic and microstructure technology

You want precision? Then we will inspire you with our custom manufacturing.

- Sputtering technology
- Electroforming of photolithographic structures
- Anisotropic etching of silicon
- Mold etching parts from copper alloys and stainless steel materials

Printing technology

Do you need information printed on your workpiece that will last for a long time? Then we will advise you on the appropriate printing technology for fonts or characters.

- Screen printing
- Pad printing

Painting technology

Coatings provide the visual finish for any workpiece, but above all they should offer lasting protection: against corrosion, impacts and scratches, but also against chemical environmental influences. From matte to gloss – according to your needs.

- Smooth lacquer
- Textured lacquer
- Bonded lacquer / Teflon coating
- Enameling
- Antireflective lacquers

Mechanical pre-treatment

Prior to any surface treatment, the workpiece must be prepared in such a way that any further finishing is applied to a viable base. That is why we grind, blast and polish your workpieces.

We develop the right coating concept for your product that meets the highest expectations for decorative and technical surfaces – for single items or series production.

Our metrology and inspection services

Precise, secure, and professional

Our material experts assist you with the analysis and optimization of materials and advise you at the application-oriented development of modern materials.



Precision measurement and sample testing

The accredited test procedures mean our results are valid and recognized worldwide. Our test lab is accredited according to DAkkS D-PL-12037-01-02.

- Initial and counter sampling of components and assemblies
- Accredited tests with documentation
- Contract measurements
- 3D coordinate measurements
- Measurement system analysis, measuring consultation, and test planning
- Digitization of 3D objects
- Optical and photometric measurements

Materials technology

The quality of the materials used is crucial for the technical innovation of a component. Our materials experts will support you in analyzing and optimizing materials so that every product can be manufactured to the highest quality.

- Hardness testing of metallic materials, glass, and ceramics
- Microscopic exams
- Scanning electron microscopy
- Materialography
- Damage analysis
- Tension and compression tests
- Spectroscopy



Calibration and test equipment management

Our calibration service guarantees full correlation to national standards for test equipment of all physical variables – either at our laboratory or on your premises (for measuring tools).

Our calibration lab is accredited according to DAkkS D-K-12037-01-00:

- Parallel gauge blocks up to 800 mm, made of steel and ceramics
- Cylindrical setting gauges, adjusting rings, plug gauges, ring gauges, test pins
- Optical 1D length standards up to 600 mm
- Optical 2D length standards up to 1000 mm x 700 mm
- Line spacings
- 1D length measuring machines up to 3000 mm (horizontal design)
- Measuring microscopes, measuring projectors, 2D optical coordinate measuring machines
- Plane standards and optical standards

Our support for your research and development

Environmental simulation

Throughout their service lives, technical products are subject to a multitude of environmental influences, e.g., heat, cold, oscillations or impacts. This influences how well and how long they function.

We can find out how the effect and cause are interrelated with an environmental simulation. We will test your products under specific environmental conditions and help you to optimize them for sustainable product development.

Climate simulation

- Air-conditioning technology with test room volume 0.3 m³ to 30 m³
- Temperature range -70°C to +180°C
- Rel. humidity 10% to 96%
- Cold, dry, and humid heat, temperature change up to 15 K/min
- Temperature/ humidity, cyclical

Our offer:

- Vibration test
- Simulations of climatic conditions
- IP protection rating, drip and splash testing
- UV irradiation
- Dust test
- Acoustics

Device safety

Ensure the reliability of your devices and systems with our accredited test reports. Our experts perform your type tests based on international standards and prove that the products are safe based on the conformity assessment procedure in line with EU directives/ regulations and international approvals.

Our test laboratory for safety tests of medical products, safety of electrical equipment, safety of optical instruments – simulated optical radiation is accredited according to DAkkS D-PL-12037-01-02.

We also offer our customers precise measurements of individual electrical, optical, and mechanical safety parameters, support with development, and training on regulatory requirements for the national and international market and specifications set out in standards.





Technology for the standard-compliant measurement and testing of:

- Insulation resistance
- Protective earth resistance
- Leakage current / touch current
- Current, voltage, power rating
- Temperature
- Sound level
- Mechanical stress
- Laser power
- Optical radiation
- Power network analysis
- Electric strength
- Mechanical simulations
- Simulation of different power supply voltages and frequencies
- IP protection class

Electromagnetic compatibility

We test the interference immunity and emitted interference of electrical devices and complex machinery. Our EMC measurements and tests conducted in accordance with standards recognize all activity in the electromagnetic field and ascertain how immune to interference a piece of equipment is. We will also offer guidance on optimizing the product in terms of its EMC properties during the development phase.

DAkKS accreditation for:

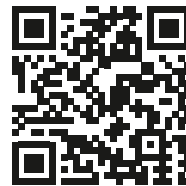
- Electromagnetic compatibility of medical electrical equipment
- Electromagnetic compatibility of electrical equipment for measurement, control, and laboratory use
- Electromagnetic compatibility of railway applications
- Electromagnetic compatibility of multimedia devices
- Various generic standards
- Various test and measurement procedures

Standard-compliant testing of medical electrical equipment. Anechoic chamber with 10 m measurement range.

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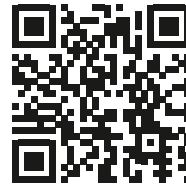
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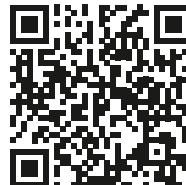


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here you will find our catalog for
auxiliary materials and supplies