



OPTICS | COMPONENTS | SYSTEMS

PHOTONICS | OPTICS | FIBER OPTICS | LASER-MEDICAL TECHNOLOGY



Your Specialist | Dieter W. Frank

Founder, CEO, Instructor, Consultant with advanced knowledge in general management disciplines.

CEO for financial, personnel and business development and CTO in a high technology business field. Superior experience in international customer services in laser, optical components, fibres & photonics and R&D.

YOUR GLOBAL PARTNER

For Photonics, Laser- & Medical Technology

- Laser technology components
- Optical and opto-mechanical components
- Precision, sapphire and quartz glass optics
- Coatings, filters
- Individual customized developments
- Fiber optics, laser cable systems
- International business development
- Opening up of new business fields
- Distribution / Agency Technology
- Consulting and patent research
- International network in Europe, Asia and the USA
- Consulting and coaching in:
photonics, optics, fiber optics,
laser and medical technology, lighting



OPTICS | COMPONENTS | SYSTEMS

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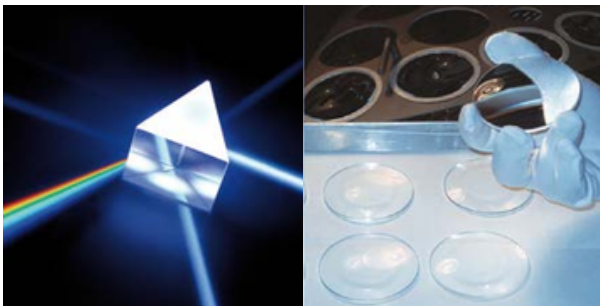
QUARTZ GLASS

For laser and medical technology, photonics, optoelectronics, systems engineering and semiconductor applications



SAPPHIRE

Sapphire components for optics, laser technology, life science and industry



LASER WINDOWS / PROTECTIVE WINDOWS

bdlp offers high-quality and cost-effective customer-specific, custom-made or standard laser protective windows for all types of lasers. Available in all required material thicknesses, dimensions, diameters and wavelengths.



LASER TECHNOLOGY COMPONENTS

For enhanced laser performance – OEM key supplier to the European laser industry



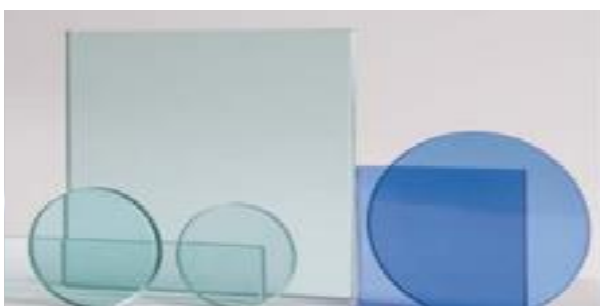
PRECISION OPTICS FROM UV TO IR

Optical components and elements for industry and science



COATINGS

Coatings for optical and glass-technical components across all spectral ranges



MATERIALS

Materials | Formed Parts | Blanks | Round Discs | Cut-to-Size Pieces

For laser and medical technology, photonics, opto-electronics, system engineering and semiconductors

OPTICAL QUARTZ GLASS COMPONENTS



Laser windows



Flow tubes & pipes



Components for industry, laboratory and instrument engineering

Quartz products for industry and science

Flat windows, prisms, wedges, slides, lenses Rods, tubes, capillaries Molded parts and substrates

Our specialties

Laser windows, laser caps, flow plates, flow tubes, flat components with bores, grooves, steps, etc. Flatness of the surface up to λ_{20} Polishing quality in accordance with DIN 10110 up to P4 Components in socket

Application

Optics, photonics, opto-electronics, sensors Laser and medical technology Laboratory and instrument technology, chemical industry, semiconductor industry Aerospace industry Lighting technology, mechanical engineering R & D, special technology

Customized flat optical and spherical precision quartz glass components

- Every desired configuration possible
- Natural and synthetic quartz crystals
- Orientated and random quartz crystal possible
- Customized AR or HR coatings
- Repair service for laboratory equipment
- Manual and automatic quartz glass blowing workshop

Quartz glass and quartz crystal are used because of their wide transmission range and their high melting point as well as their birefringence.

Standard sizes of flat components

Dimensions: $\varnothing$ 0,5//□ 0,5 - 1000 mm;

Thickness: 0,1 mm to 250 mm

Tolerances: up to $\pm$ 0,001 mm, parallelism: up to // 5"

Surface accuracy, flatness of the surface up to λ_{20}

Polishing quality in accordance with DIN 10110 up to P4

Geometries, e.g. rectangular, round, ellipsoid, rod-shaped

Sapphire components for optics, laser technology, life science and industry

OPTICAL COMPONENTS AND SAPPHIRE COMPONENTS FOR INDUSTRY AND RESEARCH



Sapphire components with bores and grooves



Sapphire optics



Industry, laboratory, instrument engineering

Sapphire products

Sapphires are distinguished by their special thermal, electrical, optical and mechanical properties which make them different from other materials. Sapphire features high mechanical strength and thermal insensitivity as well as high mechanical resistance to wear and attrition.

Technical data

C-axis / random (not orientated) High purity
Dimensions: Ø/□ 0.5 - 150 mm / thickness: up to 100 mm,
tolerances: up to +/- 0.01 mm / parallelism: up to // 5"
Standard geometries of flat components
rectangular, round, ellipsoid, rod-shaped, tubes also with
bores, grooves and threads
Surface accuracy: Flatness of the surface up to λ_{10} ,
polishing quality in accordance with DIN 10110 up to P4
Roughness depth Ra 0.5 µm / high cleanliness

Technical parameters

Crystal structure: Monocrystal aluminum oxide Al_2O_3 (99 %)
Pressure resistance: 21,500 kg/cm², tensile strength at 20 °C
4,100 kg/cm², tensile strength at 1,000 °C 2,300 kg/cm²
Tensile modulus: 2.5×10^6 kg/cm², hardness: 9 Mohs 2200
Knoop to the C-axis Melting temperature: 2,050 °C,
application temperature: 1,800 - 2,000 °C (permanent
exposure possible) Poisson's factor: 0.29, refractive index:
nd 1.760, transmission: > 80 % (300 - 5,000 nm)

Optical Components and Sapphire Components for Industry and Research

Sapphire components orientated and random, from the simple protective window to optical precision components, customized AR or HR coatings, every desired configuration – windows, plates, rods, tubes and lenses

Sight glasses | protective windows | measuring windows | camera windows | vacuum windows | lenses | prisms | wedges | flat plates | rods | tubes | nozzles | valves | molded parts | profiles | tips | blades | guides | balls | insulators | claddings | pipes | capillaries | fibers

Optics, photonics, opto-electronics, sensors | Laser and medical technology | Laboratory and instrument engineering | Chemical industry | Aerospace industry | Vacuum technology, mechanical engineering | R&D, special technology

FROM UV TO IR

OPTICAL COMPONENTS AND PARTS FOR INDUSTRY AND SCIENCE

Thanks to our many years of experience and successful activity, we are very familiar especially with the technological fields of laser and medical technology, photonics, opto-electronics, sensors, mechanical engineering as well as system engineering and have extraordinary and extensive possibilities for the development, design and production as well as customer-specific consulting. Our customers include renowned international companies and scientific institutions in Germany, Switzerland, the EU and Asia. Our partners are medium-sized companies as well as international enterprises.

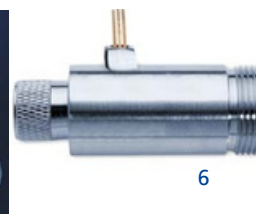
Key competences

- We can accomplish all tasks professionally and quickly.
- We are able to fulfill all individual customer wishes reliably.
- We produce and implement optical components, parts and systems according to your requirements.
- Creation of design drawings, feasibility studies and completion of optical calculations.
- We offer various dielectric and metal coatings.
- We are specialists for the complete world of lasers.
- Laser accessories (we supply components and systems for laser technology).

Business Development Laser-Photonics operates worldwide and has comprehensive know-how.

Standard components

Optical elements made of glass, crystals and special materials with flat and spherical surfaces with a flatness of the optical surfaces better than $\lambda/10$. Windows, terminating and protective windows Flat and wedged plates, Brewster windows, prisms, sapphire and quartz optics Laser optics, laser mirrors, mirror substrates Crystal optics, crystal processing Coatings, laser coatings, mirrors Filters, colored glass filters, dielectric interference filters, displays, instrument glasses Lenses and lens systems Press optics (molded optics) Optical systems, collimation and focusing systems, lenses



LASER TECHNOLOGY

Laser Technology

One-stop supplier!

BDLP – YOUR FIRST STOP WHEN YOU NEED QUALITY PRODUCTS FOR YOUR LASER.



LASER TECHNOLOGY COMPONENTS

For more laser performance | OEM key supplier to the European laser industry

Customized Components, Parts and Systems

- Individual development and production according to your technical requirements
- Optical, opto-electronic and opto-mechanical precision parts and systems for laser technology and photonics
- Industrial partner to manufacturers and developers of laser technology and mechanical engineering and their users
- Development and production of complete modules and systems
- Fiber optic beamline systems in laser material processing
- Medical fiber optic laser cable systems for laser medicine



Our specialty

Laser windows, laser terminating windows, laser protection windows, Flow plates, flow tubes Quartz and sapphire optics, Laser mirrors, mirror substrates, laser coatings Dielectric interference filters Lenses, ZnSe lenses Prisms, wedges, Non-linear laser optics (NLO) Optical systems, deflection systems, collimation and focusing systems, Laser cables, laser accessories

Laser technology components

Filters, glass cavities and laser tubes, laser rods, laser slabs, laser crystals, Ge-optics, CaF₂-optics, flash lamps, special lamps, resonators, laser cables

Application

Laser and medical technology, mechanical engineering Optics, photonics, opto-electronics, sensors Aerospace industry R & D, special technology

LASER WINDOWS

SPECIFICATIONS FOR PROTECTIVE WINDOWS

Technical data

Standard substrate: Quartz glass

Standard tolerances:

$\varnothing \pm 0.1$ mm or $+0/-1$ mm, thickness ± 0.1 mm

Edge cut with protective pane:

0.3 mm x 45° (other substrate [e. g. N-BK7, B270], tolerances on request)

Surface quality:

Optically cut & polished on both sides acc. to DIN ISO 10110, P4 flatness both sides $\lambda/2$

Standard coating:

both sides AR for 1064 nm, $T \geq 99.5$ %;

both sides AR for 808 nm, $T \geq 99.5$ %;

Wideband anti-reflective coating

both sides for AR 800-1,000nm AR

(low absorption BBAR); polarization: s, p

Angle of incidence: AOI = 0-20°

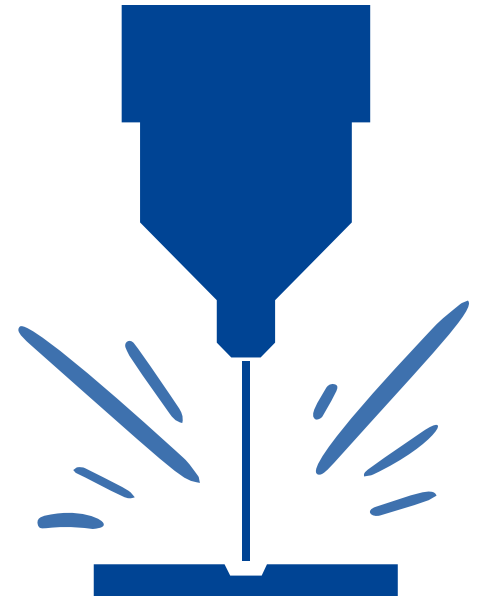
- $T \geq 99.5$ %/ $R \geq 0.5$ %
- with SiO₂-layer (passivation)

Laser destruction threshold:

> 500 W/cm² (other AR coatings [e. g. 2,100 nm, 980 nm, 532 nm] & specifications)

- Wipe and scratch-proof in accordance with MIL-C-48497, adhesive tape pull-off test in accordance with MIL-C-48497, incl. output test report & T-curve

If the protective window that you need is not listed, please contact us or send us your specifications (dimensions, coating, etc.) and we will make an appropriate offer.



Wavelength in nm	Dimensions $\varnothing$ x thickness in mm
1064	113 x 3,00
1064	100 x 4,00
1064	100 x 3,00
1064	80 x 3,00
1064	76,2 x 1,60
uncoated	76,2 x 1,15
1064	70 x 3,25
1064	65 x 2,00
800-1000	60 x 3,00
1064	60 x 2,00
1064	60 x 1,50
1064	59 x 1,15
uncoated	59 x 1,15
1064	55 x 2,00
1064	55 x 1,50
1064	54 x 2,00
1064	54 x 1,50
1064	54 x 1,15
uncoated	54 x 1,15
1064	50,80 x 3,00
1064	50 x 5,00
1064	50 x 3,00
808	50 x 3,00
1064	50 x 2,00
1064	50 x 1,50
uncoated	50 x 1,50
1064	50 x 1,15
uncoated	50 x 1,15
808	48 x 1,50
1064	46 x 1,15
1064	45 x 1,15
uncoated	45 x 1,15
uncoated	41 x 1,15
1064	40 x 2,00
1064	40 x 1,50
1064	40 x 1,50
1064	38,1 x 2,00

Wavelength in nm	Dimensions $\varnothing$ x thickness in mm
uncoated	38,1 x 1,15
1064	38 x 3,00
1064	38 x 2,00
uncoated	38 x 2,00
1064	38 x 1,20
uncoated	38 x 1,20
1064	35 x 1,60
1064	31,75 x 1,70
uncoated	31,75 x 1,15
1064	30 x 3,00
1064	30 x 2,00
uncoated	30 x 2,00
1064	30 x 1,50
uncoated	30 x 1,15
uncoated	28,50 x 1,15
uncoated	28,00 x 1,15
1064	27,94 x 2,00
1064	27 x 2,00
1064	27 x 1,50
uncoated	25,40 x 3,00
1064	25,40 x 1,15
1064	25 x 4,00
1064	25 x 3,00
uncoated	25 x 3,00
1064	25 x 1,00
1064	24 x 1,15
uncoated	24 x 1,15
1064	24 x 1,00
uncoated	23 x 1,15
1064	23 x 1,15
1064	22,50 x 1,50
1064	20 x 1,15
uncoated	19 x 1,15
1064	19 x 1,15
1064	13 x 2,54
1064	10 x 1,00
uncoated	10 x 1,00

COATINGS FOR OPTICAL AND TECHNICAL GLASS COMPONENTS
FOR ALL SPECTRAL RANGES

Individual AR Coatings for Precision and Laser Optics

VARIOUS INDUSTRIAL APPLICATIONS

Our specialty

- Electrically conductive coatings
- Tube coatings (inside and outside) AR coating and color effect
- Special coatings on request

Standard anti-reflective coatings

AR-VIS 450 - 750 nm

$T > 99\%$, $R \leq 0.3\%$ (AUI=0°)

AR-NIR 720 - 1100 nm

$T > 99\%$, $R \leq 0.3\%$ (AUI=0°)

AR-diode 800 - 940 nm

$T > 99\%$, $R \leq 0.2\%$ (AUI=0°)

AR-YAG 1064 nm

$T > 99\%$, $R \leq 0.2\%$ (AUI=0°)

Wideband anti-reflective coating both
sides for AR 800 – 1000 nm

AR (low absorption BBAR)

Polarization: s, p - angle of incidence:

AOI=0 - 20° - $T \geq 99.5\%$ / $R \leq 0.5\%$ with
SiO₂ layer (passivation)

Laser destruction threshold:

> 500 W/cm² Wipe and scratch-proof in
accordance with MIL-C-48497, adhesive
tape pull-off test in accordance with
MIL-C-48497, incl. T-curve



Color effect filters for airports, architecture, object design and entertainment

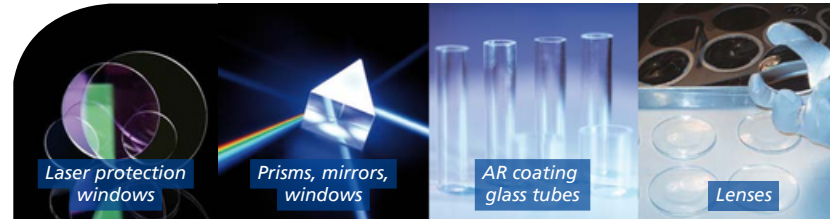
- Customized, individual, innovative solutions
- Technically high precision (e.g. Airport, railroad) and architectural tasks.
- Manufacture of every color shade palette on different glass, quartz glass and glass ceramic substrates with almost every geometry.
- Color effect filters with excellent chromatic and mechanical stability
- Project and quality management

UV band-elimination filter

To reduce the UV proportion of the light with retention of the full spectrum ($T > 90\%$) dielectric UV band-elimination filters ($UV < 2\%$ at $< 380\text{ nm}$) are used. The UV proportion in the light radiation in the light spectrum is eliminated here without altering the chromatic properties of the light source with retention of the full spectrum ($T > 90\%$).

Filters for optical systems and lighting technology

Heat protection filters - to reduce the heat development of the light - IR band-elimination filters are used as heat protection filters ($IR < 5\%$) with retention of the full spectrum ($T > 90\%$). The IR proportion in the light radiation is eliminated here without altering the chromatic properties of the light source.



CONVERSION FILTERS for lighting, entertainment, cinema technology and life science

For changing the color temperature of light sources. The conversion filters feature high transmission, chromatic, mechanical and chemical stability as well as heat resistance (up to 350 °C).

Standard conversion of daylight to artificial light

Conversion filters modify the color temperature of a light source from 5,600 K to 3,200 K

HR coatings

Dielectric mirror coatings for laser application
Cold light mirrors Customized cold light reflectors
(R > 95 %) especially for cold light sources Metal
coatings (aluminum, gold, silver)



Your Global Partner

Sapphire,
quartz glass,
crystals



Lenses
Lens systems



Flat optics
AR/HR
coatings



We manufacture
optical components
and parts from
glass, sapphire
and crystals

www.bdlp-consulting.com | www.bdlp.de

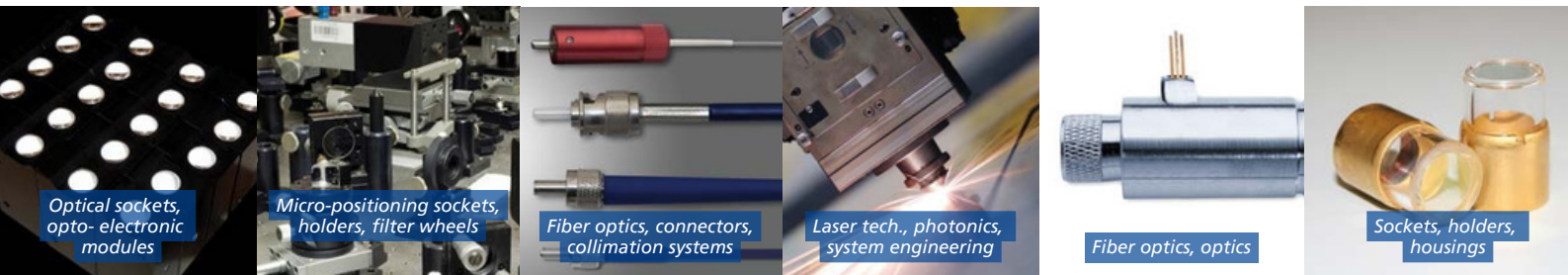


PHOTONICS Made in Europe

info@bdlp-consulting.com | info@bdlp.de

OPTO-MECHANICAL COMPONENTS

Opto-Mechanical Components



OPTO-MECHANICAL COMPONENTS

Opto-mechanical solutions for laser technology, photonics, opto-electronics, system and instrument engineering.

INDIVIDUAL OPTO-MECHANICAL SOLUTIONS FROM MODEL BUILDING TO LARGE-SCALE SERIES

- Customized products are developed and manufactured quickly, flexibly and inexpensively
- Exact production and accurate adaptation to the applications
- Short development time, global know-how
- Small and large series according to your individual wishes
- Materials available with many different surface qualities and geometries
- Natural, black, colored, gold-plated anodized surfaces
- Labelings and markings by laser

Application

Laser technology | precision logic | fiber optics Medical technology | optronics | sensor technology | Aerospace industry | microsystem technology | Mechanical engineering | instrument engineering | Lighting and signal technology | environmental technology

Mechanical components

Opto-mechanical building systems | micro-positioning | sockets | holders | filter wheels | mechanical installation elements | system elements | lenses | opto-electronic modules | LED technology | Opto-mechanical plugs | measuring and test systems | housings | measuring rigs

Standard materials

Aluminum | stainless steel | copper | brass

All surfaces can be delivered anodized, nickel-plated, galvanized, gold-plated as well as surfaces with top-coat and structured paints, reflection-reducing paints and enamels.



INDUSTRIAL SMA LASER CABLE SYSTEMS

SMA systems

ILCS-S05, ILCS-S05-free SMA plugs, optionally free-standing, with plastic jacket and bend protection, Kevlar strain relief



SMA systems with stainless steel jacket

ILCS-S05, ILCS-S05-free SMA plugs, optionally fiber free-standing, stainless steel jacket



SMA systems with electrical insulation

ILCS-S05i, ILCS-S05-free-i SMA plugs, optionally fiber free-standing, stainless steel jacket, electrically insulated



SMA systems hexagonal SP

ILCS-S05, ILCS-S05-free SMA plugs, optionally fiber free-standing, stainless steel jacket, sleeve with grooves for special fastening, hexagon nut



INDUSTRIAL HIGH-POWER LASER CABLE SYSTEMS D80

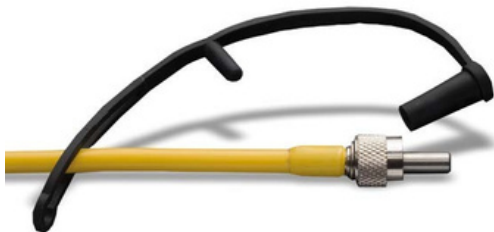
SMA laser cable systems standard

MFLCS-S05 MFLCS-S05free SMA plugs, optional fiber free-standing, (S505-free), with silicone hose and bend protection



Autoclavable SMA laser cable systems – AC

MFLCS-S05-AC MFLCS-S05-free-AC SMA plugs, optional fiber free-standing, (S505-free), with silicone hose and bend protection



SMA systems with gripping sleeve

MFLCS-S05 MFLCS-S05free SMA plugs, optional fiber free-standing, with silicone hose and band protection, gripping sleeve



ACCESSORIES, CONNECTING FLANGES

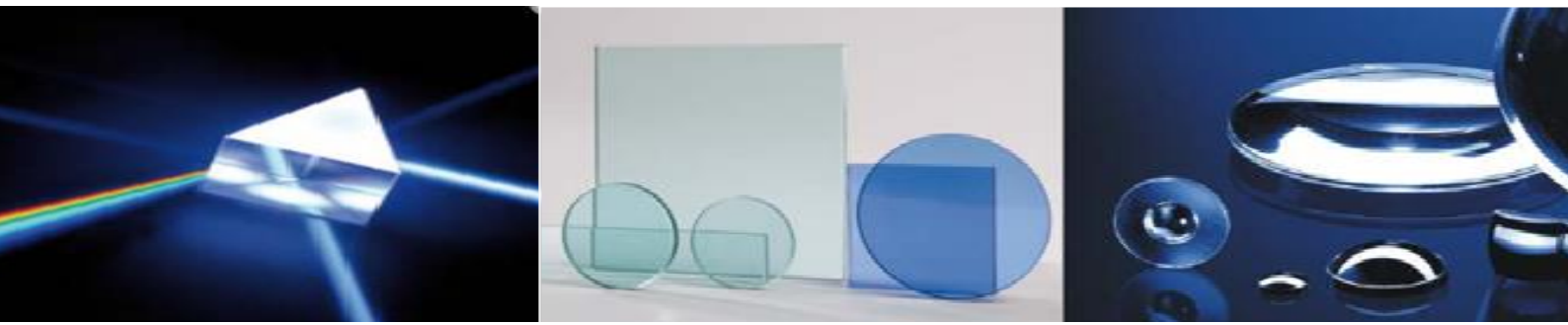


Suitable for quartz glass fibers Ø 100 to 1,200 µm



REPAIR SERVICE – LASER CABLES

We develop and manufacture customized laser cables and fiber-optic probes and applicators as well as plug systems on request.

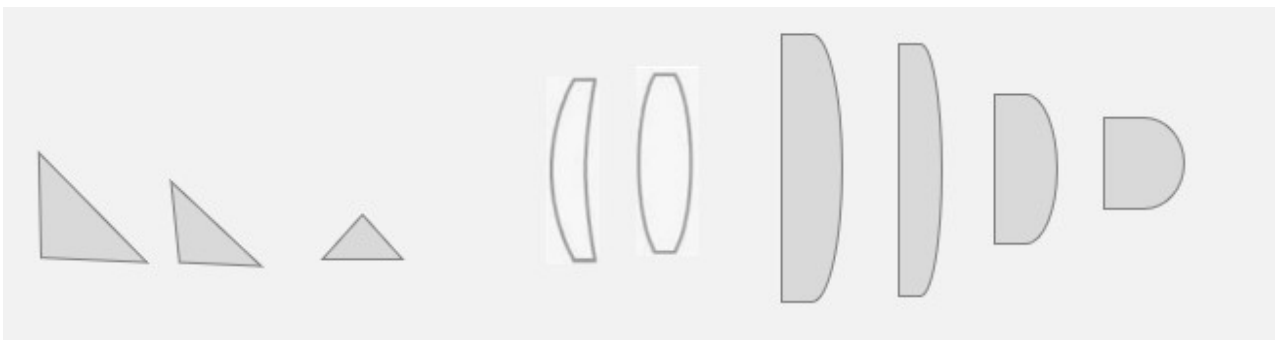
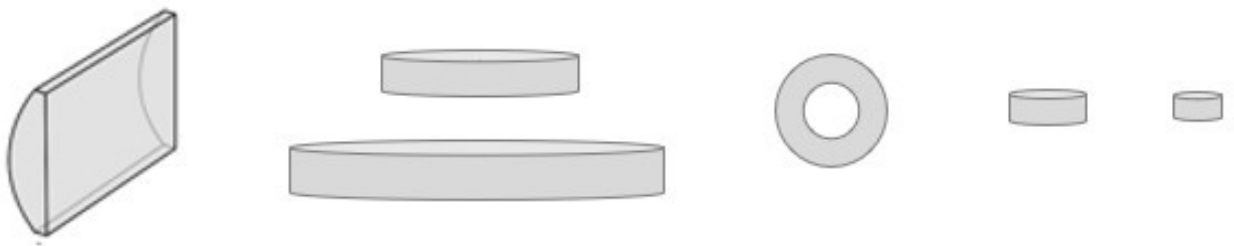


Materials | Formed Parts | Blanks | Round Discs | Cut-to-Size Pieces

All optical glasses, optical blanks, optical glass coarse annealed, B270, Borofloat®, borosilicate glass, thin glass D263, ceramics Al_2O_3 , Cearceram-Z®, glass-ceramics Zerodur®, mouldings, cut discs, preforms, fibers, filter glass, dielectric filters, colour glass filters, glass cavities, glass tubes / rods glass cavities glass tubes / rods optical blanks optical glass coarse annealed

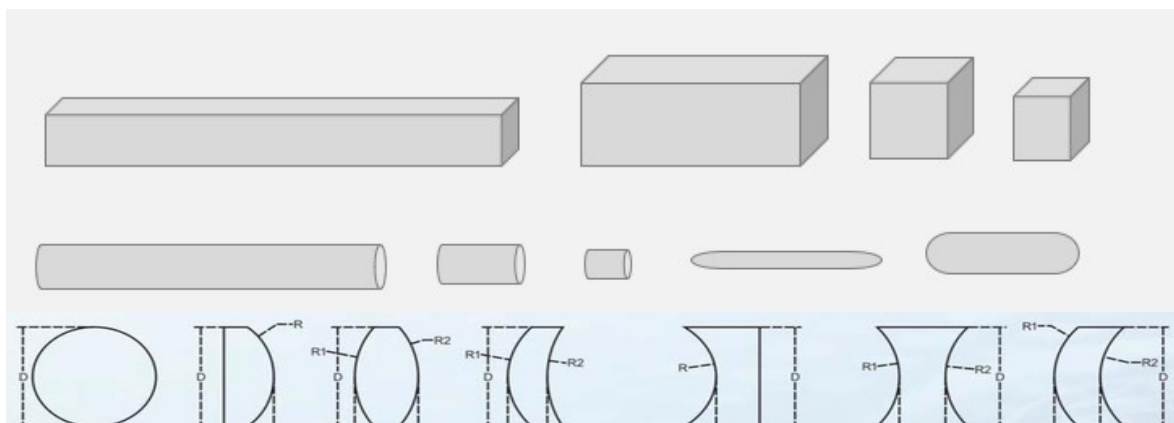
Quartz glass | Fused silica Quartz | Crystals

Rods, glass cavities, laser rods, tubes, laser tubes, blanks, Corning HPFS®7979, HPFS®7980, CDGM JGS 1 JGS 2 JGS 3, Heraeus Suprasil® Infrasil® Herasil®, SQ1, Ohara SK-1300, Nikon NIF-S, silicon, silicon, crystals Ge, ZnS, ZnSe, CaF_2 , MgF_2 , BaF_2 , sapphire c-axis / random



LISTE ACTUELLE DE MATÉRIAUX | CURRENT MATERIAL LIST GLAS MATERIAL | MOULDINGS | CUT DISC | OPTICAL BLANKS

QUARZGLAS QAURTZ GLASS VERRE DE QUARTZ	OPTISCHE GLÄSER OPTICAL GLASSES VERREDE OPTIQUE	KRISTALLE CRISTALS CRISTAUX
CORNING 7979 OA	SCHOTT feingekühlt (<i>all types</i>)	CaF ₂ (248nm)
CORNING 7979 OF	SCHOTT grobgekühlt (Pressglas)	CaF ₂ (193nm)
CORNING 7979 ARF	HOYA optische Gläser (<i>all types</i>)	CaF ₂ (157nm)
CORNING 7980 OF		Ge Germanium (IR 2-14µm)
CORNING 7980 5F	CDGM optische Gläser (<i>all types</i>)	MgF ₂ (157nm)
CORNING 7980 2F		BaF ₂
		Calcite/Kalkspat (CaCO ₃)
CORNING 7980 1D	OHARA optische Gläser (<i>all types</i>)	ZnS (VIS-IR 12µm), ZnSe (IR 3-12µm)
CORNING 7980 OC CORNING 7980 mirror grade	OHARA S-BAL42 OHARA S-TIM2 OHARA S-BSL 7	Sapphire (UV-IR) random, C- axis; A- axis; M- axis; R- axis; V- axis or other orientat. Czochralski, Kyropoulos, HEM
CORNING 7980 KrF OA	GLASS WAFER (Ra<12µm)	Si Silicium (IR 1-7µm) SINGLE SILICON
	Quarzglas	HiTran Topsil
HERAEUS INFRASIL 302	Borofloat 33	LASER CAVITY
HRAEUS INFRASIL 312	BK7, B270, D263 D263	Samarium doped Quartz glass, Pyrex
HERAEUS SUPRASIL 1 bdlp One-stop supplier The New Glass Connection La nouvelle connexion vitre	TECHNISCHE GLÄSER TECHNICAL GLASS VERRE DE TECHNOLOGIE	KUNSTSTOFF-FILTER PLASTICFILTER FILTRE EN PLASTIQUE
HERAEUS SUPRASIL2/2B	SCHOTT DURAN OROFLOAT 33 PYREX	Polycarbonate, Acrylic, Polyamide
HERAEUS HERASIL102 HRAEUS HOQ 310	BOROSILIKATGLAS B270	KUNSTSTOFF-FILTER PLASTICFILTER FILTRE EN PLASTIQUE
J-PLASMA SQ1 bdlp One-stop supplier The New Glass Connection La nouvelle connexion vitre	CORNING GORILLA GLASS GLASKERAMIK GLASSCERAMIC	Polycarbonate, Acrylic, Polyamide
OHARA SK1310 OHARA SK1310 ARF	VITRO CÉRAMIQUE Al ₂ O ₃ CERAMICS	MATERIALIEN MATERIALS MATÉRIAUX
		andere Materialien auf Anfrage other materials on request autres matériaux sur demande
QUARZGLAS JGS1, JGS2, JGS3	SCHOTT ZERODUR	OPTISCHES FILTERGLAS FILTER GLASS VERRE FILTRANT OPTIQUE
NIKON NIFS-S	OHARA CLEARCERAM-Z	SCHOTT optisches Filterglas(all types)
	Al ₂ O ₃ CERAMICS	HOYA color Filter (all types)
Kurze Lieferzeiten.	Individuelle Mengen und Abmessungen.	Zwischenverkauf vorbehalten.





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ADVANCED TECHNOLOGIES



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BUSINESS DEVELOPMENT
LASER-PHOTONICS

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