

INFRARED OPTICAL COMPONENTS FOR THE DEFENSE INDUSTRY

CUSTOMIZED INFRARED OPTICS EXPERTISE



Built for You, Built for Excellence

End-to-end solutions

Unparalleled experience and expertise

Unique and innovative engineering

Cutting-edge manufacturing technologies

Optical coating proficiency

Strict QA standards and procedures

Combining decades of expertise with the latest, cutting-edge technologies

With decades of knowledge and experience, having designed and delivered thousands of infrared components for multiple defense applications, Ophir has earned its reputation as a world-leading, one-stop-shop designer and manufacturer of Infrared thermal imaging components for defense OEMs. If you're looking for the best quality optics, built with unrivalled know-how and expertise, Ophir is the answer.

Our R&D engineering team works in collaboration with defense customers to develop, design and deliver optimized optics with unparalleled optical performance quality, for which we are known worldwide. We deliver solutions for high precision and environmentally challenging applications, answering the strict demands of customers worldwide, enabling today's most advanced aerospace and defense solution deployments. When you choose Ophir, you're choosing to partner with a team that can turn any design into a high-performance product that will enable you to reach your goals in the defense industry.

Choose the best quality optics for your high-performance defense systems

In the defense sector, optical components are used for surveillance, targeting and more. Our advanced optical components have a proven track-record in the combat field, and are integrated in the leading infrared thermal imaging systems of a wide range of defense applications, including:

- Airborne
- Security and surveillance
- Missiles
- Weapon sights
- Naval

Our core capabilities – your success

- Superior design capabilities for a diverse range of advanced optical components and assemblies
- In-house, cutting-edge, manufacturing technologies:
 - Diamond turning
 - CNC polishing
 - Coating
 - Advanced Metrology
- Highest production standards
- Manufacturing sites in Israel and EU with a clean room for the coating, inspection and packing processes.
- Complete control of production processes
- High-end and large volume production capabilities



Your one-stop-shop for unique optical components and systems



Limitless manufacturing capabilities, with high quality results

With decades of field-proven experience, and a dedicated team of engineering experts, there's no task too big or too small for us. We manufacture every optical component to the highest standard, using the best quality materials. Our high-end, large production facilities, with cutting-edge equipment, enable us to work with the tightest tolerances and produce the widest variety of components, from VIS to LWIR wavelengths, for any application.

Manufacturing a wide range of components to meet any specification

- VIS to LWIR wavelengths
- Lenses, mirrors, domes, windows and prisms
- Spherical, aspheric, diffractive, flat, and free-form
- Special truncated shapes
- Doublets or triplets
- Substrates: BK7, Fused-Silica, Zerudor, Chalcogenides, Germanium, Silicon, Calcium Fluoride, Zinc selenide, Zinc sulfide Cleartran, Copper, Aluminum and more.

Cutting-edge technologies for superior component manufacture

- Manufacturing technologies include: Grinding, CNC Polishing, Plano Polishing, Diamond Turning, Centering and Coating.
- MRF technology
- Ø5-400mm components fabrication and coating
- Tolerances (Typical | **high-end**)

	Windows	Lenses	Mirrors
Dimensional	± 0.05mm ± 0.01mm	± 0.05mm ± 0.01mm	± 0.05mm ± 0.01mm
Surface figure (P-V)	Flatness 0.5 0.2Fr Irregularity 0.2 0.1Fr	Spherical Power 2Fr 1Fr Irregularity 0.5Fr 0.2Fr	Aspherical Radius tolerance 0.1% 0.05% Irregularity 2Fr 1Fr
Parallelism	3 5 arc sec.		
Surface quality (S-D)	80-50 10-5	80-50 10-5	80-50 10-5
Roughness nm, RMS	2 0.5	2 0.5	5 2

- Statistical Process Control (SPC) over full production cycle
- Lean and Six-Sigma for excellence and continuous improvement
- Large volume high-end production capabilities
- Free form optics manufacturing and metrology
- Variety of Chalcogenide glasses
- Large Silicon lenses > Ø200mm
- Large Aluminum mirrors for Cassegrainian telescopes

The most advanced optical coatings, developed by world-leading experts

With over 40 years of experience, Ophir is recognized as a world leader in the development, production and application of advanced optical coatings.

Using a clean room, our highly abrasion-resistant, anti-reflective (AR) coatings include several types of DLC coatings which provide maximum durability, energy transmission & minimal reflection.

Innovative technologies for coating success

- Physical Vapor Deposition (PVD) – Thermal heating and electron gun
- Ion Assisted Deposition (IAD) - Ion gun
- Plasma Enhanced Chemical Vapor Deposition (PECVD) for DLC coatings
- Short radius (half sphere) surfaces coatings

Meeting coating requirements for every component

- Anti-reflective(AR), Mirrors and Filters
- UV, VIS, NIR, SWIR, MWIR, LWIR
- Multispectral coatings
- High efficacy and high durability coatings
- DLC (HC) coatings and Low Reflectance HC (LRHC)
- Laser coatings for 1.064 μ and 10.6 μ
- EUV coatings
- Wide coatings catalog



Unbeatable coating performance, guaranteed

- Broadband AR: Ref<0.5% to 0.2% / Tra >98% to 99%
- Broadband mirror: Ref>98% to 99%
- Windscreen Wiper Test TS1888 / P 5.4.3 – DLC coatings

Strict quality assurance processes – your peace of mind

With rigorous QA testing throughout product lifespan, we ensure that your finished product is optimized for your needs with the highest performance requested.

Certifications

- AS9100 Rev. D
- ISO 9001-2015
- Automotive industry certified supplier



Capabilities

- End to end control of the entire manufacturing process
- Highly professional and experienced team
- Wave front error measurement in 0.633 μ , 1.52 μ , 3.39 μ , 10.6 μ
- Wide testing tools covering all required specifications:

Radius	IRR	Roughness	Angle	Spectrum	Environmental
Test glass IRS Computerized SAG Device	Interferometers 0.633, 3.39 and 10.6 μ CGH Twyman Green and Fizeau Aspheric Interferometer VFA	Optical Profiler New View Profilometers Talsurf	Goniometer Prism Master	FTIR Perkin Elmer Cary UV, VIS and NIR	Humidity Salt spray Salt Solubility Adhesion Abrasion Wiper Temperature cycles Chemical Attack



About Ophir IR Optics

With decades worth of knowledge and experience, Ophir Optronics Solutions LTD., an MKS Company (NASDAQ: MKSI), is a world-leading designer and manufacturer of high performance IR thermal lenses and optical elements for SWIR, MWIR & LWIR imaging. Using advanced technologies, innovative engineering, and design configurations, Ophir provides a global solution for homeland security, surveillance, automotive and commercial applications: IR Components and complex lens assemblies with fixed, manual or motorized zoom lenses.

International Headquarters Ophir Optronics Solutions Ltd.

Science based industrial park
Har hotzvim P.O.B 45021
Jerusalem, 9145001 Israel
Tel. 972-2-5484444
Fax. 972-2-5822338
E-mail: mktg@ophiropt.com
www.ophiropt.com/infrared-optics

JAPAN Ophir Japan Ltd.

Mitani bldg 3F, 1-9-1 Sakuragi,
Omiya, Saitama-city,
Saitama 330-0854
Japan
Tel. +81-48-650-9966
Fax. +81-48-646-4155
E-mail: optics@ophirjapan.co.jp
[/www.ophiroptics.com](http://www.ophiroptics.com)

USA MKS Instruments Inc.

90 Industrial Way
Wilmington, MA 01887
USA
Tel. 978-296-1306
Mobile. 619-200-4043
E-mail: mktg@ophiropt.com
www.ophiropt.com/infrared-optics

AUSTRALIA AIS (Applied Infrared Sensing)

Level 1, 16-18 Carlotta street,
Artmon, NSW 2064,
Australia
Tel. 1300-557-205 Australia
Tel. 09-889-2477 New Zealand
E-mail: Dmitri.I@applied-infrared.com.au
www.ophiropt.com/infrared-optics

EUROPE Ophir optronics solutions Ltd.

La chenevarie 42140
Virigneux, France
Tel. 33-9-7785 3478
Fax. 972-2-5822 338
E-mail: gilles.delic@ophiropt.com
www.ophiropt.com/infrared-optics

KOREA Unetware Inc.

3F, 287-31, Jegi-dong,
Dongdaemun-gu,
Seoul, Korea 130-060
Tel. 82-(0)2-790-7830/1
Fax. 82-(0)2-790-0780
E-mail: ysmo53@unetware.com
www.ophiropt.com/jp

INDIA Alpine systems

Pul Prahladpur,
M.B. Road D-38,
New Delhi 110044, India
Tel. +91-(11)26364130
E-mail: info@alpinesystems.net.in
www.ophiropt.com/infrared-optics

www.ophiropt.com/infrared-optics | MKTG@ophiropt.com

