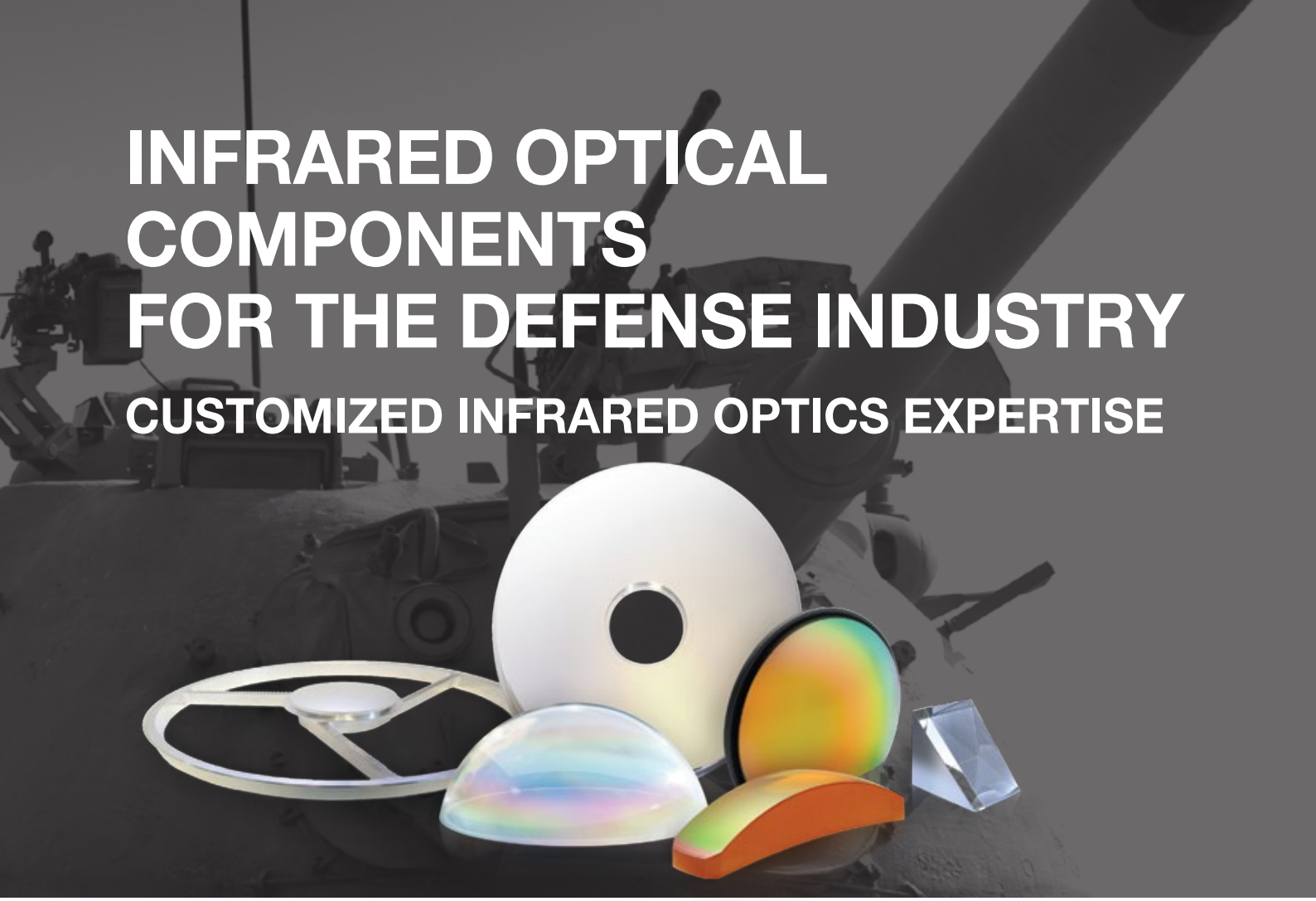

INFRARED OPTICAL COMPONENTS FOR THE DEFENSE INDUSTRY

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

mks | Ophir®

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

MANUFACTURE | COATINGS | QUALITY ASSURANCE

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**	Flatness 0.5Fr | **0.2Fr**
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 1.064µ and 10.6µ
- 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


CERTIFICATE

This is to certify that the Quality Management System of

OPHIR OPTRONICS SOLUTIONS -

OPTICS DIVISION

6 Hartum St., Jerusalem, Israel

ISO 9001:2015

Design and development, assembly of optical lenses for thermal imaging systems. Manufacturing of optical components for thermal imaging systems and CO2 laser cutting machines.


CERTIFICATE

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Ophir Optronics Solutions - Optics Division

6 Hartum St., Jerusalem, Israel

ISO 9001:2015/AS9100D

Design and development, assembly of optical lenses for thermal imaging systems. Manufacturing of optical components for thermal imaging systems and CO2 laser cutting machines.

Capabilities

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

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

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