I-PHOTONICS

OPTICAL COATINGS CATALOG

Precision Thin-Film Coatings
for Demanding Optical Systems



UV VIS NIR SWIR MWIR LWIR

Spectral coverage 250 nm – 17 µm · from UV to FIR · **i-photonics.lt**

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About I-Photonics



Advanced thin-film coatings.
Precision optics enabled.

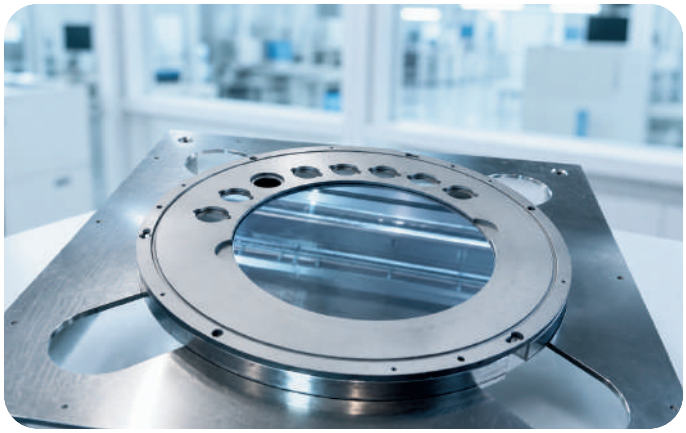
I-Photonics UAB is a leading company specialized in advanced vacuum coating and photonics technologies. We design and manufacture precision optical systems and thin-film coatings for laser and optical applications — serving industries such as laser optics, optical filters, space and communication systems, display technology, security, and scientific research.

With many years of experience in Ion Beam technology and the physics of thin films, our team brings decades of expertise in the research and development of coatings for all aspects of precision optics, as well as in developing the hardware that advances existing coating technologies.

Our facility is equipped with state-of-the-art IBS, PIAD, DLC and PARMS coaters of our own design, enabling high-performance coatings across a broad spectral range from 250 nm to 17 µm — from the ultraviolet to the far-infrared. Proprietary OCP BroadBand and OCP SingleWave optical process control ensures high-precision, high-yield multilayer coatings.

From initial feasibility studies to prototyping, pilot and mass manufacturing, I-Photonics delivers tailored, high-precision optical solutions — with or without turnkey process integration. With each customer, our aim is to establish long-term cooperation built on our experience and our capacity to continuously improve as a coating solutions provider.

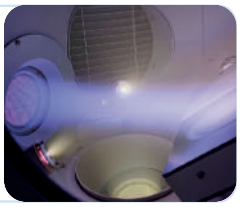




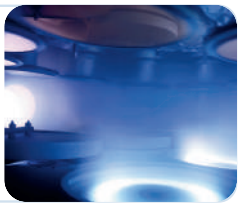
Core Technologies & Capabilities

Core Technologies

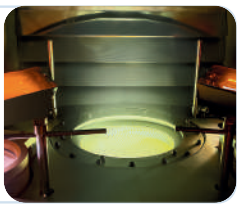
Ion Beam Sputtering (IBS) — dense, ultra-low-loss multilayer coatings with sub-nanometer spectral accuracy.



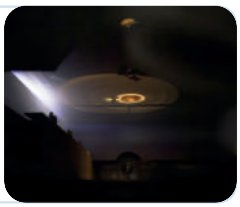
Magnetron Sputtering (PARMS) — high-rate reactive sputtering for precise filters, mirrors and thin-film polarizers.



Plasma Ion-Assisted Deposition (PIAD) — flexible VIS–IR deposition, ion-assisted for dense, durable and stable coatings.



Diamond-Like Carbon (DLC) by PECVD — hydrophobic / oleophobic, anti-scratch and anti-fog protective layers for IR optics.





Capabilities

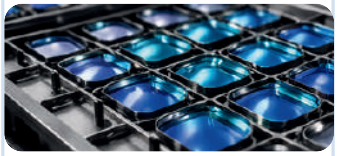
From optical design and feasibility studies to prototyping, small-scale, and pilot production, I-Photonics supports the full development cycle — tailoring coating designs to exact customer specifications across optical, mechanical, and environmental requirements.

Optical coatings design — advanced design software and in-situ optical monitoring



Advanced modeling and real-time process monitoring ensure precise coating performance and rapid iteration from concept to reality.

Optical components production — flexible manufacturing from prototypes to scalable series



Agile production processes and rigorous quality control deliver consistency and reliability at every scale.

Optical coatings service — custom solutions across the full 250 nm – 17 µm range



Comprehensive wavelength coverage from UV to the far-infrared, meeting demanding performance requirements.

R&D in thin-film technologies — continuous innovation across all deposition methods



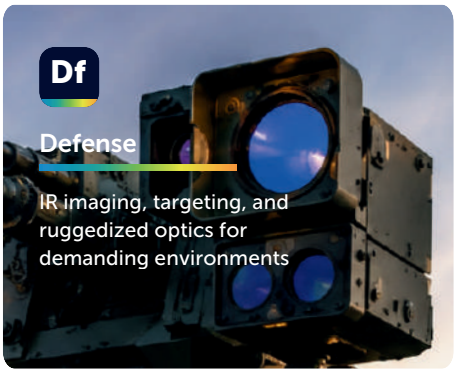
Ongoing research and development delivers next-generation coatings and process improvements for future optical solutions.

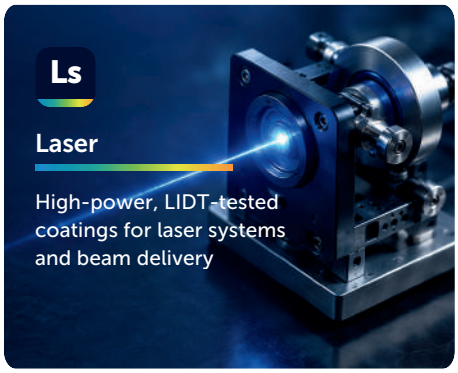
Applications Overview



I-Photonics coatings serve industries requiring high-performance optics, precise spectral control, and environmental durability.

Main Applications

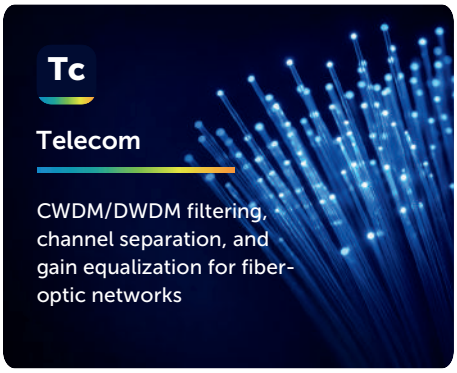












Other Applications *and more*



Automotive

LIDAR, sensing, and optical systems for driver-assistance platforms



Energy

Optical components for solar, photonics, and energy-monitoring systems



Industrial

Process monitoring, sensing, and industrial laser systems



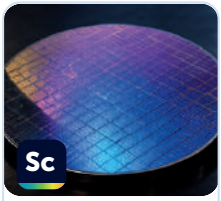
Quantum

Ultra-low-loss coatings for quantum optics and photonic experiments



Research

Custom coatings for scientific instrumentation and spectroscopy



Semiconductor

Precision optics for lithography, inspection, and metrology

How This Catalog Is Organized

This catalog is structured along two complementary axes, so you can find the right coating whichever way you start your search.

By Wavelength Range

Standard coatings are grouped into four spectral bands. Within each band, similar coatings — for example, the same anti-reflection design verified on several substrate materials — are presented together, with one representative spectrum and a list of compatible substrates.

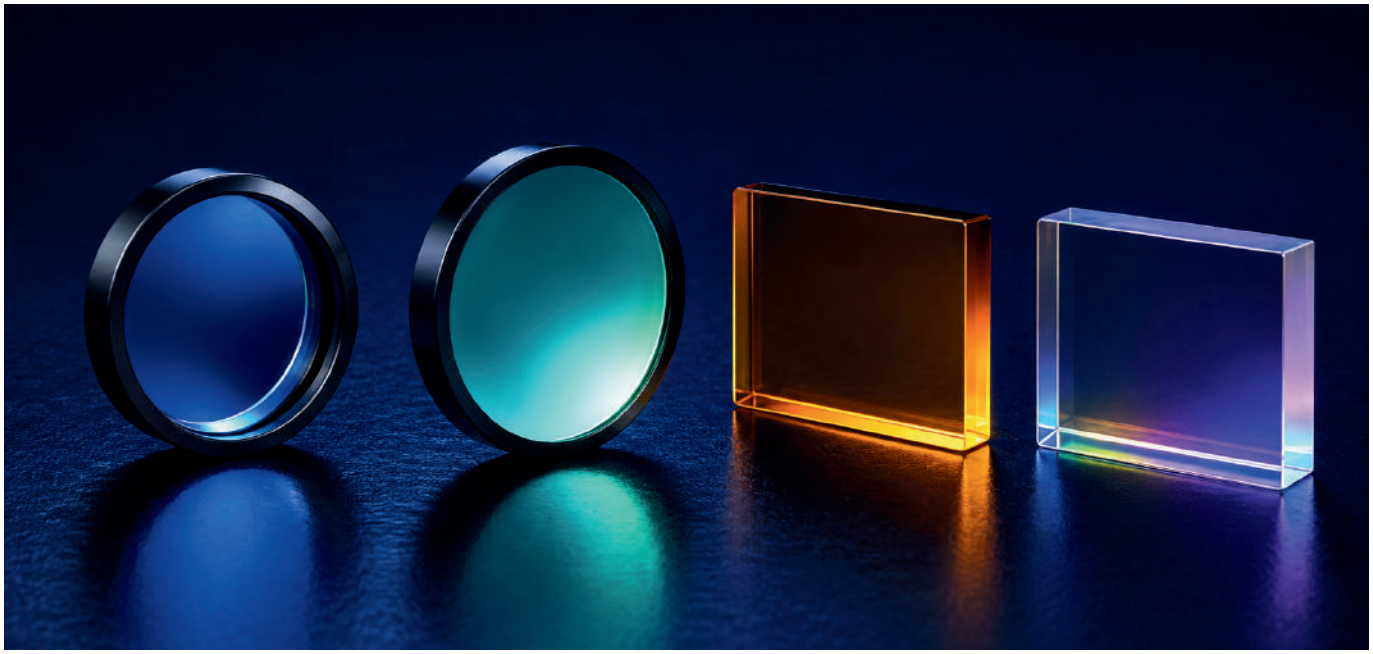
Range	Coverage
VIS	~400 – 750 nm — AR, HR/ mirror, dichroic, bandpass and multi-zone filter coatings
NIR	~0.75 – 1.4 µm — laser-line AR, mirrors, dichroics, beamsplitters, bandpass filters
SWIR + MWIR	~1.4 – 8 µm — AR on Ge / ZnS / IG6, HR mirrors, dichroics for sensing and LIDAR
LWIR	~8 – 15 µm — broadband AR on Ge / ZnS for thermal imaging, dichroics for multispectral systems

By Application

Featured application sections (Telecommunications, Medicine, Defense, Laser, Space, and more) showcase representative coatings cross-referenced to the wavelength ranges above, illustrated with real measured spectra and — where available — qualification and damage-threshold data.

Customization

Every coating in this catalog can be adapted: shifted to a different center wavelength, re-optimized for a different substrate or angle of incidence, or re-engineered to a new specification entirely. See the Customization section for our full range of capabilities.



Standard Coatings — by Wavelength Range

The following pages catalog our standard coating families, organized by spectral band.

VIS
~400–750 nm

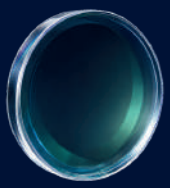
NIR
~0.75–1.4 µm

SWIR·MWIR
~1.4–8 µm

LWIR
~8–15 µm

TYPICAL COATED COMPONENTS


Laser mirror


AR lens


IR window (Ge/ZnS)


Bandpass filter


Beamsplitter


Dichroic mirror

Illustrative renderings — actual components supplied to customer drawings and substrates.

VIS

Standard Coatings — VIS

Visible · ~400–750 nm

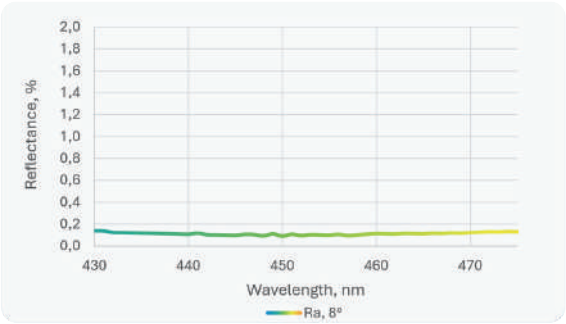




I. Single-Wavelength AR Coatings

Precision anti-reflective coatings designed to minimize reflection at a specific wavelength. Reflectance: < 0.2% at target wavelength.

Parameter	Specification
Coating Function	AR
Design Wavelength (λ)	435–470 nm
Angle of Incidence (AOI)	0–10°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	UVFS (Sapphire, NBK7, etc.)
Reflectance (R)	Ra < 0.15%

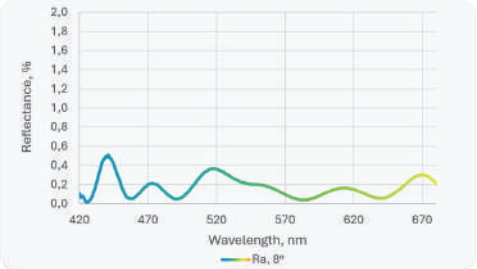


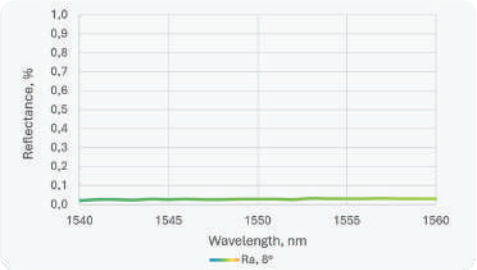
Product code: AR_001_101_L5-1

2. Dual- and Multi-Wavelength AR Coatings

Multi-wavelength AR coatings are designed to minimize reflection at several wavelengths simultaneously. Suitable for systems operating with multiple laser lines or combined spectral channels.

Parameter	Specification
Coating Function	AR
Design Wavelength (λ)	420–680 nm; 1.54–1.56 µm
Angle of Incidence (AOI)	0°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	NBK7 (Sapphire, UVFS, etc.)
Reflectance (R)	Ra < 0.2% @420–680 nm; Ra < 0.03% @1.54–1.56 µm





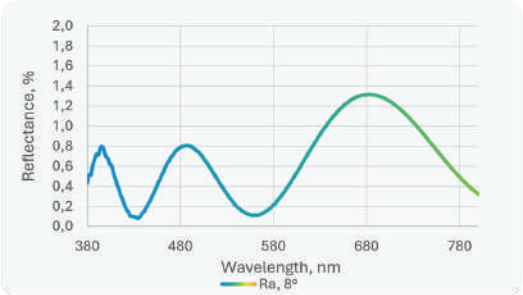
Product code: AR_001_157_L4-1

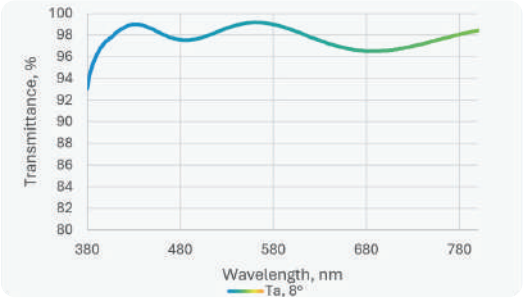
3. Broadband AR Coatings

Multilayer coatings provide low reflectance across the visible spectrum, ensuring high transmission and minimal color distortion. Usually used in imaging systems, sensors, and precision optics.

Parameter	Specification
Coating Function	AR
Design Wavelength (λ)	380–800 nm
Angle of Incidence (AOI)	0°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	N-KZFS4 (NBK7, Sapphire, UVFS, etc.)
Reflectance (R)	Ra < 0.7%
Transmission (T)	Ta > 97.5%

Product code: AR_001_161_O11-1



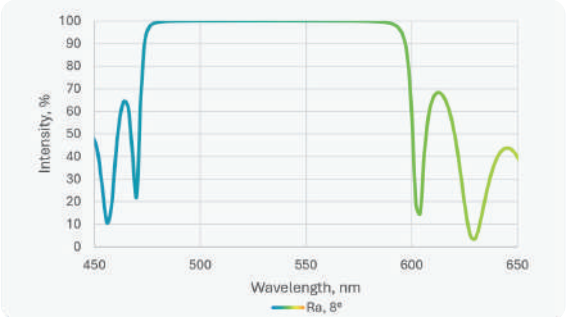


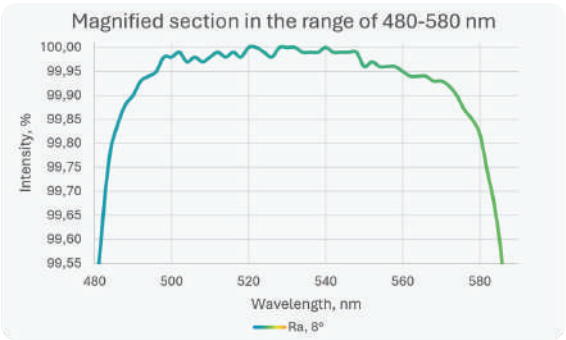
4. High Reflection / Super Mirror Coatings

Ultra-precision dielectric multilayer coatings designed to achieve extremely high reflectivity with minimal optical losses. Used in advanced laser, scientific, and photonic systems requiring maximum reflection, spectral accuracy, and long-term stability.

Parameter	Specification
Coating Function	Mirror
Design Wavelength (λ)	532 nm
Angle of Incidence (AOI)	0°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	UVFS (Sapphire, NBK7, etc.) R >
Reflectance (R)	99.995%
Total Optical Losses (Scattering + Absorption)	≤ 33 ppm
Transmission Optical Losses	≤ 11 ppm

Product code: HR_015_251_L5-1

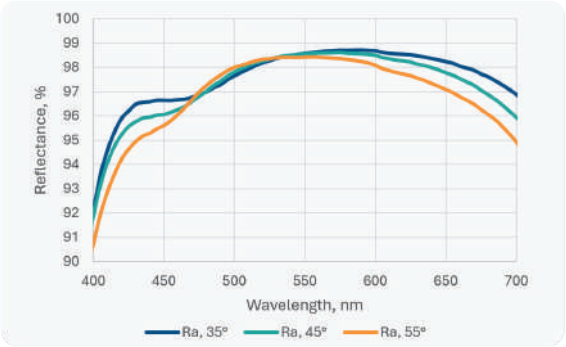




5. Multi-Wavelength High Reflection Coatings

Provide high reflectivity simultaneously at several wavelengths or spectral regions. Optimized for multi-line laser systems, spectroscopy, telecommunications, and other complex optical applications.

Parameter	Specification
Coating Function	Mirror
Design Wavelength (λ)	400 nm, 450–650 nm, 700 nm
Angle of Incidence (AOI)	35–55°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	Zerodur (UVFS, Sapphire, NBK7, etc.)
Reflectance (R)	Ra > 90% @400 nm; Ra > 97.5% @450–650 nm; Ra > 94.8% @700 nm

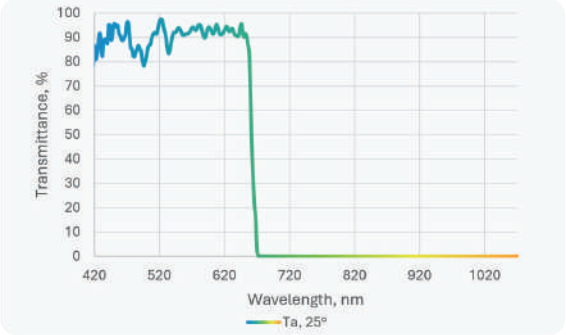


Product code: HR_017_037_L5-1

6. Shortwave Pass Filters (SWPF)

Optical thin-film coatings designed to transmit shorter wavelengths while efficiently reflecting or blocking longer wavelengths within the visible spectrum. Widely used in imaging systems, spectroscopy, fluorescence applications, and laser optics requiring precise spectral separation.

Parameter	Specification
Coating Function	Shortwave Pass Filter
Design Wavelength (λ)	420–650 nm
Angle of Incidence (AOI)	25°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	UVFS (Sapphire, NBK7, etc.)*
Transmission (T)	Ta > 90% @420–675 nm
Blocking Range	690–1070 nm
Optical Density (OD)	4



Product code: SWPF_018_391_L5-1

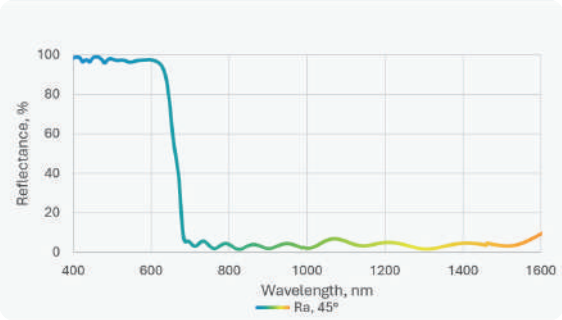
* Coating can be applied on KG6 to achieve a higher blocking value.

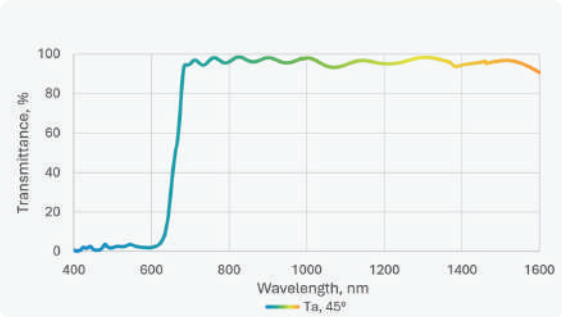
6. Dichroic Coatings

Dichroic coatings are multilayer optical coatings designed to selectively reflect specific wavelengths while transmitting others with high efficiency. Widely used in fluorescence systems, laser optics, imaging, and spectroscopy for precise spectral beam separation and wavelength management.

Dichroic Mirror — variant 1

Parameter	Specification
Coating Function	Dichroic Mirror
Design Wavelength (λ)	0.4–0.633 µm; 0.685–1.6 µm
Angle of Incidence (AOI)	45°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	NBK7 (Sapphire, UVFS, etc.)
Reflectance (R)	Rabs > 92.76% @400–633 nm; Ra > 97.32% @400–633 nm
Transmission (T)	Tabs > 90.87% @685–1600 nm; Ta > 96.05% @685–1600 nm

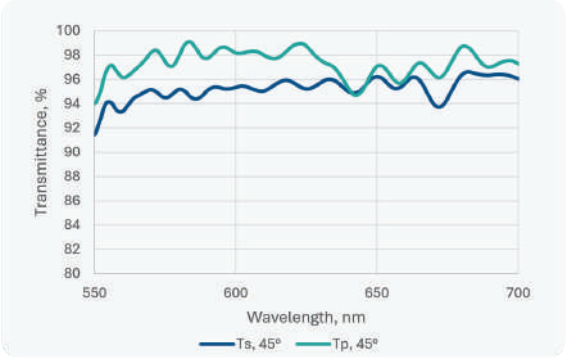


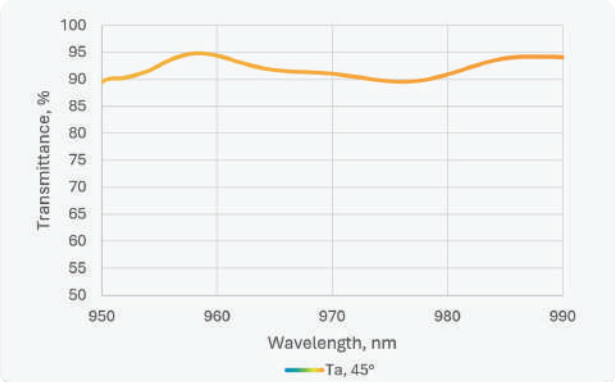


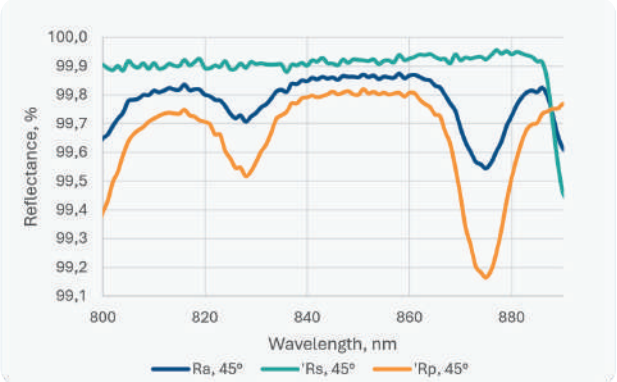
Product code: DC_012_171_L4-1

Dichroic Mirror — variant 2

Parameter	Specification
Coating Function	Dichroic Mirror
Design Wavelength (λ)	0.55–0.7 µm; 0.8–0.89 µm; 0.95– 0.99 µm
Angle of Incidence (AOI)	39–51°
Polarization	s-, p-, Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	UVFS (Sapphire, NBK7, etc.)
Reflectance (R)	Rs,p > 98.5% @0.8–0.89 µm
Transmission (T)	Ts,p > 94% @0.55–0.7 µm; Ta > 92% @0.95–0.99 µm



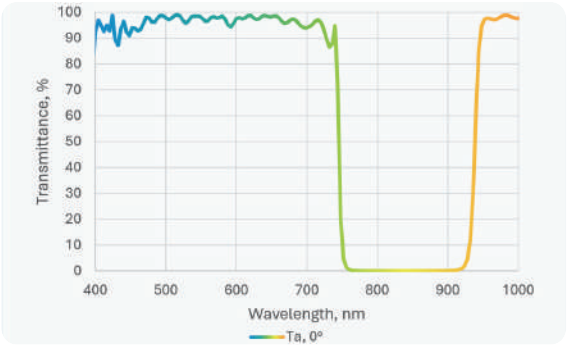




Product code: DC_012_010_L4-1

Dichroic Mirror — variant 3

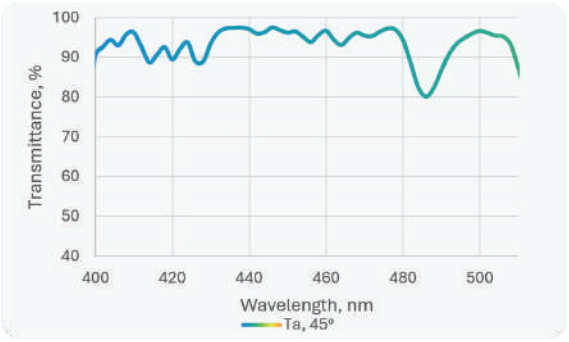
Parameter	Specification
Coating Function	Dichroic Mirror
Design Wavelength (λ)	780–915 nm; 400–700 nm, 940–1000 nm
Angle of Incidence (AOI)	0°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	NBK7 (Sapphire, UVFS, etc.)
Reflectance (R)	Ta < 0.05%; Ra > 99% @780–915 nm
Transmission (T)	Ta > 96% @400–700 nm, 940–1000 nm

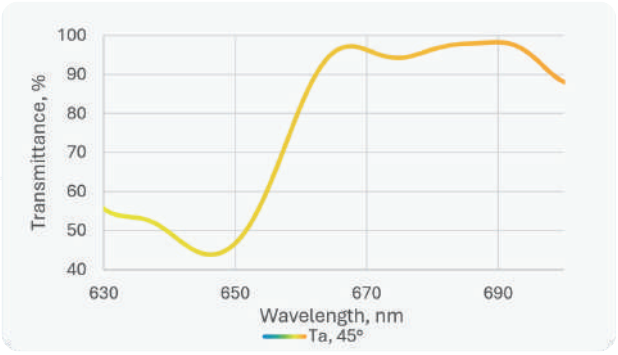


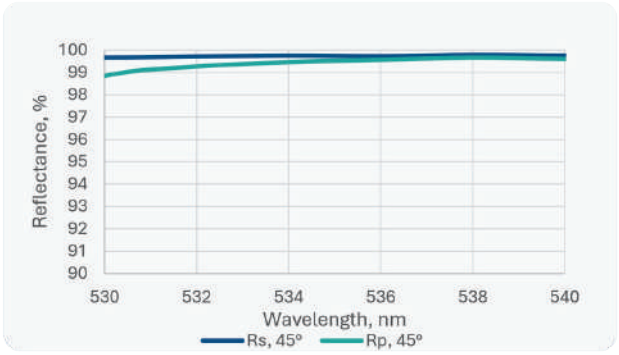
Product code: DC_012_011_L4-1

Dichroic Mirror — variant 4

Parameter	Specification
Coating Function	Dichroic Mirror
Design Wavelength (λ)	400–510 nm, 532 nm, 635 nm, 660–700 nm
Angle of Incidence (AOI)	45°
Polarization	s-, p-, Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	UVFS (Sapphire, NBK7, etc.)
Reflectance (R)	Rsp > 99% @532 nm; Ra = 50% @635 nm
Transmission (T)	Ta > 95% @400–510 nm, 660–700 nm







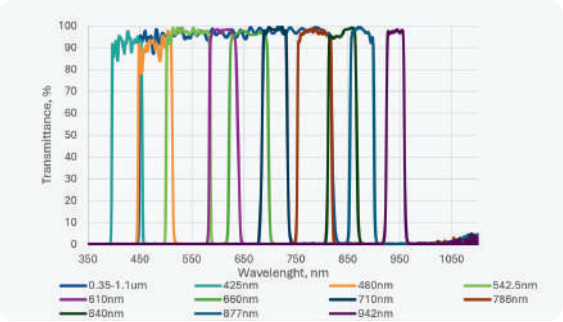
Product code: DC_012_078_L4-1

7. Bandpass Filters

Bandpass Filters (BPF) are optical coatings designed to transmit a specific wavelength range while blocking unwanted spectral regions. Due to their flexible spectral design, BPF coatings can be adapted for narrowband, broadband, or ultra-narrow applications and are widely used in imaging, spectroscopy, fluorescence, and laser systems.

The high design variability of BPF technology also enables Multi-zone filters, where different spectral functions are integrated into separate areas of a single optical component — used in multispectral imaging, fluorescence systems, machine vision, and compact photonic devices.

Parameter	Specification
Coating Function	Bandpass Filter
Angle of Incidence (AOI)	0°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	NBK7 (Sapphire, UVFS, etc.)
Blocking Range	350–1100 nm



Product code: BP_008_22_L4-0-10

CWL (nm)	Transmission	Cut-on / Cut-off	FWHM	OD
425	Ta > 92.1% @403–453 nm	395 / 454 nm	59 nm	3
480	Ta > 89.4% @449–484 nm	447 / 513 nm	66 nm	3
542.5	Ta > 96.8% @502–582 nm	500 / 585 nm	85 nm	3
610	Ta > 96.9% @585–634 nm	583 / 639 nm	56 nm	3
660	Ta > 96.2% @625–695 nm	622 / 698 nm	76 nm	3
711	Ta > 97.9% @688–731 nm	685 / 733 nm	48 nm	3
786	Ta > 96.6% @755–817 nm	753 / 819 nm	66 nm	3
840	Ta > 96.5% @813–864 nm	812 / 868 nm	56 nm	3
877	Ta > 97.1% @857–898 nm	854 / 900 nm	46 nm	3
942	Ta > 97.1% @927–957 nm	924 / 960 nm	36 nm	3

NIR

Standard Coatings — NIR

Near-IR · ~0.75–1.4 µm



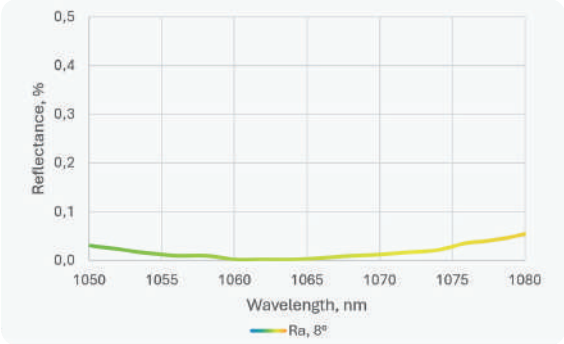
250 nm | 1 µm | 5 µm | 16 µm

1. Single-Wavelength AR Coatings (Laser Lines)

Precision anti-reflective coatings designed for standard laser wavelengths. Minimize reflection at a specific wavelength while maintaining high laser damage resistance.

Reflectance: < 0.005% at target wavelength. High LIDT: 14.4 J/cm² @1064 nm, 10 ns, 100 Hz, 220 µm.

Parameter	Specification
Coating Function	AR
Design Wavelength (λ)	1064 nm
Angle of Incidence (AOI)	0°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	UVFS (Sapphire, NBK7, etc.)
Reflectance (R)	Ra < 0.005%
Laser Damage Threshold (LIDT)	14.4 J/cm²; 1064 nm; 10 ns; 100 Hz; 220 µm

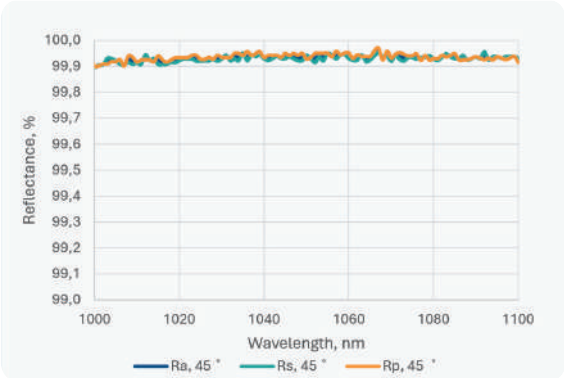


Product code: AR_001_139_L5-1

2. Mirrors

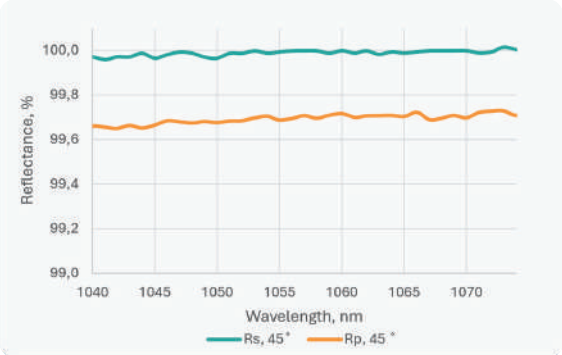
NIR Mirrors are optical multilayer coatings designed to provide high reflectivity or efficient light blocking in the Near-Infrared range. Depending on the application, these coatings can function either as precision mirrors with minimal optical losses or as blocking filters for suppression of unwanted radiation.

Parameter	Specification
Coating Function	Mirror
Design Wavelength (λ)	1–1.1 µm
Angle of Incidence (AOI)	0°
Polarization	s-, p-, Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	Cu
Reflectance (R)	Ra,s,p > 99.9%



Product code: HR_014_315_L5-1

Parameter	Specification
Coating Function	Blocking
Design Wavelength (λ)	1.030–1.064 µm
Angle of Incidence (AOI)	45°
Polarization	s-, p-
Operating Temperature	–40°C to +85°C
Substrate Material	UVFS (Sapphire, NBK7, etc.)
Reflectance (R)	Rs > 99.98% / Rp > 99.67% @1.030–1.064 µm



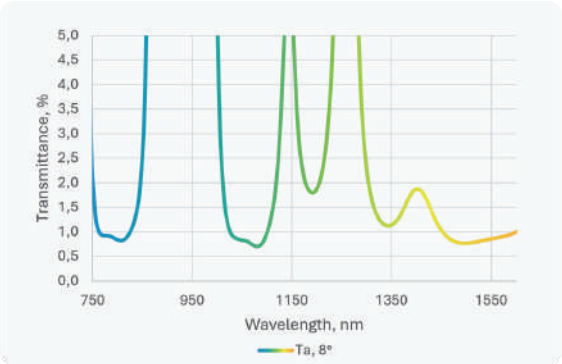
Product code: HR_015_191_L5-1

3. Multiwavelength Mirrors

Advanced optical multilayer coatings designed to provide high reflection or efficient blocking at several discrete wavelengths simultaneously. Can operate either as precision reflective mirrors or as multi-band blocking filters.

Widely used in multi-line laser systems, spectroscopy, fluorescence instrumentation, telecommunications, and complex photonic applications.

Parameter	Specification
Coating Function	Blocking
Design Wavelength (λ)	0.8 µm, 1.064 µm, 1.52–1.57 µm
Angle of Incidence (AOI)	5°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	UVFS (Sapphire, NBK7, etc.)
Transmission (T)	Ta = 0.839% @0.8 µm; Ta < 0.86% @1.53–1.57 µm; Ta = 0.783% @1.064 µm



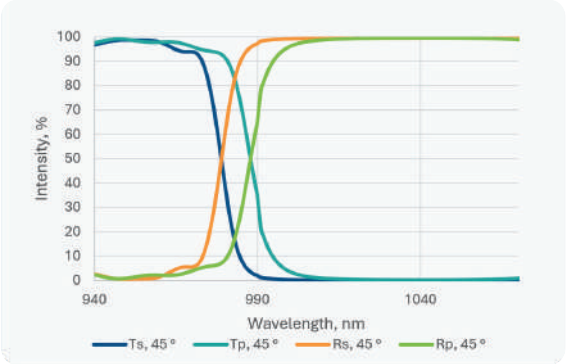
Product code: HR_015_033_L5-1

4. Dichroic Mirror

NIR Dichroic Mirrors are precision optical coatings engineered to selectively reflect specific NIR wavelengths while transmitting others. Used for spectral separation, beam combining, and wavelength management in laser systems, sensing, spectroscopy, and advanced photonic applications.

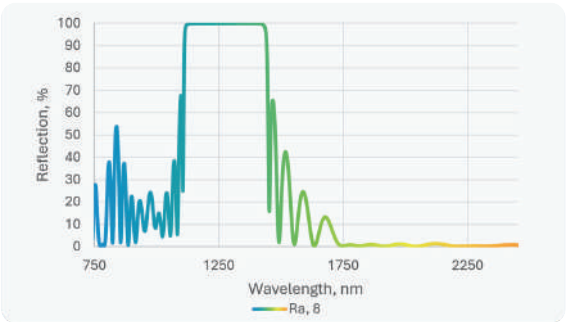
Parameter	Specification
Coating Function	Dichroic Mirror
Design Wavelength (λ)	1.02–1.07 µm; 0.94–0.98 µm
Angle of Incidence (AOI)	45°
Polarization	s-, p-
Operating Temperature	–40°C to +85°C
Substrate Material	UVFS (Sapphire, NBK7, etc.)
Reflectance (R)	Rs > 99.53% / Rp > 99.40% @1.02– 1.07 µm
Transmission (T)	Ts > 92.58% / Tp > 97.24% @0.940–0.980 µm

Product code: DC_012_069_L5-1



Parameter	Specification
Coating Function	Dichroic Mirror
Design Wavelength (λ)	1.15–1.4 µm; 0.775–0.785 µm; 1.75–2.45 µm
Angle of Incidence (AOI)	0°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	UVFS (Sapphire, NBK7, etc.)
Reflectance (R)	Rabs > 99.9% @1.15–1.4 µm; R < 1% @0.775–0.785, 1.75–2.45 µm
Transmission (T)	Ta > 95% @0.775–0.785, 1.75–2.45 µm

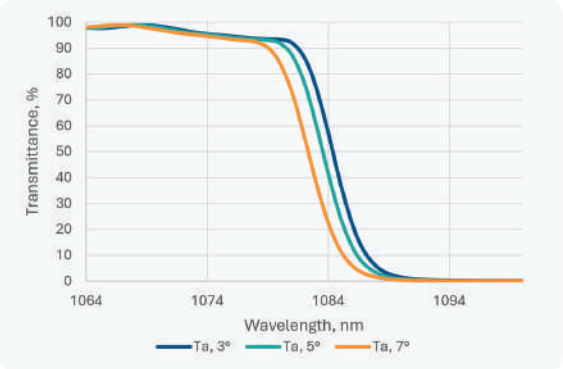
Product code: DC_012_461_L5-1



5. Shortwave Pass Filters (SWPF)

Optical multilayer coatings designed to transmit shorter Near-Infrared wavelengths while reflecting or blocking longer wavelengths. Widely used in spectroscopy, laser systems, sensing, telecommunications, and scientific instrumentation.

Parameter	Specification
Coating Function	Shortwave Pass Filter
Design Wavelength (λ)	1.062–1.08 μm
Angle of Incidence (AOI)	3–7°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	UVFS (Sapphire, NBK7, etc.)
Transmission (T)	Ta > 96% @1.062–1.08 μm
Blocking Range	1.090 μm
Optical Density (OD)	2

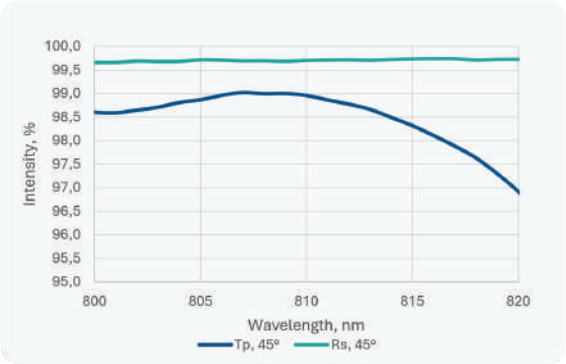


Product code: SWPF_018_472_L5-1

6. Beam Splitter

Optical multilayer coatings designed to divide incident light into reflected/blocked and transmitted beams with precisely controlled ratios. Can operate as conventional non-polarizing or polarizing beam splitters.

Parameter	Specification
Coating Function	Beam Splitter
Design Wavelength (λ)	803–813 nm
Angle of Incidence (AOI)	0°
Polarization	s-, p-
Operating Temperature	–40°C to +85°C
Substrate Material	UVFS (Sapphire, NBK7, etc.)
Reflectance (R)	Rs > 99.48% (α=40°), 99.68% (α=45°), 99.81% (α=50°) @803–813 nm
Transmission (T)	Tp > 88.25% (α=40°), 98.66% (α=45°), 98.74% (α=50°) @803–813 nm
Blocking Range	s-pol 803–813 nm
Optical Density (OD)	2



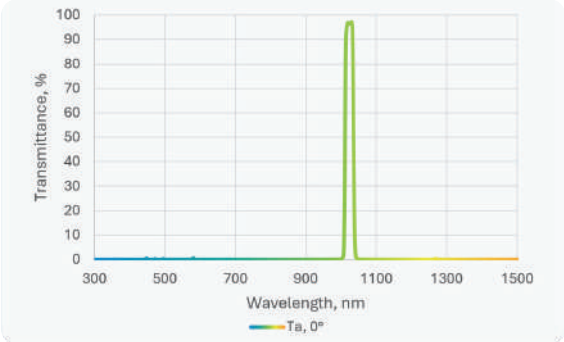
Product code: BS_010_251_L5-1

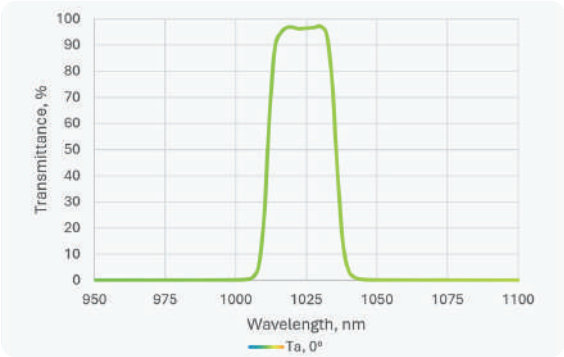
7. BPF and NBPF

Bandpass and Narrow Bandpass Filters are optical multilayer coatings designed to transmit specific spectral regions while efficiently blocking unwanted wavelengths with the required optical density.

Parameter	Specification
Coating Function	Bandpass Filter
Design Wavelength (λ)	1024.5 nm
Angle of Incidence (AOI)	0°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	NBK7 (Sapphire, UVFS, etc.)
Transmission (T)	Ta > 96.5% @1.015–1.035 µm
Central Wavelength (CWL)	1024.5 nm
Cut-on / Cut-off	1012 nm / 1036 nm
FWHM (Bandwidth)	24.86 nm
Blocking Range	300–1500 nm
Optical Density (OD)	4

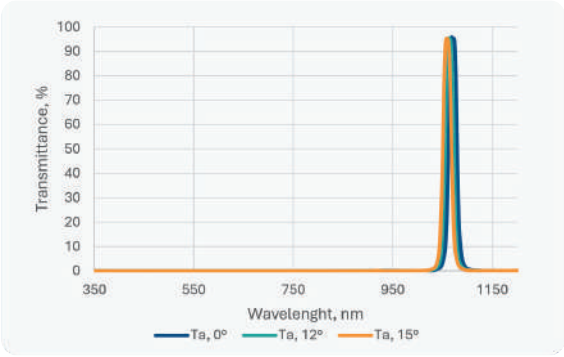
Product code: BP_008_95_L4-1

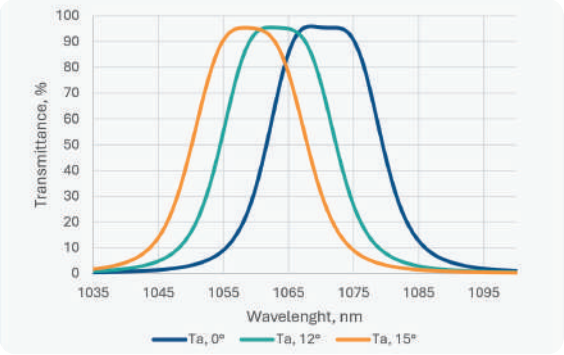




Parameter	Specification
Coating Function	Narrow Bandpass Filter
Design Wavelength (λ)	1070.5 nm
AOI	0°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	RG850
Transmission (T)	Ta > 95% @1068–1072 nm
Central Wavelength (CWL)	1070.5 nm
Cut-off / Cut-on	1062 nm / 1079 nm
FWHM (Bandwidth)	17 nm
Blocking Range	350–1200 nm
Optical Density (OD)	3

Product code: BP_009_180_L4-1





SWIR·MWIR

Standard Coatings — SWIR + MWIR

Short/Mid-IR · ~1.4–8 µm



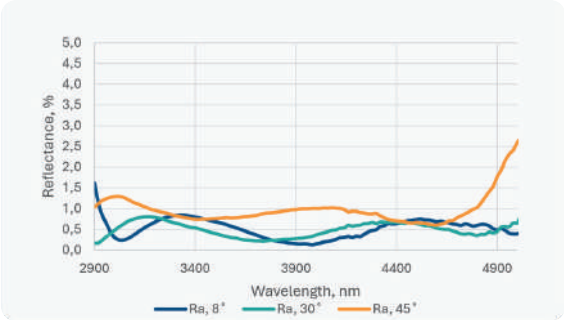


1. AR Coatings (3–5 µm range)

AR coatings for the 3–5 µm range on IG6, Ge, and ZnS substrates minimize surface reflections and maximize transmission in the mid-wave infrared (MWIR) spectral region. Widely used in thermal imaging, IR optics, laser systems, sensing, and defense applications.

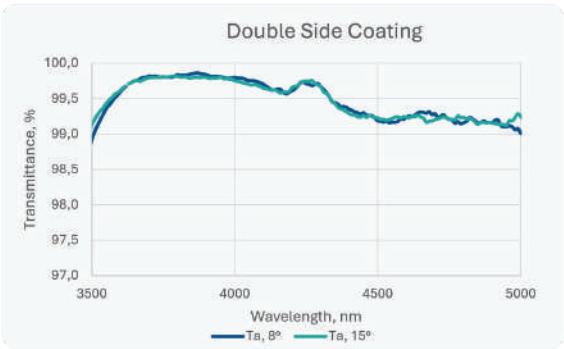
Parameter	Specification
Coating Function	AR
Design Wavelength (λ)	3–5 µm
Angle of Incidence (AOI)	0–45°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	Ge
Reflectance (R)	Ra < 0.5%, Rmax < 0.85% @AOI 0°; Ra < 1%, Rmax < 2.4% @AOI 45°

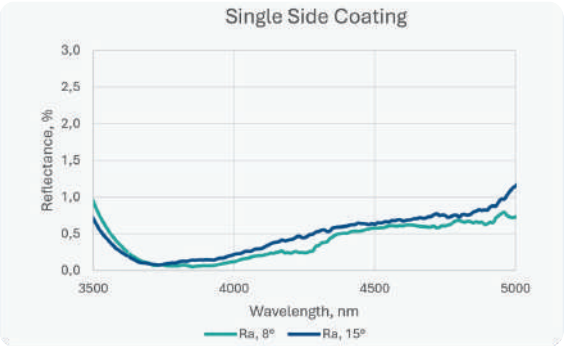
Product code: AR_002_81_11-1



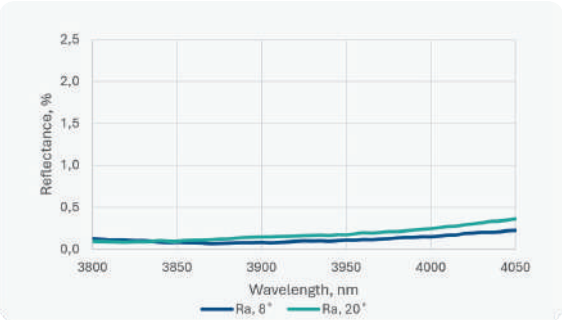
Parameter	Specification
Coating Function	AR
Design Wavelength (λ)	3.5–5 µm
Angle of Incidence (AOI)	0–15°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	ZnS
Reflectance (R)	Ra < 0.5% @3.5–5 µm
Transmission (T)	Ta > 99.4% @3.5–5 µm

Product code: AR_007_092_11-1





Parameter	Specification
Coating Function	AR
Design Wavelength (λ)	3.8–4.05 µm
Angle of Incidence (AOI)	0–20°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	IG6
Reflectance (R)	Rabs < 0.3% @3.6–4.05 µm AOI 0°; Rabs < 0.4% @AOI 20°

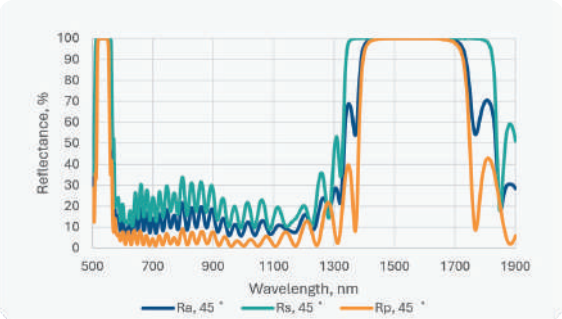


Product code: AR_003_113_O7-1

2. Single- and Multi-wavelength Mirror Coatings

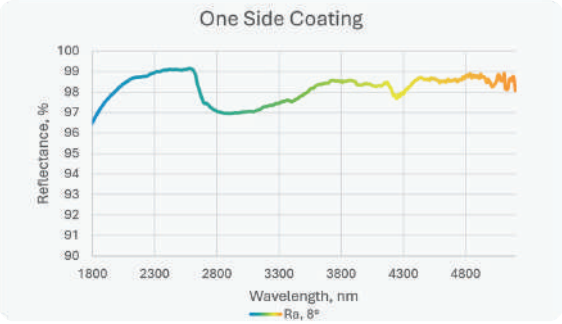
Optical multilayer coatings designed to provide high reflection or efficient blocking at single or multiple wavelengths with precise spectral control. Suitable for laser systems, interferometry, spectroscopy, telecommunications, and LIDAR applications.

Parameter	Specification
Coating Function	Mirror
Design Wavelength (λ)	1.54–1.56 µm
Angle of Incidence (AOI)	45°
Polarization	s-, p-, Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	UVFS (Sapphire, NBK7, etc.)
Reflectance (R)	Ra > 99.9%



Product code: HR_017_034_L5-1

Parameter	Specification
Coating Function	HR
Design Wavelength (λ)	1.8–2.7 µm; 4.1–5.2 µm
Angle of Incidence (AOI)	0°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	Si
Reflectance (R)	Ra > 98% @1.8–5.2 µm; Rmin = 97.3% @1.8–2.7 µm; Rmin = 98.2% @4.1–5.2 µm

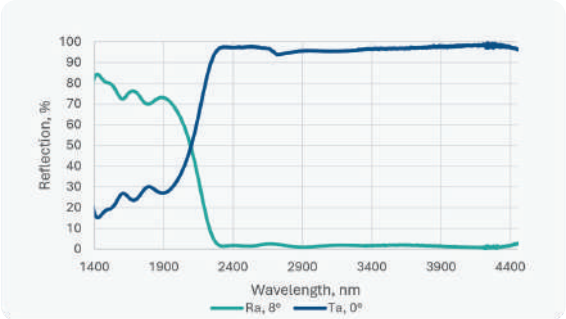


Product code: HR_016_158_O11-1

3. Dichroic Mirrors (SWIR–MWIR)

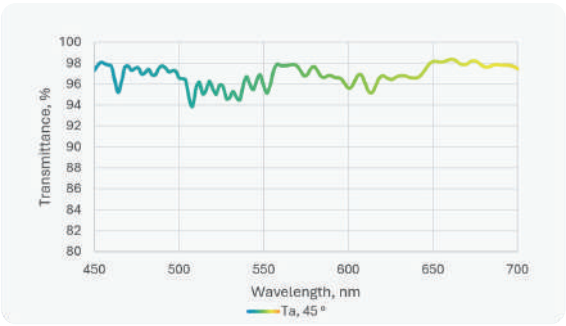
Optical multilayer coatings designed to selectively reflect and transmit specific wavelength bands from the short-wave to mid-wave infrared regions. Provide precise spectral separation for spectroscopy, thermal imaging, sensing, laser systems, and multispectral applications.

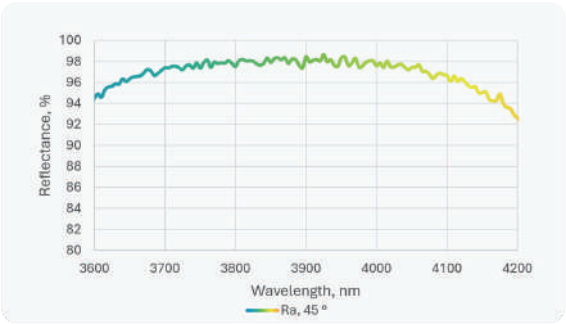
Parameter	Specification
Coating Function	Dichroic Mirror
Design Wavelength (λ)	1.4–2 µm, 2.275–4.45 µm
Angle of Incidence (AOI)	0°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	CaF2
Reflectance (R)	Rmin > 66.4%; Ra ~ 79.5% @1.4–1.6 µm; Ra ~ 74.4% @1.6–1.72 µm
Transmission (T)	Ta > 96.5% @2.275–4.45 µm



Product code: DC_011_781_M4-1

Parameter	Specification
Coating Function	Dichroic Mirror
Design Wavelength (λ)	3.6–4.2 µm; 0.45–0.7 µm
AOI	45°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	NBK7 (UVFS, Sapphire, etc.)
Reflectance (R)	Ra > 96.5% @3.6–4.2 µm
Transmission (T)	Ta > 96.5% @0.45–0.7 µm



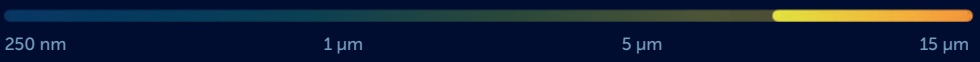


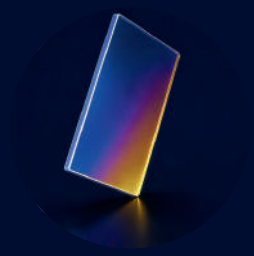
Product code: DC_012_051_L4-1

LWIR

Standard Coatings — LWIR

Long-wave IR · ~8–15 µm





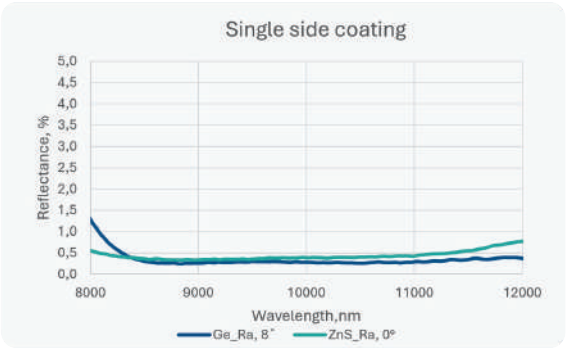
1. BBAR Coatings (8–12 µm)

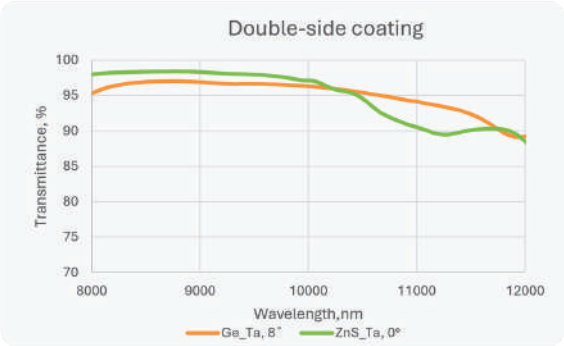
Broadband anti-reflection coatings optimized for the standard long-wave infrared atmospheric window. Minimize surface reflections and maximize transmission for thermal imaging, surveillance, industrial thermography, and conventional LWIR optical systems.

Parameter	Specification
Coating Function	AR
Design Wavelength (λ)	8–12 µm
AOI	0–10°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	Ge, ZnS
Reflectance (R)	R < 0.5%
Transmission (T)	Ta > 95%

Product code: Ge_AR_002_185_11-1

Product code: Zn_AR_007_708_11-1



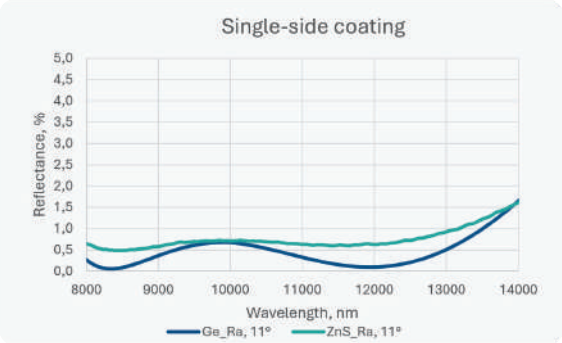


2. BBAR Coatings (8–14 µm)

Broadband anti-reflection coatings designed for extended LWIR spectral coverage. Used in advanced thermal imaging, hyperspectral sensing, scientific instrumentation, and multispectral IR systems.

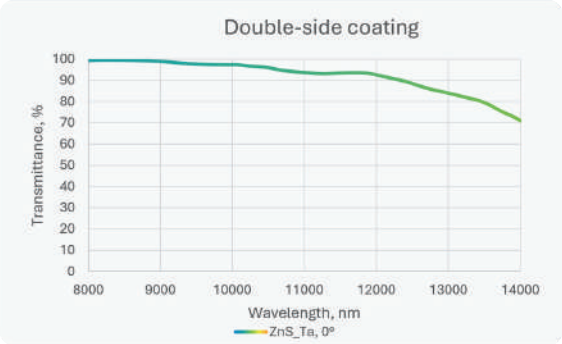
Parameter	Specification
Coating Function	AR
Design Wavelength (λ)	8–14 µm
AOI	0–27°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	Ge
Reflectance (R)	Ra < 0.6% @8–12 µm; Ra < 0.8% @12–14 µm

Product code: AR_002_46_11-1



Parameter	Specification
Coating Function	AR
Design Wavelength (λ)	8–14 µm
AOI	0–27°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	ZnS
Reflectance (R)	R < 0.7% @8–12 µm; R < 0.85% @8–14 µm; R < 1% @12–14 µm
Transmission (T)	Ta > 97% @8–12 µm; Ta > 92% @8–14 µm; Ta > 83% @12–14 µm

Product code: AR_007_046_11-1

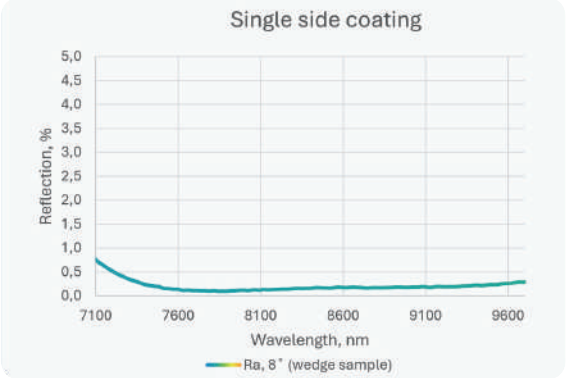


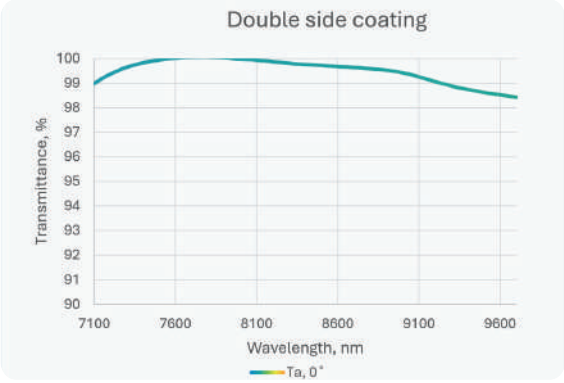
3. BBAR Coatings (7.1–9.7 µm)

A specialized LWIR anti-reflection solution optimized for a narrower spectral window than conventional broadband infrared coatings, achieving enhanced optical performance with lower residual reflection and higher transmission.

Parameter	Specification
Coating Function	AR
Design Wavelength (λ)	7.1–9.7 µm
AOI	0°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	Ge
Reflectance (R)	Ra < 0.4%
Transmission (T)	Ta > 99.5%

Product code: AR_002_303_11-1



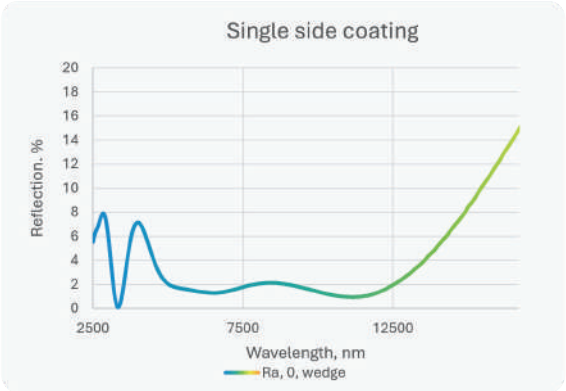


4. Ultra-Broadband AR Coatings (2–17 µm)

Deliver efficient anti-reflection performance across an exceptionally wide infrared spectrum. Used in advanced multispectral systems, broadband IR optics, spectroscopy, and scientific instrumentation requiring maximum spectral coverage from MWIR to LWIR.

Parameter	Specification
Coating Function	AR
Design Wavelength (λ)	2.5–16.7 µm
AOI	0°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	Ge
Reflectance (R)	Ra < 5%

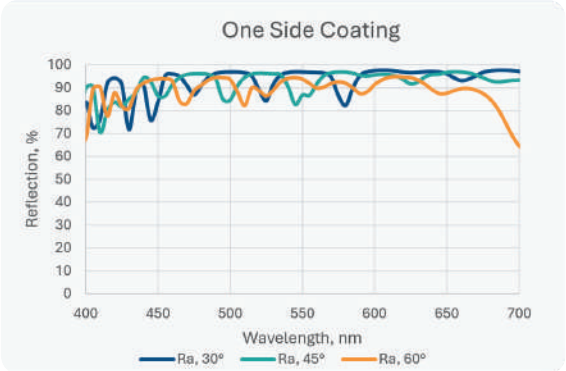
Product code: AR_002_575_11-1



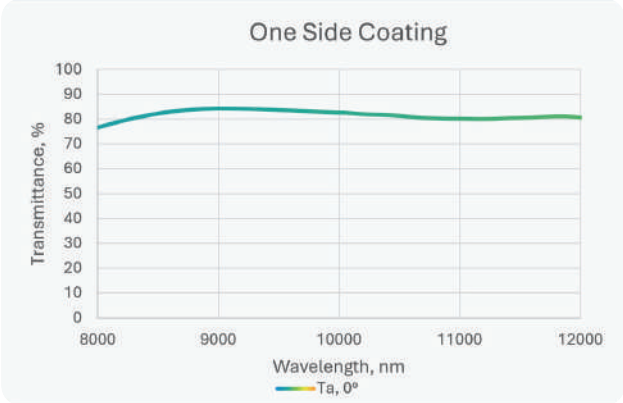
5. Dichroic Mirrors (LWIR)

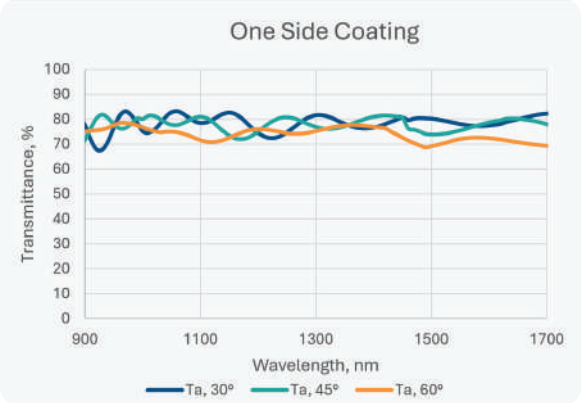
Optical multilayer coatings designed to selectively reflect and transmit specific wavelength ranges within the long-wave infrared spectrum. Used in thermal imaging systems, IR sensors, spectroscopy, multispectral optics, and advanced infrared photonic applications.

Parameter	Specification
Coating Function	Dichroic Mirror
Design Wavelength (λ)	0.4–0.7 µm; 0.9–1.7 µm; 8–12 µm
AOI	0°, 30–60°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Substrate Material	ZnS
Reflectance (R)	Ra > 87% @0.4–0.7 µm, 30–60°
Transmission (T)	Ta > 75% @0.9–1.7 µm, 30–60°; Ta > 79% @8–12 µm, 0°



Product code: DC_013_209_O11-1





APPLICATION

Telecommunications



I-Photonics delivers advanced thin-film coating solutions for modern fiber-optic communication systems, supporting high-capacity, low-loss signal transmission across O-, C- and L-band wavelength windows. Leveraging proprietary coating technologies — including Ion Beam Sputtering (IBS), magnetron sputtering and plasma-assisted deposition — we achieve dense, highly stable multilayer structures with exceptional spectral precision.

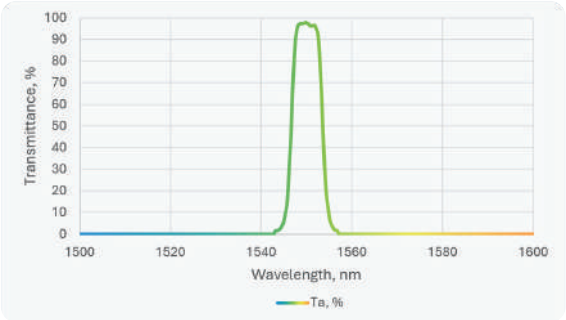
Our telecom coatings enable critical wavelength management functions such as CWDM/DWDM filtering, channel separation, and gain equalization. With precise optical monitoring and process control, we ensure tight tolerances, low insertion loss, and high channel isolation required for next-generation optical networks.

All coatings are engineered for long-term reliability, providing excellent environmental resistance to temperature, humidity, and mechanical stress, and can be designed to meet industry standards such as Telcordia.

CWDM Thin-Film Filters

Advanced CWDM thin-film coating solutions for efficient wavelength multiplexing and demultiplexing in fiber optic networks. Designed for operation across the standard ITU-T CWDM grid (1270–1610 nm), enabling reliable channel separation with relaxed tolerances and cost-effective system integration.

Parameter	Specification
Central Wavelength (CWL)	1550 nm
Bandwidth (FWHM)	8 nm
Total Transmittance	> 90%
Blocking Range	1.4–1.7 µm
Optical Density (OD)	≥ 6
Angle of Incidence (AOI)	0°
Front Surface	Bandpass Filter
Back Surface	Anti-Reflection (AR)
Substrate Material	Fused Silica



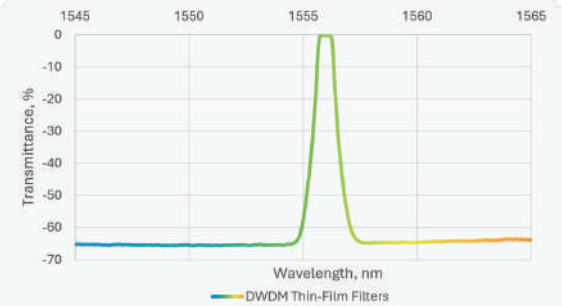
Product code: BP_008_00_M4-1

Environmental	Performance
Operating Temperature	–40°C to +85°C
Thermal Stability	No degradation (MIL-C-48497A, ISO 9022-2)
Humidity Resistance	24h @95% RH, 40°C
Temperature Cycling	–40°C to +85°C, 10 cycles
Abrasion Resistance	Moderate
Adhesion	Tape test, no peeling
Chemical Resistance	Acetone, IPA, no delamination

DWDM Thin-Film Filters

High-precision DWDM thin-film coatings engineered for dense wavelength division multiplexing in high-capacity optical networks, operating within the C-band with narrow channel spacing and steep spectral edges.

Parameter	Specification
Wavelength Range	1528–1565 nm (C-band)
Channel Spacing	100 GHz / 50 GHz
Bandwidth (FWHM)	~0.2–0.6 nm
Insertion Loss	≤ 0.5 dB
Adjacent Channel Isolation	≥ 30 dB
Non-Adjacent Isolation	≥ 45 dB
Return Loss	≥ 45 dB
PDL	≤ 0.2 dB
Front / Back Surface	DWDM / Anti-Reflection (AR)
AOI	0° or 8°
Substrate Material	Fused Silica

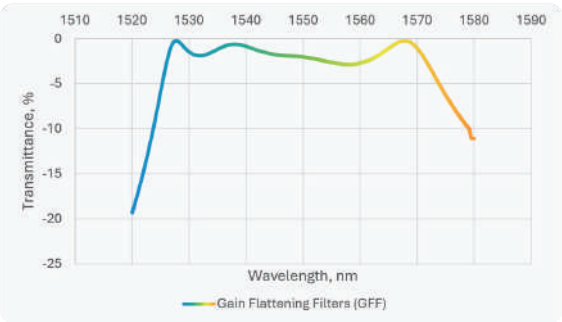


Product code: BP_008_001_M4-1

Gain Flattening Filters (GFF)

Designed to equalize the spectral gain profile of optical amplifiers (e.g. EDFAs) in DWDM systems — precisely shaping the transmission spectrum to compensate for wavelength-dependent gain variations across the C-band.

Parameter	Specification
Wavelength Range	1525–1570 nm (C-band)
Function	Gain Equalization (Spectral Shaping)
Attenuation Profile	Custom (application-specific)
Dynamic Range	~2–3 dB (typical)
Spectral Ripple	≤ ±0.5 dB
Insertion Loss	≤ 1.0 dB (excl. shaping profile)
AOI	0°
Front / Back Surface	Gain Flattening Coating / AR
Substrate Material	Fused Silica



Product code: BP_008_002_M4-1

APPLICATION

Medicine



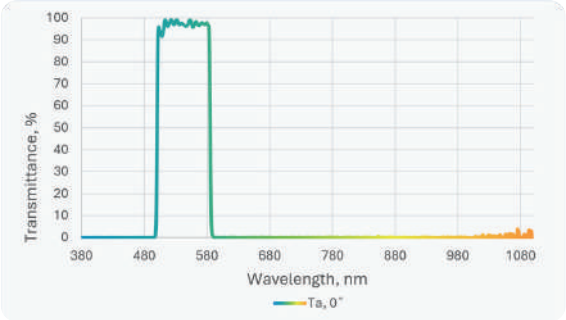
Medical optical systems require thin-film coatings that combine high optical performance with exceptional long-term reliability. In medical imaging, diagnostics, and laser-based therapeutic equipment, coatings must maintain stable spectral characteristics under continuous illumination, frequent cleaning, sterilization, and exposure to humidity and temperature variations.

I-Photonics develops advanced optical coating solutions for medical and bioanalytical applications using IBS, magnetron sputtering, and plasma-assisted deposition — for fluorescence microscopy, endoscopy, diagnostic instrumentation, and medical laser systems.

Fluorescence Bandpass Filters

Designed for medical imaging, fluorescence microscopy, and bioanalytical instrumentation. Enable precise wavelength selection with high transmission efficiency and effective out-of-band blocking; can be optimized for low autofluorescence and high spectral purity.

Parameter	Specification
Central Wavelength (CWL)	542.5 nm
Bandwidth (FWHM)	85 nm
Peak Transmission	Ta > 96.8%
Transmission Range	502–582 nm
Blocking Range	300–1100 nm
Optical Density (OD)	≥ 4
AOI	0°
Polarization	Unpolarized
Signal-to-Noise Optimization	High out-of-band suppression
Spectral Purity	Optimized for fluorescence applications
Substrate Material	Fused Silica



Product code: BP_008_22_L4-3

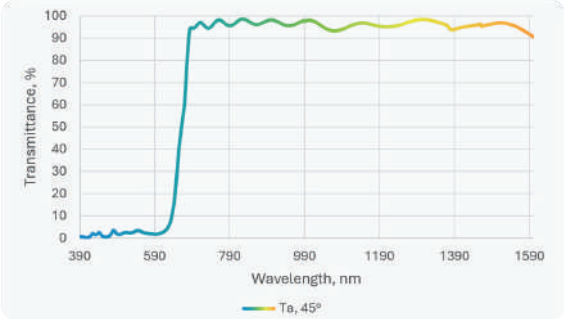
Environmental	Performance
Operating Temperature	–40°C to +85°C
Thermal Stability	No degradation
Humidity Resistance	24h @95% RH, 40°C
Temperature Cycling	–40°C to +85°C, 10 cycles
Abrasion Resistance	Moderate
Adhesion	Tape test, no peeling
Chemical Resistance	Acetone, IPA, no delamination
Sterilization Compatibility	Compatible with standard medical cleaning
Long-Term Stability	Optimized for continuous medical use

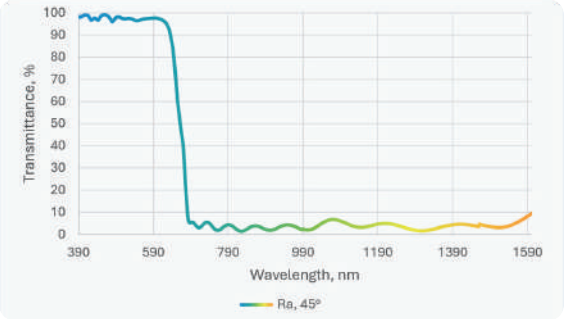
Dichroic Beamsplitters

High-performance dichroic beamsplitter coatings for fluorescence microscopy, medical imaging, analytical instrumentation, and bioanalytical systems. Designed for 45° AOI, enabling high reflection in the visible range and high transmission in the near-infrared region.

Parameter	Specification
Reflection Range	400–633 nm
Transmission Range	685–1600 nm
AOI	45°
Polarization	Unpolarized
Average Reflectance	> 97% @400–633 nm
Average Transmission	> 95% @685–1600 nm
Optical Performance	High contrast wavelength separation
Imaging Optimization	Optimized for fluorescence / multispectral imaging

Product code: DC_012_171_L4-1

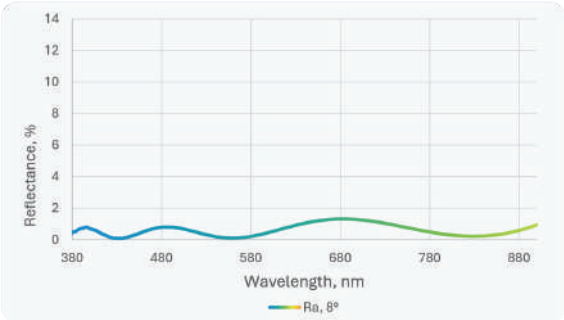




Broadband Anti-Reflection Coatings (VIS)

Broadband AR coatings for medical imaging, microscopy, endoscopy, diagnostic instrumentation, and bioanalytical optical systems across the visible range. Controlled residual reflection and neutral color appearance help maintain accurate color reproduction.

Parameter	Specification
Spectral Range	400–900 nm
Average Transmission	> 98%
Average Reflectance	< 1.5%
AOI	8°
Polarization	Unpolarized
Broadband Performance	VIS optimized
Stray Light Suppression	Enhanced
Color Appearance	Neutral residual color
Color Uniformity	Optimized for imaging applications
Substrate Material	Fused Silica



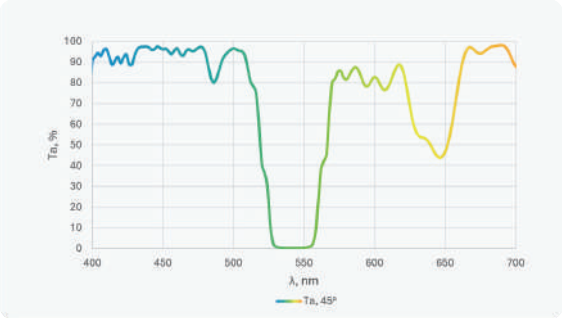
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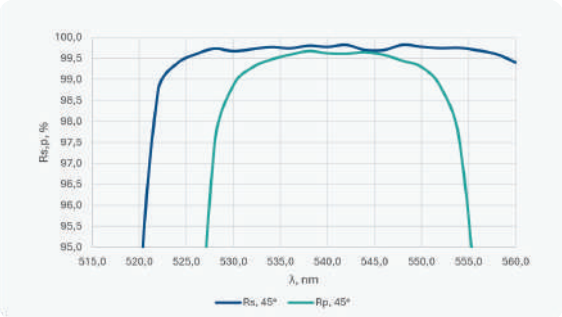
Notch Filter Coatings (NF)

Notch filter coatings for Raman spectroscopy, fluorescence imaging, and laser-based diagnostic instrumentation in the visible range. Precise rejection of the excitation laser line combined with high transmission on either side enables clean separation of weak signal light from strong backscattered laser light in optical biopsy and endoscopic Raman systems.

Parameter	Specification
Central Wavelength (CWL)	532+/-5nm
Peak Reflectance	Rs > 99.5%, Rp > 99%
Additional Reflectance	635+/-10nm, R~50%
Transmission range	400-510nm & 660-700nm
Transmission value	Tavg > 90% (unpolarized)
AOI	45°
Polarization	S-, P-, unpolarized

Product code: DC_012_078_L4-1





APPLICATION

Defense



Modern electro-optical systems impose increasingly demanding requirements on the performance of optical components in defense, aerospace, industrial automation, and scientific instrumentation. Thin-film optical coatings control reflection, transmission, and spectral performance, enhancing efficiency across the ultraviolet (UV), visible (VIS), and infrared (IR) spectral ranges — while providing enhanced resistance to environmental exposure, mechanical abrasion, temperature cycling, and humidity.

I-Photonics offers a comprehensive portfolio of thin-film optical coatings for a wide variety of substrate materials and spectral applications. All coatings are manufactured using state-of-the-art vacuum deposition technologies and undergo rigorous quality control ensuring exceptional performance, high process repeatability, and compliance with international industry standards.

Broadband Anti-Reflection Coatings (BBAR)

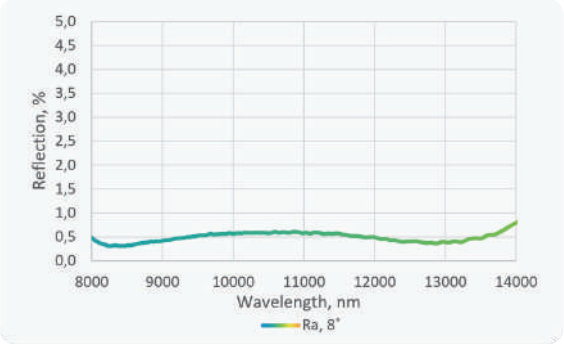
Infrared optical materials such as Ge, ZnS, ZnSe, Si, GaAs, and chalcogenide glasses possess relatively high refractive indices — each uncoated surface may reflect 15–36% of incident radiation. BBAR coatings suppress these losses, improving optical throughput, image contrast, and system performance.

Applications: thermal imaging cameras, IR surveillance systems, target acquisition devices, missile seekers, laser systems, hyperspectral sensors, and industrial inspection equipment operating in SWIR (1.4-3 µm), MWIR (3-8 µm), LWIR (8-15 µm) and FIR (15-1000) spectral regions.

BBAR 8–14 µm (Ge)

Parameter	Specification
Reflection Range	8–14 µm
AOI / Substrate	8° / Ge
Polarization	Unpolarized
Avg. Reflectance	< 0.5% @8–14 µm
Max. Reflectance	< 1% @8–14 µm
Optical Performance	High contrast and high transmission

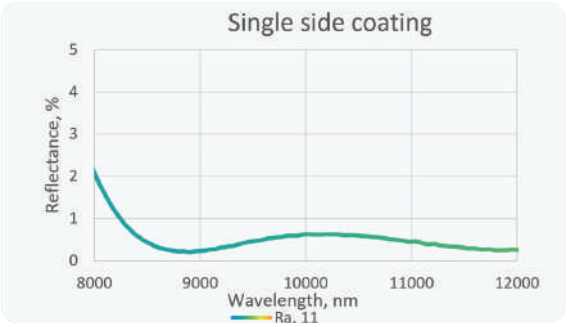
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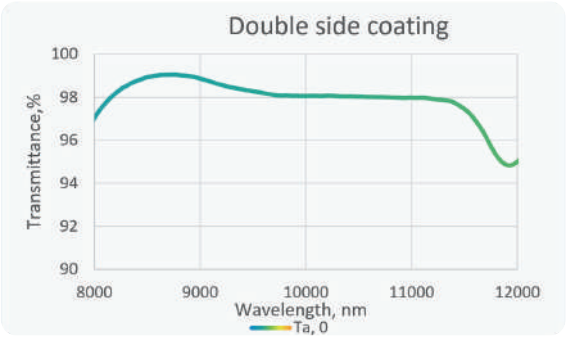


BBAR 8–12 µm (Ge)

Parameter	Specification
Reflection / Transmission	8–12 µm / 8–12 µm
AOI / Substrate	R-11°; T-0° / Ge
Polarization	Unpolarized
Avg. Reflectance	< 0.5% @8–12 µm
Avg. Transmittance	> 97.9% @8–12 µm
Optical Performance	High contrast and high transmission

Product code: AR_002_185_11-1

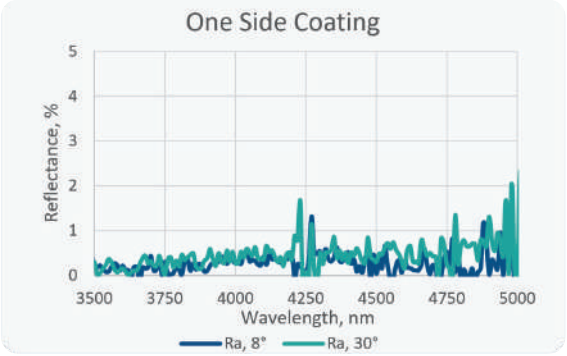


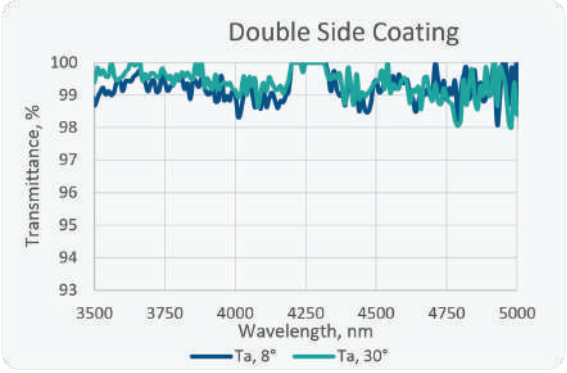


BBAR 3.6–4.9 µm (Si)

Parameter	Specification
Reflection / Transmission	3.6–4.9 µm / 3.6–4.9 µm
AOI / Substrate	8°; 30° / Si
Polarization	Unpolarized
Avg. Reflectance	< 0.5% @3.6–4.9 µm
Avg. Transmittance	> 99% @3.6–4.9 µm
Optical Performance	High contrast and high transmission

Product code: AR_005_231_11-1

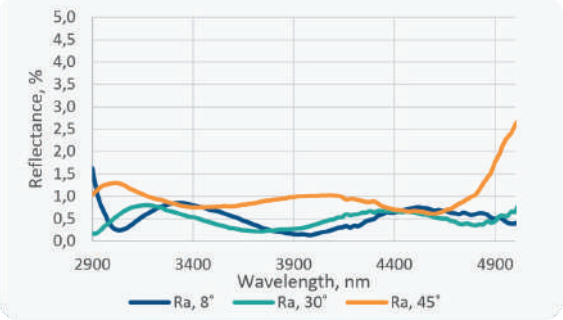




BBAR 2.9–4.9 µm (Ge)

Parameter	Specification
Reflection Range	2.9–4.9 µm
AOI / Substrate	0–45° / Ge
Polarization	Unpolarized
Avg. Reflectance	< 1% @2.9–4.9 µm
Optical Performance	High contrast and high transmission

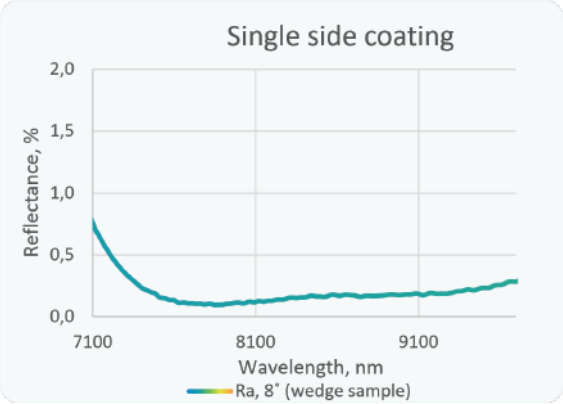
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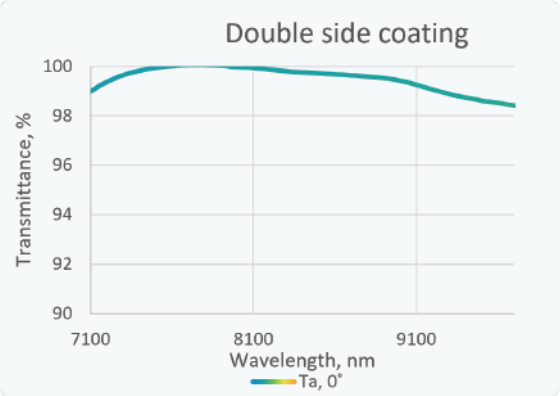


BBAR 7.1–9.7 µm (Ge)

Parameter	Specification
Reflection Range	7.1–9.7 µm / 7.1–9.7 µm
AOI / Substrate	0° / Ge
Polarization	Unpolarized
Avg. Reflectance	< 0.3% @7.1–9.7 µm
Avg. Transmittance	> 99.5% @7.1–9.7 µm
Optical Performance	High contrast and high transmission

Product code: AR_002_303_11-1

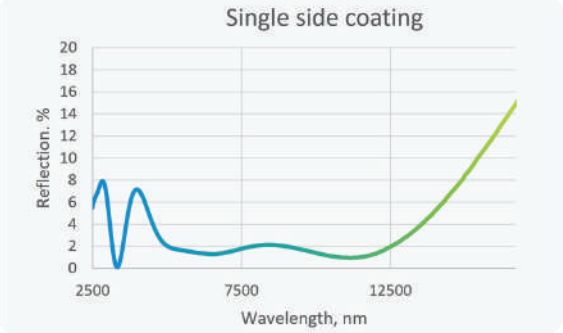




BBAR 2.5–16.7 µm (Ge)

Parameter	Specification
Reflection Range	2.5–16.7 µm
AOI / Substrate	0° / Ge
Polarization	Unpolarized
Avg. Reflectance	< 5% @2.5–16.7 µm
Optical Performance	High contrast and high transmission

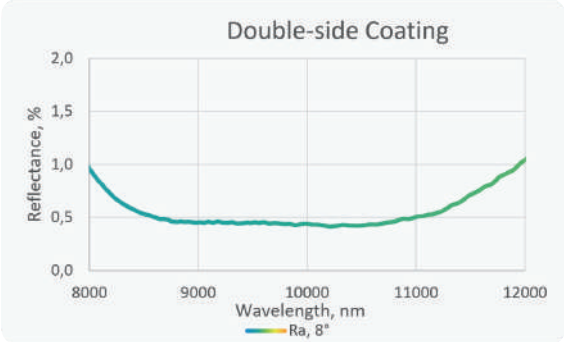
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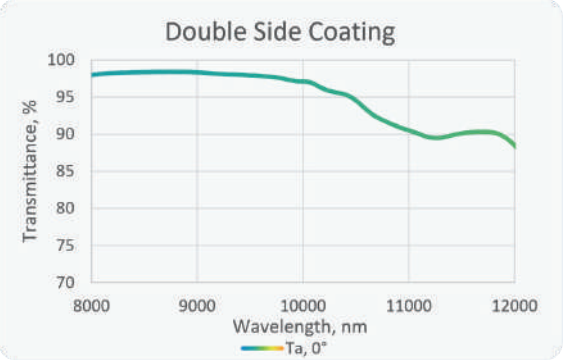


BBAR 8–12 µm (ZnS)

Parameter	Specification
Reflection Range	8–12 µm
AOI / Substrate	0–10° / ZnS
Polarization	Unpolarized
Avg. Reflectance	< 0.5% @8–12 µm
Avg. Transmittance	> 95% @8–12 µm
Optical Performance	High contrast and high transmission

Product code: AR_007_708_11-1

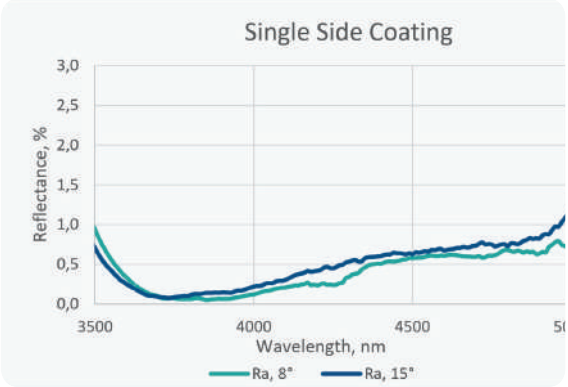


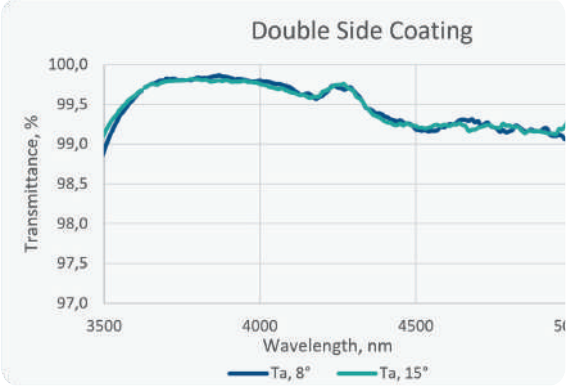


BBAR 3.5–5 µm (ZnS)

Parameter	Specification
Reflection Range	3.5–5 µm
AOI / Substrate	0–15° / ZnS
Polarization	Unpolarized
Avg. Reflectance	< 0.5% @3.5–5 µm
Avg. Transmittance	> 99.4% @3.5–5 µm
Optical Performance	High contrast and high transmission

Product code: AR_007_092_11-1





Diamond-Like Carbon (DLC) Coatings

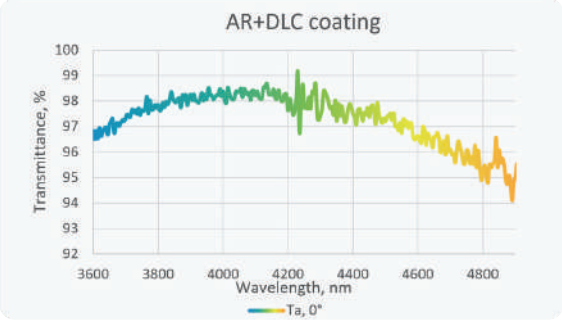
DLC coatings are high-performance protective thin films combining exceptional hardness, low coefficient of friction, and outstanding chemical resistance. Applied to Ge, Si, and other IR optical materials, they provide long-term surface protection while maintaining excellent optical performance in harsh environments — abrasion, moisture, sand, and dust.

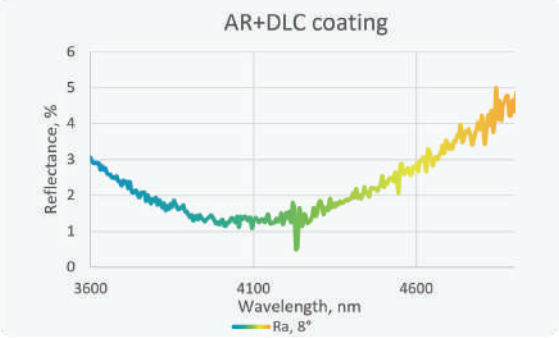
Applications: thermal imaging systems, night vision devices, surveillance and target acquisition systems, airborne and naval electro-optical platforms, and laser/industrial infrared applications.

DLC + AR 3.6–4.9 µm (Si)

Parameter	Specification
Reflection Range	3.6–4.9 µm
AOI / Substrate	0–10° / Si
Polarization	Unpolarized
Avg. Reflectance	< 2.5% @3.6–4.9 µm
Avg. Transmittance	> 97% @3.6–4.9 µm
Optical Performance	High contrast and high transmission

Product code: DLC-AR_020_509_O11-1

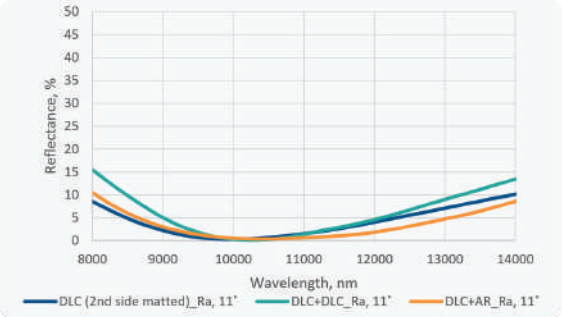


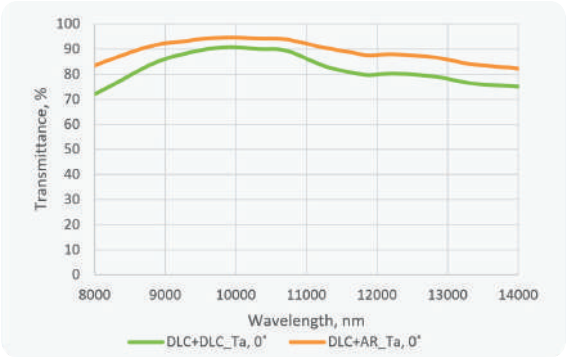


DLC + AR 8–14 µm (Ge)

Parameter	Specification
Reflection Range	8–14 µm
AOI / Substrate	0–11° / Ge
Polarization	Unpolarized
Avg. Reflectance	< 3.5% @8–14 µm
Avg. Transmittance	> 90% @8–14 µm
Optical Performance	High contrast and high transmission

Product code: DLC-AR_020_509_O11-1

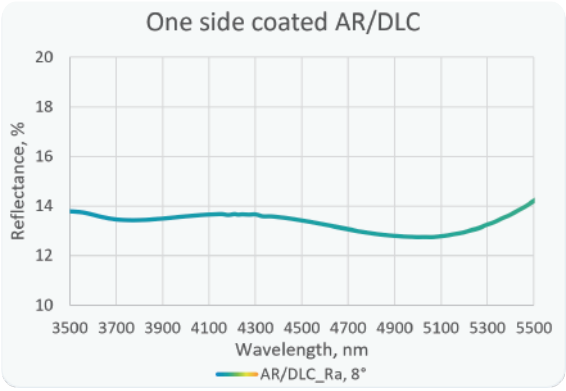


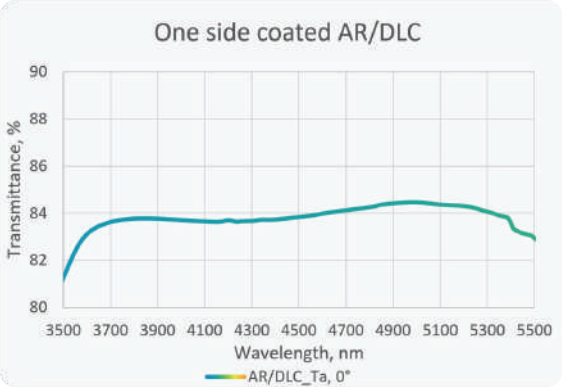


DLC + AR hybrid-coating (ZnS)

Parameter	Specification
Reflection Range	3.5–5.5 µm
AOI / Substrate	0–11° / ZnS
Polarization	Unpolarized
Avg. Reflectance	< 14% @3.5–5.5 µm
Avg. Transmittance	> 84% @3.5–5.5 µm
Optical Performance	High contrast and high transmission

Product code: DLC-AR_020_001_11-1



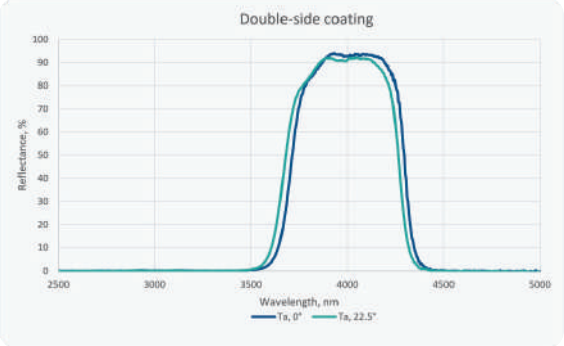


Broadband Bandpass Filters (BBPF)

Precision-engineered multilayer interference coatings designed to transmit a specified spectral band while effectively blocking radiation outside the designated wavelength range. High spectral selectivity, low in-band losses, and excellent out-of-band rejection — optimized for thermal imaging, multispectral systems, laser applications, hyperspectral imaging, remote sensing, and defense electro-optical systems.

BBPF 4.0 µm (ZnS)

Parameter	Specification
Central Wavelength (CWL)	4.0 µm
AOI / Substrate	0–22.5° / ZnS
Polarization	Unpolarized
Transmittance Range	3.8–4.2 µm
Total Transmittance	> 84% @3.8–4.2 µm
Blocking Range	0.28–3.5 µm; 4.5–6 µm
Avg. Blocking Trans.	< 0.5% @0.28–3.5 µm; 4.5–6 µm
Optical Performance	High contrast and high transmission



Product code: BP_021_275_11-1

Environmental & Qualification Standards

All listed coatings pass the following environmental tests:

Environmental	Performance
Operating Temperature	–40°C to +85°C
Thermal Stability	No degradation (MIL-C-48497A, ISO 9022-2)
Humidity Resistance	24 h @ 95% RH, 40°C (MIL-C-48497A, ISO 9211-3)
Temperature Cycling	–40°C to +85°C, 10 cycles (MIL-STD-810H, ISO 9022-2)
Abrasion Resistance	Moderate (MIL-C-48497A, ASTM D1044)
Adhesion	Tape test, no peeling (MIL-C-48497A, ASTM D3359)
Chemical Resistance	Acetone, IPA, no delamination (MIL-C-48497A, ISO 9022-5)

Product code:

APPLICATION

Laser-Induced Damage Threshold (LIDT)



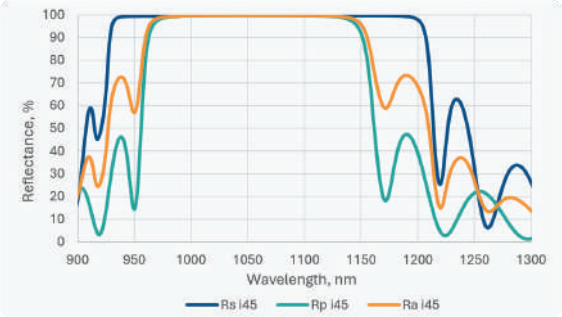
For optical coatings operating in high-power laser systems, laser-induced damage resistance is often one of the most critical performance parameters. LIDT defines the maximum laser fluence an optical component can withstand without permanent degradation.

Representative samples are independently tested according to ISO 21254 LIDT standards, using standardized S-on-1 procedures for single-pulse and multi-pulse exposure conditions.

High-Reflectivity Laser Mirrors (1064 nm, AOI 45°)

Dielectric mirror coatings optimized for 45° AOI, providing precise reflectance control for both s- and p-polarized light in Nd laser systems. Used in beam delivery assemblies, optical isolators, resonator architectures, and polarization-sensitive laser setups.

Parameter	Specification
Coating Function	High-Reflectivity Mirror (HR)
Design	1064 nm
Wavelength AOI	45°
Reflectance, Rs	≥ 99.98%
Reflectance, Rp	≥ 99.93%
Polarization	S / P
Front Surface	Dielectric HR Coating
Back Surface	Uncoated or AR (optional)



Product code: HR_015_191_L5-1

Environmental	Performance
Thermal Stability	No degradation
Humidity Resistance	24h @95% RH, 40°C
Temperature	–40°C to +85°C
Cycling Adhesion	Tape test, no peeling
Chemical Resistance	Acetone, IPA
Abrasion Resistance	Moderate to severe

LIDT Test Data

Parameter	Specification
Test Standard	ISO 21254 S-on-1
Wavelength	1064 nm
Pulse Duration (FWHM)	9.8 ns
Repetition Rate	100 Hz
Angle of Incidence	45°
Polarization	Linear P
Beam Diameter (1/e²)	220 µm
1-on-1 LIDT	40 J/cm²
1000-on-1 LIDT	31.8 J/cm²

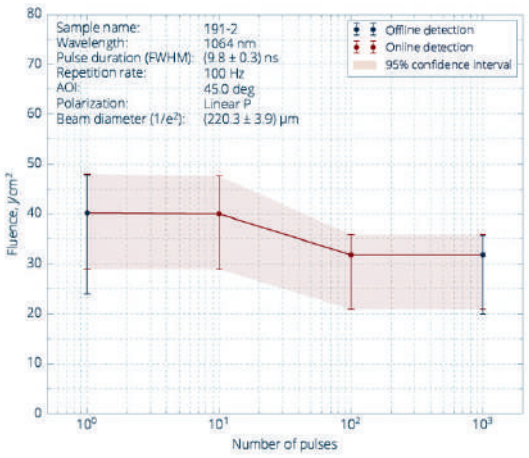
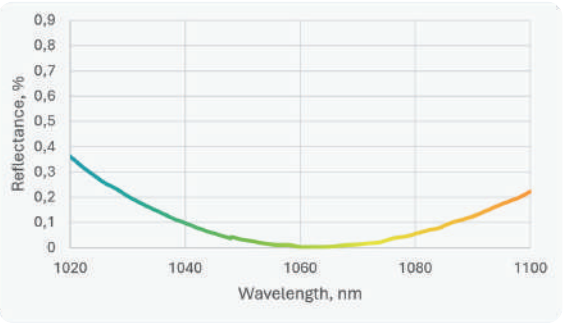


Figure 2. Characteristic damage curve.

Anti-Reflection Coatings (1064 nm, AOI 0°)

Anti-reflection coatings at 1064 nm developed to maximize optical throughput in Nd laser systems by minimizing Fresnel reflections. Suited for laser windows, lenses, beam expanders, nonlinear crystals, and other transmissive components in high-power laser assemblies.

Parameter	Specification
Design Wavelength	1064 nm
Residual Reflectance (R)	≤ 0.05%
Transmission (T)	≥ 99.95%
AOI	0°
Polarization	Unpolarized

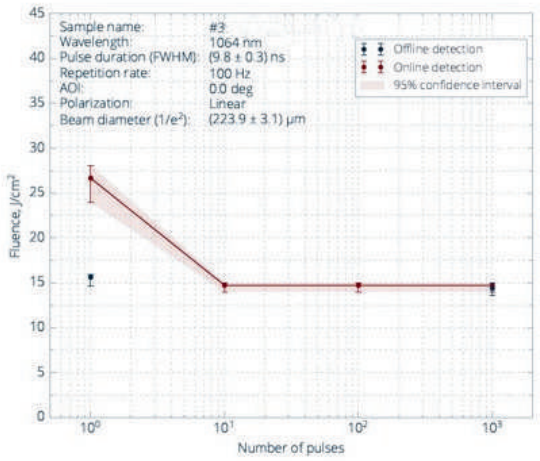


Environmental	Performance
Thermal Stability	No degradation
Humidity Resistance	24h @95% RH, 40°C
Temperature	–40°C to +85°C, 10 cycles
Cycling Adhesion	Tape test, no peeling
Chemical Resistance	Acetone, IPA
Abrasion Resistance	Moderate abrasion

Product code: AR_001_139_L5-1

LIDT Test Data

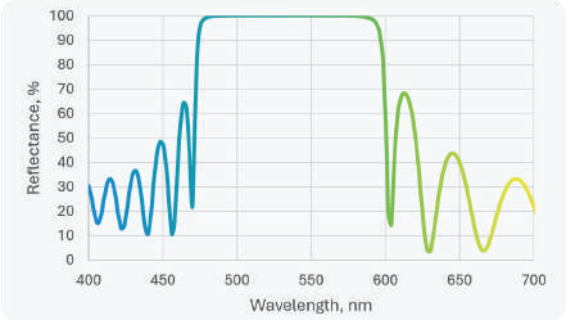
Parameter	Specification
Test Standard	ISO 21254 S-on-1
Wavelength	1064 nm
Pulse Duration (FWHM)	9.8 ns
Repetition Rate	100 Hz
Angle of Incidence	0°
Polarization	Linear
Beam Diameter (1/e²)	224 µm
1-on-1 LIDT	15.6 J/cm²
1000-on-1 LIDT	14.4 J/cm²



High-Reflectivity Laser Mirrors (532 nm, AOI 0°)

High-reflectivity dielectric coatings at 532 nm designed for frequency-doubled laser systems requiring maximum optical efficiency and low intracavity losses — optimized for green DPSS and Nd harmonic-generation platforms.

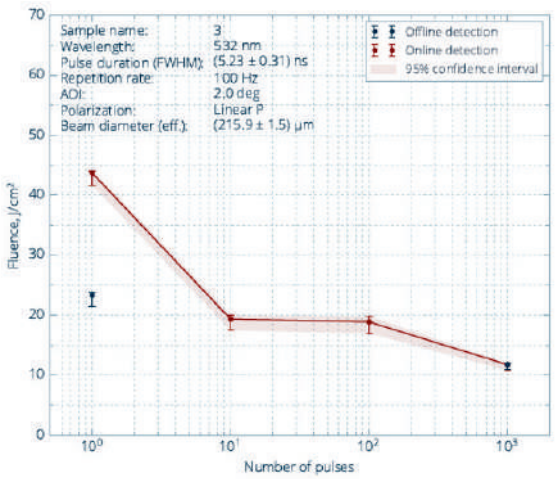
Parameter	Specification
Coating Function	High-Reflectivity Mirror (HR)
Design Wavelength	532 nm
Reflectance (R)	≥ 99.993%
AOI	0°
Polarization	Unpolarized
Front Surface	Dielectric HR Coating
Back Surface	AR @532 nm
Total Optical Losses	≤ 35 ppm
Operating Temperature	–40°C to +85°C



Product code: HR_015_251_L5-1

LIDT Test Data

Parameter	Specification
Test Standard	ISO 21254 S-on-1
Wavelength	532 nm
Pulse Duration (FWHM)	5.23 ns
Repetition Rate	100 Hz
Polarization	Linear P
Angle of Incidence	2°
Beam Diameter (1/e²)	216 µm
1-on-1 LIDT	23.3 J/cm²
1000-on-1 LIDT	11.8 J/cm²



Environmental	Performance
Thermal Stability	No degradation
Humidity Resistance	24h @95% RH, 40°C
Temperature	–40°C to +85°C, 10 cycles
Cycling Adhesion	Tape test, no peeling
Chemical Resistance	Acetone, IPA
Abrasion Resistance	Moderate to severe

APPLICATION

Optical Coatings for Space Communication



Optical coatings for space communication systems are critical components in satellite optical terminals, free-space optical communication links, laser transmitters and receivers, beam steering assemblies, and multichannel optical payloads. These coatings provide precise wavelength control, high optical throughput, low residual reflection, and efficient spectral separation between communication, tracking, alignment, beacon, and imaging channels.

Coatings can be optimized for key laser communication wavelengths, including 1064 nm and 1550 nm, as well as for auxiliary 850 nm, 940 nm, VIS, NIR, SWIR, MWIR, and LWIR spectral channels. Depending on the optical system architecture, the coating may function as an anti-reflection coating, high-reflectivity mirror, dichroic beam combiner, short-pass or long-pass filter, bandpass filter, or multi-zone spectral filter.

At I-Photonics, custom thin-film coatings are developed using advanced deposition technologies, including Ion Beam Sputtering, magnetron sputtering, and plasma-assisted processes. Coating designs can be adapted to customer-specific optical and environmental requirements, including thermal cycling, operating temperature range, adhesion, abrasion resistance, vacuum compatibility, radiation exposure, and laser-induced damage resistance.

Key Coating Solutions for Space Communication

Space communication optical systems combine several coating functions within the same optical path. AR coatings increase transmission through windows and lenses, HR mirrors provide beam steering and folding, dichroic coatings separate communication, tracking and alignment channels, while bandpass and multi-zone filters support spectral selection in compact multichannel optical payloads.

Application Area	Optical Coating Functions
Satellite optical communication terminals	AR, HR, dichroic coatings
Free-space optical links	AR @1064 / 1550 nm, HR mirrors, beam combiners
Laser transmitters and receivers	AR, HR, narrowband filters
Tracking and beacon channels	Dichroic mirrors, bandpass filters, edge filters
Multichannel space payloads	Bandpass and multi-zone filters
Spaceborne imaging and sensing	VIS/NIR/SWIR/MWIR/LWIR AR coatings and filters

Selected Coating Examples

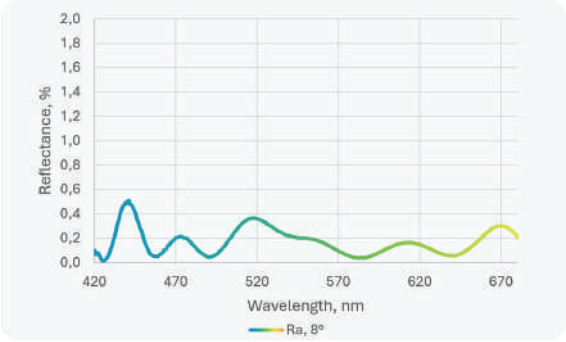
Selected coating examples demonstrate typical thin-film solutions applicable to space and free-space optical communication systems — anti-reflection coatings for high-transmission optical paths, high-reflectivity mirrors for beam steering, and dichroic coatings for spectral channel separation.

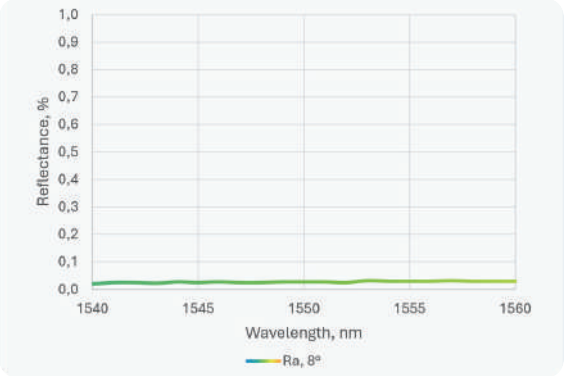
Example 1 — Dual-band AR: VIS + 1550 nm

Designed for optical paths where a visible alignment or imaging channel is combined with a 1550 nm laser communication channel. Low residual reflection in both spectral regions improves transmission through windows, lenses, and receiver/transmitter optics, reducing optical losses and parasitic reflections in compact space communication terminals.

Parameter	Specification
Coating Function	AR
Design Wavelength (λ)	420–680 nm; 1.54–1.560 µm
Angle of Incidence (AOI)	0°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C
Reflectance (R)	Ra < 0.2% @420–680 nm; Ra < 0.03% @1.54–1.560 µm

Product code: AR_001_157_L4-1



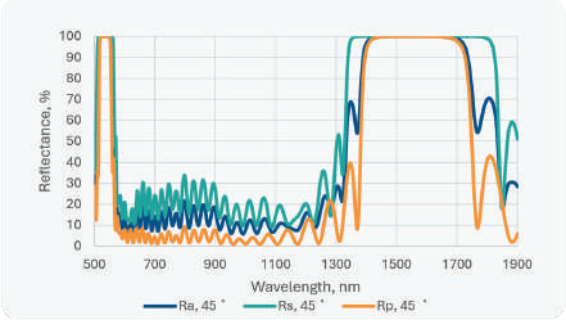


Example 2 — HR Mirror @ 1.54–1.56 µm

High-reflectivity mirrors at 1.54–1.56 µm are used for beam steering and beam folding in 1550 nm free-space and space laser communication systems, providing high reflectance at oblique incidence for efficient beam routing inside compact optical terminals.

Parameter	Specification
Coating Function	Mirror
Design Wavelength (λ)	1.54–1.56 µm
Angle of Incidence (AOI)	45°
Polarization	s-, p-, Unpolarized
Operating Temperature	–40°C to +85°C
Reflectance (R)	Ra > 99.9%

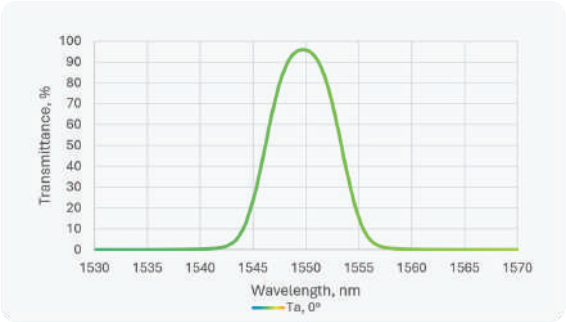
Product code: HR_017_034_L5-1



Example 3 — Narrow Bandpass Filter @ 1550 nm

Used for spectral selection in receiver channels of free-space and space optical communication systems. Transmits the communication wavelength while suppressing out-of-band radiation, improving detector selectivity and reducing background noise.

Parameter	Specification
Coating Function	Narrow Bandpass Filter
Design Wavelength (λ)	1550 nm
Angle of Incidence (AOI)	0°
Polarization	Unpolarized
Transmission (T)	Ta > 95%
FWHM (Bandwidth)	8 nm
Blocking Range	1.4–1.7 µm
Optical Density (OD)	6
Operating Temperature	–40°C to +85°C

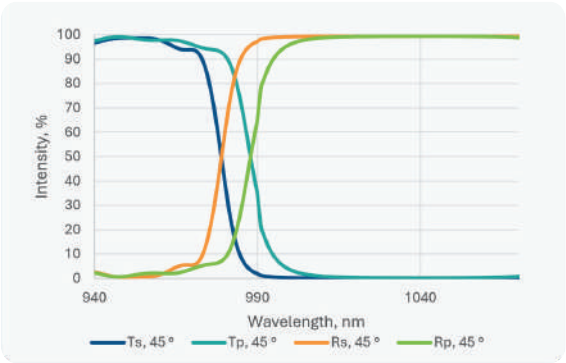


Product code: BP_008_00_M4-1

Example 4 — Dichroic Mirror for Channel Separation

Used to separate or combine different optical channels within the same system — e.g. separating a 1064 nm laser channel from a 940–980 nm tracking, beacon, or auxiliary NIR channel.

Parameter	Specification
Coating Function	Dichroic Mirror
Design Wavelength (λ)	1.02–1.07 µm; 0.94–0.98 µm
Angle of Incidence (AOI)	45°
Polarization	s-, p-
Operating Temperature	–40°C to +85°C
Reflectance (R)	Rs > 99.53% / Rp > 99.40% @1.02–1.07 µm
Transmission (T)	Ts > 92.58% / Tp > 97.24% @0.940–0.980 µm



Product code: DC_012_069_L5-1

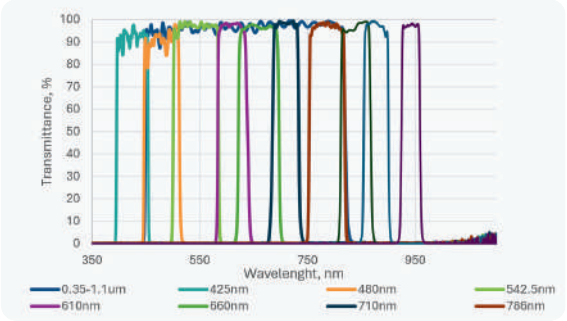
Multi-Zone Spectral Filters for Compact Space Payloads

Multi-zone spectral filters combine several bandpass channels on a single optical component. Each zone can be optimized for a different wavelength band, enabling compact multichannel optical systems for space payloads, multispectral imaging, tracking, alignment, and detector-channel selection.

Such filters help reduce the number of separate optical components and support compact optical layouts where several spectral channels must be integrated within a limited volume.

Parameter	Specification
Coating Function	Bandpass Filter
Angle of Incidence (AOI)	0°
Polarization	Unpolarized
Operating Temperature	–40°C to +85°C

Product code: BP_008_22_L4-0-10



CWL (nm)	Transmission	Cut-on / Cut-off	FWHM	OD
425	Ta > 92.1% @403–453 nm	395 / 454 nm	59 nm	3
480	Ta > 89.4% @449–484 nm	447 / 513 nm	66 nm	3
542.5	Ta > 96.8% @502–582 nm	500 / 585 nm	85 nm	3
610	Ta > 96.9% @585–634 nm	583 / 639 nm	56 nm	3
660	Ta > 96.2% @625–695 nm	622 / 698 nm	76 nm	3
711	Ta > 97.9% @688–731 nm	685 / 733 nm	48 nm	3
786	Ta > 96.6% @755–817 nm	753 / 819 nm	66 nm	3
840	Ta > 96.5% @813–864 nm	812 / 868 nm	56 nm	3
877	Ta > 97.1% @857–898 nm	854 / 900 nm	46 nm	3
942	Ta > 97.1% @927–957 nm	924 / 960 nm	36 nm	3

Blocking Range for all variants: 350–1100 nm. Zone geometry, number of channels, spectral layout, and substrate material can be customized according to system requirements.

Custom and Space-Related Qualification

Coating designs can be customized according to customer-specific optical layouts, wavelength ranges, angles of incidence, polarization states, substrate materials, and environmental requirements.

For space-related applications, coatings can be adapted and qualified upon request for thermal cycling, wide operating temperature ranges, adhesion, abrasion resistance, vacuum compatibility, radiation exposure, humidity resistance, and laser-induced damage resistance.

APPLICATION

Machine Vision



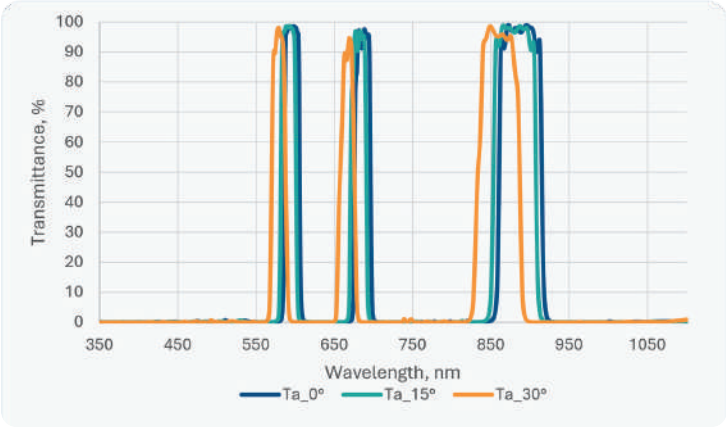
Modern machine vision systems require optical coatings that provide precise spectral control, high transmission, and reliable imaging performance. In multispectral imaging, automated inspection, sorting, and industrial quality control, optical filters can selectively transmit specific visible and near-infrared spectral regions, helping optimize illumination and detection while improving image contrast and suppressing unwanted spectral wavelengths.

I-Photonics develops advanced thin-film coating solutions for machine vision applications using IBS and magnetron sputtering. Our coatings can be engineered for visible, near-infrared, and multispectral imaging systems, with spectral characteristics tailored to the illumination source, camera sensitivity, and optical configuration.

Triple-Bandpass Filter Coating

Our Triple-Bandpass Filter Coating is designed for machine vision systems requiring simultaneous transmission of three discrete spectral regions through a single optical component. It is suitable for multispectral imaging systems combining visible and near-infrared illumination, providing selective spectral detection with high optical throughput and peak transmission above 97%.

The spectral characteristics can be optimized for different illumination and imaging requirements, including the angle-dependent spectral shift of interference filters.



Substrate: Fused Silica (UV grade) · Blocking 350–1100 nm excluding passbands, OD_{ave} > 3 *Product code: BP_008_262_M4-10*

AOI	Central λ	FWHM	T max	T avg (passband)	Blocking 350–1100 nm
0°	596 nm	20 nm	98.5%	> 97%	OD_{ave} > 3
0°	686 nm	20 nm	98.5%	> 93%	OD_{ave} > 3
0°	887 nm	55 nm	98.5%	> 95%	OD_{ave} > 3
15°	591 nm	19 nm	98.5%	> 97%	OD_{ave} > 3
15°	681 nm	20 nm	97%	> 93%	OD_{ave} > 3
15°	880 nm	54 nm	98.5%	> 95%	OD_{ave} > 3
30°	579 nm	18 nm	97.5%	> 92%	OD_{ave} > 3
30°	666 nm	19 nm	94%	> 88%	OD_{ave} > 3
30°	860 nm	54 nm	98%	> 94%	OD_{ave} > 3

Customization

I-Photonics delivers custom thin-film solutions built to your target specifications. We take projects from early-stage prototyping to full pilot production, ensuring strict compliance with optical and environmental standards.



- ✓ Custom wavelength design across UV, VIS, NIR, SWIR, MWIR, and LWIR spectral ranges
- ✓ Custom angles of incidence — from normal incidence (0°) to oblique angles of 60°+
- ✓ Polarization-sensitive designs (Rs / Rp optimization)
- ✓ Advanced multilayer coatings — 100+ layers, sub-nanometer spectral control
- ✓ Bandpass, edge, dichroic, beamsplitter, DWDM/ CWDM and gain-flattening (GFF) designs
- ✓ Custom substrate configurations — characteristics verified across multiple substrate materials
- ✓ Environmental qualification — temperature, humidity, abrasion, and chemical resistance
- ✓ Rapid prototyping and scalable production, from feasibility to pilot series
- ✓ LIDT-optimized coatings for high-power and pulsed laser systems

We focus on meeting your exact requirements with fully custom optical solutions.

I-PHOTONICS

Let's engineer your coating.

Every coating in this catalog can be shifted in wavelength, re-optimized for a different substrate or angle of incidence, or engineered to an entirely new specification.

Talk to us about your optical, mechanical and environmental requirements — from feasibility study to pilot series.



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