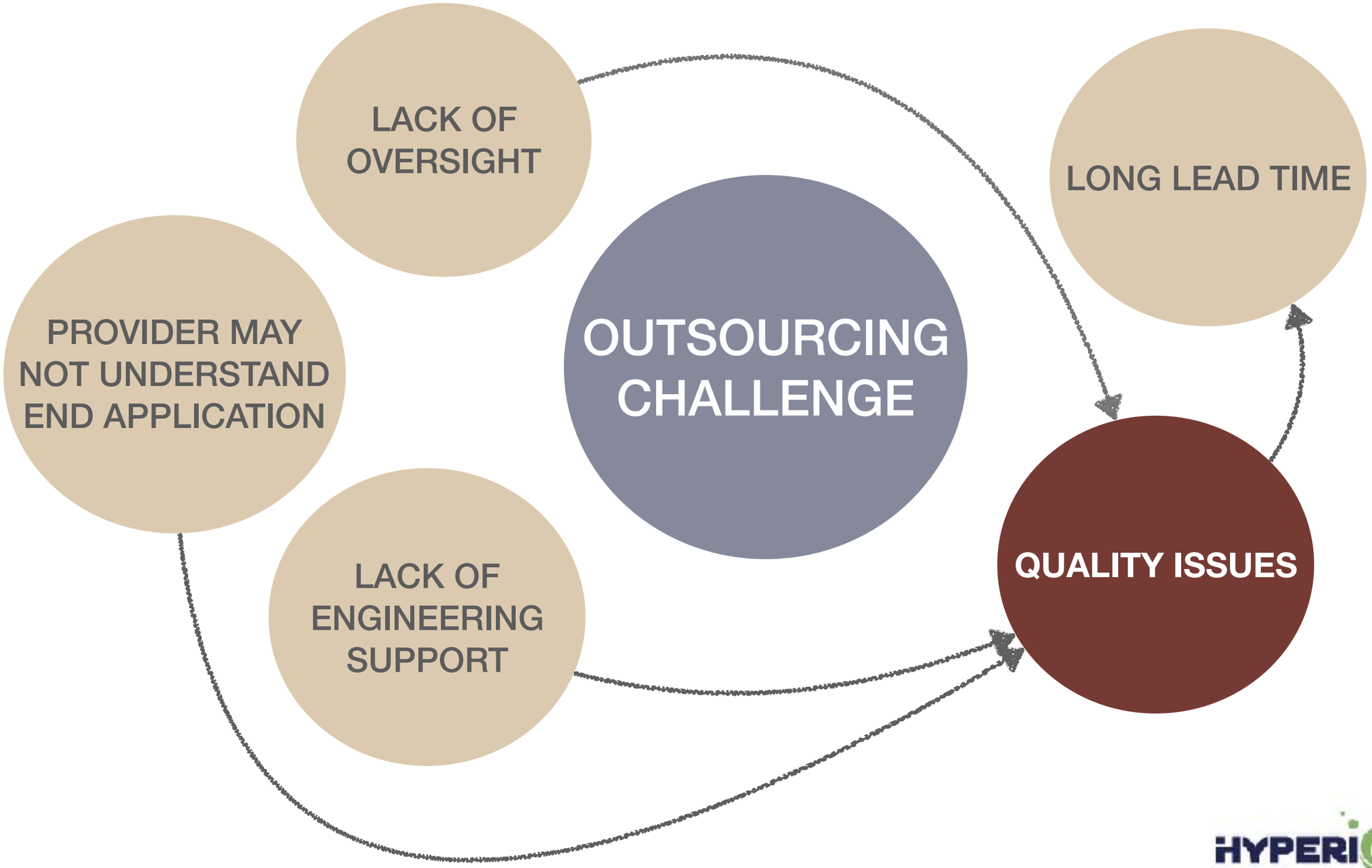

HYPERION
OPTICS

AGENDA

- Introduction
- Hyperion Capabilities
- Quotation Review
- Questions & Discussion

What are your biggest supply chain pain points?



HYPERION OPTICS

WHO ARE WE?

Hyperion is a premium custom optics & optical assembly provider established in 2008. Our team works in an iterative + collaborative way with our clients to optimize their go-to-market strategies.

We specialize in **DFM/ DFA (Design for Manufacturability/ Assembly)** and providing cost-competitive, high-quality custom optics and lens assemblies.

We work with clients in industries such as biomedical, aerospace, commercial sensing, and R&D labs to create compact yet high-performance optical systems.

THE HYPERION DIFFERENCE

ENGINEERING CREATIVITY
Hyperion often comes up with out-of-the-box solutions for challenging optical designs

FREE INITIAL DESIGN CONSULTATION
Thorough engineering review for component-level design prior to fabrication, complete with tolerance analysis for custom parts

METICULOUS ENGINEERING REVIEW: Hyperion conducts a detailed review of the user application to take in all considerations during specs evaluation

COMPETITIVE PRICING
Hyperion adopts a cost-effective philosophy and delivers the savings to our customers via optimization of specs and fabrication processes

THE HYPERION OPTICS DIFFERENCE

CRITICAL STAGE STATUS REPORT
Hyperion regularly updates customers during mid-production for better timeline management and on-time delivery

QUICK TURNAROUND
Hyperion's diligence to meet short deadline has earned us a reputation of the overseas supplier with the fastest lead time.

FACILITY

TWO MANUFACTURING SITES @JIANGSU

- **DanYang facility**
  - 2,583 sq.ft,
  - SPDT capability
  - Specialized fabrication in high-precision aspherical & free-form optics
- **ChangZhou facility**
  - 21,000 sq.ft.
  - Specialize in volume production of spherical/ custom lens components, & high-precision lens assembly
  - Conventional grinding & polishing devices,
  - 2 Coating chambers with VIS to IR capabilities

LOCAL SUPPORT

SALES OFFICE IN EDISON, NJ

- **In-depth understanding of US business culture and processes**
- **Proximity advantage = better service**
  - 24 hours turnaround quotation
  - In-timezone communication
  - Bilingual support

FAST PROTOTYPING

LRIP (LOW RATIO INITIAL PRODUCTION)

- Fast material accesses (strong material suppliers w/ Ohara, CDGM)
- Pre-mold pressed substrates at competitive price
- > 6000+ test plates; dramatically shorten the overall lead time
- Specialized prototyping production team oversees projects with aiming at delivery <4 weeks, from grinding, polishing, to coating

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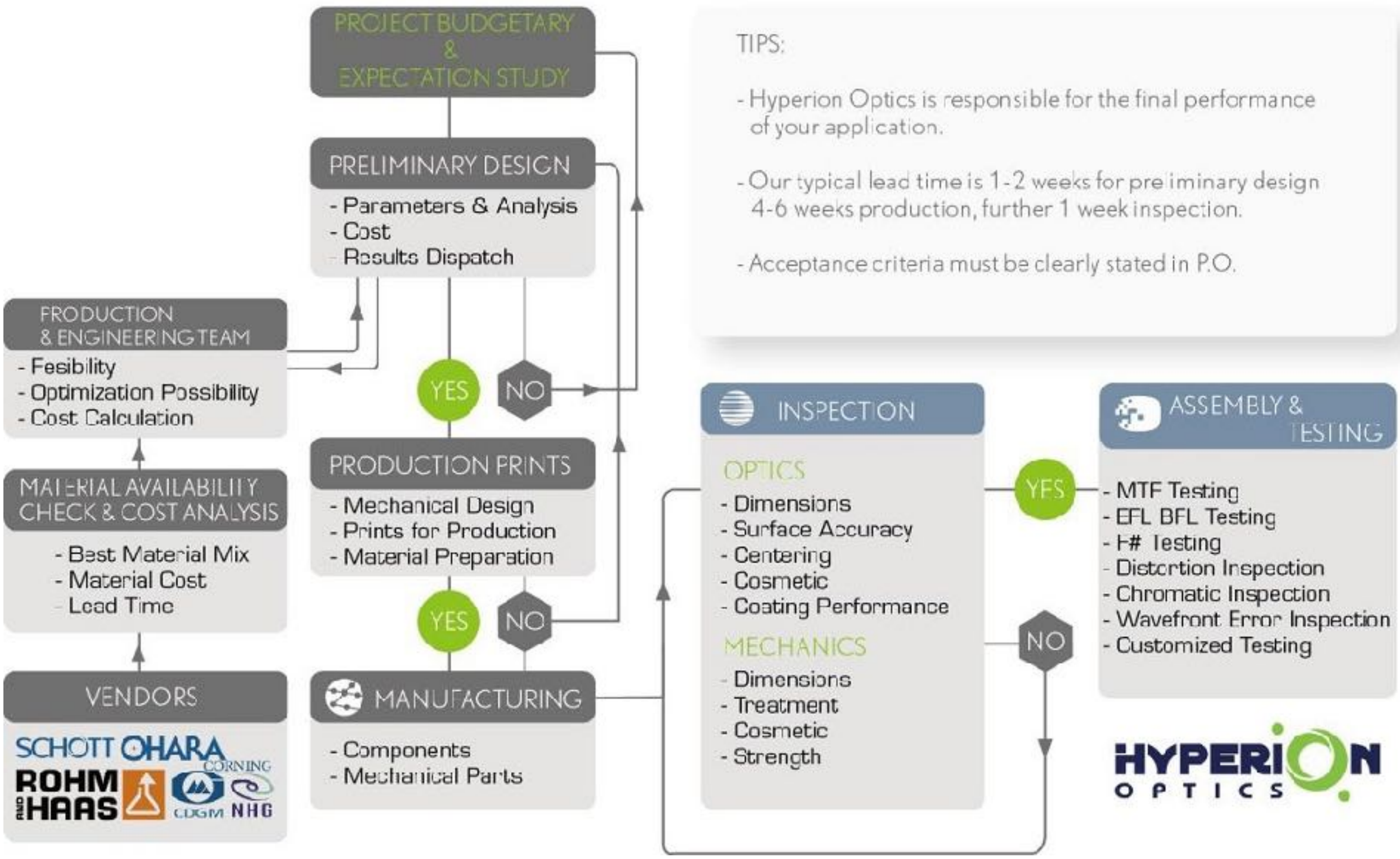
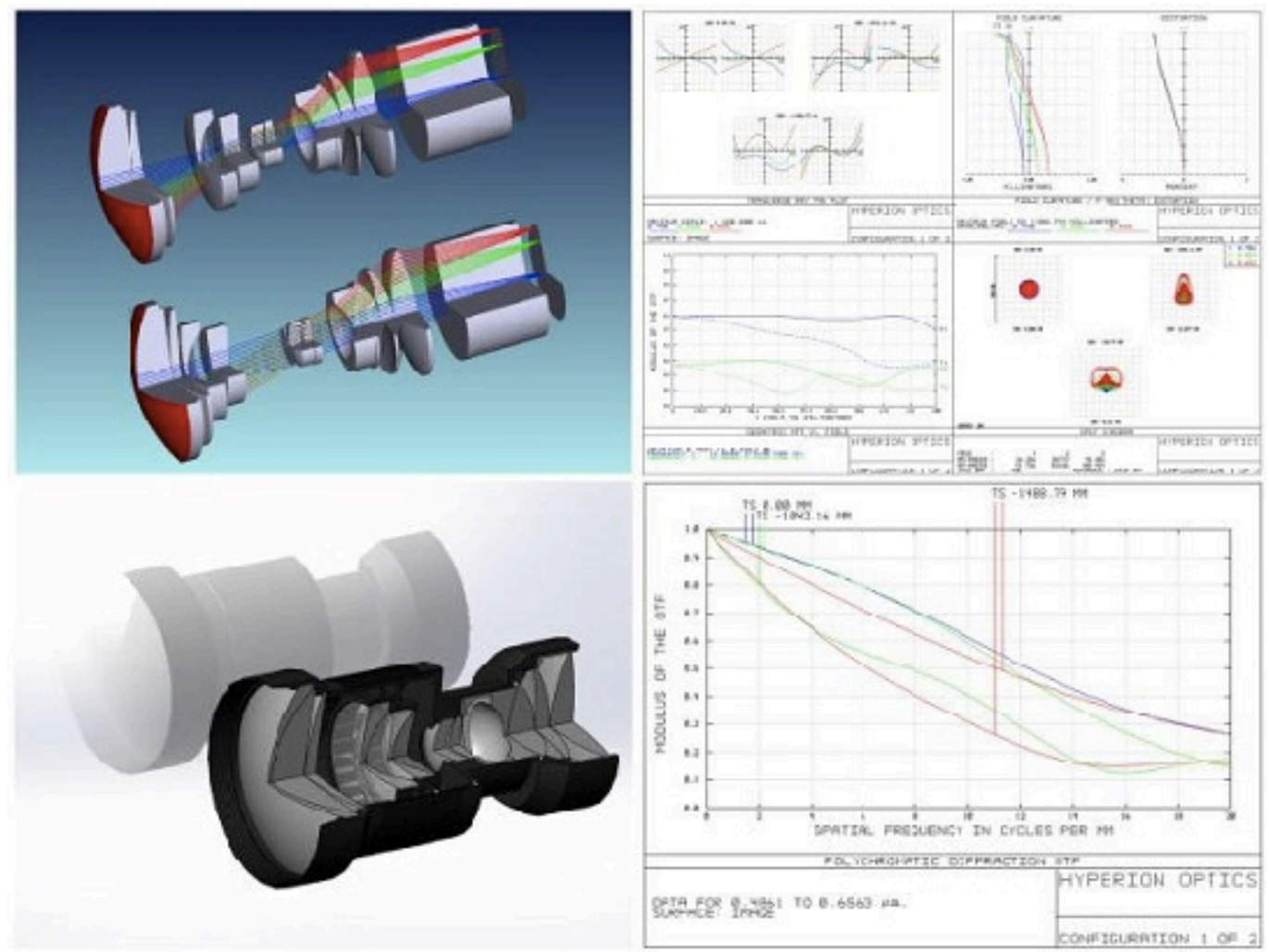
LENS DESIGN WORKFLOW



DFM/ DFA INPUT

Hyperion's DFM-Driven Approach = Optimal Cost-to-Performance Ratio

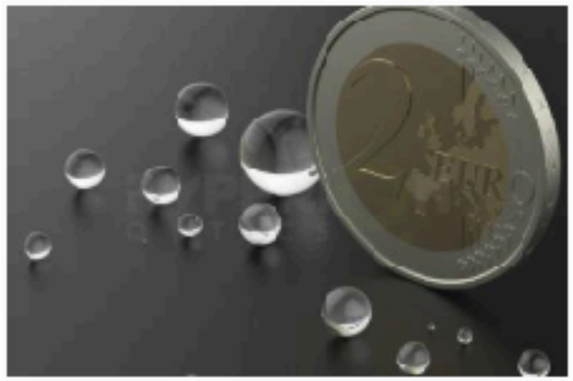
- **Optical Engineering Expertise**
  - 15 Optical and Mechanical Engineers
  - Feasibility Study/ Proof of Concepts
  - Free-Initial Design Consultation
- **10+ Years of Precision Optics Fabrication**
  - Pre-Production Tolerance Analyses
  - 3D CAD Modeling
  - Optimizes Production Yield Based on Application Requirements



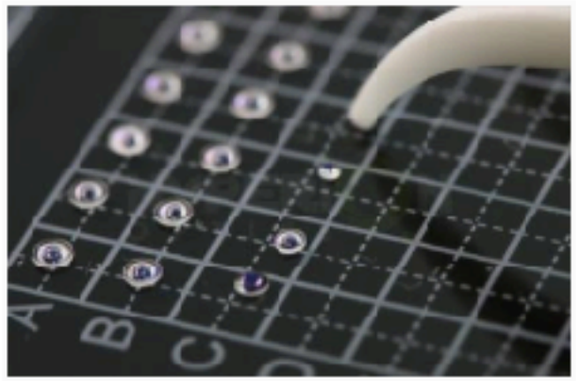
CUSTOM COMPONENTS

SPHERICAL LENSES

Achromatic Doublet Lenses



Ball & Half Ball Lenses



Micro Sphere Lenses

Singlet Lenses

- Plano-Convex/Concave, Bi-Concave, Bi-Convex
- Positive and Negative Meniscus
- Custom coatings
- Available in various optical glass types (Schott, Ohara, CDGM), fused silica, and crystal
- Special treatment (i.e. edge blackening/ special packaging/ labeling) available upon request

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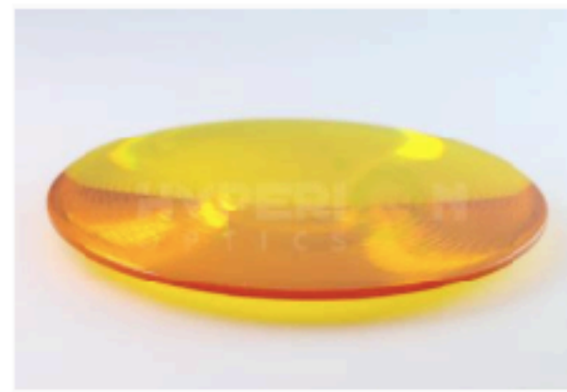
CUSTOM COMPONENTS

ASPHERICAL LENSES

Asphere Lenses

IR Asphere Lenses



Diffractive Optical Elements

Parabolic Mirrors

- Capabilities from high precision VIS imaging systems to LWIR/ infrared athermal lenses
- Precise fabrication on optical glasses and infrared materials including **Germanium, Zinc Sulfide, Zinc Selenide, Calcium Fluoride**, **Chacolgenide glasses,** and more
- Diameter ranges from 3mm - 250mm *refer to appendix for our standard asphere production tolerances

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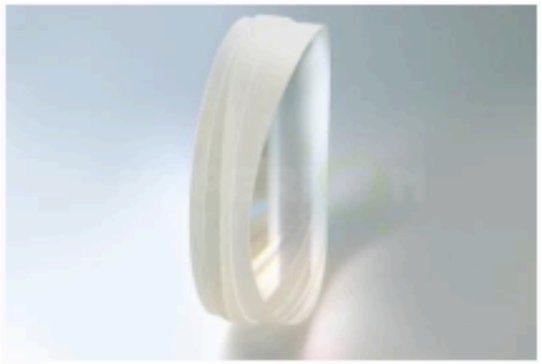
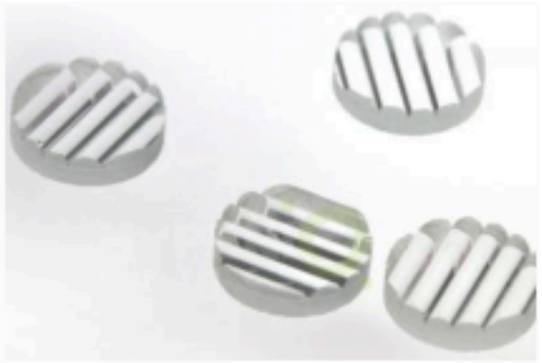
CUSTOM COMPONENTS

CYLINDRICAL LENSES



Achromatic Cylindrical Lenses

Cylindrical Lenses



Line Generating Fresnel Lenses

Rod and Cone Lenses

- Various optical glass available depending on the design
- Dia. Tol.: ±0.025mm
- Precision grade: Irregularity can achieve 1/10L; S/D 10-5

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CUSTOM COMPONENTS

WINDOWS, FILTERS, DOMES, MIRRORS




- Custom fabricated based on drawings and specifications
- Prototyping quantities (as low as 2, 5pcs) available depending on the part

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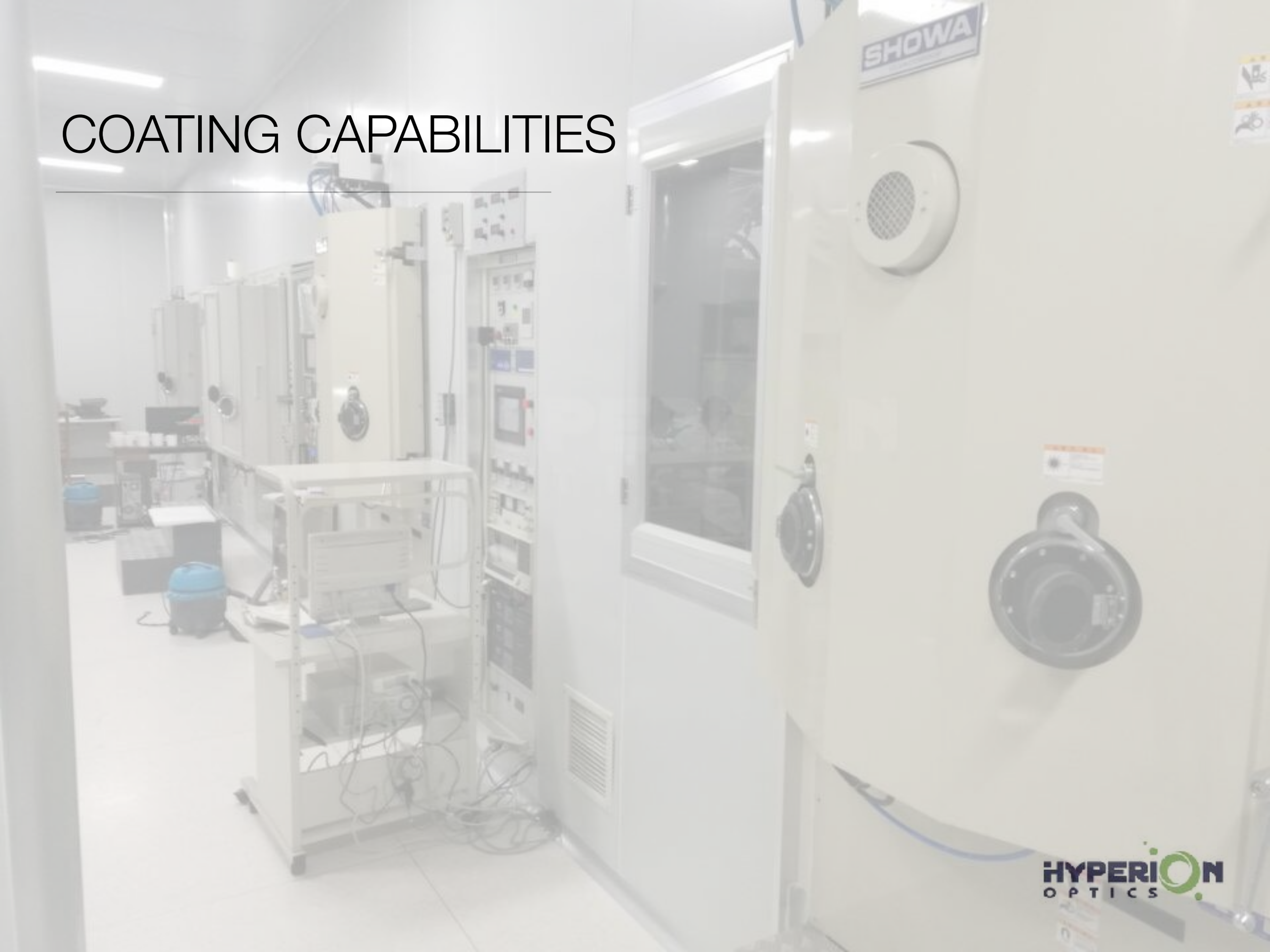
COATING CAPABILITIES

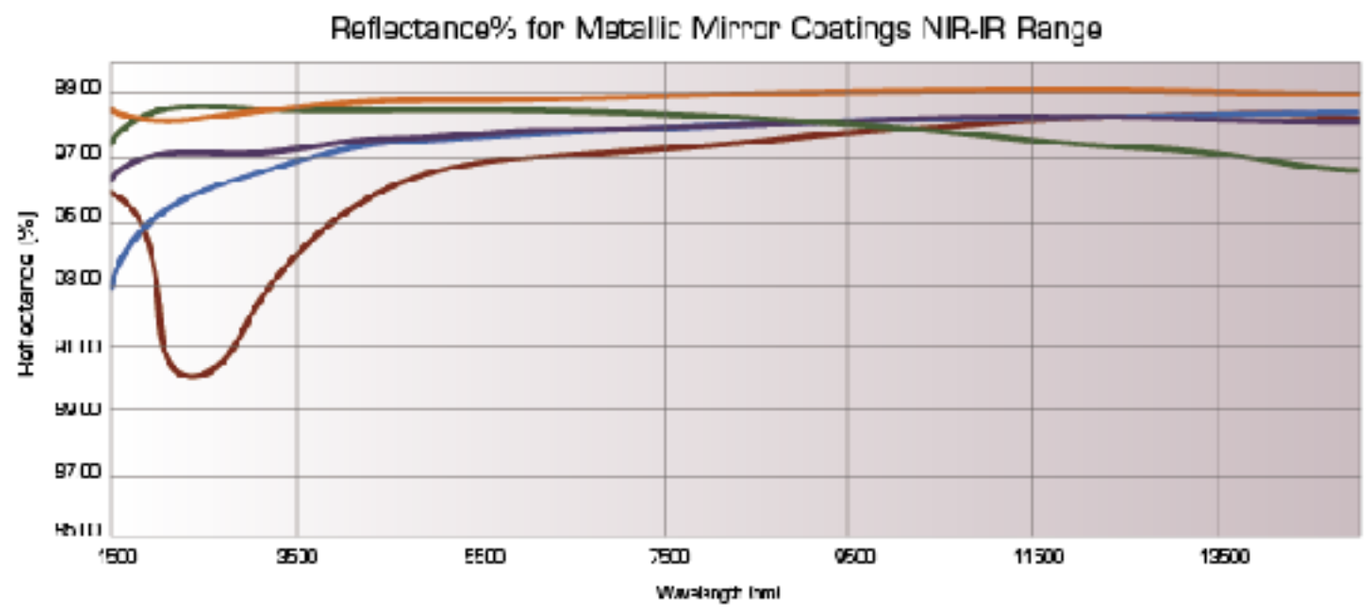


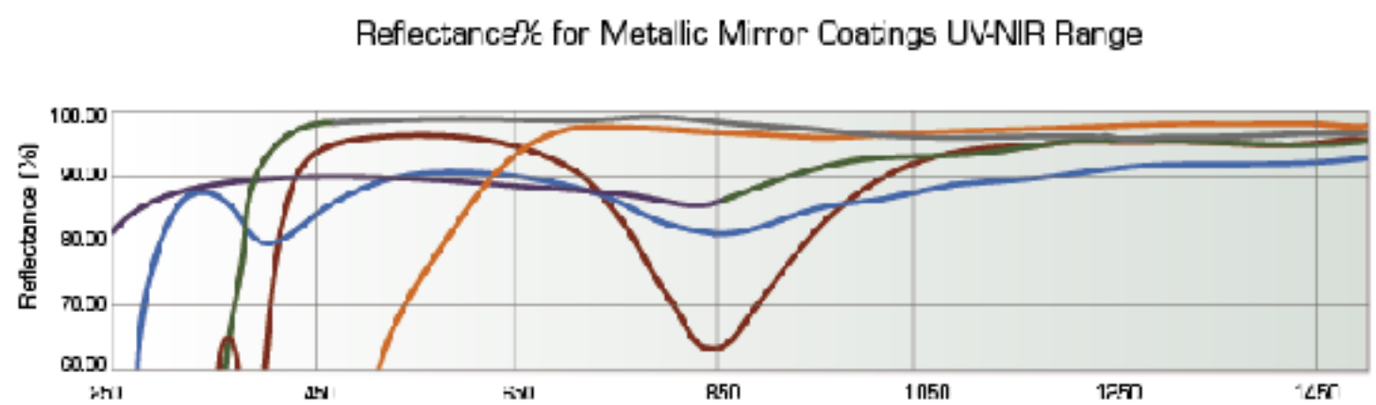
HYPERION OPTICS

COATING CAPABILITIES

Hyperion offers custom coating designs, including:

- Anti-reflective (AR) , High-Reflective (HR), partial reflective coatings
- Dielectric Coatings: BBAR Coatings, V-coatings, Dual wavelength coatings, sharp cut-on and cut-off filters coating
- Other specialized coating, such as ITO, DLC, hydrophobic coating, complex multilayer stacks





Protected Aluminum		Enhanced Aluminum		UV Enhanced Aluminum		Protected Gold		Protected Silver	
Range (µm)	% Reflection	Range (µm)	% Reflection	Range (µm)	% Reflection	Range (µm)	% Reflection	Range (µm)	% Reflection
0.4 - 0.7	85	0.45 - 0.65	95	0.25 - 0.45	89	0.7 - 2.0	98	0.45 - 2.0	98
0.4 - 0.2	90	NA	NA	0.25 - 0.70	95	2.0 - 10.0	96	2.0 - 10.0	98

HYPERION OPTICS

ASSEMBLY CAPABILITIES

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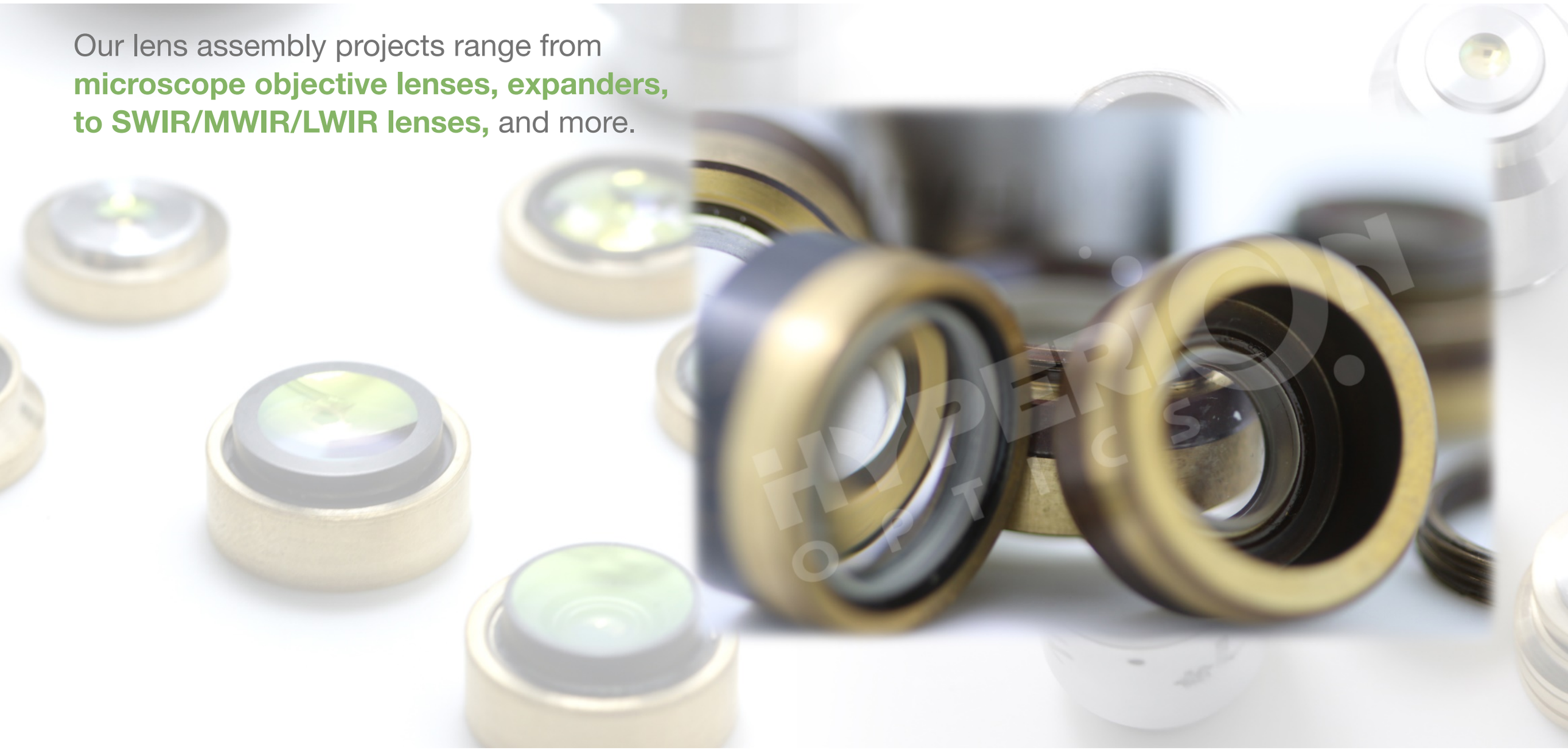
ASSEMBLY CAPABILITIES

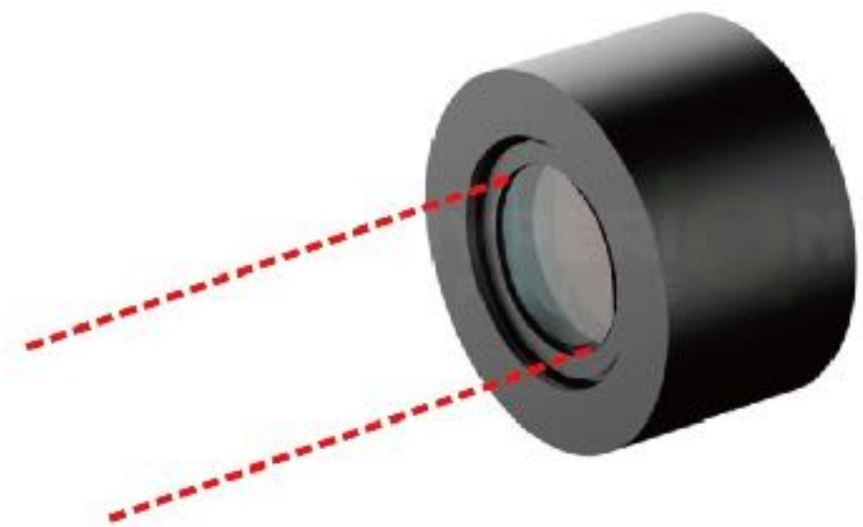
Hyperion Optics has more than 40+ custom precision assembly projects annually, from prototyping to mass production.

Our lens assembly projects range from **microscope objective lenses, expanders, to SWIR/MWIR/LWIR lenses,** and more.



LENS ASSEMBLIES

COLLIMATING LENS



Clear Aperture

- Custom collimators in both singlet and chromatic formats
- Responsive at UV-VIS, or VIS-NIR spectrum

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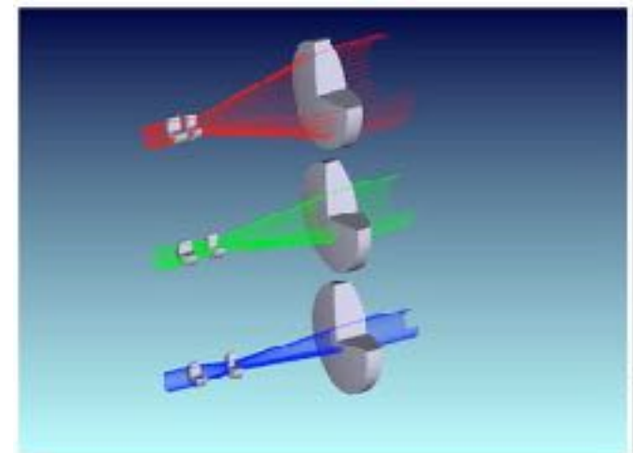
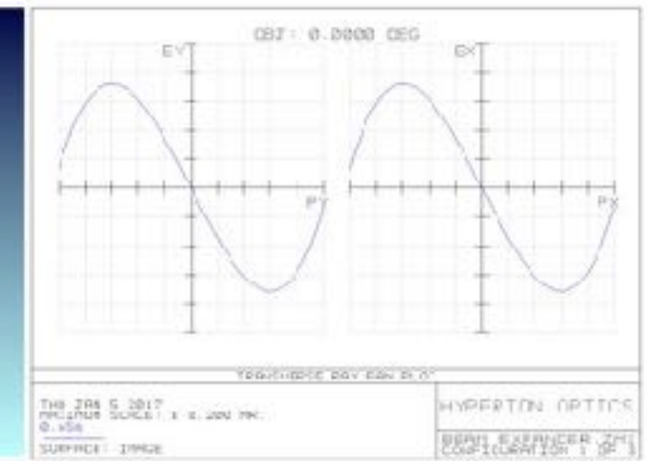
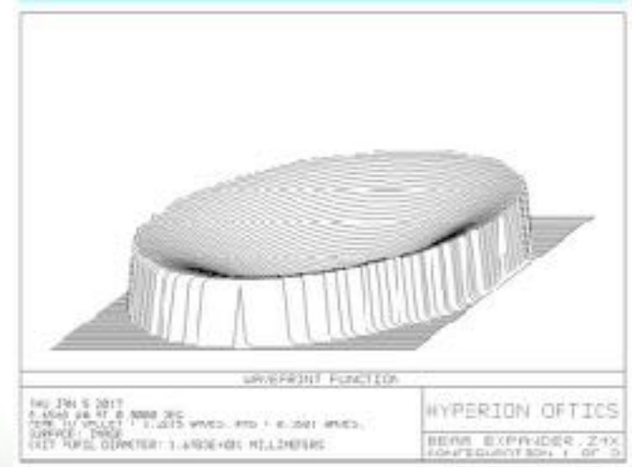
LENS ASSEMBLIES

BEAM EXPANDERS







- Consultation on optical & mechanical design
- DFM Engineering/ prototyping services
- End-user application performance guarantee

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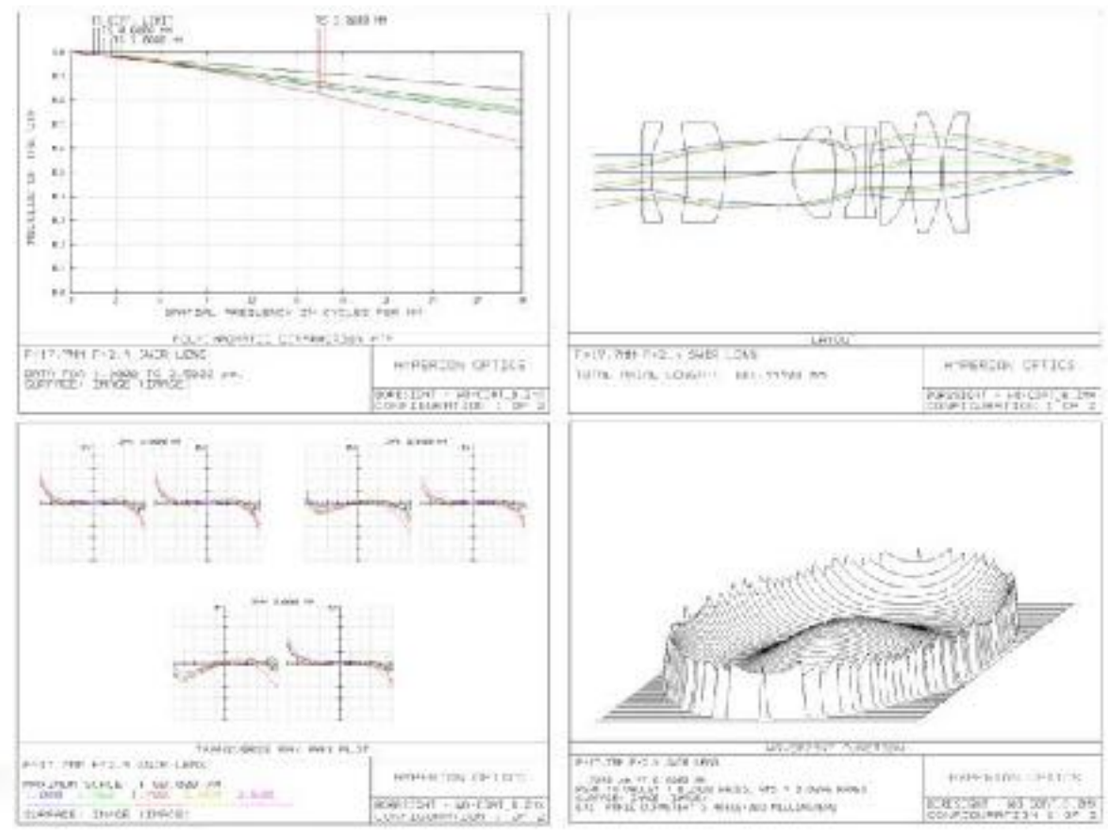
LENS ASSEMBLIES

SWIR LENSES



- Advantages over visible-NIR wavebands; 900nm-1700nm / 700nm-3400nm
- Compatible with the detector size up to 20mm diagonal and pixel size of 15-50μm
- Machine vision, quality inspection, military applications
- DFM Engineering/ prototyping services

HYPERION OPTICS

LENS ASSEMBLIES

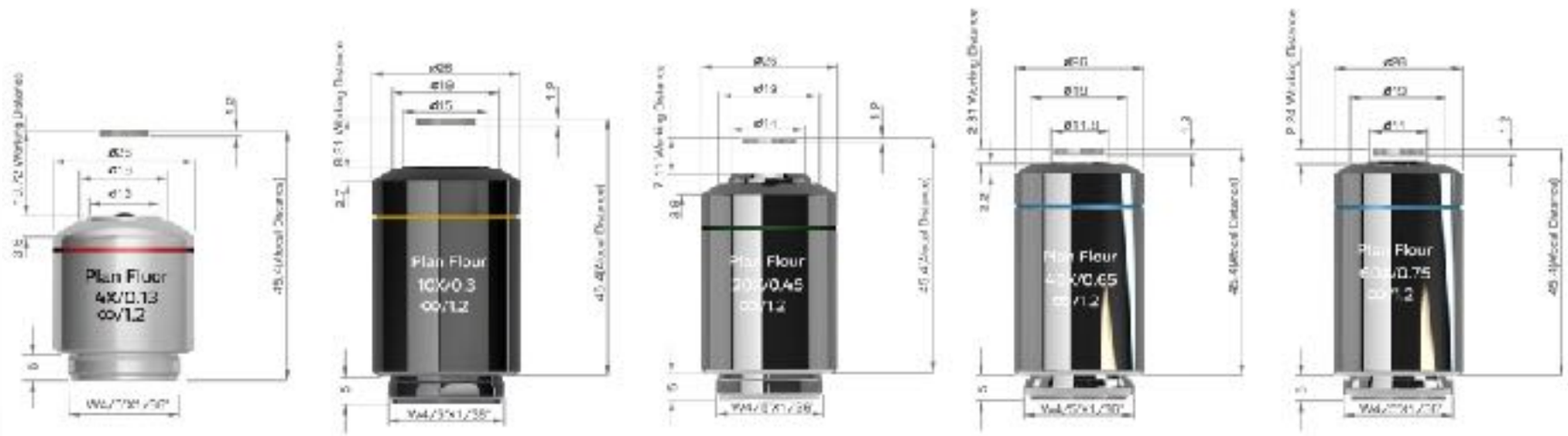
F-THETA LENSES

- Off-the-shelf design availability
- Laser scanning application
- DFM Engineering/ prototyping services
- End-user application performance guarantee

HYPERION OPTICS

LENS ASSEMBLIES

MICROSCOPE OBJECTIVE LENSES



	Objective Lens					Tube Lens		
	Numerical Aperture	Working Distance(mm)	Focal Length(mm)	Resolution (μm)	Depth of Focus(μm)	Magnification	Object field(mm)	Depth of Focus(μm)
Invertac Fluorescence Objective 4X	0.13	19.72	55	2.12	16.27	40X	ø6.25	43.74
Invertac Fluorescence Objective 10X	0.3	8.31	22	0.92	3.06	100X	ø2.5	7.82
Invertac Fluorescence Objective 20X	0.45	7.11	11	0.61	1.38	200X	ø1.25	2.95
Invertac Fluorescence Objective 40X	0.65	2.81	5.5	0.42	0.65	400X	ø0.625	1.2
Invertac Fluorescence Objective 60X	0.75	2.24	3.7	0.37	0.49	600X	ø0.42	0.8

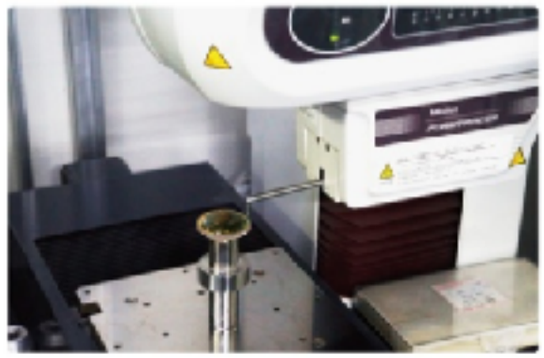
- Range from UV to Infrared wavelength
- Diffractive limit microscope objective lenses fit most research oriented labs applications and commercial microscope devices
- Custom options available

HYPERION OPTICS

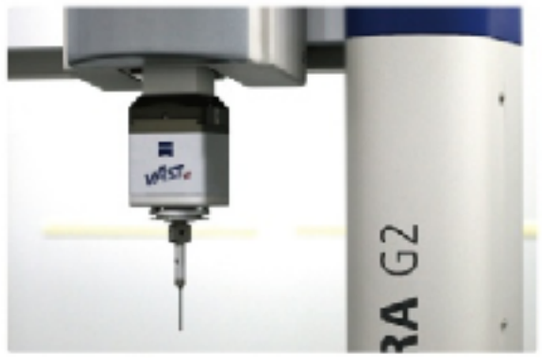
METROLOGY

You don't know what you can't measure!

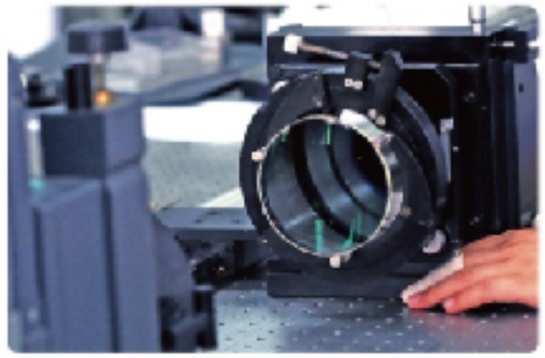
- Zygo© Verfire Interferometer
- TriOptics© MTF Station
- Mitutoyo Profiler
- Industrial-grade projector
- CMM Station (Coordinates Measurements)
- Spectrophotometer



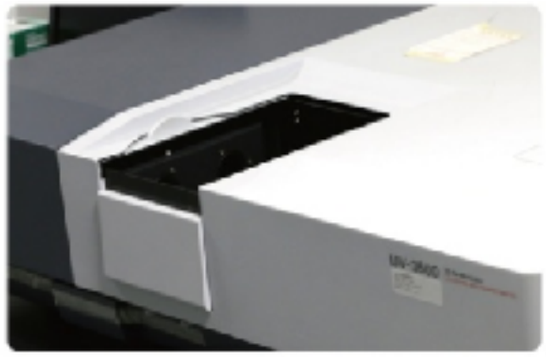
Profilometer



CMM Coordinate Measuring

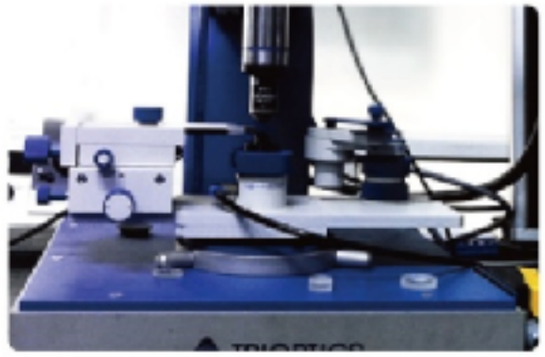


Zygo Interferometer



Spectrophotometer

MTF Testing Station



Centering Station

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METROLOGY

ASPHERICAL SURFACE	TESTING ITEMS	DOCUMENTATION
	- Dimension - Profile - Surface Accuracy - Focal Length - Centering - Coating	- COC Cert - Material Cert - Inspection Report - Profiler Report - Spectral Report

- Dimentional data
- Focal Length
- Centering Data
- Cosmetic

SPHERE SURFACE DOUBLET/TRIPLET	TESTING ITEMS	DOCUMENTATION
	- Dimension - Radius - Surface Accuracy - Focal Length - Centering - Coating	- COC Cert - Material Cert - Inspection Report - Interferometry Report - Spectral Report

- Dimentional data
- Radius
- Focal Length
- Centering Data
- Cosmetic

LENSES	TESTING ITEMS	DOCUMENTATION
	- MTF - EFL, BFL - F#/N.A. - Chromatic Aberration - Distortion - Chief Ray Angle	- COC Cert - Material Cert - Elements Inspection Report - Lens Inspection Report - Interferometry Report - MTF Chart Report - Spectral Report * Customized Documentation is also available

HYPERION OPTICS

ISO:9001:2015 CERTIFIED

QUALITY ASSURANCE IS OUR COMMITMENT

- Renewed/ Upgraded to 9001:2015
- Material certificate & COC
- Each order shipment include standard inspection reports
  - Dimensional measurements
  - Zygo Interferometry reports
  - Actual coating curve
  - Profiler plot
  - Custom/ specialized tests available upon request*

CERTIFICATE OF QUALITY
MANAGEMENT SYSTEM CERTIFICATION

Certificate No.: 19819QC2173R0S
Unified Social Credit Code /Organization Code:91320115MA1NJCRC6X

We hereby certify that the organization:
Hyperion Optics

Is in conformity with Quality Management System Standard:
GB/T19001-2016 idt ISO9001:2015

The certificate is valid to the following product(s)/service:

Sales and manufacturing service of Laser crystal, optical prism, windows, spherical and aspherical lenses, filters (VIS to IR), optical system design, assembly and metrology

Registration Address: Nanjing Jiangning district, Changxing street 764-302 Xintiandi block building 14 302
Audit Address: Nanjing aoti avenue #118, Danjie road #100

Date of Initial Issuance: Mar 05, 2019
Date of This Issuance: Mar 05, 2019
Date of Expiration: Mar 04, 2022

中国认可
国际互认
管理体系
MANAGEMENT SYSTEM
CNAS C178-M

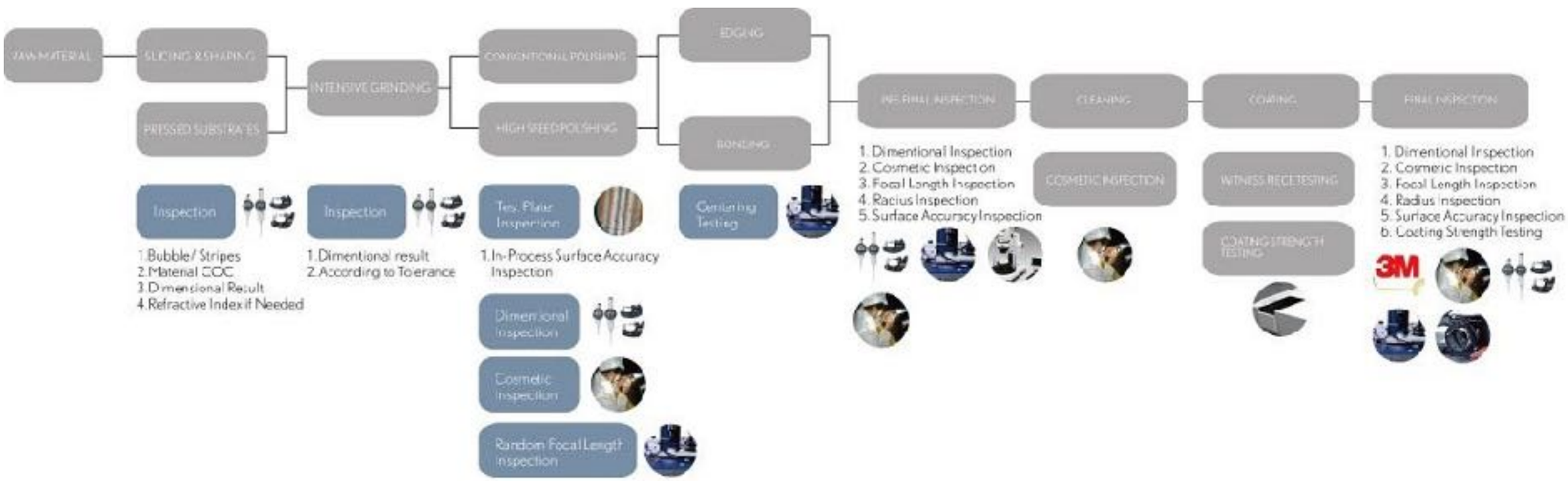
Issued By:

The certificate is valid within the period of validity of various state administrative licensing and qualification licensing
To maintain the validity of the certificate, the certified organization must accept and pass the regular surveillance audit
To check the validity of certificate, please visist our website at www.xjyrz.com or login to CNCA website at www.cnca.gov.cn, or scan QR code

Beijing Xinjiyuan Certification Co.,Ltd.
Address:Room.1201,North Area,11th Floor,Building 122,Nanhu East Garden,
Chaoyang District,Beijing City,China (Post Code:100102)

ISO:9001:2015 CERTIFIED

QUALITY ASSURANCE IS OUR COMMITMENT



HYPERION OPTICS

APPENDIX

APPENDIX A-1

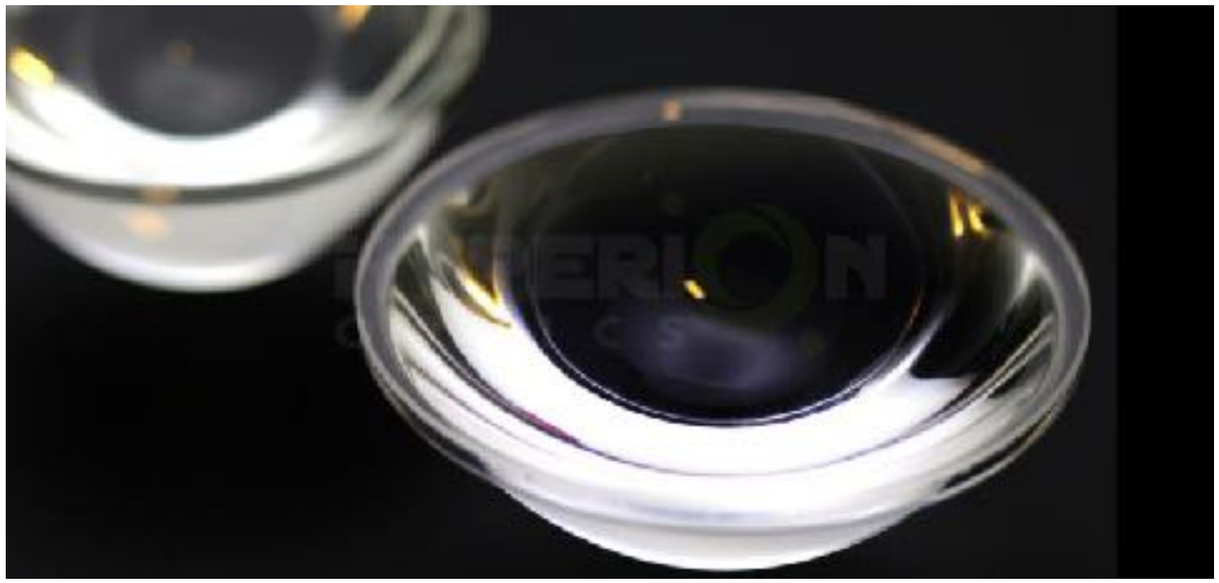
MANUFACTURING TOLERANCES FOR SPHERICAL LENSES

	COMMERCIAL GRADE	FACTORY STANDARD	PRECISION GRADE
Diameter Tolerance(mm)	±0.05	±0.03	±0.0125
Center Thickness(mm)	±0.01	±0.03	±0.025
Radius (%)	±1%	±0.5%	±0.3%
Focal Length Tolerance (%)	±3%	±1%	±0.5%
Cosmetic(MIL-C-13830A)	100-80	40-20	10-5
Figure Tolerance in λ(Pow/irreg)	3 - 1	2 - 1/4	1 - 1/10
Centration (Arc min)	6	<3	<1
Dia. To Thick Ratio	9~50:1		
Coating (T% avg)	96-98%	99%	99.5%
Materials			

HYPERION OPTICS

APPENDIX A-2

MANUFACTURING TOLERANCES FOR ASPHERICAL LENSES



Manufacturing Limits for Aspheric Surfaces Based on Form Error Tolerance		
Form Error > 2µm Lower Resolution Profilometry (2-D)1		
Attribute	Minimum	Maximum
Diameter (mm)	3	250
Local Radius (mm)	-8 (Concave)	∞
Sag (mm)	0	502
Departure (mm)	0.01	20
Included Angle (°)	0	120
Form Error 0.5 – 2µm Higher Resolution Profilometry (2-D)1		
Attribute	Minimum	Maximum
Diameter (mm)3	3	250
Local Radius (mm)	-12 (Concave)	∞
Sag (mm)	0	252
Departure (mm)	0.01	20
Included Angle (°)	0	150
Form Error < 0.5µm Interferometry with Stitching (3-D)		
Attribute	Minimum	Maximum
Diameter (mm)3	3	250
Local Radius (mm)	-13 (Concave)	∞
Sag (mm)	0	252,4
Departure (mm)	0.002	1
Included Angle (°)	0	120+5

APPENDIX A-3

MANUFACTURING TOLERANCES FOR ACYLINDRICAL LENSES

AchromaticCylindrical Lenses	COMMERCIAL GRADE	FACTORY STANDARD	PRECISION GRADE
Size Tolerance Length/Width(mm)	+0/-0.30	+0/-0.25	+0/-0.25
Diameter (mm)	+0/-0.15	+0/-0.10	±0.025
Wedge (along axis)	5 mrad	3 mrad	1 mrad
Focal Length Tolerance (%)	±2%	±2%	±1%
Cosmetic(MIL-C-13830A)	80-50	60-40	10-5
Irregularity (Lambda @ 632.8nm)	1 L	1/2 L	1/10 L
Centration (Arc min)	<5'	<3'	<1'
Coating (T% avg)	99%	99.5%	99.5%
Materials	Optical Glasses Depends On Design		

HYPERION OPTICS

THANK YOU!

We Look Forward To Becoming Your Trusted Partner In Your Optics Procurement Process

HYPERION OPTICS