

IMAGING OPTICS

CUSTOMIZED - PORTFOLIO - SPECIAL LENSES

2024





CUSTOMIZED IMAGING LENSES

BENEFIT FROM OUR EXPERTISE

Sill Optics has been a trusted partner for customized imaging lens solutions for many years. We specialize in various areas of application and offer a wide range of design types. With our extensive experience, we have successfully completed numerous projects involving customized optical designs and unique mechanical layouts.

The key to our success lies in the close cooperation between our different internal departments, our vast manufacturing capabilities, and our commitment to high-quality production. These factors enable us to build your prototype in the shortest possible time.

In recent years, we have focused on developing nearly 80% of our imaging lens orders as individual development projects. We actively participate in public research projects and respond to specific inquiries from our customers. Our expertise has been particularly applied in high-precision measurement applications for mechanical engineering, as well as in biomedical applications and material processing.

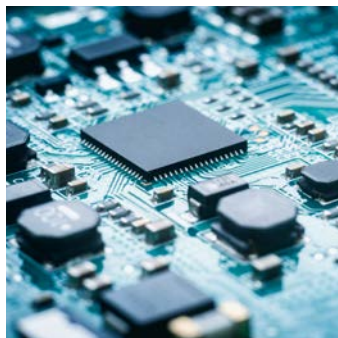
We take pride in our ability to deliver tailored solutions to meet your specific requirements. By choosing Sill Optics, you benefit from our experience, expertise, and dedication to providing top-notch imaging lens solutions.



MACHINE VISION



**BIOMEDICAL
IMAGING**



**SEMICONDUCTOR
INSPECTION**



**OPTICAL
METROLOGY**

CUSTOMIZED IMAGING LENSES

BENEFIT FROM OUR EXPERTISE



YOUR BENEFITS FROM SILL OPTICS DEVELOPMENT

WHY SILL OPTICS?

- Development of specification sheets closely aligned with design and production capabilities
- Direct contact with optical designers and project managers
- Short distances between design, development, and production
- Quick turnaround for prototypes
- High quality in series production
- Customized quality assurance based on individual needs

WHICH SPECIFICATIONS?

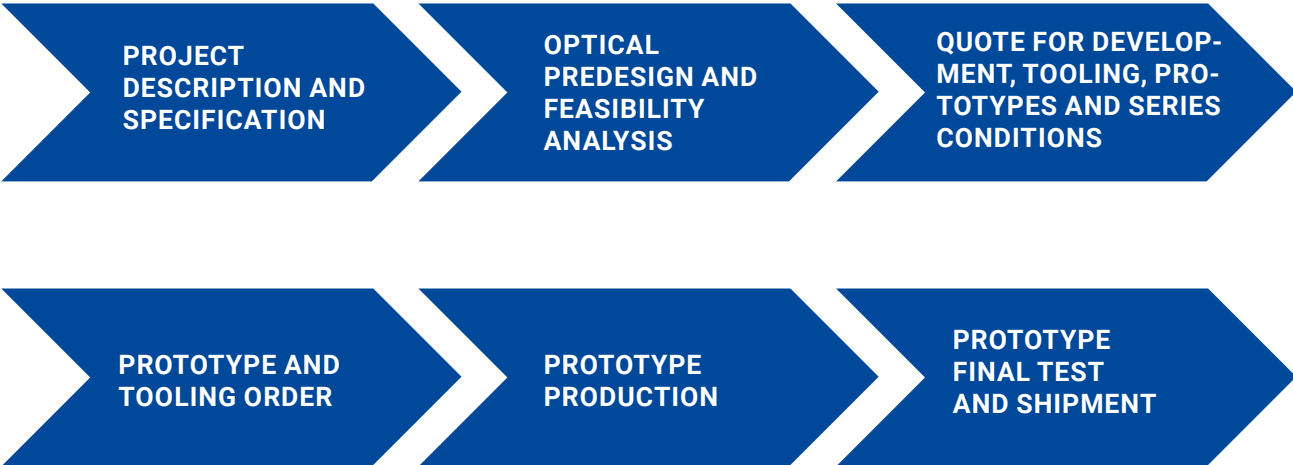
- Aperture
- Field size (FOV, sensor size)
- Waveband (UV, VIS, IR, bandwidth)
- Space constraints (total track, working distance, maximum length, maximum diameter, mounting)
- Camera specifications (sensor dimensions, pixel size, resolution, camera thread, back flange distance, maximum chief ray angle, color)
- Performance requirements (Strehl ratio, MTF, edge spread function, distortion, color correction)

WHEN STARTING A PROJECT?

A typical starting point for a customized design, considering the overall benefit in terms of the price-performance ratio, is around 50-100 lenses per year. Sill Optics' production capacity is well-suited for up to 500 pieces per year.

However, the ideal number of lenses will vary depending on the size, number of elements, and complexity of the system. For highly complex designs with large elements, special glass types, high alignment demands and end test requirements, even as few as 5 pieces can be beneficial. Other designs may start with quantities of 20 or 50 pieces.

WORKFLOW THROUGH OUR CUSTOM DESIGN PROCESS



LENS DESIGNS – TELECENTRIC LENSES

OBJECT-SIDED TELECENTRIC LENS

Object-sided telecentric lenses offer the highest measurement precision because the chief rays in the object space are parallel, and there is no magnification change with variations in working distance within the depth of field.

In addition to our portfolio of telecentric lenses, Sill Optics has successfully developed numerous customized telecentric designs for series production.

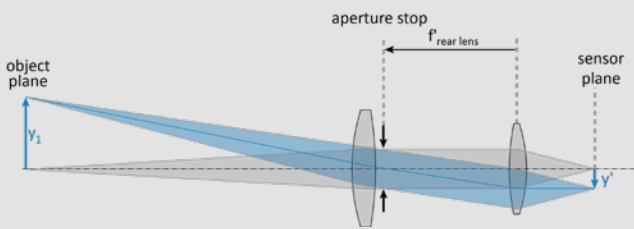
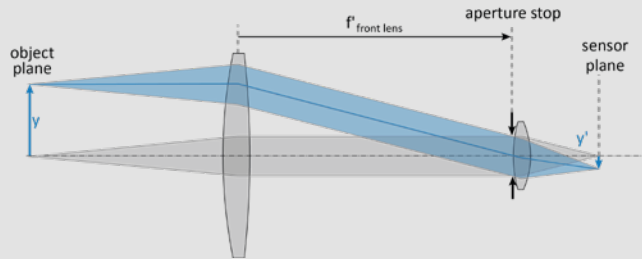


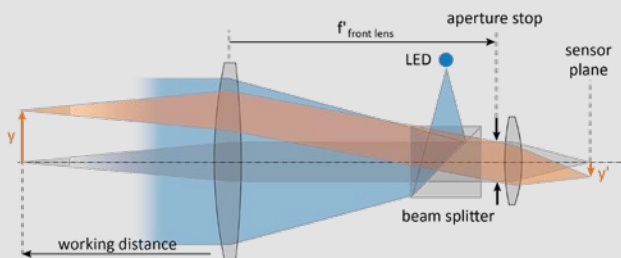
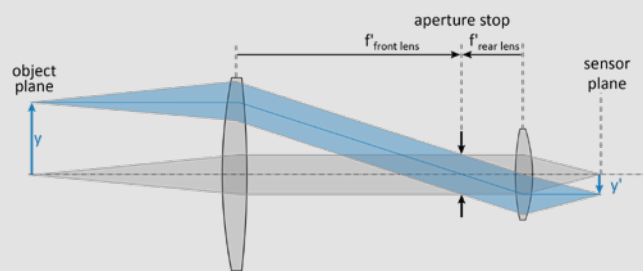
IMAGE-SIDED TELECENTRIC LENS

Image-sided telecentric lenses are essential for various specialized imaging purposes or specific camera types. These lenses are specifically designed for applications where intermediate images are required for follow-up systems (e.g., spectrometers) or for prism-based three-chip sensors.

In many applications with CMOS sensors, a small angle of incidence at the sensor side is adequate for optimal performance.

BI-TELECENTRIC LENS

Bi-telecentric lenses integrate both object-sided and image-sided telecentric beam paths into a single lens. These lenses offer significant advantages for high-spec imaging applications and provide minimal distortion.



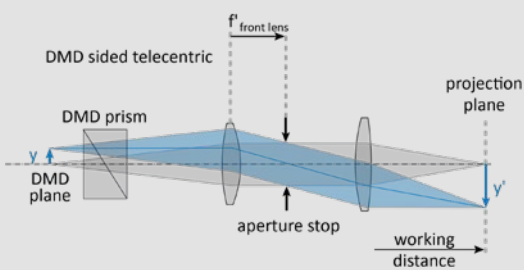
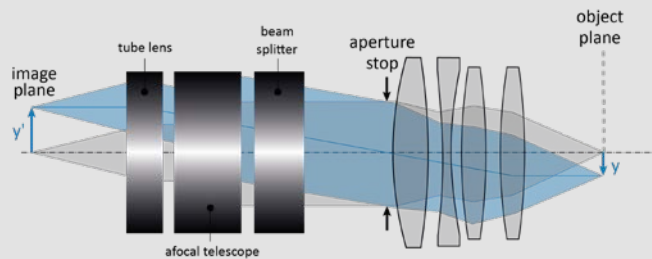
TELECENTRIC LENS WITH INTEGRATED COAXIAL ILLUMINATION

Telecentric lenses with integrated coaxial illumination offer a unique combination of telecentric imaging and coaxial collimated front illumination. This design incorporates a beam splitter to introduce the illumination path, while the front part of the telecentric lens collimates the light.

LENS DESIGNS – TELECENTRIC LENSES

MICROSCOPE LENSES

Please note that Sill Optics does not offer standard microscope lenses with very small working distances and high magnification. Our expertise lies in providing solutions for applications that require a large field of view (FOV), large working distance, or non-typical bandwidth where standard options are not suitable. We are your trusted partner in finding customized solutions to meet your specific requirements.



DMD LENSES

DMD lenses are specifically designed for the projection of a digital micromirror device. These lenses feature a telecentric design on the DMD side. When working with DMDs, it is essential to consider the prism material and internal distances to prevent axial color shift.

At Sill Optics, we are your trusted partner, especially when it comes to lenses for DMD manufacturing and precision measurement pattern projection. Our expertise in this area ensures that we can provide you with the optimal lens solutions tailored to your specific needs.

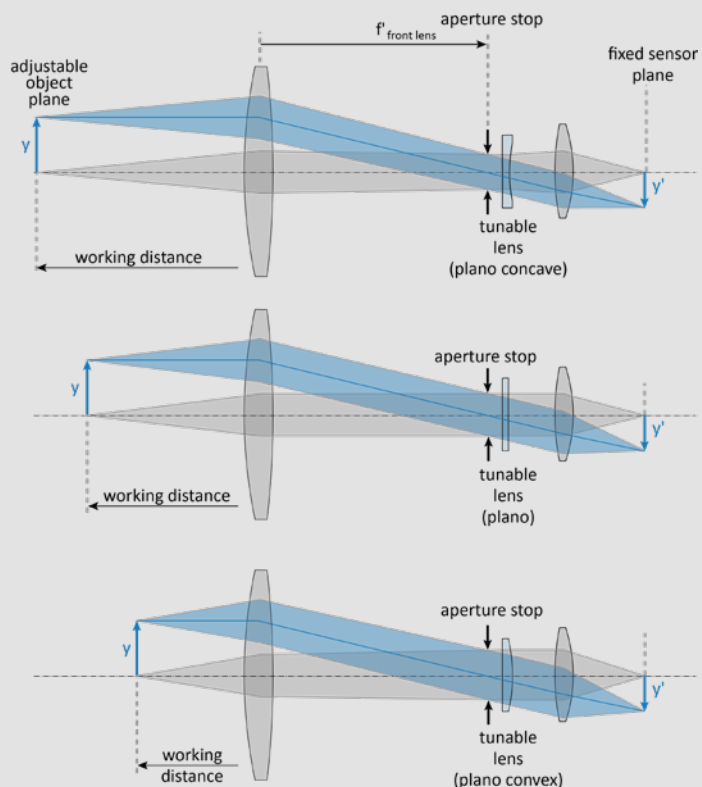
TELECENTRIC LENSES WITH INTEGRATED TUNABLE LIQUID LENS

Telecentric lenses with integrated tunable liquid lenses provide the capability for fast focus changes without the need for moving elements. While Sill Optics offers a range of telecentric lenses in our portfolio, our true strength lies in designing custom lenses with integrated liquid lenses.

In our projects, we typically incorporate liquid lenses from Optotune, as we have had positive experiences with their reliable products.

However, it is worth noting that we can also develop entocentric designs with integrated lenses if needed.

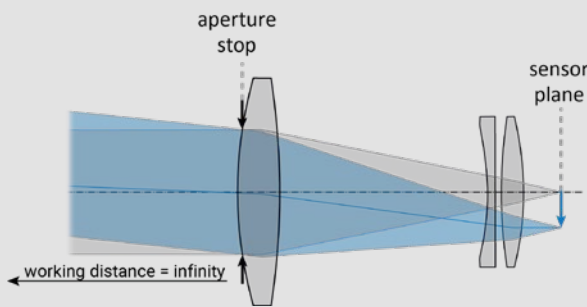
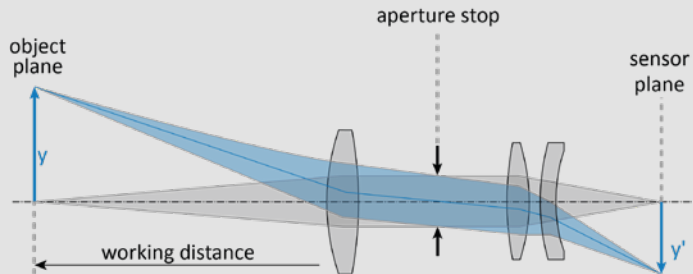
Count on Sill Optics to deliver the precise lens solution with integrated tunable liquid lenses that meets your specific requirements.



LENS DESIGNS - ENTOCENTRIC LENSES

LARGE FIELD ENTOCENTRIC LENS

Sill Optics defines "large field" as referring to lenses designed for use with sensors of a large diagonal size. When dealing with line scan cameras or large format area sensors with a length or diagonal size exceeding 43.3mm (full format), the complexity of entocentric lens design increases. These scenarios create a demand for custom development, particularly when high aperture, high resolution, and/or large bandwidth are required.



TELEPHOTO LENS

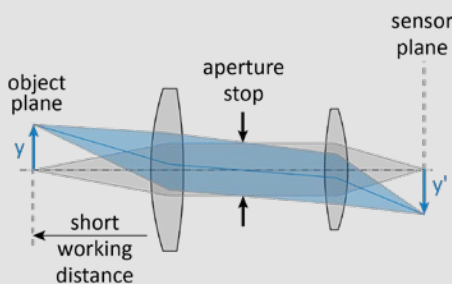
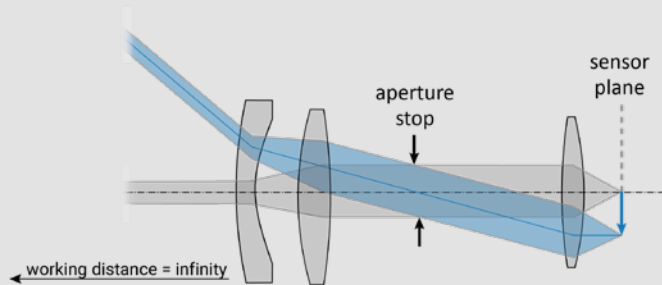
Telephoto lenses are characterized by their long focal length, which is typically greater than their physical length. These lenses are designed to capture images of distant objects with a specific magnification factor.

In telephoto lenses, the aperture stop is typically positioned at the front surface of the lens. When a larger aperture is desired, a correspondingly large front lens element is necessary to accommodate it.

WIDE-ANGLE LENS

Wide-angle lenses are commonly used for observation applications or imaging tasks that require capturing a large field of view at significant distances.

These lenses can be designed in two main configurations: fisheye lenses, which feature concave lens elements at the front, as shown; or pinhole lenses, where the aperture is positioned outside the lens assembly.



MACRO LENS

Macro lenses are entocentric lenses designed for capturing close-up shots with magnifications ranging from approximately 0.5x to 1.5x. These lenses feature a small optical transfer length and typically have a large aperture.

Due to the short transfer length, macro lenses require a short focal length and must be carefully designed to fit within the available space without compromising performance.

CUSTOMIZED IMAGING LENSES

BENEFIT FROM OUR EXPERTISE

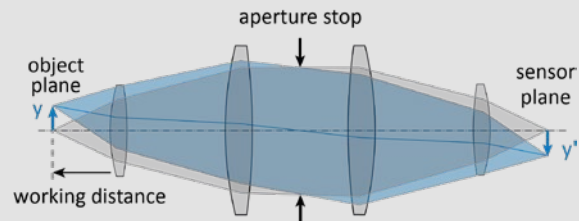


LENS DESIGNS - ENTOCENTRIC LENSES

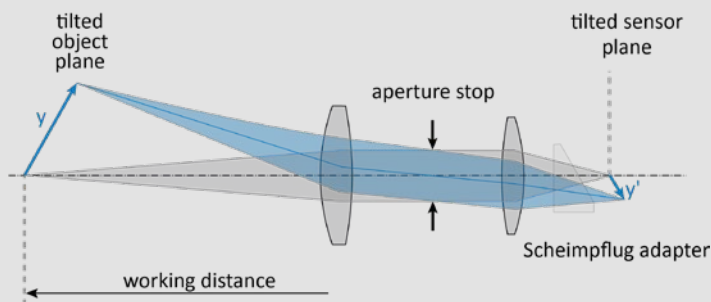
RELAY LENS

Relay lenses are integral components of optical systems used to transfer an intermediate image plane to the pupil plane (Fourier plane) and/or back to a final image plane. They play a crucial role in various applications, such as refractive spectrometers.

Relay systems can be designed in a symmetric configuration, where the magnification is 1:1, or in an asymmetric configuration with a magnification ratio of 1:X. The choice of configuration depends on the specific requirements of the optical system.



Furthermore, relay lenses can also be utilized for pupil relays in specialized scanning setups. These setups allow for precise scanning and control of the beam path.



SCHEIMPFLUG LENS FOR TILTED OBJECT PLANE

Scheimpflug lenses are designed to image a tilted object plane onto a tilted image plane while minimizing critical blur. This allows for capturing accurate measurements even when dealing with non-planar objects. The distortion can also be optimized for specific measurement purposes.

To accommodate standard imaging cameras, a tilting adapter can be used to meet the imaging performance requirements. This adapter ensures that the Scheimpflug imaging setup is compatible with the camera system being used.





PORTFOLIO IMAGING LENSES

BENEFIT FROM OUR 40 YEARS OF EXPERIENCE



OUR HIGHLIGHTS 2024

Sill Optics has developed magnifying telecentric lenses with a large aperture designed for a $2.74 \mu\text{m}$ pixel size and a 1.2" sensor diagonal, covering various wavebands. These lenses offer fixed magnifications of 1.5x (S5LPJ6415), 2.0x (S5LPJ6420), 2.5x (S5LPJ6425), and 3.0x (S5LPJ6430), which were launched in 2021.

The addition of a focus tunable liquid lens while maintaining imaging performance posed a challenge. However, through collaboration between Sill Optics and Optotune, it has been achieved with remarkable results. The lenses utilize the EL16-40 liquid lens with the best wavefront specification in vertical alignment, allowing for 90 lp/mm resolution across the entire field of view. These lenses, equipped with automatic

focus adjustment (tuning range of $\pm 3 \text{ mm}$), are now available in 1.5x (S5VPJ6415), 2.0x (S5VPJ6420), and 2.5x (S5VPJ6425) configurations.

The performance of these lenses is outstanding for telecentric applications and supports sensors with up to 25 megapixels. This product represents a significant advancement in the fields of semiconductor inspection and precision metrology, enabling new milestones to be reached.

Experience the cutting-edge capabilities of these telecentric lenses and unlock new possibilities in semiconductor inspection and precision metrology. Contact Sill Optics today to explore how these lenses can elevate your applications to the next level.



Sill Optics is meeting the growing demand for C-mount lenses designed for large sensors by introducing a new series of telecentric lenses. This series comprises three lenses with magnifications of 0.6x (S5LPJ6406), 0.7x (S5LPJ6407), and 0.8x (S5LPJ6408), specifically optimized for sensors up to 22 mm diagonal. These lenses are an ideal match for the current Sony Pregius S series sensors, featuring a pixel size of $2.74 \mu\text{m}$, thanks to their high resolution.

The lenses can be utilized with monochromatic or white light setups, and they can also be adjusted slightly to accommodate Near-Infrared (NIR) applications by modifying the working distance. This versatility enables their use in various imaging scenarios.

By adding this lens series to our portfolio, we have successfully addressed the gap and now offer high-resolution telecentric lenses with magnifications ranging from 0.13x to 3.0x for 1.25" sensors. At Sill Optics, we prioritize the highest sensor resolution and telecentric lens designs in our standard lens portfolio, taking another step towards meeting future requirements.

Discover the possibilities of our new telecentric lens series, which provides outstanding resolution and performance. Contact Sill Optics today to explore how these lenses can enhance your imaging applications.





PORTFOLIO IMAGING LENSES

BENEFIT FROM OUR 40 YEARS OF EXPERIENCE

For nearly 40 years, Sill Optics has been manufacturing **high-end telecentric imaging lenses**. These lenses are specifically designed for measurement applications in industrial machine vision, aiming to eliminate magnification changes and measurement deviations caused by depth of field or defocus.

With the increasing data rates and sensor sizes, there is a clear trend towards larger sensor diagonals and smaller pixel sizes. As a result, our lens portfolio focuses on lenses optimized for small pixel sizes, supporting sensors up to 1.5" (with a sensor diagonal of 24.0 mm).

Benefit from our extensive experience and expertise in telecentric imaging lenses. Contact Sill Optics today to discuss your specific requirements and discover the right lens solution for your measurement applications.

PART NUMBER	MAGNIFICATION	RECOMMENDED SENSOR DIAGONAL [mm]	WORKING DISTANCE [mm]	WAVELENGTH BAND MONO (RED, GREEN, BLUE) WHITE (COLOR/BAYER) NIR (800-900 nm)	RECOMMENDED PIXEL SIZE [µm]	THREAD	PART NUMBER FOR VERSION WITH INTEGR. COAXIAL ILLUMINATION
LENSES FOR 1/3" AND 1/2" SENSORS							
S5LPJ1823	0.044	6.0	300.0	R,G,B,NIR	2.20	C	S5LPL1823-LED
S5LPJ1514	0.054	6.0	284.0	R,G,B	2.20	C	S5LPL1514-LED
S5LPJ1824	0.056	8.0	300.0	R,G,B	2.20	C	S5LPL1824-LED
S5LPJ1522	0.068	8.0	284.0	R,G,B	2.20	C	S5LPL1522-LED
S5LPJ1722	0.068	8.0	284.0	R,G,B,W,NIR	2.00	C	-
S5LPJ6014	0.079	6.0	180.0	R,G,B	2.00	C	S5LPL6014-LED
S5LPJ1523	0.082	8.0	284.0	R,G,B	3.45	C	S5LPL1523-LED
S5LPJ6022	0.100	8.0	180.0	R,G,B	2.20	C	S5LPL6022-LED
S5LPJ6122	0.100	8.0	180.0	R,G,B,W,NIR	2.00	C	-
S5LPJ1224	0.110	6.0	190.0	R,G,B,W,NIR	2.20	C	S5LPL1224-LED
S5LPJ1201	0.132	6.0	190.0	R,G,B,W	2.20	C	S5LPL1201-LED
S5LPJ1223	0.158	8.0	190.0	R,G,B,NIR	2.00	C	S5LPL1223-LED
S5LPJ4425	1.000	8.0	107.5	R,G,B	3.45	C	-
LENSES FOR 1/1.8" AND 2/3" SENSORS							
S5LPJ1832	0.065	8.9	300.0	R,G,B,NIR	2.00	C	S5LPL1832-LED
S5LPJ1533	0.098	11.0	284.0	R,G,B	2.00	C	S5LPL1533-LED
S5LPJ1733	0.098	11.0	284.0	R,G,B,W,NIR	2.00	C	-
S5LPJ6024	0.121	8.9	180.0	R,G,B	2.20	C	S5LPL6024-LED
S5LPJ6033	0.145	11.0	180.0	R,G,B	2.50	C	S5LPL6033-LED
S5LPJ6133	0.145	11.0	180.0	R,G,B,W,NIR	2.50	C	-
S5LPJ5015	0.160	8.9	88.0	R,G,B	2.80	C	S5LPL5015-LED
S5LPJ1299	0.200	11.0	92.0	R,G,B,NIR	2.80	C	S5LPL1299-LED
S5LPJ2298	0.244	11.0	92.0	R,G,B,W	4.60	C	S5LPL2298-LED
S5LPJ1252	0.265	11.0	190.0	R,G,B,W	2.50	C	S5LPL1252-LED
S5LPJ2893	0.292	11.0	92.0	R,G,B,W,NIR	2.50	C	S5LPL2893-LED

In case of deviations from the portfolio and delivery times, please contact our Customer Care Team.

PORTFOLIO IMAGING LENSES

BENEFIT FROM OUR 40 YEARS OF EXPERIENCE



PART NUMBER	MAGNIFICATION	RECOMMENDED SENSOR DIAGONAL [mm]	WORKING DISTANCE [mm] (TR= TUNING RANGE)	WAVELENGTH BAND MONO (RED, GREEN, BLUE) WHITE (COLOR/ BAYER) NIR (800-900 nm)	RECOMMENDED PIXEL SIZE [µm]	THREAD	PART NUMBER FOR VERSION WITH INTEGR. COAXIAL ILLUMINATION
LENSES FOR 1" AND 1.1" SENSORS							
S5LPJ1852	0.112	16.0	300.0	R,G,B	2.20	C	S5LPL1852-LED
S5LPJ1860	0.134	17.6	300.0	R,G,B	3.45	C	S5LPL1860-LED
S5LPJ1551	0.165	16.0	284.0	R,G,B	3.45	C	S5LPL1551-LED
S5LPJ1750	0.165	17.6	284.0	R,G,B,W,NIR	3.45	C	-
S5LPJ1565	0.195	16.0	284.0	R,G,B	4.20	C	S5LPL1565-LED
S5LPJ6050	0.246	16.0	180.0	R,G,B	3.45	C	S5LPL6050-LED
S5LPJ6150	0.246	17.6	180.0	R,G,B,W,NIR	3.45	C	-
S5LPJ6060	0.292	16.0	180.0	R,G,B	3.45	C	S5LPL6060-LED
S5LPJ1260	0.313	16.0	190.0	R,G,B	4.60	C	S5LPL1260-LED
S5LPJ2499	0.492	17.6	92.0	R,G,B,W,NIR	3.45	C	S5LPL2499-LED
S5LPJ2898	0.581	17.6	92.0	R,G,B,W,NIR	4.60	C	S5LPL2898-LED
S5LPJ4061-216	0.600	16.0	121.0	R,G,B,W	3.45	C	-
S5LPJ3208	0.770	16.0	119.5	R,G,B,W	3.45	C	-
LENSES FOR 1.2" AND 1.5" SENSORS							
S5LPJ1862	0.130	19.2	300.0	R,G,B,W,NIR	2.74	C	-
S5LPJ1762	0.200	19.2	284.0	R,G,B,W,NIR	2.74	C	-
S5LPJ1762-M42	0.200	24.0	284.0	R,G,B,W,NIR	2.74	M42	-
S5LPJ6162	0.300	19.2	180.0	R,G,B,W,NIR	2.74	C	-
S5LPJ6162-M42	0.300	24.0	180.0	R,G,B,W,NIR	2.74	M42	-
S5LPJ6406	0.600	22.0	155.0	R,G,B,W,NIR	2.74	C	-
S5LPJ6407	0.700	22.0	140.0	R,G,B,W,NIR	2.74	C	-
S5LPJ6408	0.800	22.0	131.0	R,G,B,W,NIR	2.74	C	-
S5LPJ7201	1.000	21.4	81.0	R,G,B,W,NIR	2.74	C	-
S5LPJ7201-M42	1.000	32.6	81.0	R,G,B,W,NIR	2.74	M42	-
S5LPJ6415	1.500	21.4	80.2	R,G,B,W	2.40	C	-
S5LPJ6420	2.000	21.4	68.1	R,G,B,W	2.74	C	-
S5LPJ6425	2.500	19.2	61.4	R,G,B,W	3.10	C	-
S5LPJ6430	3.000	19.2	57.0	R,G,B,W	3.45	C	-
LENSES WITH FOCUS TUNABLE OPTOTUNE LENS FOR 1" AND 1.1" SENSORS							
S5VPJ1565	0.193	16.0	284.0 TR≈140	R,G,B	2.74	C	-
S5VPJ6060	0.289	16.0	180.0 TR≈65	R,G,B	2.74	C	S5VPL6060-LED
S5VPJ1260	0.311	16.0	190.0 TR≈55	R,G,B	3.10	C	-
S5VPJ2898	0.578	16.0	92.0 TR≈17	R,G,B	3.10	C	S5VPL2898-LED
S5VPJ6415	1.500	19.2	80.2 TR≈6	R,G,B,W	2.74	C	-
S5VPJ6420	2.000	19.2	68.2 TR≈6	R,G,B,W	2.74	C	-
S5VPJ6425	2.500	19.2	61.4 TR≈6	R,G,B,W	3.10	C	-

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In case of deviations from the portfolio and delivery times, please contact our Customer Care Team.

Besides our portfolio telecentric lenses, we also offer a variety of **telecentric and entocentric designs upon request**.

These special lenses are not manufactured regularly. We kindly ask you to send us your inquiry to check availability, lead time and price according your required quantity.

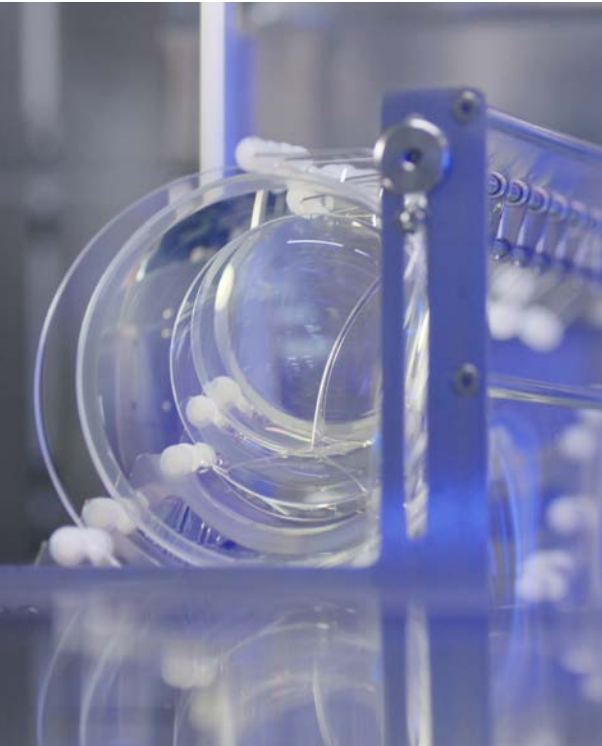
To enable a short lead-time for your test setup, we are going to build up a demo lens stock.

PART NUMBER	MAGNIFICATION	RECOMMENDED SENSOR DIAGONAL [mm]	WORKING DISTANCE [mm]	WAVELENGTH BAND MONO (RED, GREEN, BLUE) WHITE (COLOR/BAYER) NIR (800-900nm) SWIR (900-1700nm)	RECOMMENDED PIXEL SIZE [µm]	THREAD
LENSES FOR APS FORMAT SENSORS						
S5LPJ2606-M42	0.71	32.6	143.0	R,G,B	2.74	M42
S5LPJ7201-M42	1.00	32.6	81.0	R,G,B,W,NIR	2.74	M42
S5LPJ0492-M42	2.00	35.0	96.5	R,G,B,W	4.60	M42
LENSES FOR FULL FORMAT AND LARGER SENSORS						
S5LPJ3025-M58	0.25	43.3	310.0	R,G,B,W	3.45	M58
S5LPJ3005-M72	0.33	60.0	310.0	R,G,B	3.45	M72
S5LPJ1556-M58	0.46	43.3	332.3	R,G,B,W,NIR	3.30	M58
S5LPJ7207-M72	0.66	43.3	180.0	R,G,B	5.50	M72
S5LPJ7209-M72	0.80	43.3	180.0	R,G,B	4.00	M72
S5LPJ7255-M72	1.00	56.0	120.0	R,G,B	4.60	M72
S5LPJ7211-M90	1.00	70.0	180.0	R,G,B	5.00	M90
S5LPJ7212-M90	1.25	70.0	141.0	R,G,B	4.20	M90
S5LPJ7215-M90	1.51	70.0	111.0	R,G,B	6.00	M90
HIGH-MAGNIFICATION TELECENTRIC LENSES						
S5LPJ2533	3.00	16.0	100.4	R	3.45	C
S5LPJ2555	5.00	16.0	100.5	R	4.50	C
TELECENTRIC SWIR LENSES						
S5LPJ6835	0.33	16.0	147.0	SWIR	10.00	C
S5LPJ6837	0.50	24.0	147.0	SWIR	10.00	M42
ENTOCENTRIC SWIR LENSES						
S5LPJ6805-216	f'=50.0	16.0	400 - inf	SWIR	10.00	C
S5LPJ6807-M42	f'=75.0	25.6	500 - inf	SWIR	10.00	M42
ENTOCENTRIC TELE LENSES FOR LASER PROCESS IMAGING						
S5LPJ0305	f'=150.3	8.0	infinity	R	5.60	C
S5LPJ0303	f'=305.3	11.0	infinity	R	5.00	C
ENTOCENTRIC TELE LENSES FOR LASER PROCESS IMAGING WITH INTEGRATED LIQUID LENS						
S5VPJ0305	f'=150.0	11.0	infinity	R	5.60	C
S5VPJ0303	f'=304.3	11.0	infinity	R	5.00	C

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SPECIAL IMAGING LENSES

BENEFIT FROM OUR CAPABILITIES



Within our telecentric imaging lens portfolio, we have also developed LED condensers that complement our offerings. These condensers serve as collimated backlights for high-precision measurements in machine vision applications. Our main expertise lies in optical subassemblies that ensure the emitted light exhibits high homogeneity and parallelism.

In addition to the condensers available in our portfolio, we can provide other sizes (up to an illumination diameter of Ø150) and offer modifications or custom developments upon request. We are committed to meet your specific requirements and providing tailored solutions for your imaging needs.

PART NUMBER	CLEAR APERTURE/ ILLUMINATION DIAMETER [mm]	FOCAL LENGTH [mm]	LED	WAVELENGTH [nm]	MAX. CURRENT [mA]	CONNECTOR
IR CONDENSER						
S6IRI4530	30.0	30.0	SFH4770S	850	1000	M8 / 4-pin
S6IRI4540	55.0	76.0	SFH4770S	850	1000	M8 / 4-pin
S6IRI4550	73.0	100.0	SFH4770S	850	1000	M8 / 4-pin
RED CONDENSER						
S6IRI4531	30.0	30.0	GR QSSPA1.13	623	1000	M8 / 4-pin
S6IRI4541	55.0	76.0	GR QSSPA1.13	623	1000	M8 / 4-pin
S6IRI4551	73.0	100.0	GR QSSPA1.13	623	1000	M8 / 4-pin
BLUE CONDENSER						
S6IRI4532	30.0	30.0	GB QSSPA1.13	470	1000	M8 / 4-pin
S6IRI4542	55.0	76.0	GB QSSPA1.13	470	1000	M8 / 4-pin
S6IRI4552	73.0	100.0	GB QSSPA1.13	470	1000	M8 / 4-pin
GREEN CONDENSER						
S6IRI4533	30.0	30.0	GT QSSPA1.13	528	1000	M8 / 4-pin
S6IRI4543	55.0	76.0	GT QSSPA1.13	528	1000	M8 / 4-pin
S6IRI4553	73.0	100.0	GT QSSPA1.13	528	1000	M8 / 4-pin

ACCESSORY FOR TELECENTRIC IMAGING LENSES AND LED CONDENSERS

PART NUMBER	DESCRIPTION
LENS MOUNT SET	
S5SET0020	Clamping Ø60/Ø75 for many telecentric lenses
S5SET0022	Clamping Ø47 for all LED condensers
BEAMS SPLITTER CUBES FOR INTEGRATED COAXIAL ILLUMINATION	
S0SET9125-000	Polarized beam splitter (standard condition)
S0SET9125-017	Non-polarized beam splitter
RETARDATION PLATES FOR INTEGRATED COAXIAL ILLUMINATION	
S5SET1150	half wave plate for 630nm, slide-in unit
S5SET8325-040	half wave plate for 630nm, add-on unit
USB DRIVER FOR FOCUS TUNABLE OPTOTUNE LENSES	
S5ZUB1640	Optotune USB Driver EL-E-4i
S5ZUB1641	Hirose 6-pin connection cable for USB Driver EL-E-4i

Other accessory upon request.

In case of deviations from the portfolio and delivery times, please contact our Customer Care Team.

NOTES

FOR YOUR INDIVIDUAL PROJECT



Field size (FOV, sensor size)

Camera specifications

(sensor dimensions, pixel size, resolution, camera thread, back flange distance, maximum chief ray angle, color)

Aperture

Waveband

(UV, VIS, IR, bandwidth)

Space constraints

(total track, working distance, maximum length, maximum diameter, mounting)

Performance requirements

(Strehl ratio, MTF, edge spread function, distortion, color correction)



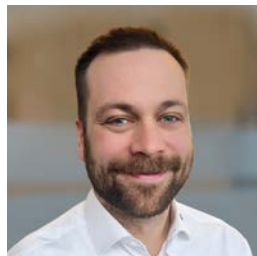
our **VISION** is to be

an innovation leader, developing pioneering application solutions that draw **global attention** in the high-end field of photonics.

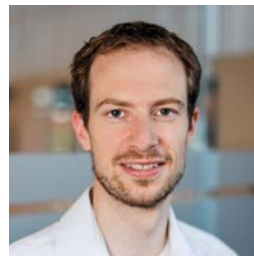
Join us on this exciting journey as we shape the future of photonics together.



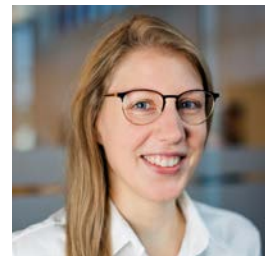
Sabrina Rienesl
Customer Care



Julian Perlitz
Project Management



Andreas Platz
Project Management



Katharina Konerth
Project Management

WWW.SILLOPTICS.DE

www.silloptics.de/en/contact

