Line-Scan Lens

- Introduction
- Measured Data

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Line-Scan Lenses

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Designed best for close-up applications and sensors up to 45mm, creating high-definition images right up to the periphery!

＜Application Examples＞
Web Inspection System
FPD Inspection System

FL-YFL3528 FL-YFL5028

High Resolution Low Distortion	**Suitable for large-scale line sensors such as 7.5K × 4.7μm and 6K × 7μm, creating high-definition and high-contrast images.**
Floating Mechanism	**Captures high-resolution images with lower distortion at any magnification from infinity to 0.5x.**
Industry Standard F-Mount	**Designed with the industry standard F-mount to be used with a variety of cameras.**

High Resolution and Contrast

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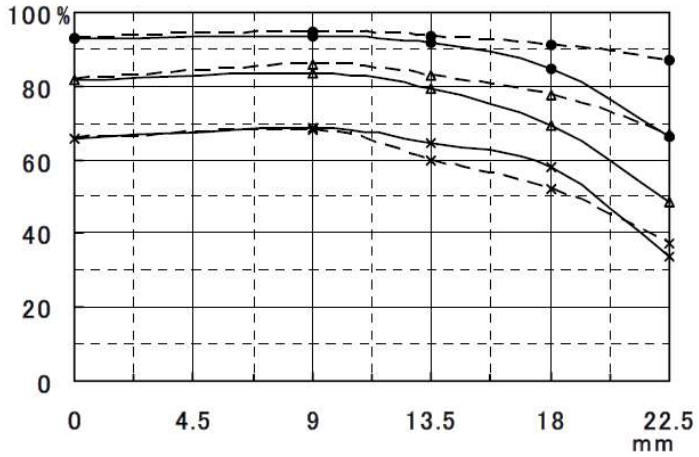
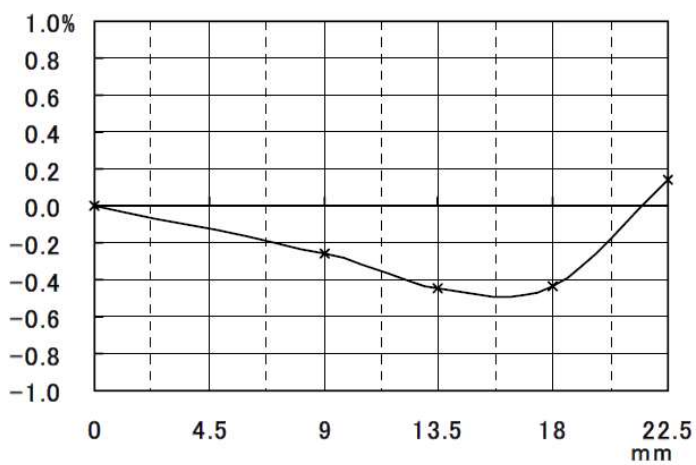
Capable of capturing high-definition images from the center right up to the periphery.

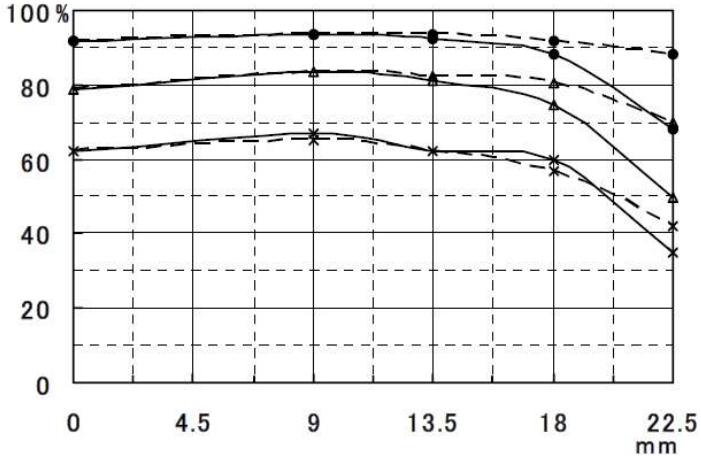
35mm MTF



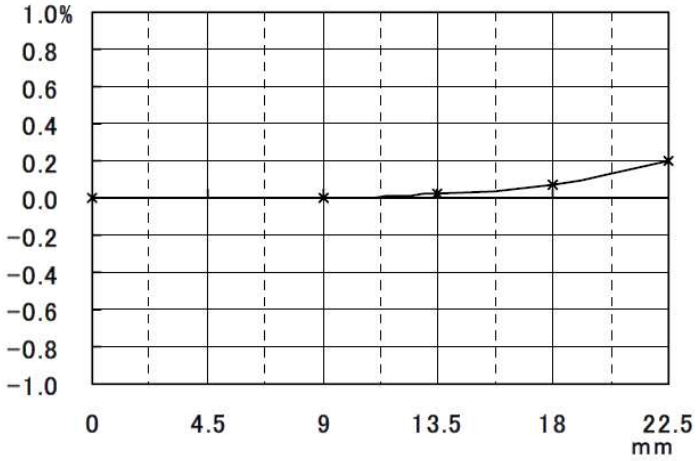
35mm Distortion



50mm MTF



50mm Distortion



※Iris: F2.8, Magnification: 0.2x

Floating Focusing Mechanism

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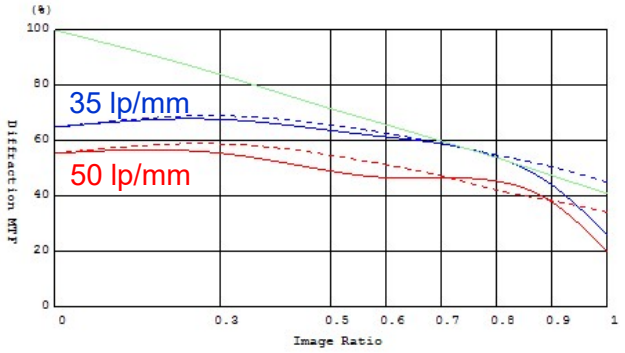
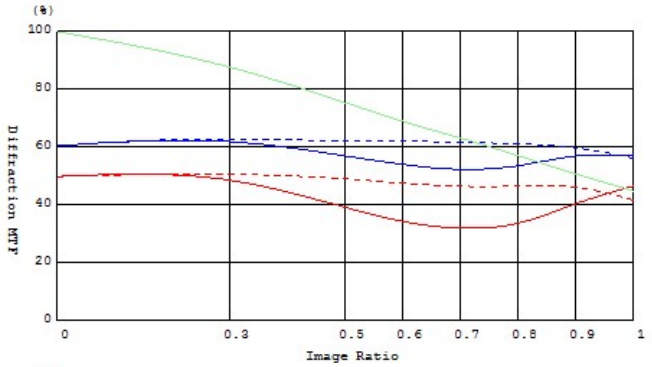
Floating focusing mechanism maintains high resolution images which are unhindered by changes in working distance.

FL-YFL5028　MTF data

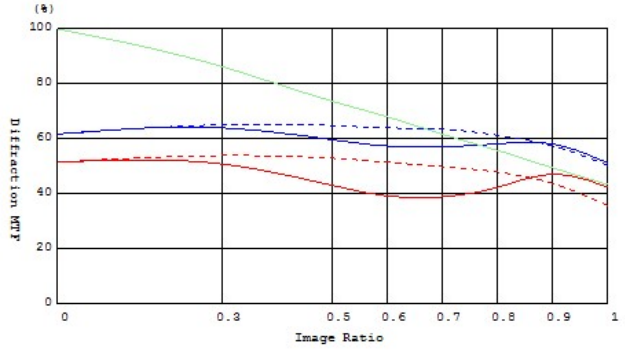
0.14x



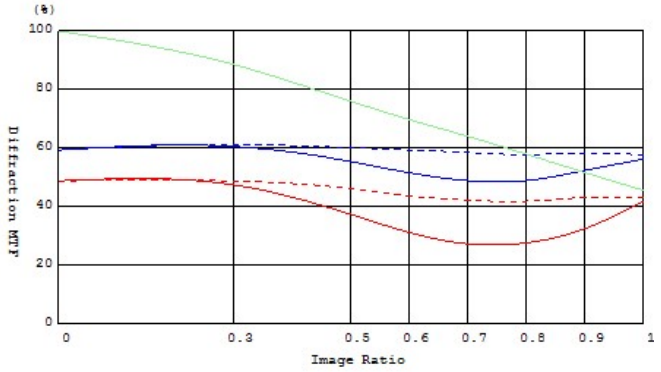
0.35x



0.28x



0.40x



※Iris: F2.8, Image height: 22.5mm

Bright through to the Periphery

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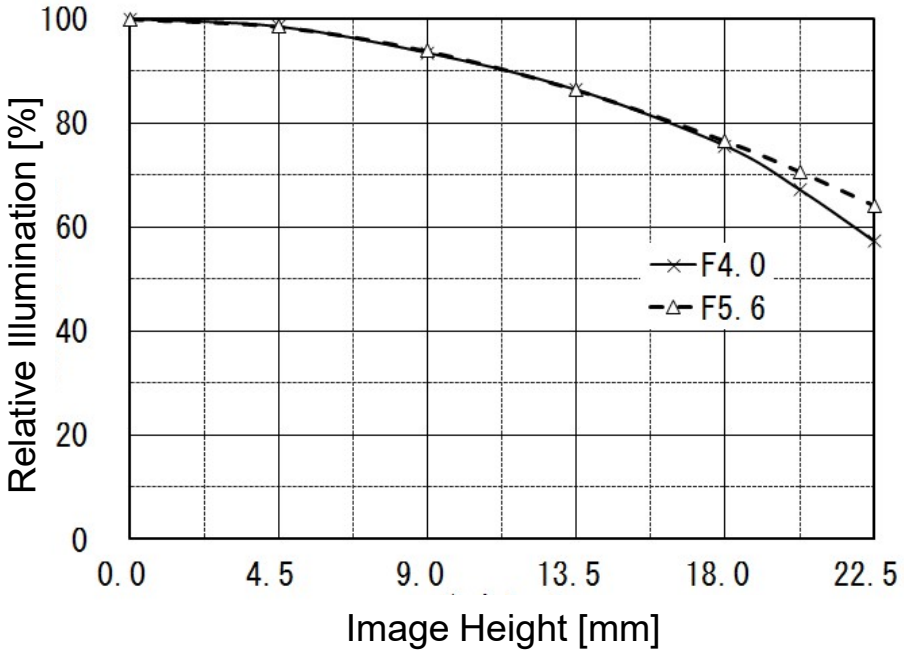
Designed to provide 60% of peripheral relative illumination (quantity of marginal light) and capture bright and clear images from the center to the periphery.

FL-YFL3528 Relative Illumination



*Iris: F5.6
*Magnification: 0.2x

Lens Specifications

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		FL-YFL3528	FL-YFL5028
Sensor Length		45 mm	45 mm
Focal Length		35 mm	50 mm
Max. Aperture		1:2.8	1:2.8
Iris Range		2.8-22	2.8-22
Mount		F	F
Field of View	4,096×7μm	57 mm（Maginification: 0.5x)	57 mm（Magnification: 0.5x)
	7,450×4.7μm	70 mm（Magnification: 0.5x)	70 mm（Magnification: 0.5x)
	4,096×10μm	81 mm（Maginification: 0.5x)	81 mm（Magnification: 0.5x)
Min. Focusing Distance		0.19 m（Magnification: 0.5x)	0.25 m（Maginification: 0.5x)
Back Focal Length		33.22 mm	36.99 mm
Filter Size		62 mm P=0.75 mm	62 mm P=0.75 mm
Dimensions		φ72×56.8 mm	φ72×56.8 mm
Min. & Max. Maginification		∞~0.5x	∞~0.5x
Weight		380 g	370 g
Note		Focus lock screw	Focus lock screw
		Click-stop iris	Click-stop iris
		Not for photographic cameras	Not for photographic cameras

Magnification & Field of View Quick Reference

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FL-YFL3528
f=35mm F2.8

Working Distance (mm)	Optical Magnification
900	0.041
850	0.043
800	0.046
750	0.049
700	0.052
650	0.057
600	0.061
550	0.067
500	0.074
450	0.082
400	0.093
350	0.106
300	0.124
250	0.150
200	0.189
150	0.255
100	0.394

FL-YFL5028
f=50mm F2.8

Working Distance (mm)	Optical Magnification
944	0.058
836	0.066
752	0.074
684	0.082
628	0.089
582	0.097
543	0.105
509	0.112
453	0.127
392	0.150
346	0.172
302	0.201
248	0.251
201	0.322
152	0.455

WD：Between the 1st lens vertex and an object

※Calculated based on design value

Measured MTF of Real Lenses

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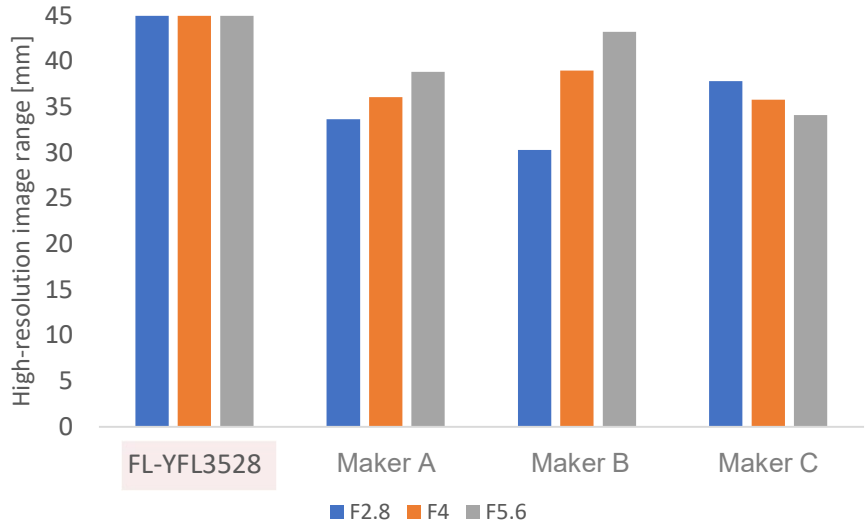
Resulting from MTF measurement of real lenses, only the RICOH lens maintains high resolution through to the periphery at various F-Stops, ensuring accurate inspection of a wide field of view simultaneously.

Application examples: Web inspection and FPD inspection

High-resolution image range



What is the high-resolution image range?

Definition of “High-resolution Image range” is the area where measured MTF value is 20% or higher.
In high-speed inspection of damage, stains, foreign objects by line-scan cameras, it is the key to choose a high-resolution lens that detects those defects without omission.

Magnification: 0.2 x Nyquist frequency: 40lp/mm
Sensor length: 45mm
***Following Japan Industrial Imaging Association (JIIA) Technical Report, defined high-resolution image range is MTF 20% or higher.**

Measured MTF of Real Lenses

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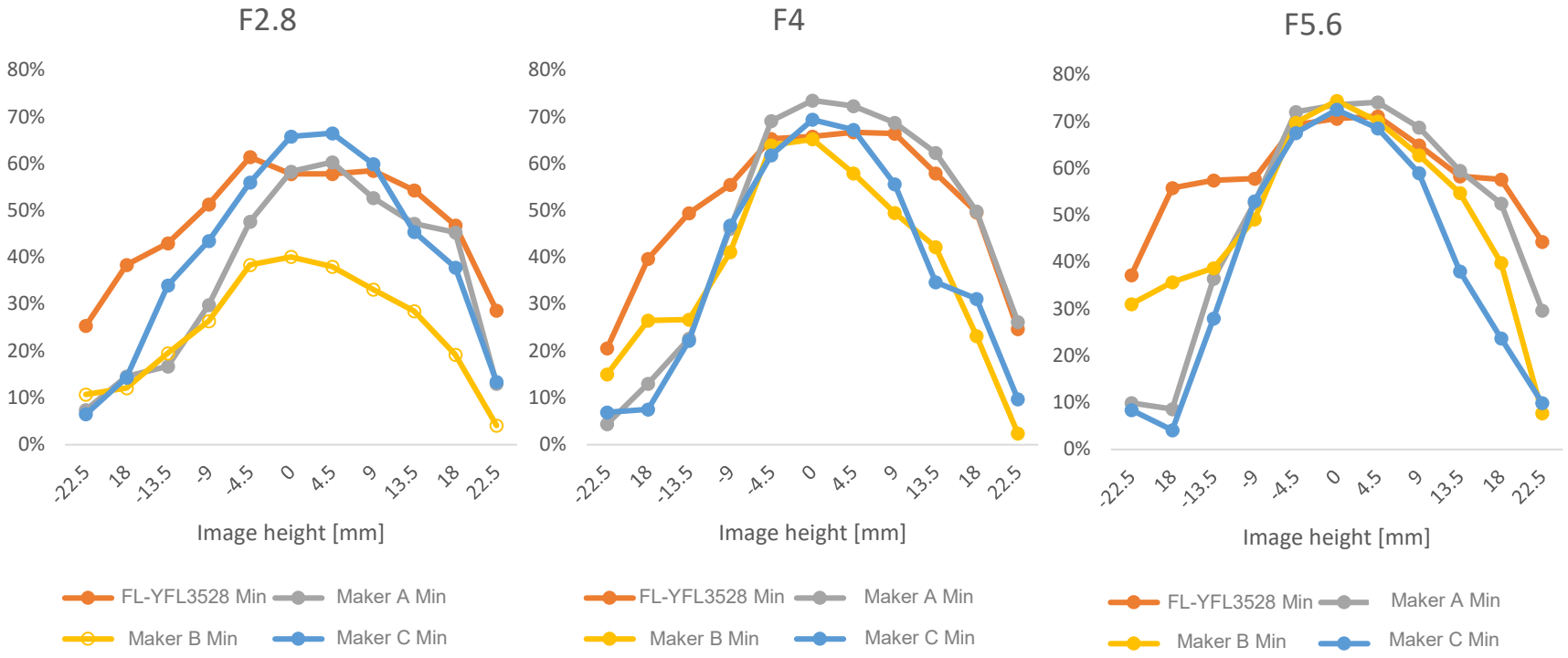
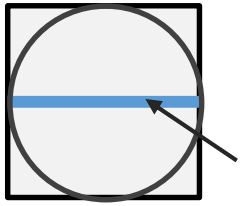
The graphs are created with the lowest measured MTF values.



＜Illustration of measurement＞



Magnification: 0.2 x Nyquist frequency: 40lp/mm

Sensor length: 45mm

***Following Japan Industrial Imaging Association (JIIA) Technical Report, defined high-resolution image range is MTF 20% or higher.**

Relative Illumination of Real Lenses

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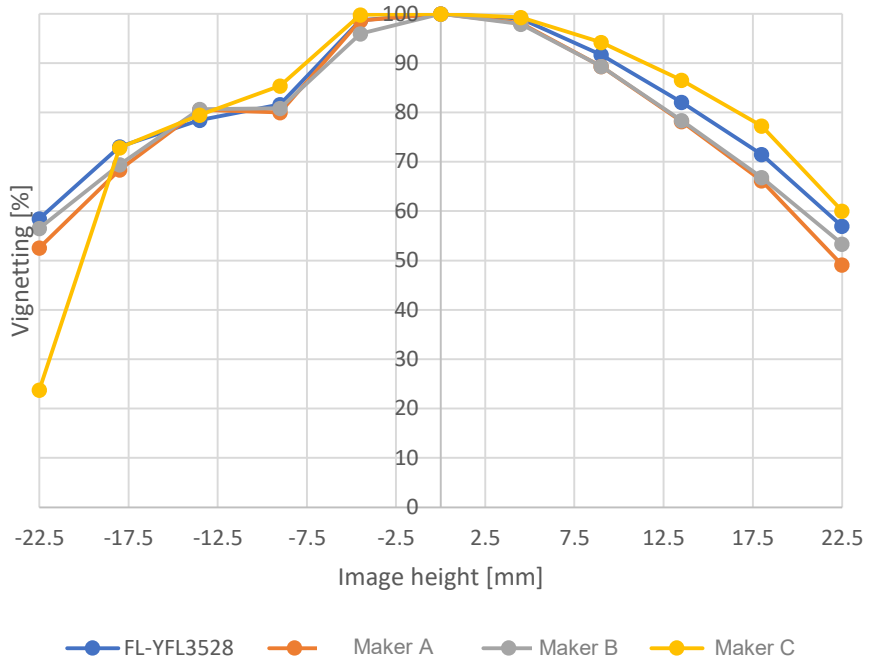
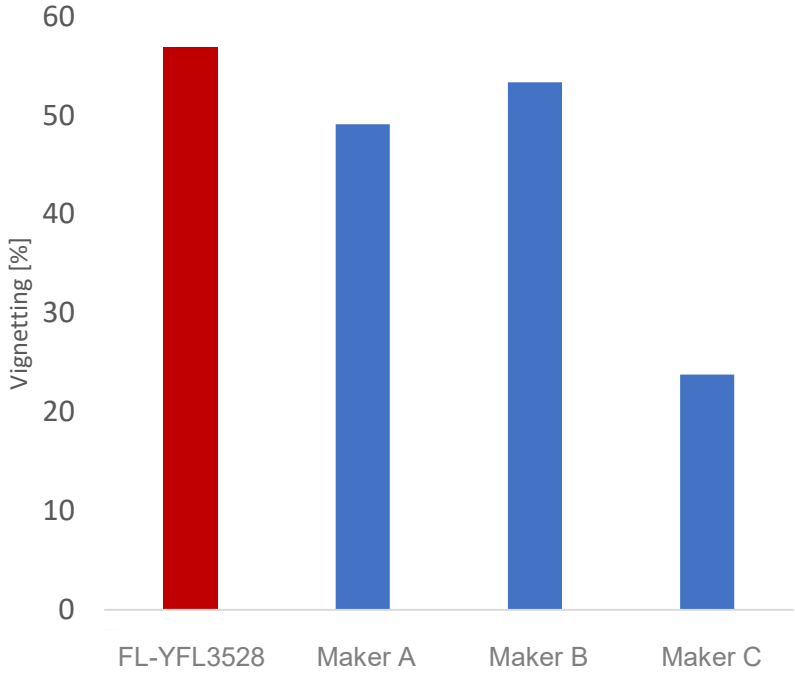
At the most popular and practical F stop of F5.6, RICOH line-scan lens maintains high relative illumination, delivering a high quantity of light, right through to the peripheries capturing uniform and high-quality images.

Relative Illumination



Quantity of Marginal Light



Iris: F5.6
Magnification: 0.2 x
Sensor length: 45mm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