Xenon-Sapphire 3.5/96

This highspeed lens is optimized for 16k with 3.5 µm (57.3 mm) or 12k / 5µm (62.5 mm) line scan sensors or can also be used with area scan cameras. The lens provides high performance at 100 LP/mm and detects the smallest targets to solve the most challenging applications. The V-Mount interface makes it easy to install numerous mounts and allows to rotate the lens into the highest performance.

Key features

- For 16k / 3.5 µm (57.3 mm) or 12k / 5 µm (62.5 mm) line scan sensors
- Best azimuth marking
- 400 nm to 1000 nm broadband AR-coating
- Lockable distance and aperture settings

Applications

- FPD inspection
- PCB inspection
- High resolution defect detection
- Quality assurance systems

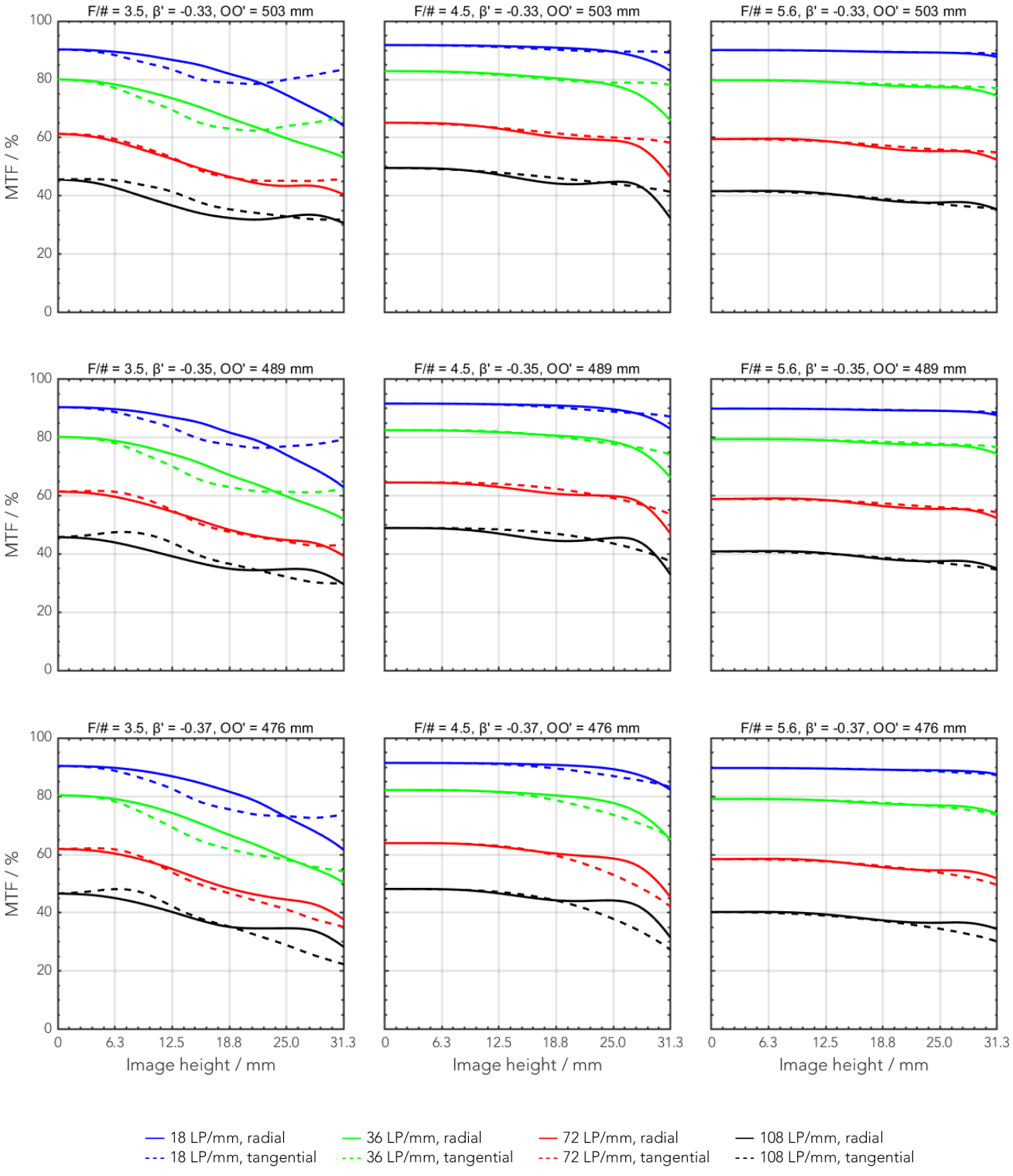
Technical specifications

Type	-0001
ID	1068012
Interface	V70-Mount
Focal length [mm]	96
F/# range	F/3.5 ... F/8
Numerical aperture	0.05
Max. sensor size [mm]	62.5
Max. angle of view [°]	27
Rec. magnification range	-0.35 (-0.39 ... -0.3)
Rec. working distance range [mm]	287 ... 360
Max. mechanical focus travel [mm]	23.9
Filter thread [mm]	M52 x 0.75
Storage temperature [°C]	-25 … +70
Net. weight [g]	830
Additional info	-
f'eff [mm]	95.49
SF [mm]	-49.68
S'F' [mm]	52.28
HH' [mm]	-9.02
ß'P	1.01
SEP [mm]	44.60
S'AP [mm]	-44.44
Σd [mm]	79.99

Xenon-Sapphire 3.5/96

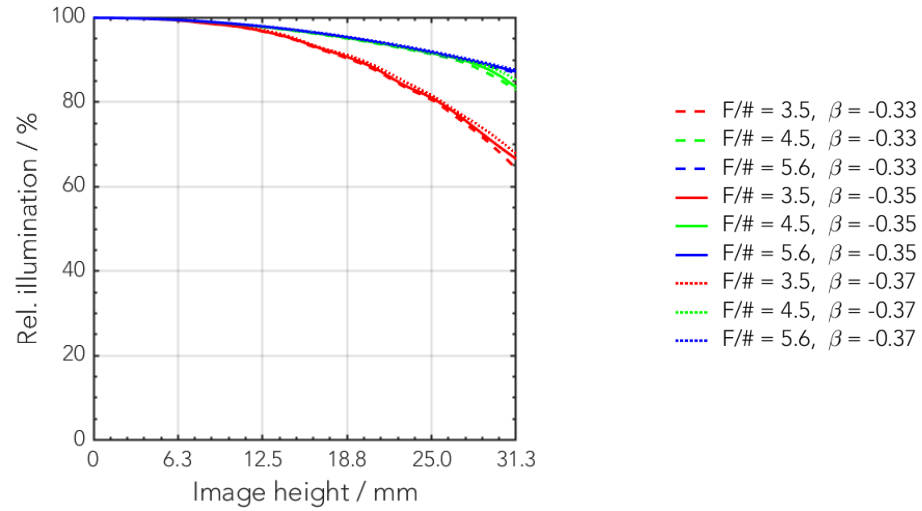
MTF charts

Spectrum name	VIS					
Wavelengths [nm]	425	475	525	575	625	675
Rel. weights [%]	8	16	23	22	19	13

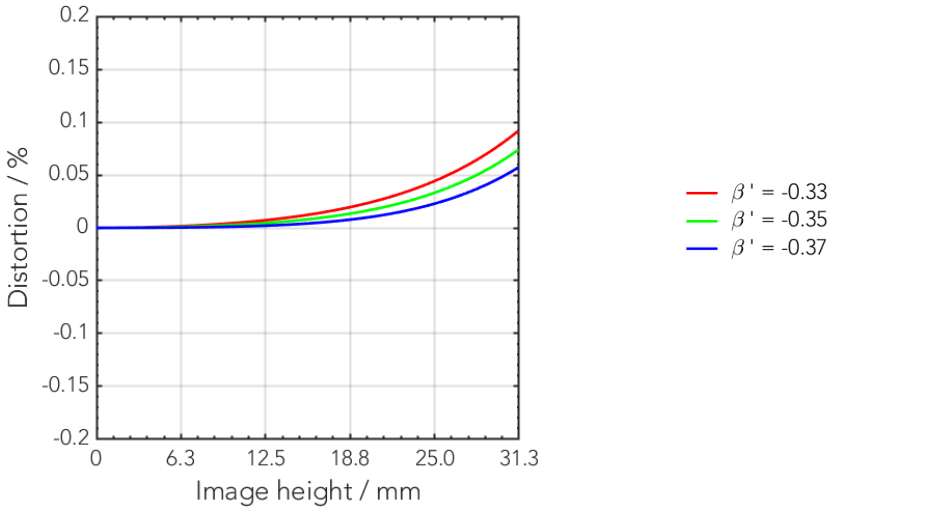


Xenon-Sapphire 3.5/96

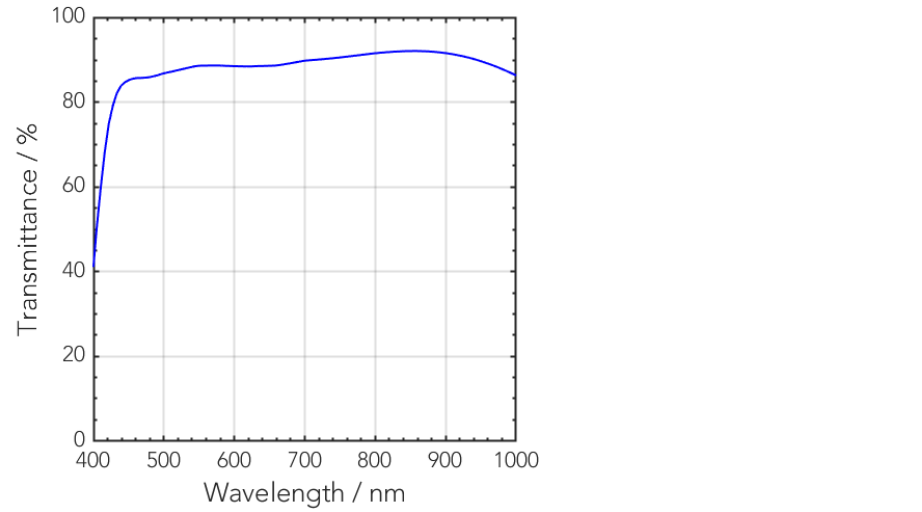
Rel. illumination vs. image height



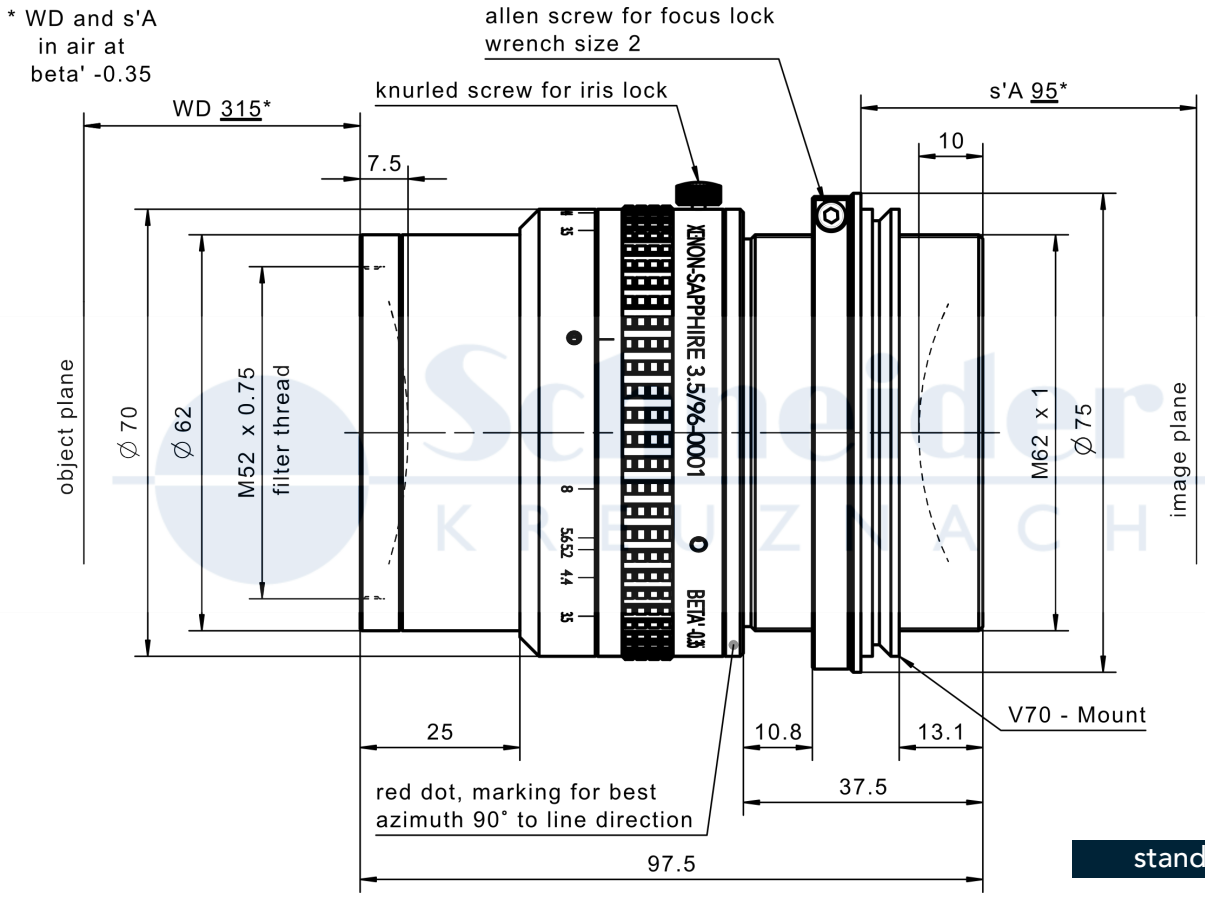
Distortion vs. image height



Transmittance vs. wavelength



Technical drawings



standard

Xenon-Sapphire 3.5/96

Accessories	Mount	Eff. length	ID
Adapter	V70 / M72 x 0.75	10 mm	1072419
Extension tube	M72 x 0.75 / M72 x 0.75	5 mm	1072420
	M72 x 0.75 / M72 x 0.75	10 mm	1072421
	M72 x 0.75 / M72 x 0.75	25 mm	26406
	M72 x 0.75 / M72 x 0.75	50 mm	1054733

Annotation	
Focal length	Nominal focal length
F/# range	Image space F-number range for infinity focus position
Numerical aperture	Maximum real numerical aperture (depending on recommended magnification range either for infinity or respective fixed magnification)
Max. sensor size	Image circle diameter
Max. angle of view	Angle of view associated with maximum sensor size (depending on recommended magnification range either for infinity or respective fixed magnification)
Rec. magnification range	Magnification range as recommended by Schneider-Kreuznach
Rec. working distance range	Working distance, i.e. distance between object and first mechanical element, associated with recommended magnification range
Max. mechanical focus travel	Maximum possible movement of the lens from infinity position (depending on recommended magnification range either for infinity or respective fixed magnification)
Net weight	weight of unpacked lens without lens cap
f'eff	Effective focal length
SF	Distance between vertex of first lens surface and object space focal point
S'F'	Distance between vertex of last lens surface and image space focal point (back focal distance at infinity)
HH'	Distance between principal planes
ß'P	Pupil magnification (= exit pupil diameter / entrance pupil diameter)
SEP	Distance between vertex of first lens surface and entrance pupil
S'AP	Distance between vertex of last lens surface and exit pupil
Σ d	Distance between vertices of first and last lens surface
s'A	Flange focal distance (in air) for infinite object distance (depending on recommended magnification range either for infinity or respective fixed magnification)
ß'	Magnification (= image size / object size), negative value because image is inverted
OO'	Distance between object and image

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Xenon-Sapphire 3.2/96

This highspeed lens is optimized for 16k with 3.5 µm (57.3 mm) or 12k / 5µm (62.5 mm) line scan sensors or can also be used with area scan cameras. The lens provides high performance at 100 LP/mm and detects the smallest targets to solve the most challenging applications. The V-Mount interface makes it easy to install numerous mounts and allows to rotate the lens into the highest performance.

Key features

- For 16k / 3.5 µm (57.3 mm) or 12k / 5 µm (62.5 mm) line scan sensors
- Best azimuth marking
- 400 nm to 1000 nm broadband AR-coating
- Lockable distance and aperture settings

Applications

- FPD inspection
- PCB inspection
- High resolution defect detection
- Quality assurance systems

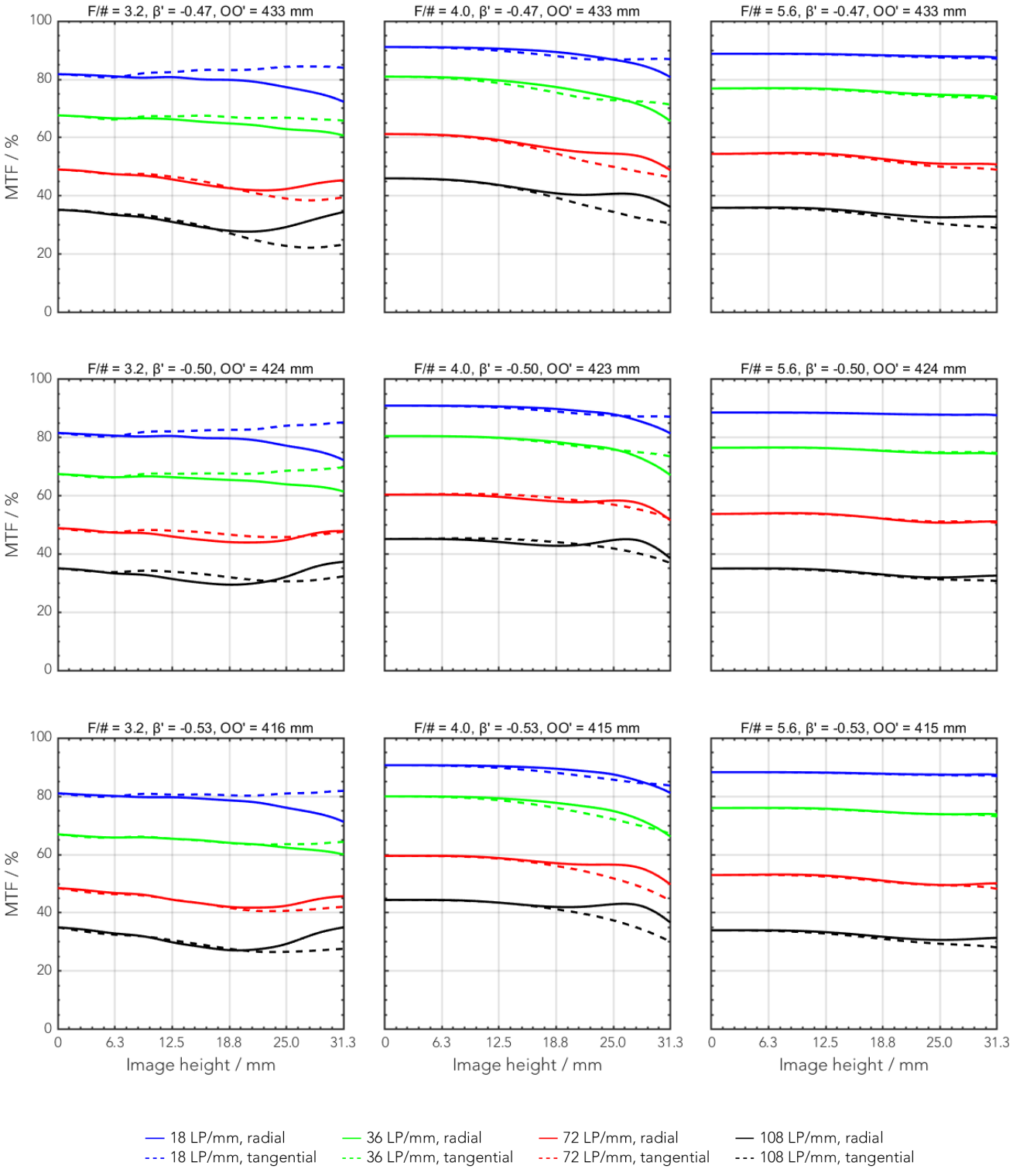
Technical specifications

Type	-0001
ID	1071189
Interface	V70-Mount
Focal length [mm]	96
F/# range	F/3.2 ... F/11.3
Numerical aperture	0.10
Max. sensor size [mm]	62.5
Max. angle of view [°]	25
Rec. magnification range	-0.5 (-0.55 ... -0.45)
Rec. working distance range [mm]	215 ... 254
Max. mechanical focus travel [mm]	23.9
Filter thread [mm]	M52 x 0.75
Storage temperature [°C]	-25 … +70
Net. weight [g]	700
Additional info	-
f'eff [mm]	96.22
SF [mm]	-47.32
S'F' [mm]	53.49
HH' [mm]	-9.79
ß'P	1.02
SEP [mm]	47.07
S'AP [mm]	-44.59
Σd [mm]	81.84

Xenon-Sapphire 3.2/96

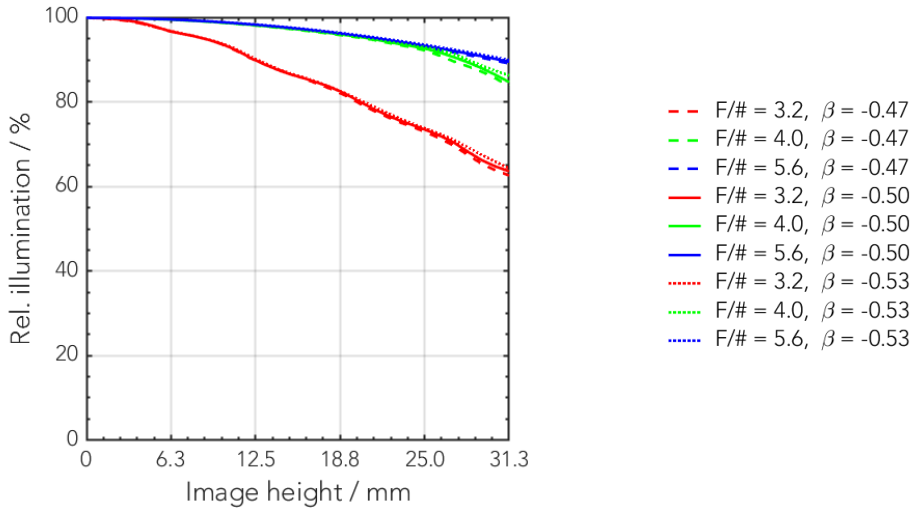
MTF charts

Spectrum name	VIS					
Wavelengths [nm]	425	475	525	575	625	675
Rel. weights [%]	8	16	23	22	19	13

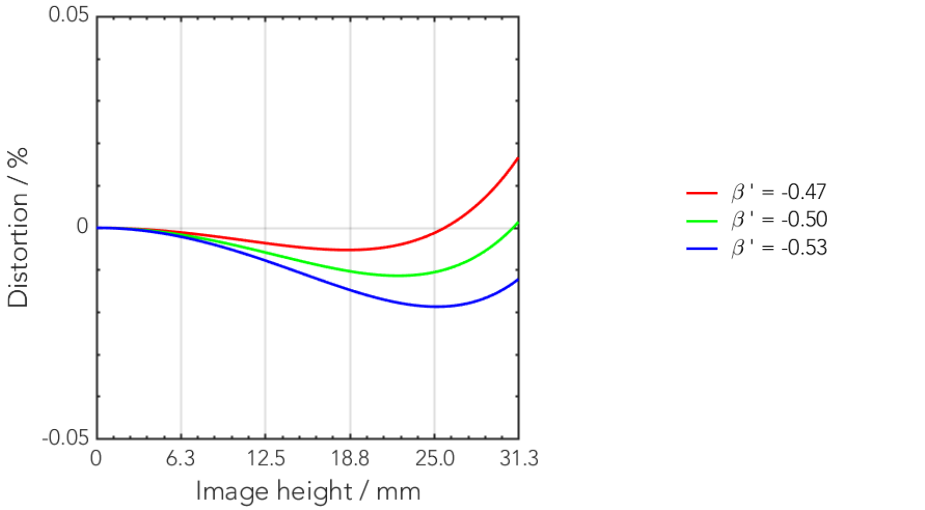


Xenon-Sapphire 3.2/96

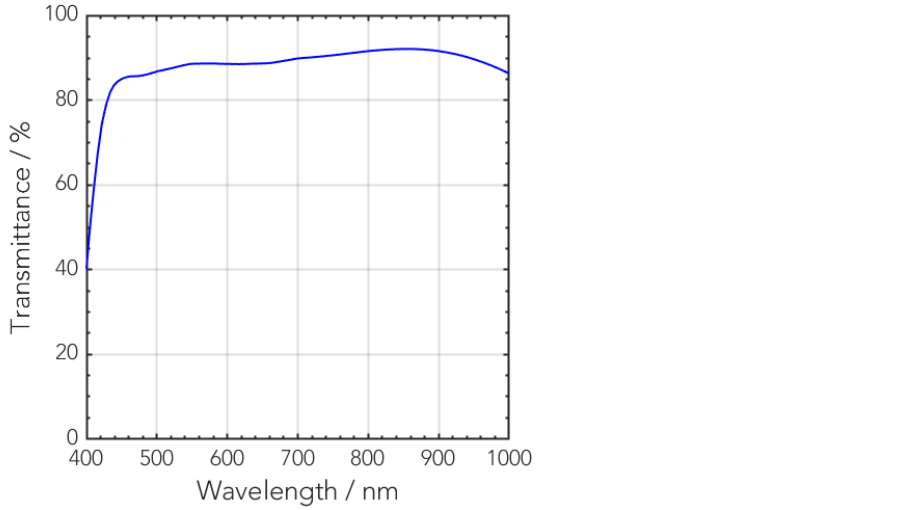
Rel. illumination vs. image height



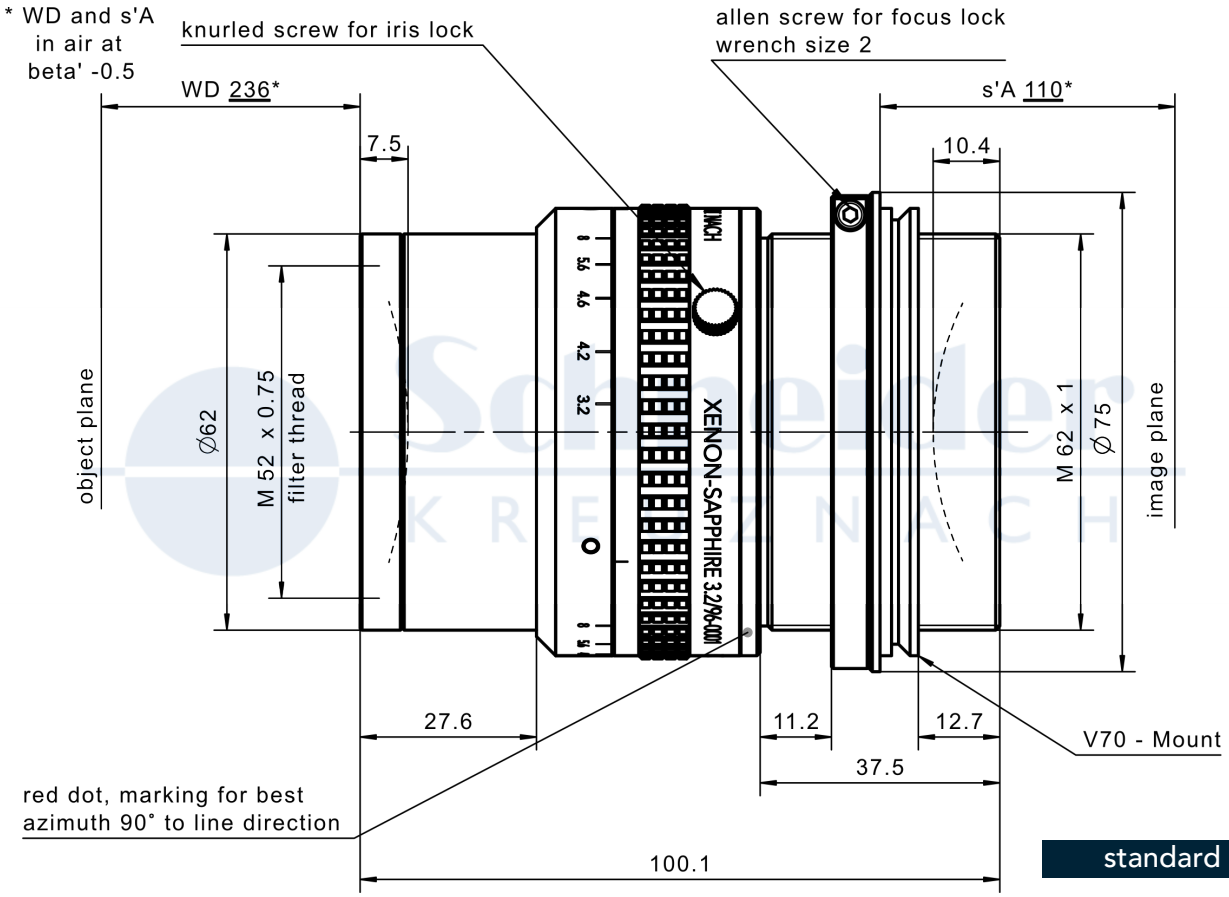
Distortion vs. image height



Transmittance vs. wavelength



Technical drawings



standard

Xenon-Sapphire 3.2/96

Accessories	Mount	Eff. length	ID
Adapter	V70 / M72 x 0.75	10 mm	1072419
Extension tube	M72 x 0.75 / M72 x 0.75	5 mm	1072420
	M72 x 0.75 / M72 x 0.75	10 mm	1072421
	M72 x 0.75 / M72 x 0.75	25 mm	26406
	M72 x 0.75 / M72 x 0.75	50 mm	1054733

Annotation	
Focal length	Nominal focal length
F/# range	Image space F-number range for infinity focus position
Numerical aperture	Maximum real numerical aperture (depending on recommended magnification range either for infinity or respective fixed magnification)
Max. sensor size	Image circle diameter
Max. angle of view	Angle of view associated with maximum sensor size (depending on recommended magnification range either for infinity or respective fixed magnification)
Rec. magnification range	Magnification range as recommended by Schneider-Kreuznach
Rec. working distance range	Working distance, i.e. distance between object and first mechanical element, associated with recommended magnification range
Max. mechanical focus travel	Maximum possible movement of the lens from infinity position (depending on recommended magnification range either for infinity or respective fixed magnification)
Net weight	weight of unpacked lens without lens cap
f'eff	Effective focal length
SF	Distance between vertex of first lens surface and object space focal point
S'F'	Distance between vertex of last lens surface and image space focal point (back focal distance at infinity)
HH'	Distance between principal planes
ß'P	Pupil magnification (= exit pupil diameter / entrance pupil diameter)
SEP	Distance between vertex of first lens surface and entrance pupil
S'AP	Distance between vertex of last lens surface and exit pupil
Σ d	Distance between vertices of first and last lens surface
s'A	Flange focal distance (in air) for infinite object distance (depending on recommended magnification range either for infinity or respective fixed magnification)
ß'	Magnification (= image size / object size), negative value because image is inverted
OO'	Distance between object and image

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Xenon-Sapphire 3.2/97

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Key features

- For 16k / 3.5 µm (57.3 mm) or 12k / 5 µm (62.5 mm) line scan sensors
- Best azimuth marking
- 400 nm to 1000 nm broadband AR-coating
- Lockable distance and aperture settings

Applications

- FPD inspection
- PCB inspection
- High resolution defect detection
- Quality assurance systems

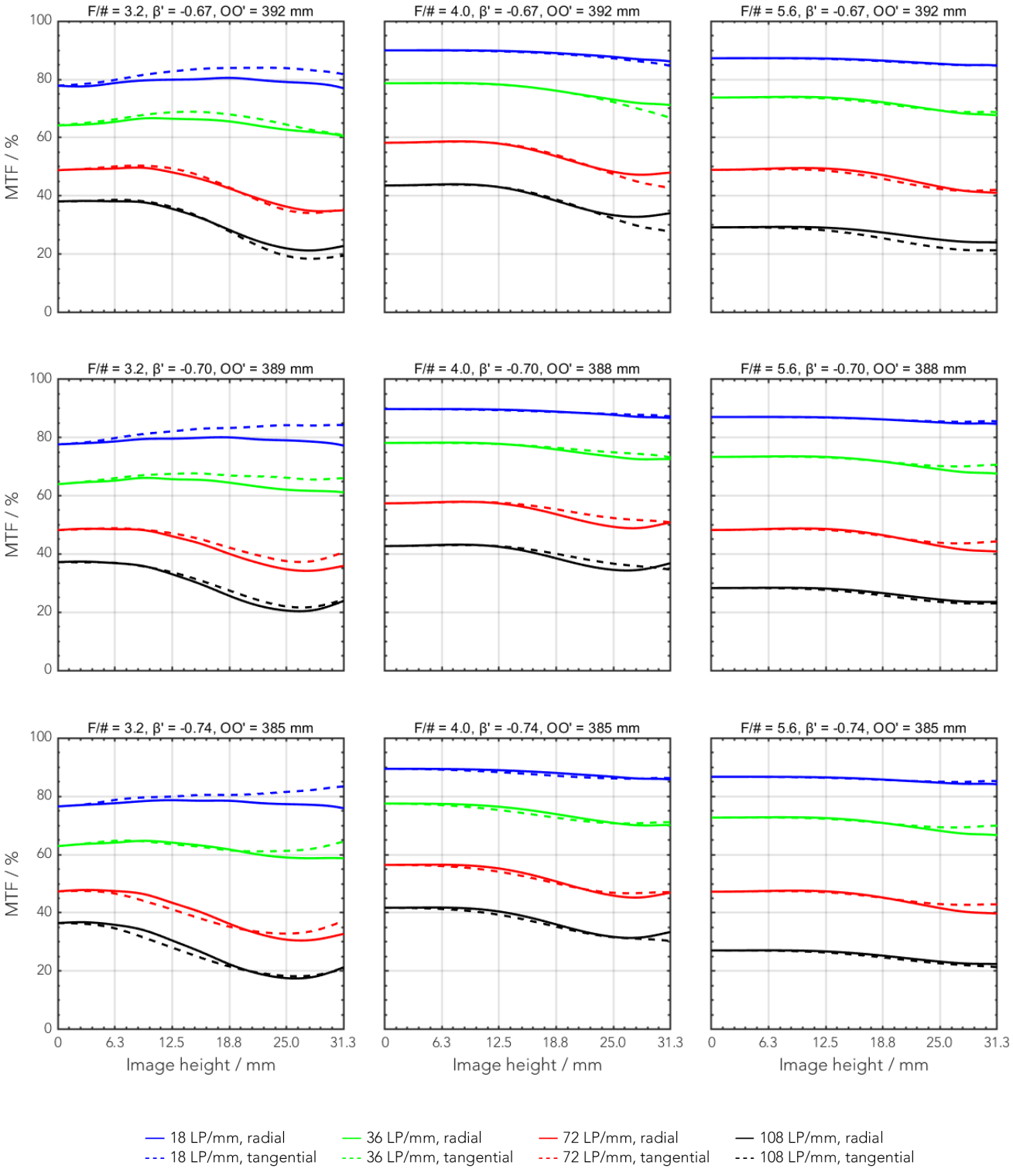
Technical specifications

Type	-0001
ID	1071190
Interface	V70-Mount
Focal length [mm]	97
F/# range	F/3.2 ... F/11.3
Numerical aperture	0.09
Max. sensor size [mm]	62.5
Max. angle of view [°]	22
Rec. magnification range	-0.7 (-0.76 ... -0.65)
Rec. working distance range [mm]	169 ... 191
Max. mechanical focus travel [mm]	24.7
Filter thread [mm]	M52 x 0.75
Storage temperature [°C]	-25 … +70
Net. weight [g]	810
Additional info	-
f'eff [mm]	96.97
SF [mm]	-49.39
S'F' [mm]	52.84
HH' [mm]	-12.13
ß'P	1.03
SEP [mm]	45.03
S'AP [mm]	-46.76
Σd [mm]	79.59

Xenon-Sapphire 3.2/97

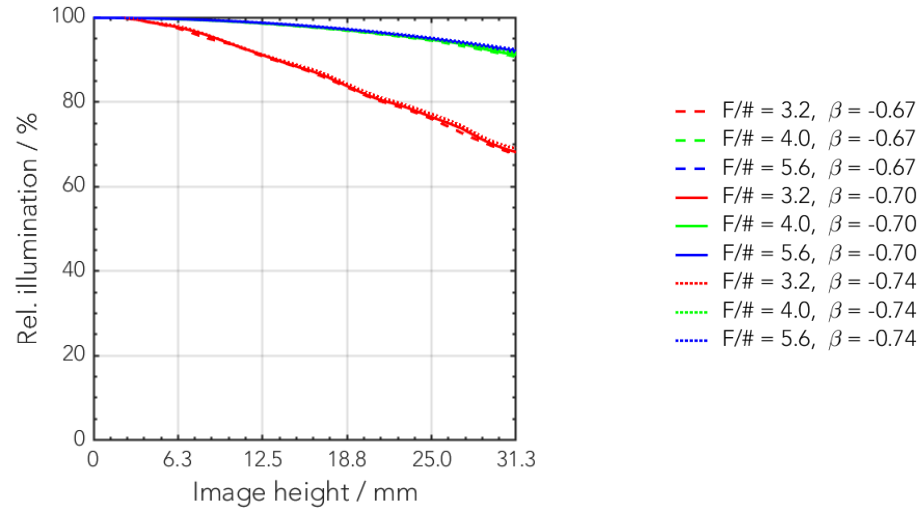
MTF charts

Spectrum name	VIS					
Wavelengths [nm]	425	475	525	575	625	675
Rel. weights [%]	8	16	23	22	19	13

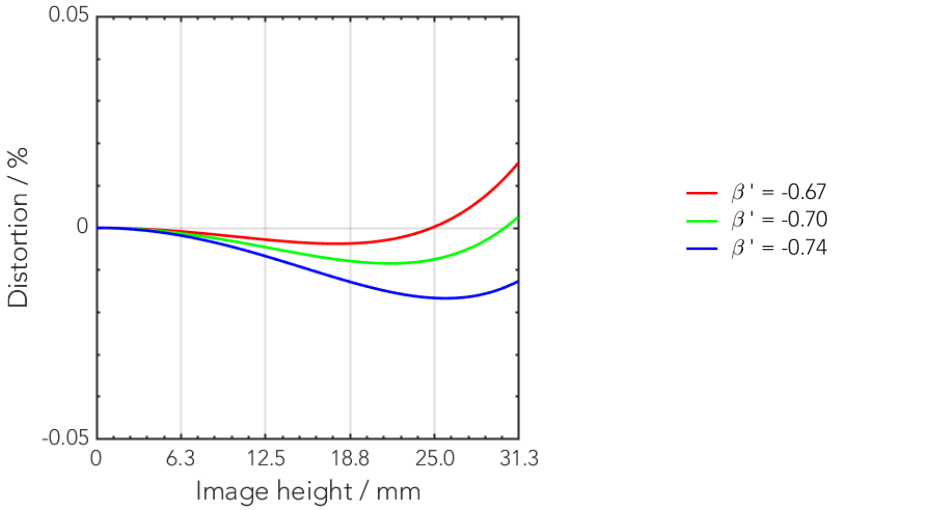


Xenon-Sapphire 3.2/97

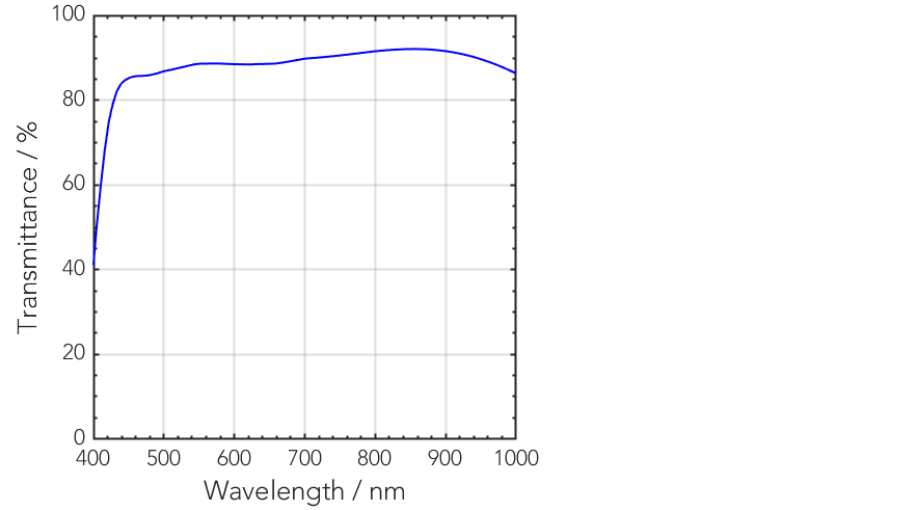
Rel. illumination vs. image height



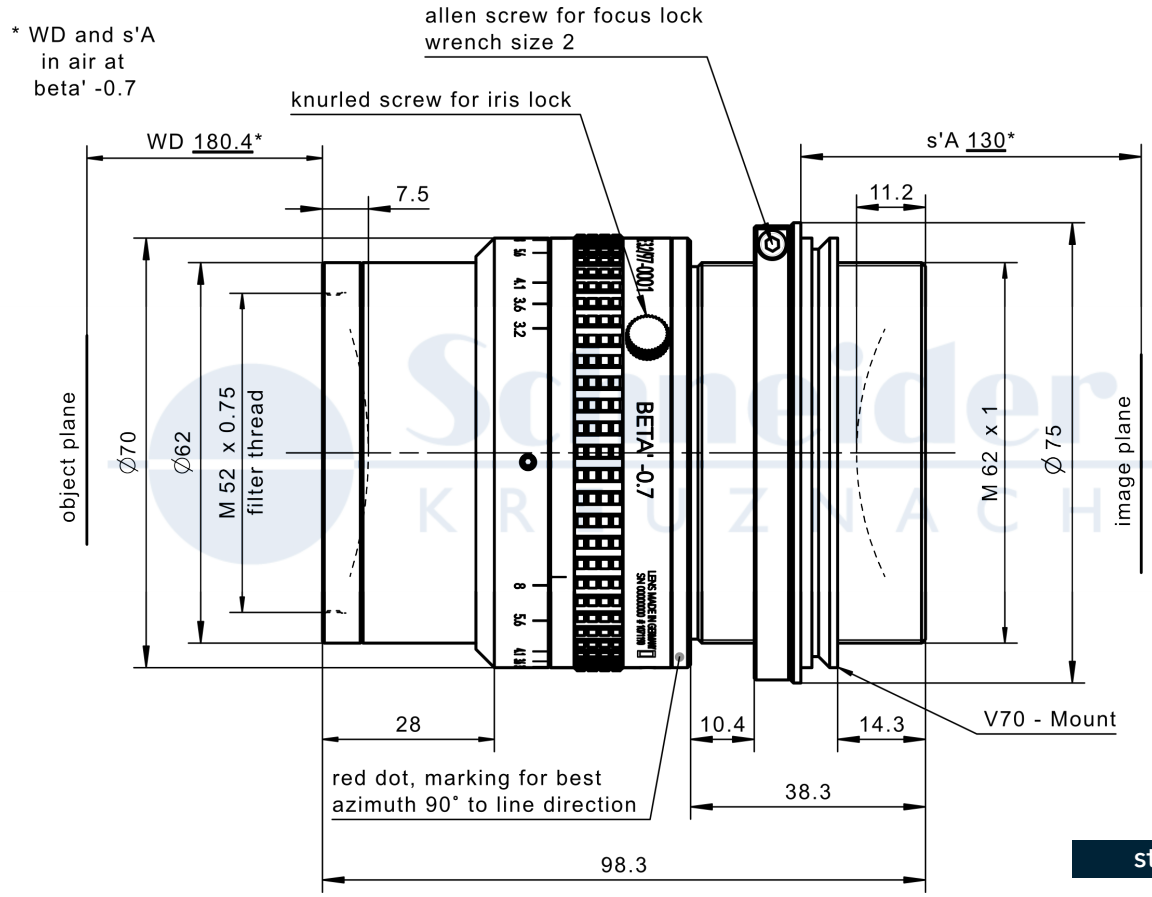
Distortion vs. image height



Transmittance vs. wavelength



Technical drawings



standard

Xenon-Sapphire 3.2/97

Accessories	Mount	Eff. length	ID
Adapter	V70 / M72 x 0.75	10 mm	1072419
Extension tube	M72 x 0.75 / M72 x 0.75	5 mm	1072420
	M72 x 0.75 / M72 x 0.75	10 mm	1072421
	M72 x 0.75 / M72 x 0.75	25 mm	26406
	M72 x 0.75 / M72 x 0.75	50 mm	1054733

Annotation	
Focal length	Nominal focal length
F/# range	Image space F-number range for infinity focus position
Numerical aperture	Maximum real numerical aperture (depending on recommended magnification range either for infinity or respective fixed magnification)
Max. sensor size	Image circle diameter
Max. angle of view	Angle of view associated with maximum sensor size (depending on recommended magnification range either for infinity or respective fixed magnification)
Rec. magnification range	Magnification range as recommended by Schneider-Kreuznach
Rec. working distance range	Working distance, i.e. distance between object and first mechanical element, associated with recommended magnification range
Max. mechanical focus travel	Maximum possible movement of the lens from infinity position (depending on recommended magnification range either for infinity or respective fixed magnification)
Net weight	weight of unpacked lens without lens cap
f'eff	Effective focal length
SF	Distance between vertex of first lens surface and object space focal point
S'F'	Distance between vertex of last lens surface and image space focal point (back focal distance at infinity)
HH'	Distance between principal planes
ß'P	Pupil magnification (= exit pupil diameter / entrance pupil diameter)
SEP	Distance between vertex of first lens surface and entrance pupil
S'AP	Distance between vertex of last lens surface and exit pupil
Σ d	Distance between vertices of first and last lens surface
s'A	Flange focal distance (in air) for infinite object distance (depending on recommended magnification range either for infinity or respective fixed magnification)
ß'	Magnification (= image size / object size), negative value because image is inverted
OO'	Distance between object and image

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Xenon-Sapphire 2.8/98

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Key features

- For 16k / 3.5 µm (57.3 mm) or 12k / 5 µm (62.5 mm) line scan sensors
- Best azimuth marking
- 400 nm to 1000 nm broadband AR-coating
- Lockable distance and aperture settings

Applications

- FPD inspection
- PCB inspection
- High resolution defect detection
- Quality assurance systems

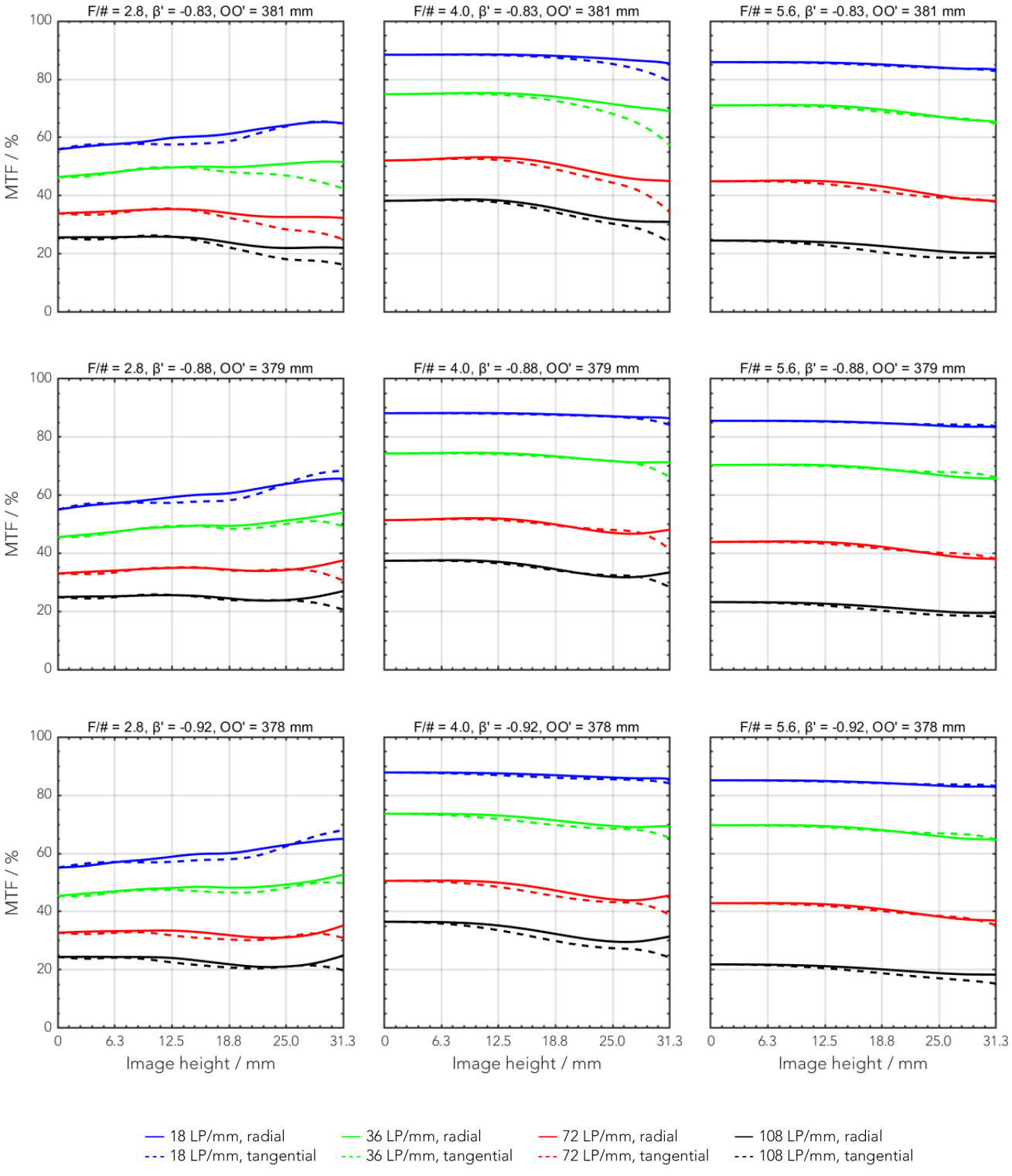
Technical specifications

Type	-0001
ID	1076452
Interface	V70-Mount
Focal length [mm]	98
F/# range	F/2.8 ... F/8
Numerical aperture	0.10
Max. sensor size [mm]	62.5
Max. angle of view [°]	19
Rec. magnification range	-0.875 (-0.92 ... -0.83)
Rec. working distance range [mm]	148 ... 159
Max. mechanical focus travel [mm]	25.7
Filter thread [mm]	M52 x 0.75
Storage temperature [°C]	-25 … +70
Net. weight [g]	720
Additional info	-
f'eff [mm]	97.50
SF [mm]	-49.51
S'F' [mm]	52.28
HH' [mm]	-13.08
ß'P	1.04
SEP [mm]	44.54
S'AP [mm]	-48.79
Σd [mm]	80.13

Xenon-Sapphire 2.8/98

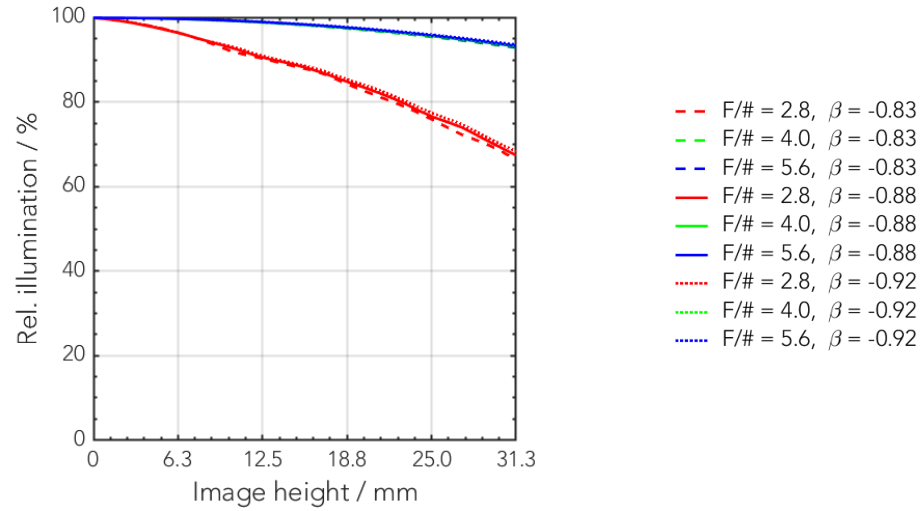
MTF charts

Spectrum name	VIS					
Wavelengths [nm]	425	475	525	575	625	675
Rel. weights [%]	8	16	23	22	19	13

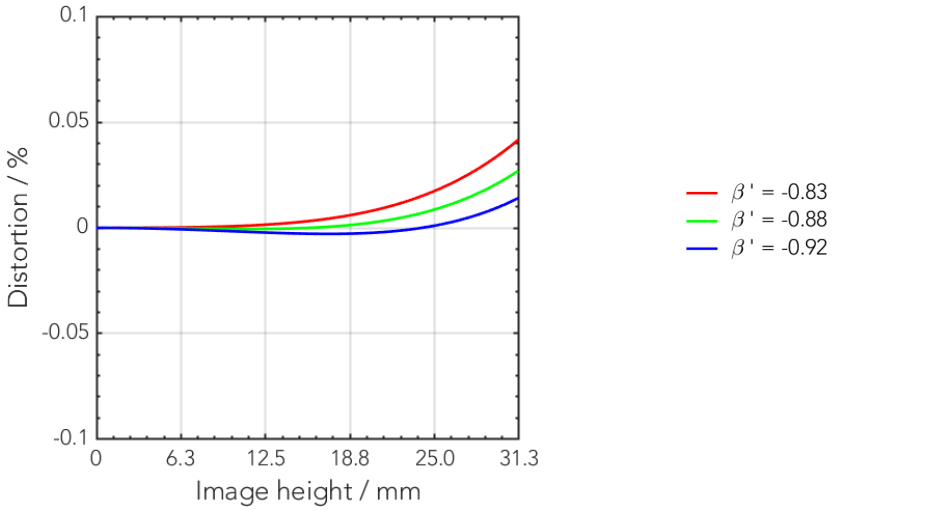


Xenon-Sapphire 2.8/98

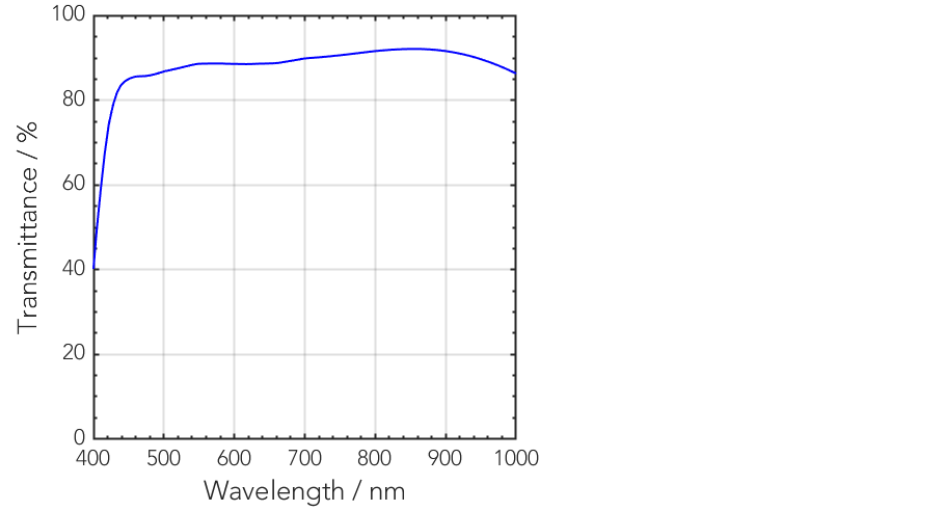
Rel. illumination vs. image height



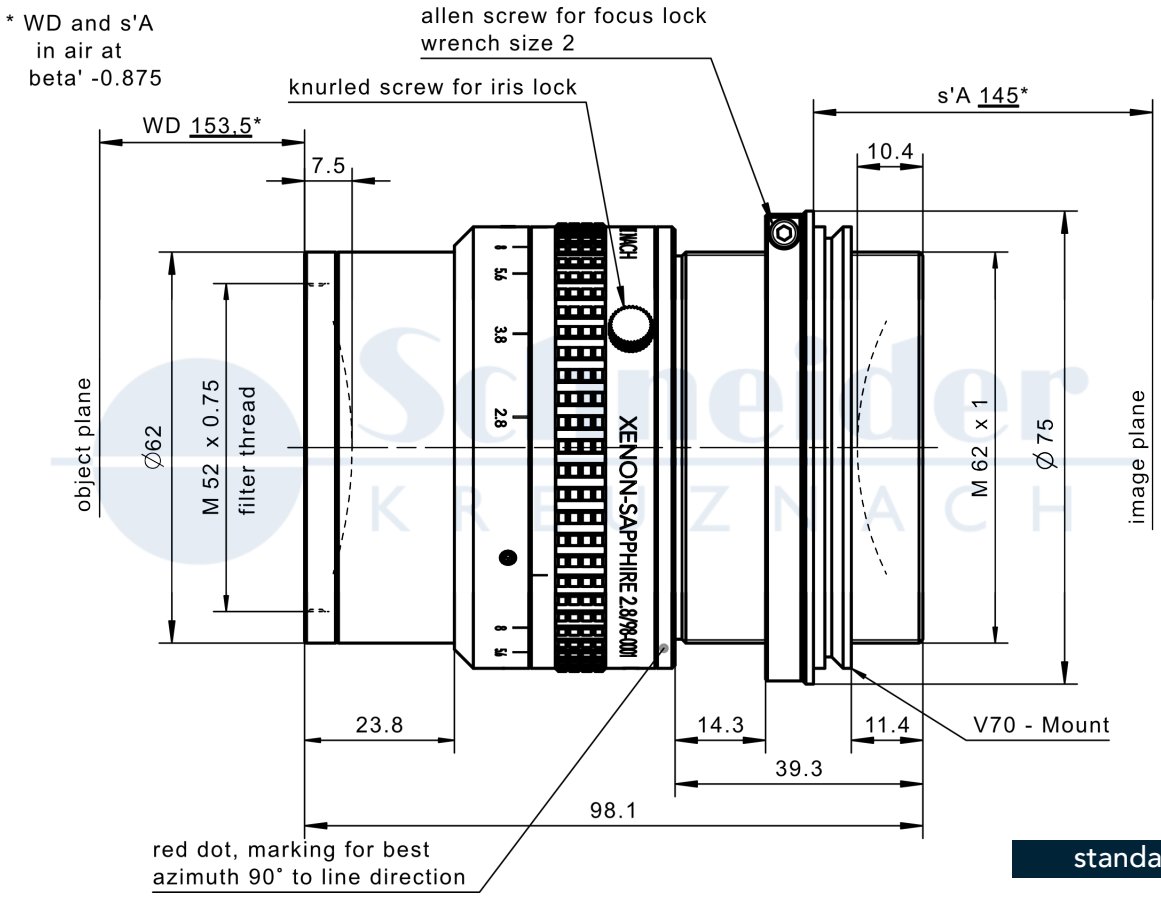
Distortion vs. image height



Transmittance vs. wavelength



Technical drawings



standard

Xenon-Sapphire 2.8/98

Accessories	Mount	Eff. length	ID
Adapter	V70 / M72 x 0.75	10 mm	1072419
Extension tube	M72 x 0.75 / M72 x 0.75	5 mm	1072420
	M72 x 0.75 / M72 x 0.75	10 mm	1072421
	M72 x 0.75 / M72 x 0.75	25 mm	26406
	M72 x 0.75 / M72 x 0.75	50 mm	1054733

Annotation	
Focal length	Nominal focal length
F/# range	Image space F-number range for infinity focus position
Numerical aperture	Maximum real numerical aperture (depending on recommended magnification range either for infinity or respective fixed magnification)
Max. sensor size	Image circle diameter
Max. angle of view	Angle of view associated with maximum sensor size (depending on recommended magnification range either for infinity or respective fixed magnification)
Rec. magnification range	Magnification range as recommended by Schneider-Kreuznach
Rec. working distance range	Working distance, i.e. distance between object and first mechanical element, associated with recommended magnification range
Max. mechanical focus travel	Maximum possible movement of the lens from infinity position (depending on recommended magnification range either for infinity or respective fixed magnification)
Net weight	weight of unpacked lens without lens cap
f'eff	Effective focal length
SF	Distance between vertex of first lens surface and object space focal point
S'F'	Distance between vertex of last lens surface and image space focal point (back focal distance at infinity)
HH'	Distance between principal planes
ß'P	Pupil magnification (= exit pupil diameter / entrance pupil diameter)
SEP	Distance between vertex of first lens surface and entrance pupil
S'AP	Distance between vertex of last lens surface and exit pupil
Σ d	Distance between vertices of first and last lens surface
s'A	Flange focal distance (in air) for infinite object distance (depending on recommended magnification range either for infinity or respective fixed magnification)
ß'	Magnification (= image size / object size), negative value because image is inverted
OO'	Distance between object and image

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Xenon-Sapphire 2.8/98

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Key features

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- Best azimuth marking
- 400 nm to 1000 nm broadband AR-coating
- Lockable distance and aperture settings

Applications

- FPD inspection
- PCB inspection
- High resolution defect detection
- Quality assurance systems

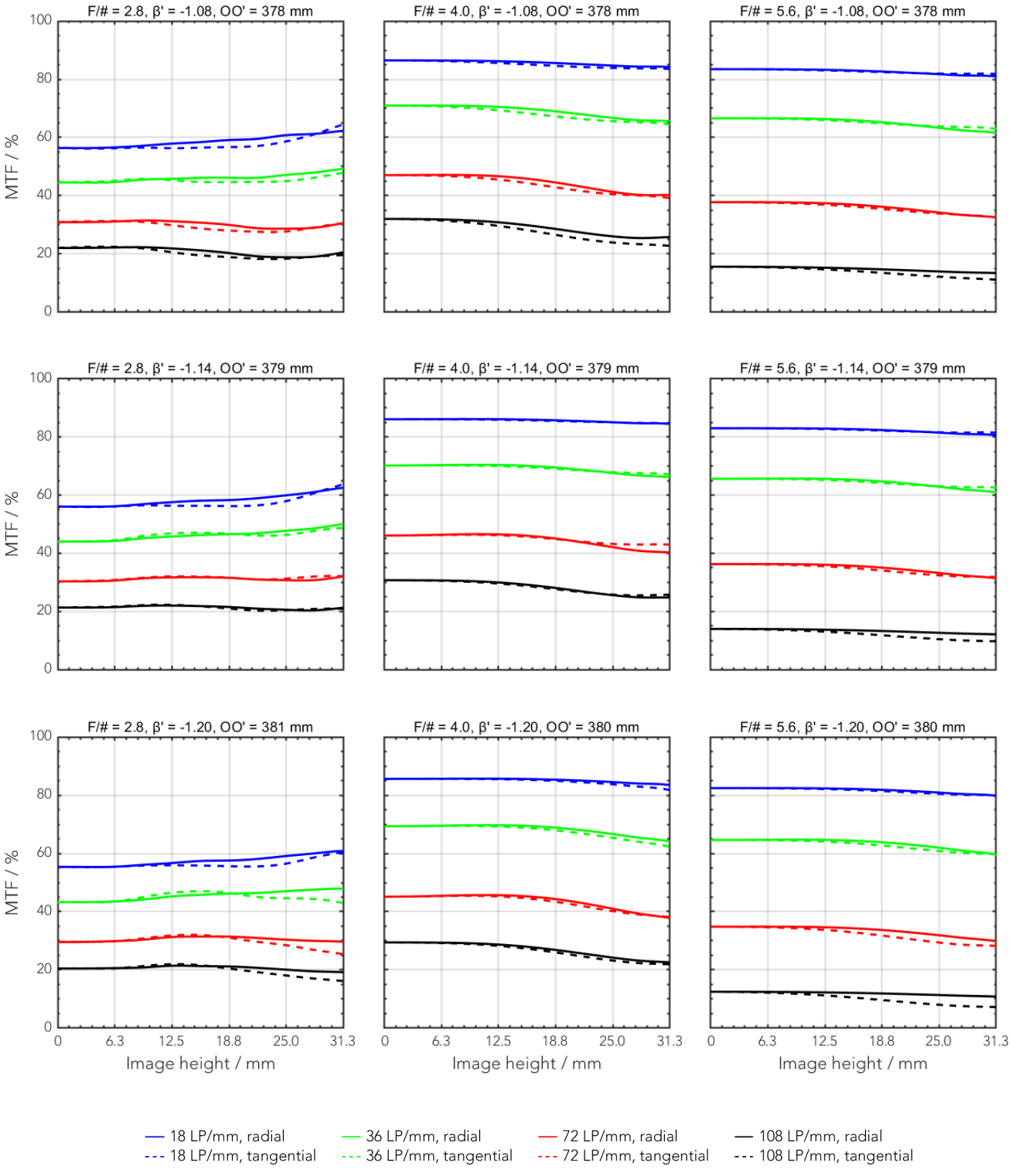
Technical specifications

Type	-0011
ID	1076453
Interface	V70-Mount
Focal length [mm]	98
F/# range	F/2.8 ... F/8
Numerical aperture	0.10
Max. sensor size [mm]	62.5
Max. angle of view [°]	17
Rec. magnification range	-1.143 (-1.2 ... -1.08)
Rec. working distance range [mm]	123 ... 132
Max. mechanical focus travel [mm]	26.4
Filter thread [mm]	M58 x 0.75
Storage temperature [°C]	-25 … +70
Net. weight [g]	750
Additional info	-
f'eff [mm]	97.50
SF [mm]	-52.28
S'F' [mm]	49.36
HH' [mm]	-13.23
ß'P	0.96
SEP [mm]	48.79
S'AP [mm]	-44.54
Σd [mm]	80.13

Xenon-Sapphire 2.8/98

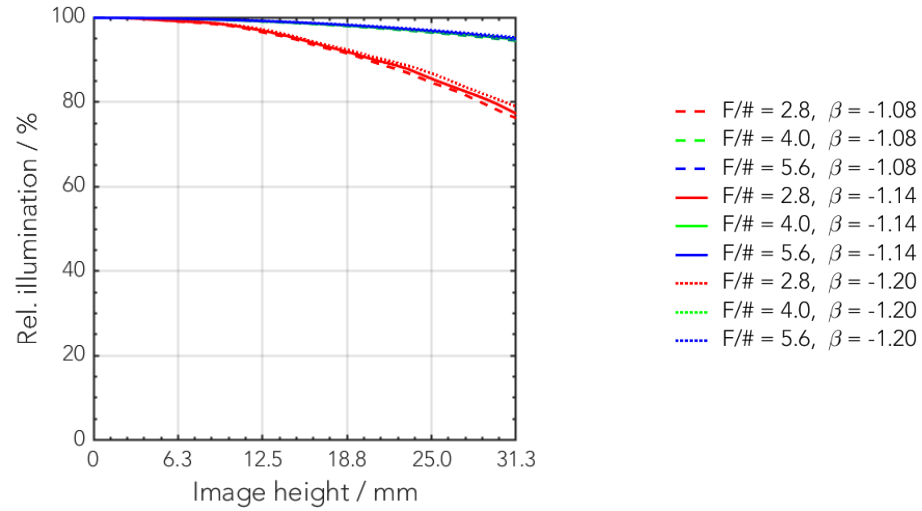
MTF charts

Spectrum name	VIS					
Wavelengths [nm]	425	475	525	575	625	675
Rel. weights [%]	8	16	23	22	19	13

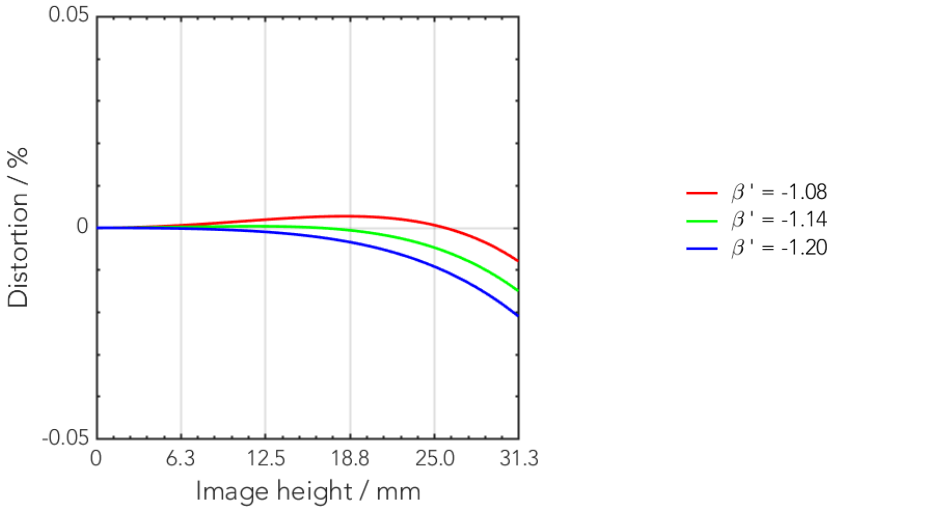


Xenon-Sapphire 2.8/98

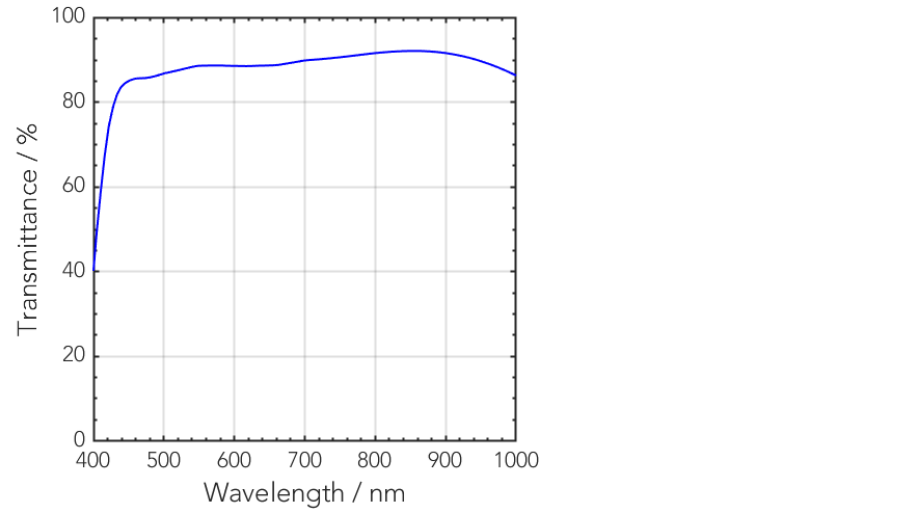
Rel. illumination vs. image height



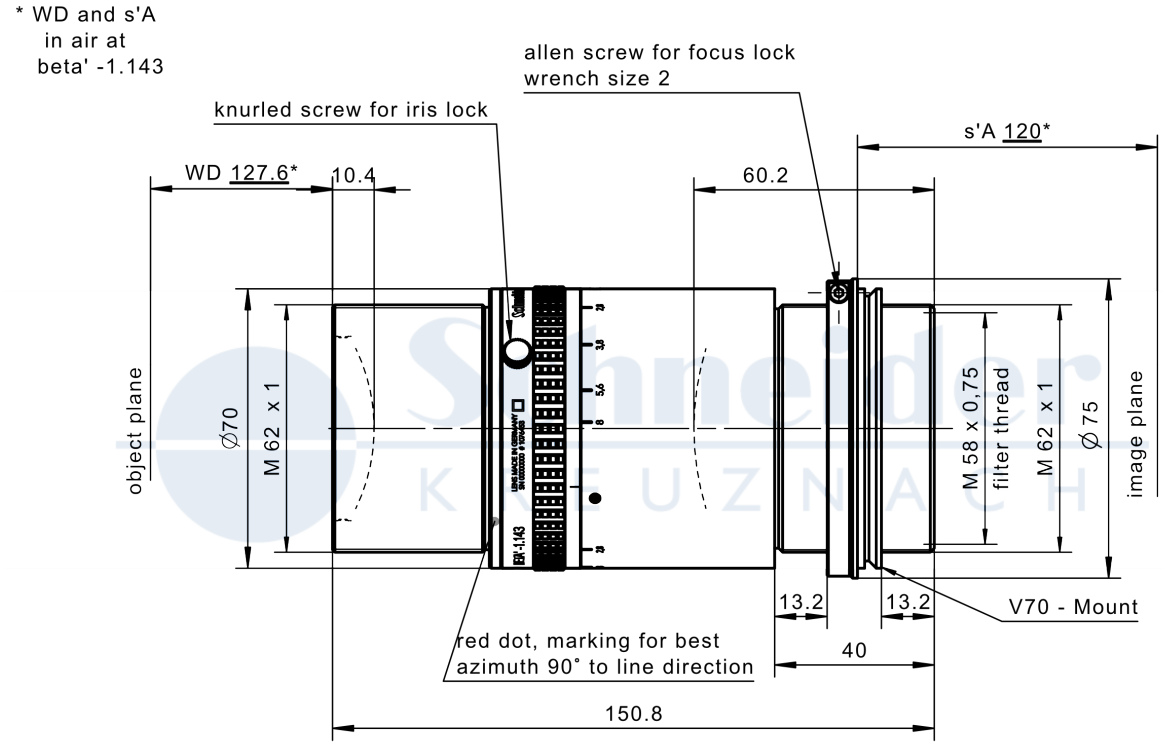
Distortion vs. image height



Transmittance vs. wavelength



Technical drawings



standard

Xenon-Sapphire 2.8/98

Accessories	Mount	Eff. length	ID
Adapter	V70 / M72 x 0.75	10 mm	1072419
Extension tube	M72 x 0.75 / M72 x 0.75	5 mm	1072420
	M72 x 0.75 / M72 x 0.75	10 mm	1072421
	M72 x 0.75 / M72 x 0.75	25 mm	26406
	M72 x 0.75 / M72 x 0.75	50 mm	1054733

Annotation	
Focal length	Nominal focal length
F/# range	Image space F-number range for infinity focus position
Numerical aperture	Maximum real numerical aperture (depending on recommended magnification range either for infinity or respective fixed magnification)
Max. sensor size	Image circle diameter
Max. angle of view	Angle of view associated with maximum sensor size (depending on recommended magnification range either for infinity or respective fixed magnification)
Rec. magnification range	Magnification range as recommended by Schneider-Kreuznach
Rec. working distance range	Working distance, i.e. distance between object and first mechanical element, associated with recommended magnification range
Max. mechanical focus travel	Maximum possible movement of the lens from infinity position (depending on recommended magnification range either for infinity or respective fixed magnification)
Net weight	weight of unpacked lens without lens cap
f'eff	Effective focal length
SF	Distance between vertex of first lens surface and object space focal point
S'F'	Distance between vertex of last lens surface and image space focal point (back focal distance at infinity)
HH'	Distance between principal planes
ß'P	Pupil magnification (= exit pupil diameter / entrance pupil diameter)
SEP	Distance between vertex of first lens surface and entrance pupil
S'AP	Distance between vertex of last lens surface and exit pupil
Σ d	Distance between vertices of first and last lens surface
s'A	Flange focal distance (in air) for infinite object distance (depending on recommended magnification range either for infinity or respective fixed magnification)
ß'	Magnification (= image size / object size), negative value because image is inverted
OO'	Distance between object and image

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Xenon-Sapphire 3.2/97

This highspeed lens is optimized for 16k / 3.5 µm (57.3 mm) /5µm (82 mm) or 12k / 5µm (62.5 mm) line scan sensors or can also be used with area scan cameras. It provides high performance at 100 LP/mm and detects the smallest targets to solve the most challenging applications. The V-Mount interface makes it easy to install numerous mounts and allows to rotate the lens into the highest performance.

Key features

- For 16k / 3.5 µm (57.3 mm) or 16k / 5 µm (82 mm) line scan sensors
- Best azimuth marking
- 400 nm to 1000 nm broadband AR-coating
- Lockable distance and aperture settings

Applications

- FPD inspection
- PCB inspection
- High resolution defect detection
- Quality assurance systems

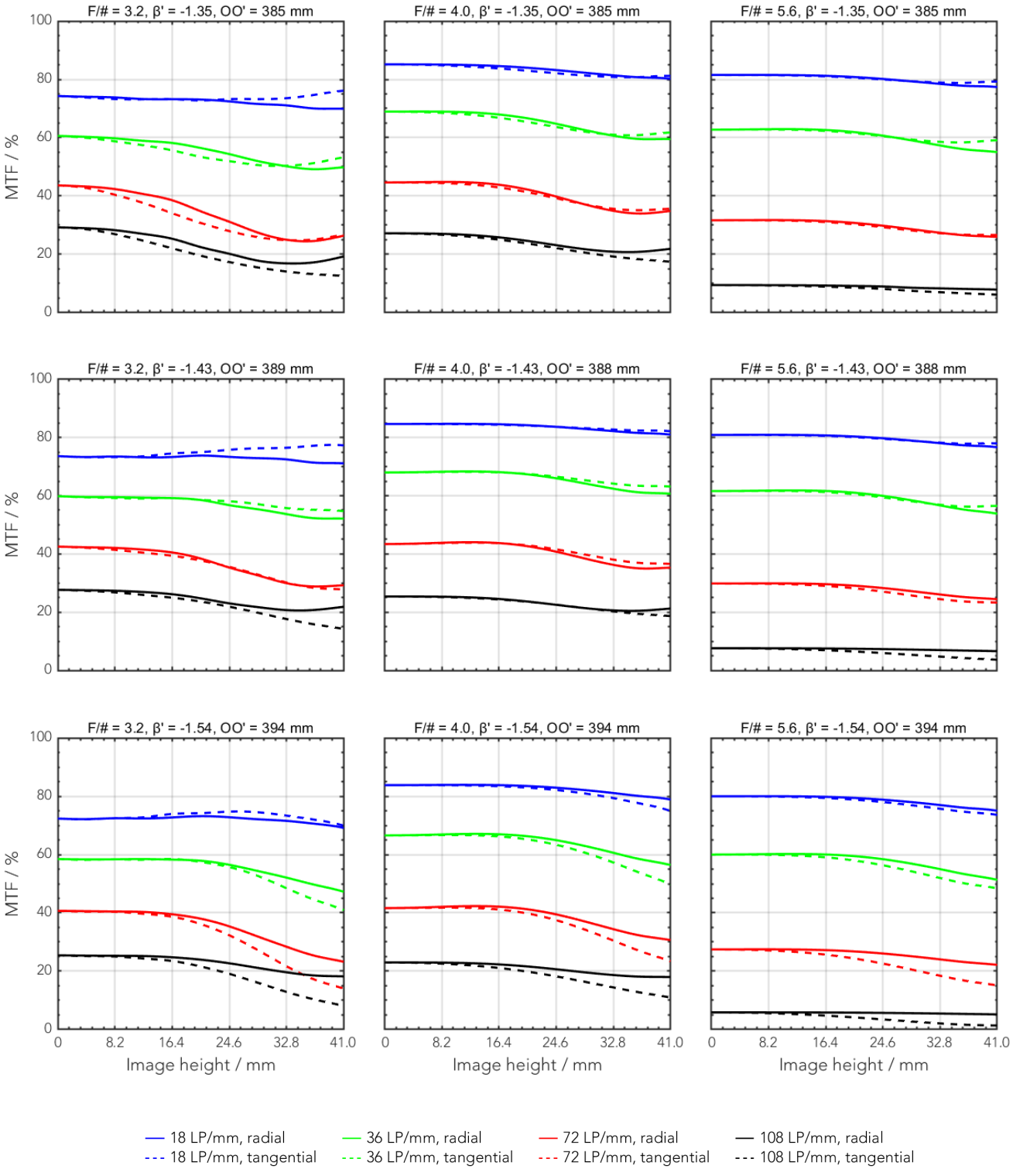
Technical specifications

Type	-0011
ID	1076096
Interface	V70-Mount
Focal length [mm]	97
F/# range	F/3.2 ... F/11.3
Numerical aperture	0.09
Max. sensor size [mm]	82
Max. angle of view [°]	19
Rec. magnification range	-1.43 (-1.54 ... -1.35)
Rec. working distance range [mm]	105 ... 113
Max. mechanical focus travel [mm]	26.4
Filter thread [mm]	M58 x 0.75
Storage temperature [°C]	-25 … +70
Net. weight [g]	840
Additional info	-
f'eff [mm]	96.97
SF [mm]	-52.84
S'F' [mm]	49.39
HH' [mm]	-12.13
ß'P	0.97
SEP [mm]	46.76
S'AP [mm]	-45.03
Σd [mm]	79.59

Xenon-Sapphire 3.2/97

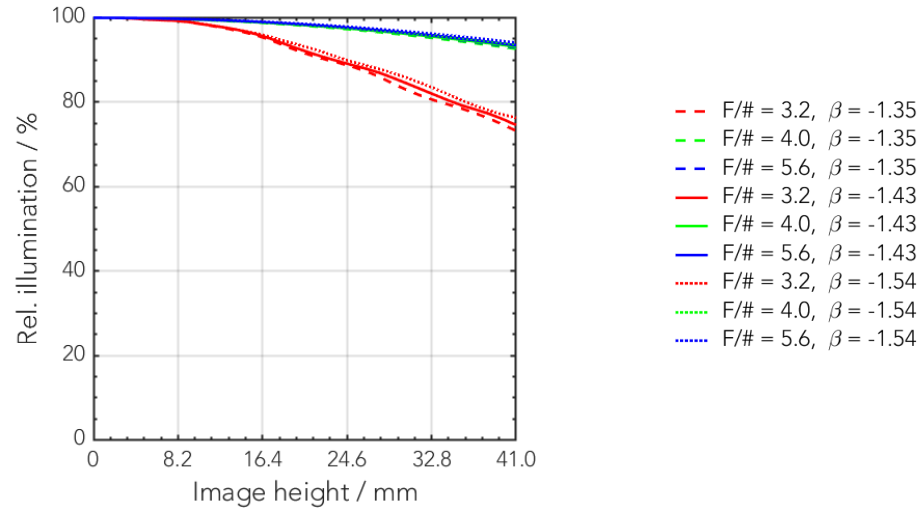
MTF charts

Spectrum name	VIS					
Wavelengths [nm]	425	475	525	575	625	675
Rel. weights [%]	8	16	23	22	19	13

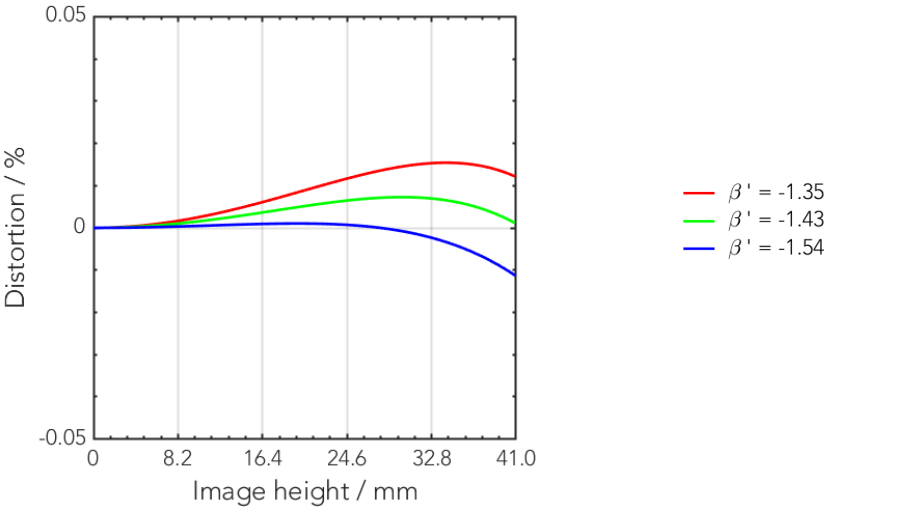


Xenon-Sapphire 3.2/97

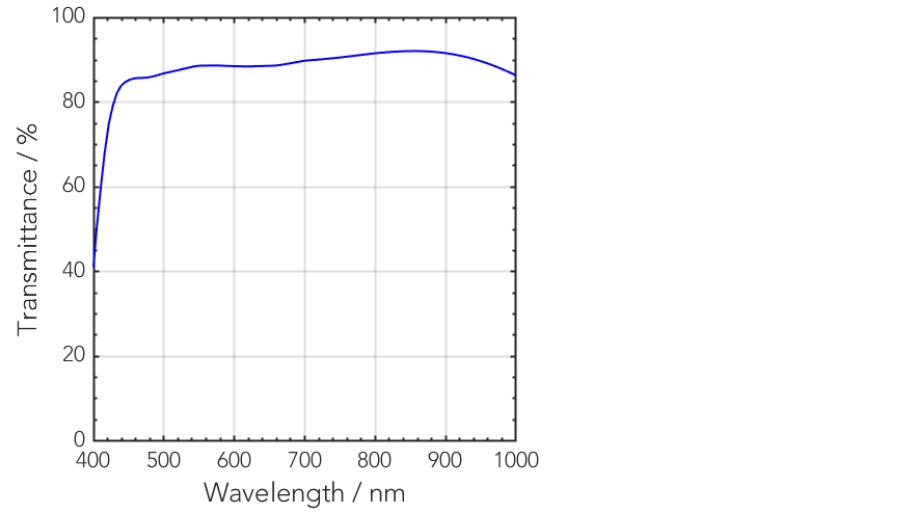
Rel. illumination vs. image height



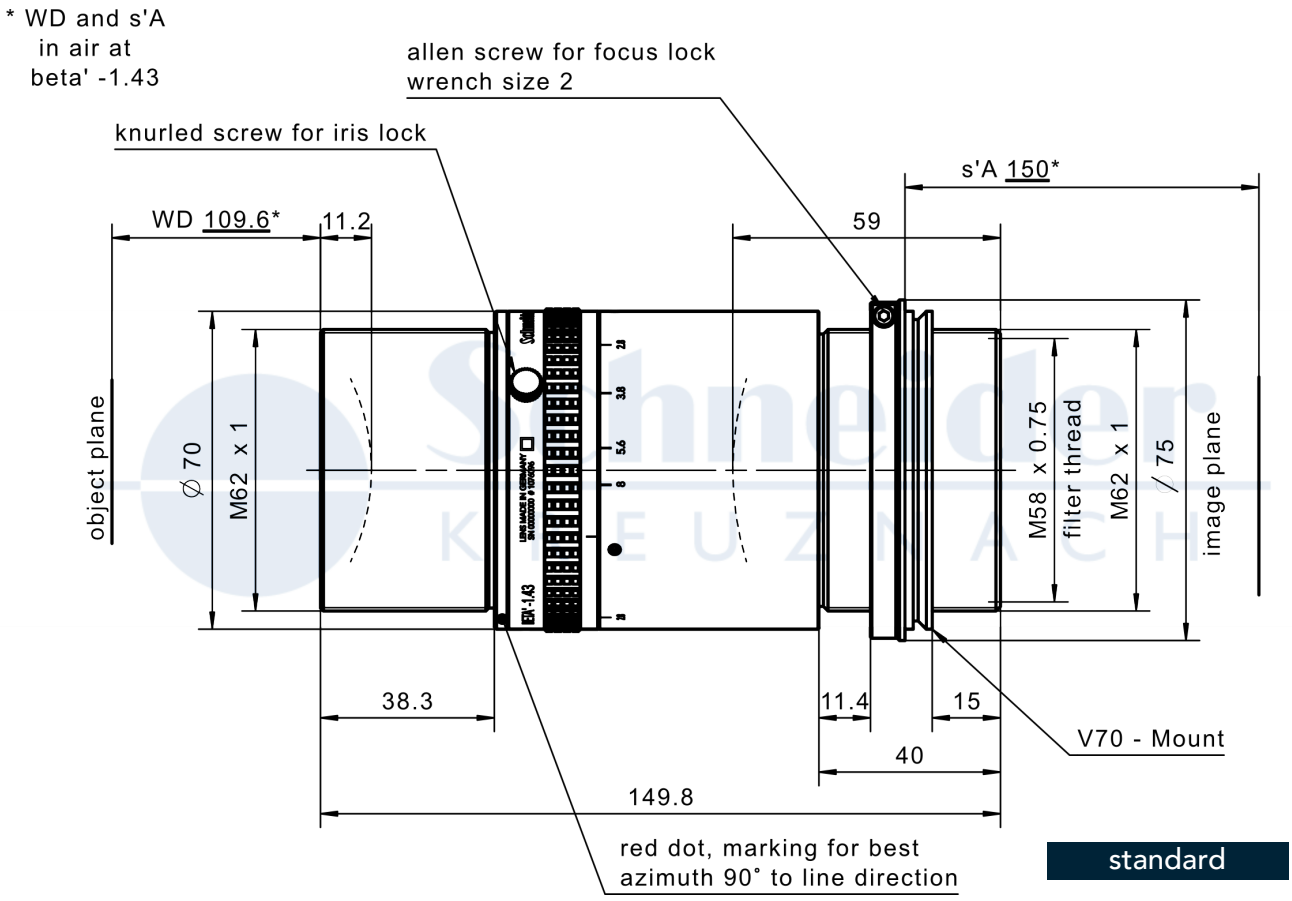
Distortion vs. image height



Transmittance vs. wavelength



Technical drawings



standard

Xenon-Sapphire 3.2/97

Accessories	Mount	Eff. length	ID
Adapter	V70 / M72 x 0.75	10 mm	1072419
Extension tube	M72 x 0.75 / M72 x 0.75	5 mm	1072420
	M72 x 0.75 / M72 x 0.75	10 mm	1072421
	M72 x 0.75 / M72 x 0.75	25 mm	26406
	M72 x 0.75 / M72 x 0.75	50 mm	1054733

Annotation	
Focal length	Nominal focal length
F/# range	Image space F-number range for infinity focus position
Numerical aperture	Maximum real numerical aperture (depending on recommended magnification range either for infinity or respective fixed magnification)
Max. sensor size	Image circle diameter
Max. angle of view	Angle of view associated with maximum sensor size (depending on recommended magnification range either for infinity or respective fixed magnification)
Rec. magnification range	Magnification range as recommended by Schneider-Kreuznach
Rec. working distance range	Working distance, i.e. distance between object and first mechanical element, associated with recommended magnification range
Max. mechanical focus travel	Maximum possible movement of the lens from infinity position (depending on recommended magnification range either for infinity or respective fixed magnification)
Net weight	weight of unpacked lens without lens cap
f'eff	Effective focal length
SF	Distance between vertex of first lens surface and object space focal point
S'F'	Distance between vertex of last lens surface and image space focal point (back focal distance at infinity)
HH'	Distance between principal planes
ß'P	Pupil magnification (= exit pupil diameter / entrance pupil diameter)
SEP	Distance between vertex of first lens surface and entrance pupil
S'AP	Distance between vertex of last lens surface and exit pupil
Σ d	Distance between vertices of first and last lens surface
s'A	Flange focal distance (in air) for infinite object distance (depending on recommended magnification range either for infinity or respective fixed magnification)
ß'	Magnification (= image size / object size), negative value because image is inverted
OO'	Distance between object and image

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Xenon-Sapphire 3.2/88

This highspeed lens is optimized for 16k / 3.5 µm (57.3 mm) /5µm (82 mm) or 12k / 5µm (62.5 mm) line scan sensors or can also be used with area scan cameras. It provides high performance at 100 LP/mm and detects the smallest targets to solve the most challenging applications. The V-Mount interface makes it easy to install numerous mounts and allows to rotate the lens into the highest performance.

Key features

- For 16k / 3.5 µm (57.3 mm) or 16k / 5 µm (82 mm) line scan sensors
- Best azimuth marking
- 400 nm to 1000 nm broadband AR-coating
- Lockable distance and aperture settings

Applications

- FPD inspection
- PCB inspection
- High resolution defect detection
- Quality assurance systems

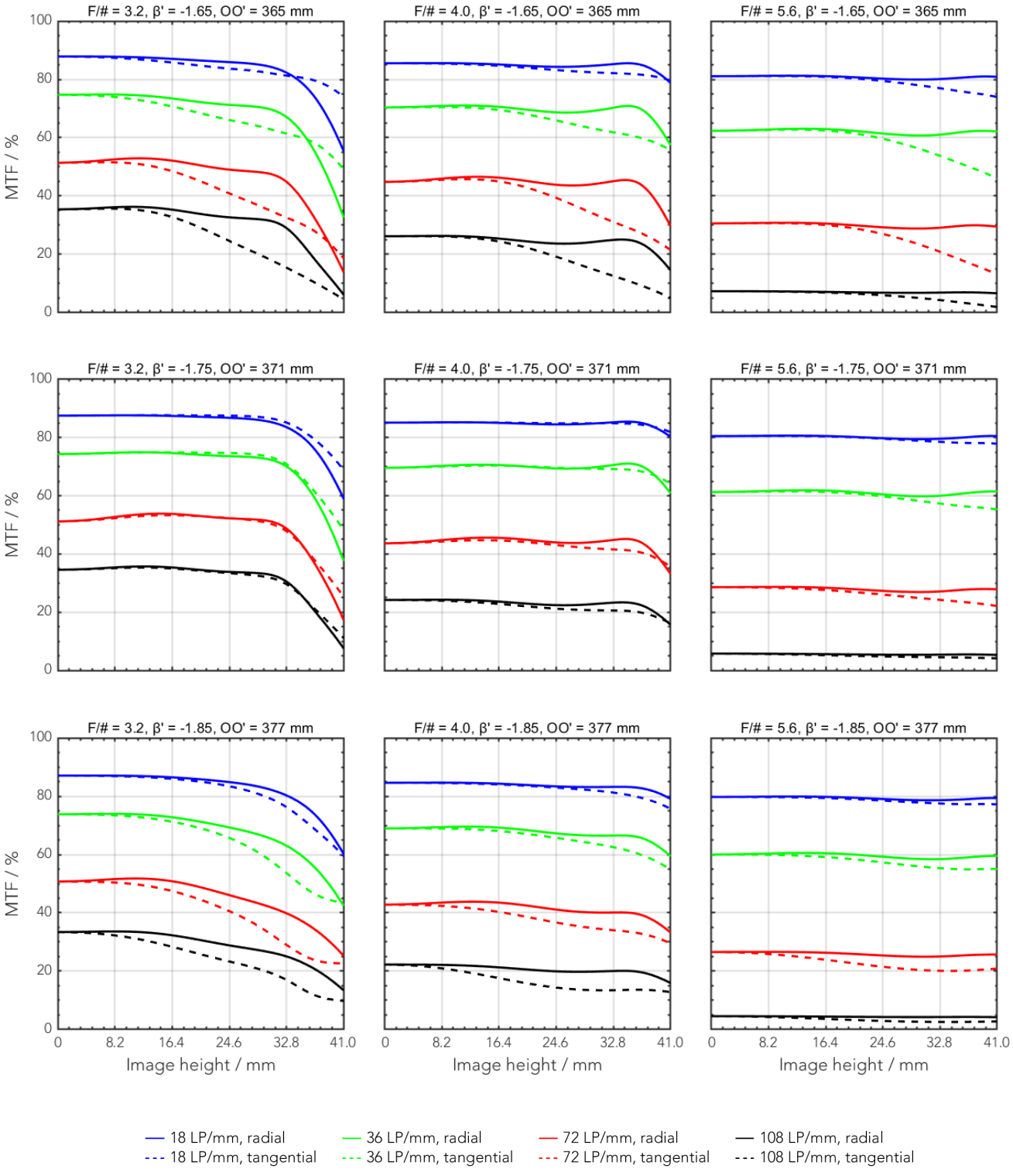
Technical specifications

Type	-0001
ID	1068014
Interface	V70-Mount
Focal length [mm]	88
F/# range	F/3.2 ... F/8
Numerical aperture	0.05
Max. sensor size [mm]	82
Max. angle of view [°]	20
Rec. magnification range	-1.75 (-1.85 ... -1.65)
Rec. working distance range [mm]	81 ... 87
Max. mechanical focus travel [mm]	23.9
Filter thread [mm]	M40.5 x 0.5
Storage temperature [°C]	-25 … +70
Net. weight [g]	688
Additional info	-
f'eff [mm]	87.77
SF [mm]	-38.23
S'F' [mm]	56.40
HH' [mm]	-8.74
ß'P	1.07
SEP [mm]	43.96
S'AP [mm]	-37.20
Σd [mm]	72.17

Xenon-Sapphire 3.2/88

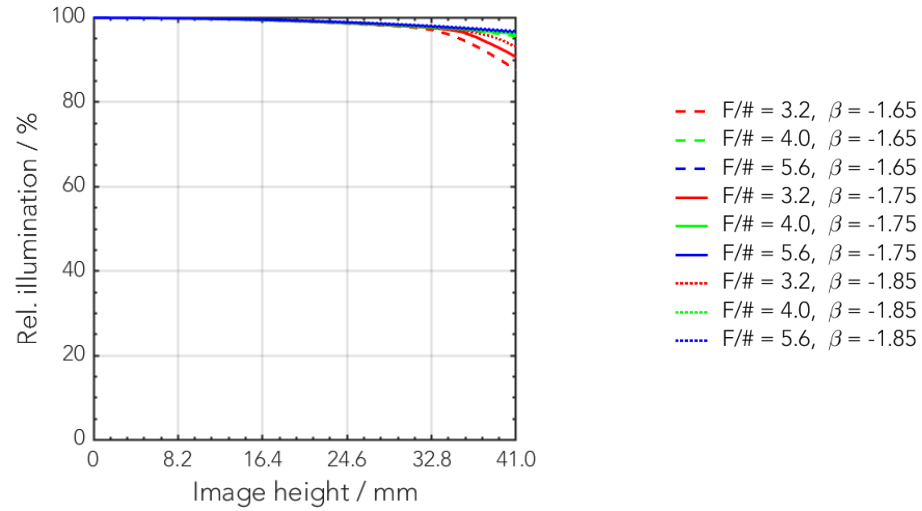
MTF charts

Spectrum name	VIS					
Wavelengths [nm]	425	475	525	575	625	675
Rel. weights [%]	8	16	23	22	19	13

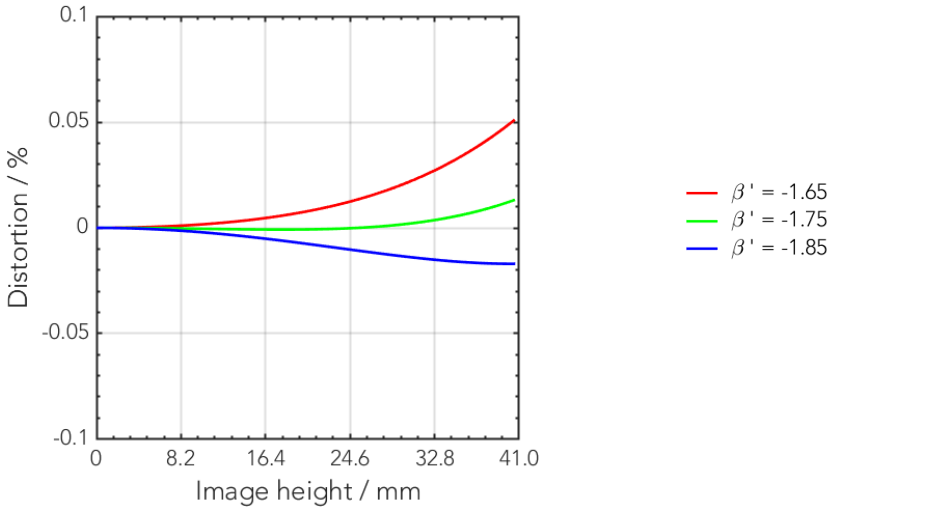


Xenon-Sapphire 3.2/88

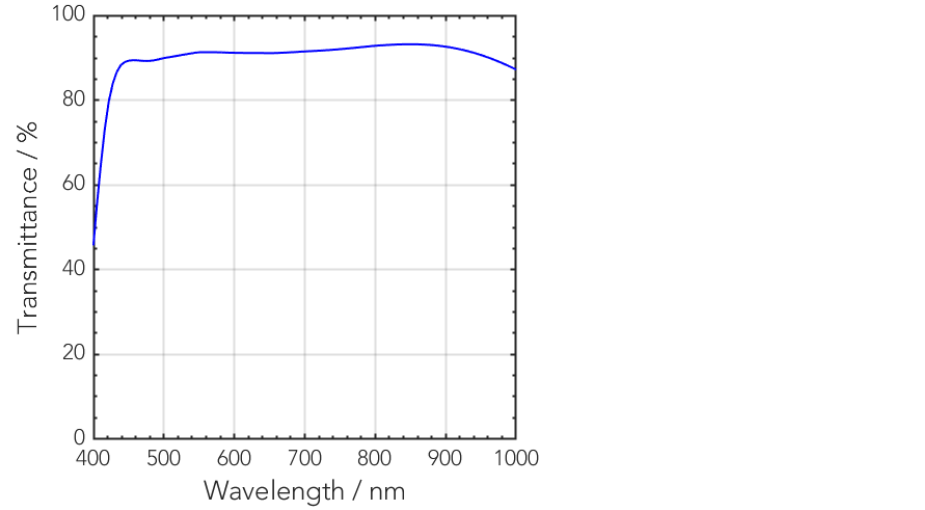
Rel. illumination vs. image height



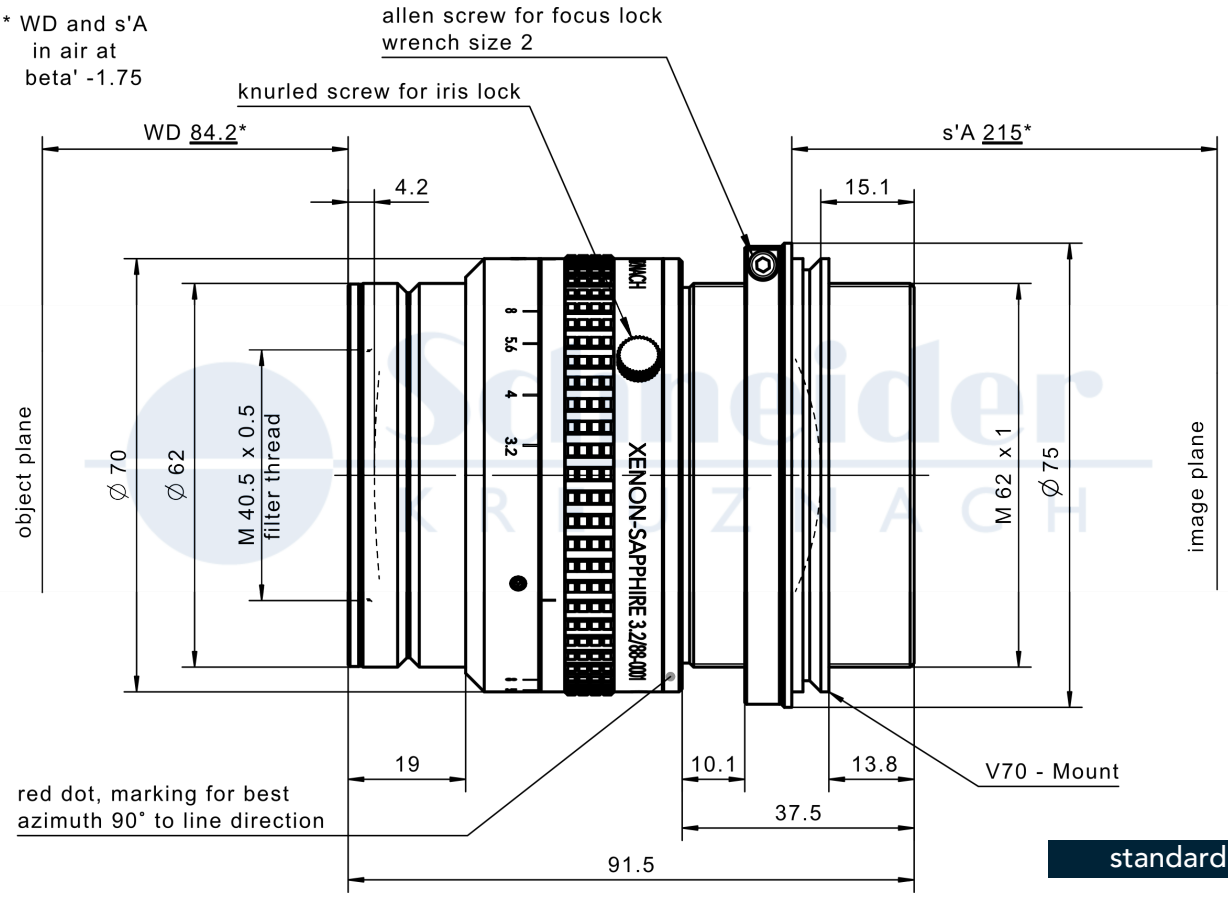
Distortion vs. image height



Transmittance vs. wavelength



Technical drawings



standard

Xenon-Sapphire 3.2/88

Accessories	Mount	Eff. length	ID
Adapter	V70 / M72 x 0.75	10 mm	1072419
Extension tube	M72 x 0.75 / M72 x 0.75	5 mm	1072420
	M72 x 0.75 / M72 x 0.75	10 mm	1072421
	M72 x 0.75 / M72 x 0.75	25 mm	26406
	M72 x 0.75 / M72 x 0.75	50 mm	1054733

Annotation	
Focal length	Nominal focal length
F/# range	Image space F-number range for infinity focus position
Numerical aperture	Maximum real numerical aperture (depending on recommended magnification range either for infinity or respective fixed magnification)
Max. sensor size	Image circle diameter
Max. angle of view	Angle of view associated with maximum sensor size (depending on recommended magnification range either for infinity or respective fixed magnification)
Rec. magnification range	Magnification range as recommended by Schneider-Kreuznach
Rec. working distance range	Working distance, i.e. distance between object and first mechanical element, associated with recommended magnification range
Max. mechanical focus travel	Maximum possible movement of the lens from infinity position (depending on recommended magnification range either for infinity or respective fixed magnification)
Net weight	weight of unpacked lens without lens cap
f'eff	Effective focal length
SF	Distance between vertex of first lens surface and object space focal point
S'F'	Distance between vertex of last lens surface and image space focal point (back focal distance at infinity)
HH'	Distance between principal planes
ß'P	Pupil magnification (= exit pupil diameter / entrance pupil diameter)
SEP	Distance between vertex of first lens surface and entrance pupil
S'AP	Distance between vertex of last lens surface and exit pupil
Σ d	Distance between vertices of first and last lens surface
s'A	Flange focal distance (in air) for infinite object distance (depending on recommended magnification range either for infinity or respective fixed magnification)
ß'	Magnification (= image size / object size), negative value because image is inverted
OO'	Distance between object and image

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Xenon-Sapphire 3.2/88 with BS

This lens with beam splitter for axial illumination is optimized for 16k / 3.5 µm (57.3 mm) or 5 µm (up to 82 mm) line scan sensors or can be used with area scan cameras. It provides high performance at 100 LP/mm and detects the smallest targets to solve the most challenging applications. The V-Mount interface makes it easy to install mounts and to rotate the lens into the highest performance.

Key features

- For 16k / 3.5 µm (57.3 mm) or 16k / 5 µm (82 mm) line scan sensors
- With beam splitter for axial in-line illumination
- 400 nm to 1000 nm broadband AR-coating
- Lockable distance and aperture settings

Applications

- FPD inspection
- PCB inspection
- High resolution defect detection
- Quality assurance systems

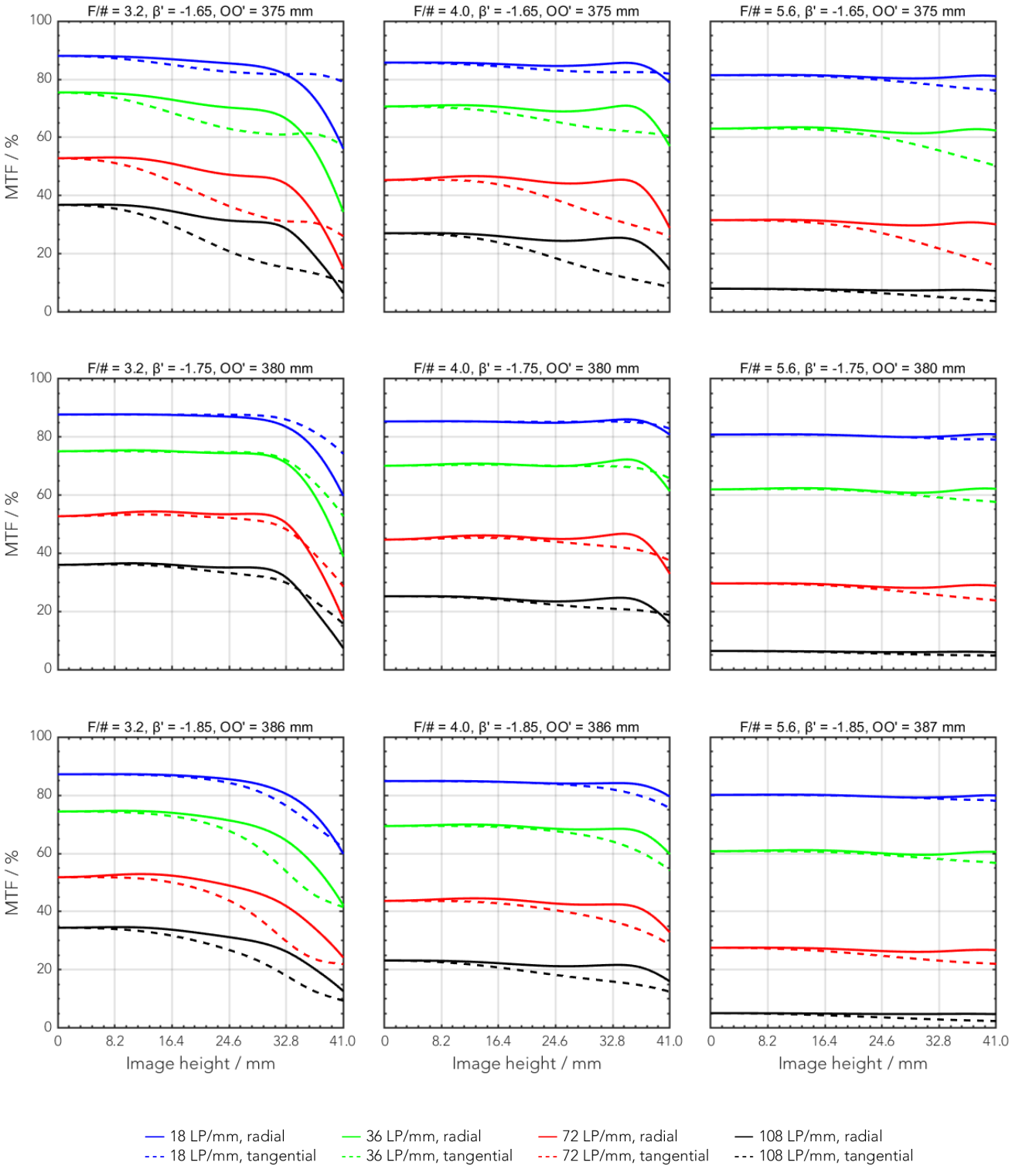
Technical specifications

Type	-0003
ID	1073347
Interface	V70-Mount
Focal length [mm]	88
F/# range	F/3.2 ... F/8
Numerical aperture	0.05
Max. sensor size [mm]	82
Max. angle of view [°]	20
Rec. magnification range	-1.75 (-1.85 ... -1.65)
Rec. working distance range [mm]	59 ... 64
Max. mechanical focus travel [mm]	24
Filter thread [mm]	-
Storage temperature [°C]	-25 … +70
Net. weight [g]	935
Additional info	Chief ray angle in object space = 10.2°
f'eff [mm]	88.22
SF [mm]	-11.97
S'F' [mm]	56.80
HH' [mm]	-0.80
ß'P	1.10
SEP [mm]	68.50
S'AP [mm]	-39.92
Σd [mm]	106.87

Xenon-Sapphire 3.2/88 with BS

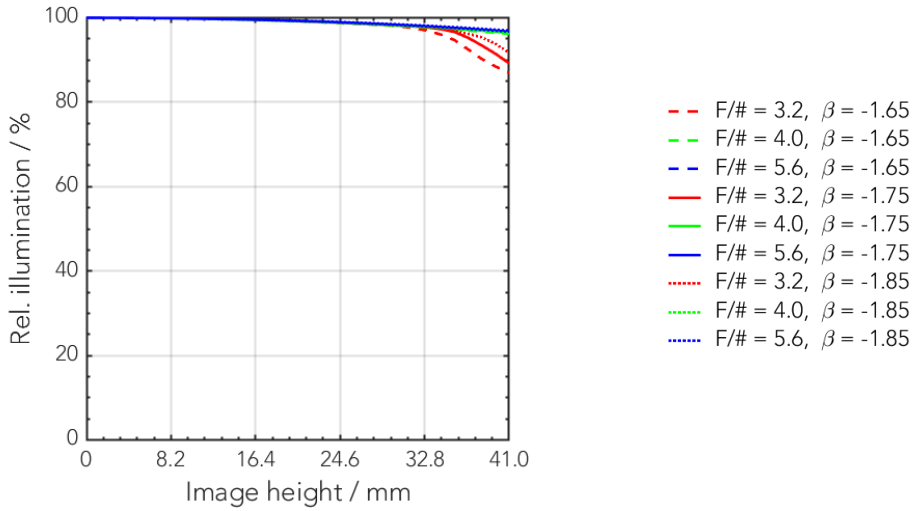
MTF charts

Spectrum name	VIS					
Wavelengths [nm]	425	475	525	575	625	675
Rel. weights [%]	8	16	23	22	19	13

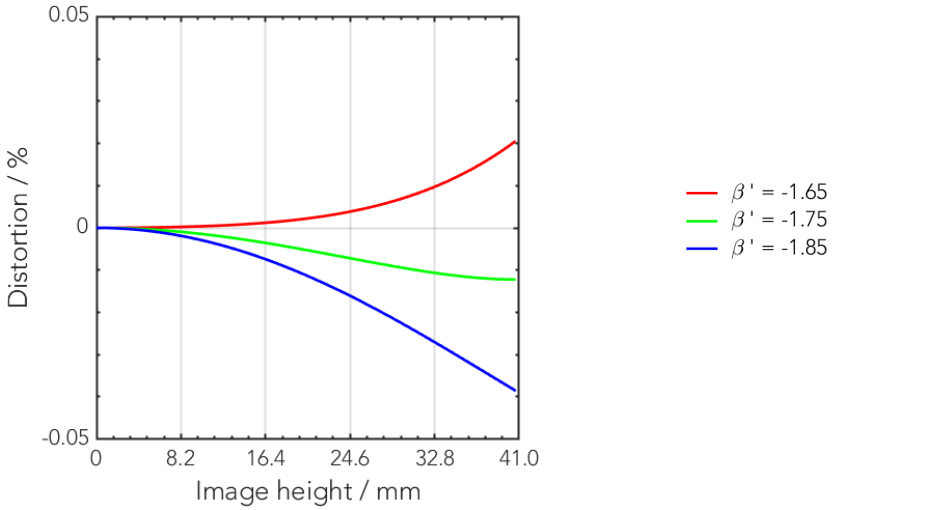


Xenon-Sapphire 3.2/88 with BS

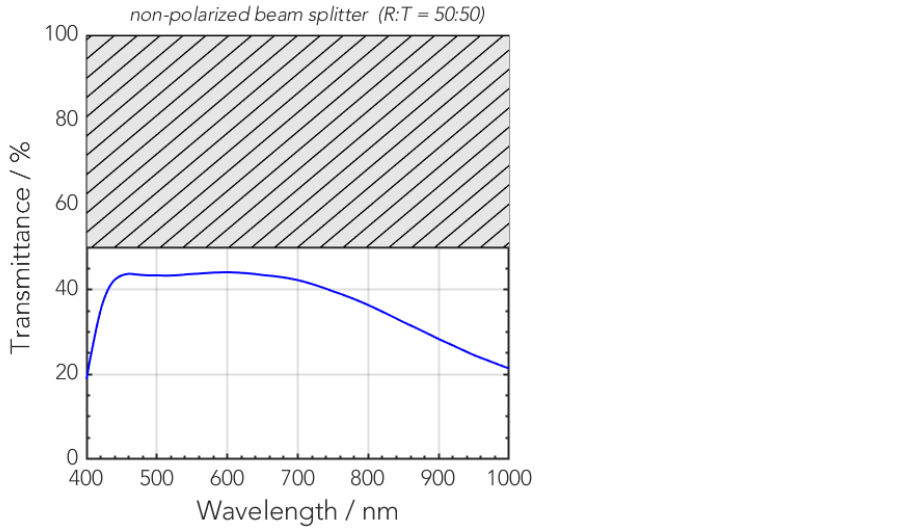
Rel. illumination vs. image height



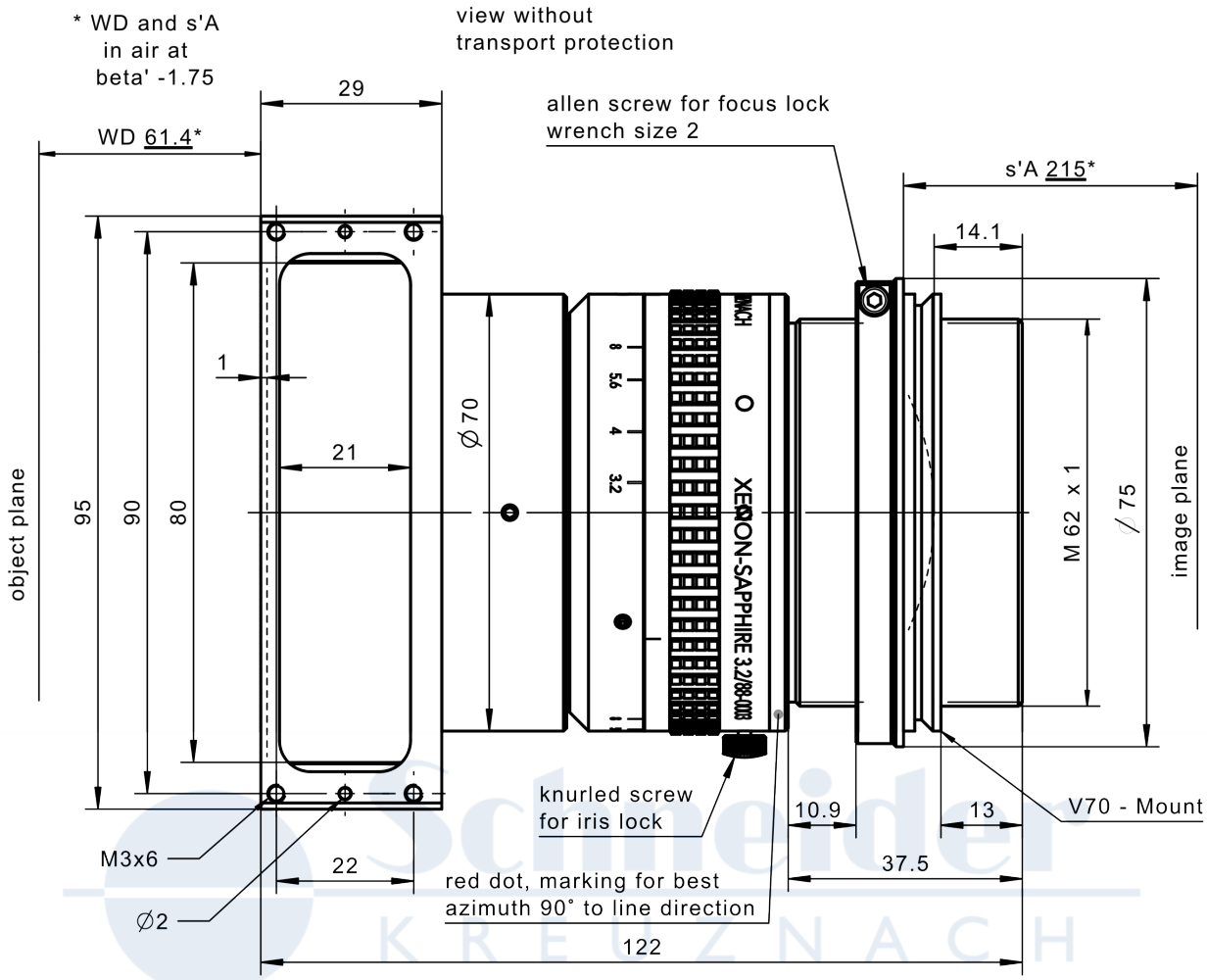
Distortion vs. image height

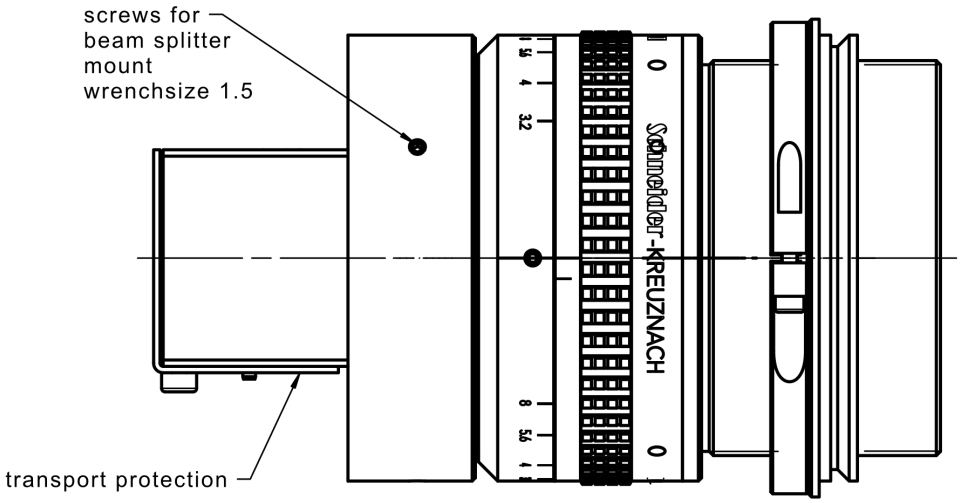


Transmittance vs. wavelength



Technical drawings





standard

Xenon-Sapphire 3.2/88 with BS

Accessories	Mount	Eff. length	ID
Adapter	V70 / M72 x 0.75	10 mm	1072419
Extension tube	M72 x 0.75 / M72 x 0.75	5 mm	1072420
	M72 x 0.75 / M72 x 0.75	10 mm	1072421
	M72 x 0.75 / M72 x 0.75	25 mm	26406
	M72 x 0.75 / M72 x 0.75	50 mm	1054733

Annotation	
Focal length	Nominal focal length
F/# range	Image space F-number range for infinity focus position
Numerical aperture	Maximum real numerical aperture (depending on recommended magnification range either for infinity or respective fixed magnification)
Max. sensor size	Image circle diameter
Max. angle of view	Angle of view associated with maximum sensor size (depending on recommended magnification range either for infinity or respective fixed magnification)
Rec. magnification range	Magnification range as recommended by Schneider-Kreuznach
Rec. working distance range	Working distance, i.e. distance between object and first mechanical element, associated with recommended magnification range
Max. mechanical focus travel	Maximum possible movement of the lens from infinity position (depending on recommended magnification range either for infinity or respective fixed magnification)
Net weight	weight of unpacked lens without lens cap
f'eff	Effective focal length
SF	Distance between vertex of first lens surface and object space focal point
S'F'	Distance between vertex of last lens surface and image space focal point (back focal distance at infinity)
HH'	Distance between principal planes
ß'P	Pupil magnification (= exit pupil diameter / entrance pupil diameter)
SEP	Distance between vertex of first lens surface and entrance pupil
S'AP	Distance between vertex of last lens surface and exit pupil
Σ d	Distance between vertices of first and last lens surface
s'A	Flange focal distance (in air) for infinite object distance (depending on recommended magnification range either for infinity or respective fixed magnification)
ß'	Magnification (= image size / object size), negative value because image is inverted
OO'	Distance between object and image

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Xenon-Sapphire 3.2/88 with BS

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Xenon-Sapphire 3.2/96

This highspeed lens is optimized for 16k / 3.5 µm (57.3 mm) /5µm (82 mm) or 12k / 5µm (62.5 mm) line scan sensors or can also be used with area scan cameras. It provides high performance at 100 LP/mm and detects the smallest targets to solve the most challenging applications. The V-Mount interface makes it easy to install numerous mounts and allows to rotate the lens into the highest performance.

Key features

- For 16k / 3.5 µm (57.3 mm) or 16k / 5 µm (82 mm) line scan sensors
- Best azimuth marking
- 400 nm to 1000 nm broadband AR-coating
- Lockable distance and aperture settings

Applications

- FPD inspection
- PCB inspection
- High resolution defect detection
- Quality assurance systems

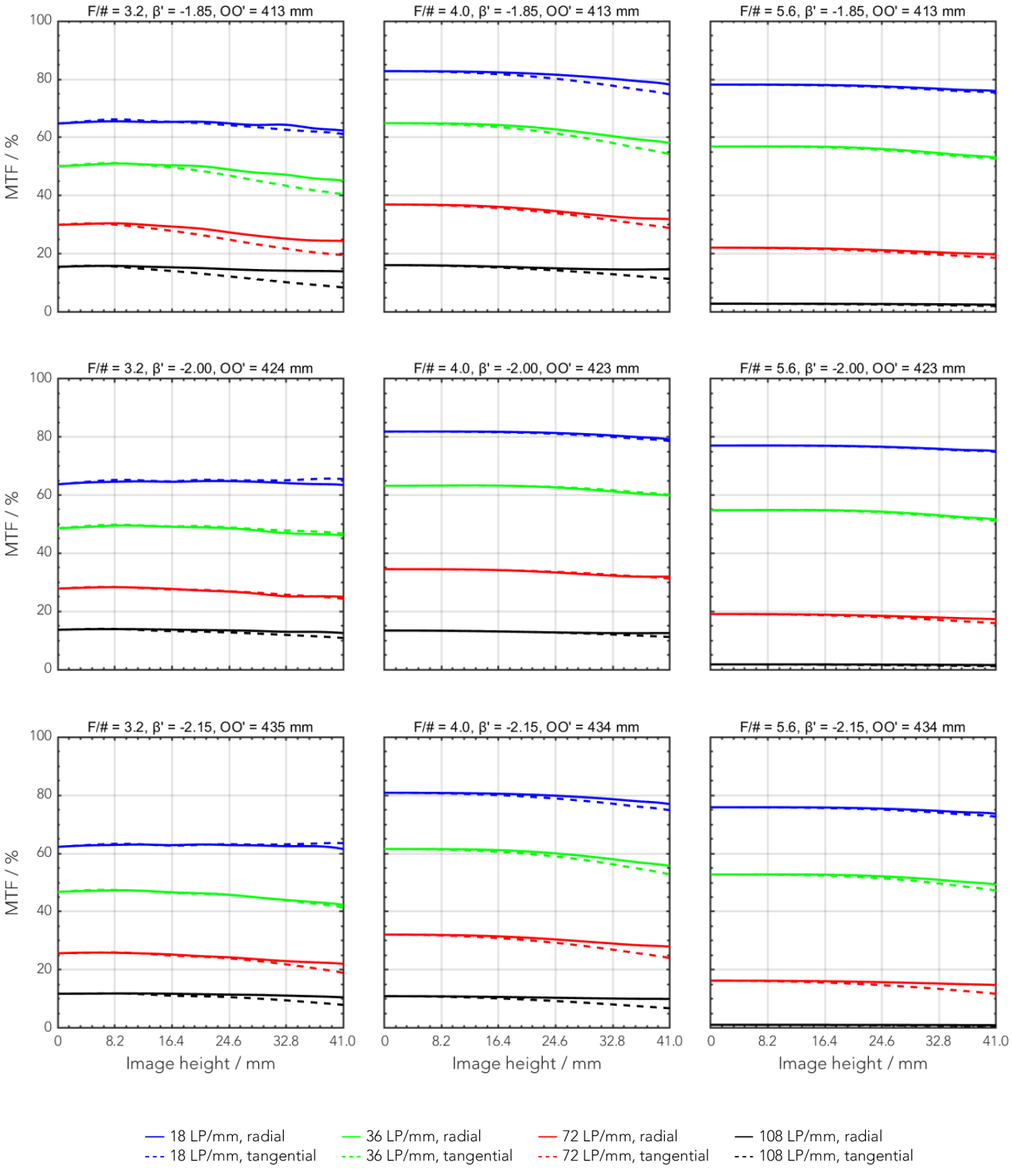
Technical specifications

Type	-0011
ID	1076451
Interface	V70-Mount
Focal length [mm]	96
F/# range	F/3.2 ... F/8
Numerical aperture	0.10
Max. sensor size [mm]	82
Max. angle of view [°]	16
Rec. magnification range	-2 (-2.15 ... -1.85)
Rec. working distance range [mm]	88 ... 95
Max. mechanical focus travel [mm]	26.4
Filter thread [mm]	M58 x 0.75
Storage temperature [°C]	-25 … +70
Net. weight [g]	840
Additional info	-
f'eff [mm]	96.18
SF [mm]	-53.42
S'F' [mm]	47.15
HH' [mm]	-9.61
ß'P	0.98
SEP [mm]	44.61
S'AP [mm]	-47.21
Σd [mm]	82.17

Xenon-Sapphire 3.2/96

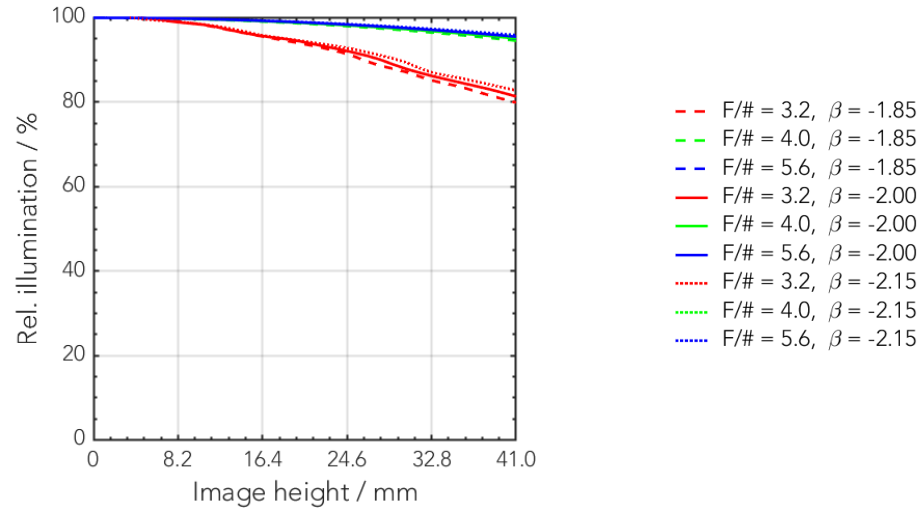
MTF charts

Spectrum name	VIS					
Wavelengths [nm]	425	475	525	575	625	675
Rel. weights [%]	8	16	23	22	19	13

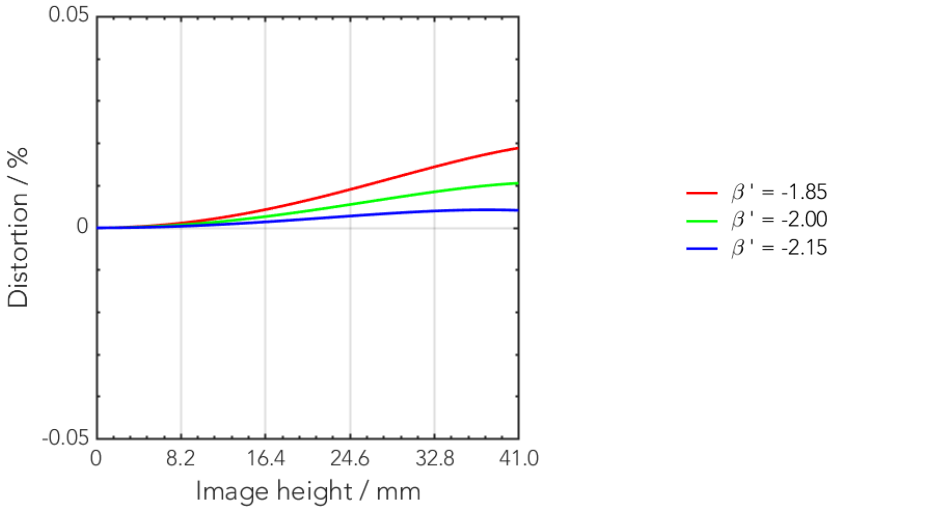


Xenon-Sapphire 3.2/96

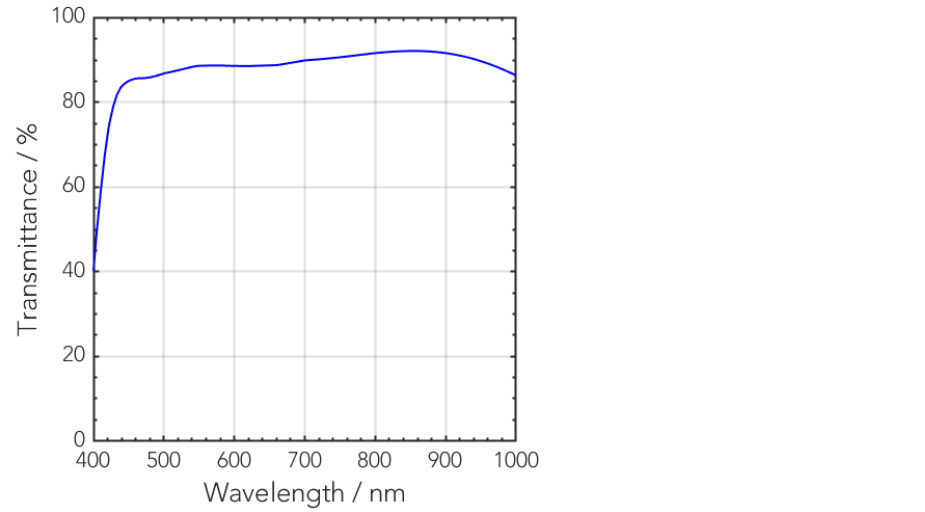
Rel. illumination vs. image height



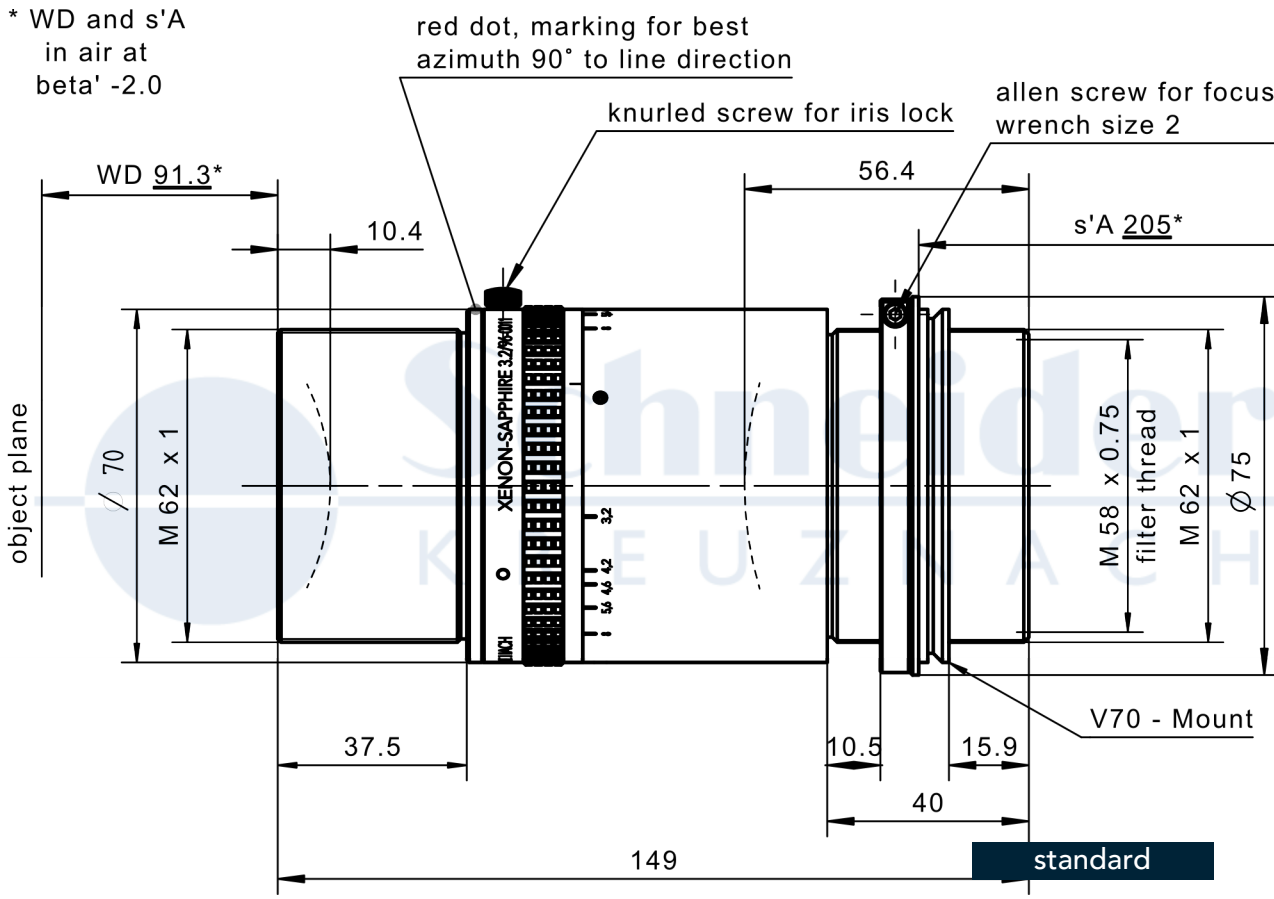
Distortion vs. image height



Transmittance vs. wavelength



Technical drawings



Xenon-Sapphire 3.2/96

Accessories	Mount	Eff. length	ID
Adapter	V70 / M72 x 0.75	10 mm	1072419
Extension tube	M72 x 0.75 / M72 x 0.75	5 mm	1072420
	M72 x 0.75 / M72 x 0.75	10 mm	1072421
	M72 x 0.75 / M72 x 0.75	25 mm	26406
	M72 x 0.75 / M72 x 0.75	50 mm	1054733

Annotation	
Focal length	Nominal focal length
F/# range	Image space F-number range for infinity focus position
Numerical aperture	Maximum real numerical aperture (depending on recommended magnification range either for infinity or respective fixed magnification)
Max. sensor size	Image circle diameter
Max. angle of view	Angle of view associated with maximum sensor size (depending on recommended magnification range either for infinity or respective fixed magnification)
Rec. magnification range	Magnification range as recommended by Schneider-Kreuznach
Rec. working distance range	Working distance, i.e. distance between object and first mechanical element, associated with recommended magnification range
Max. mechanical focus travel	Maximum possible movement of the lens from infinity position (depending on recommended magnification range either for infinity or respective fixed magnification)
Net weight	weight of unpacked lens without lens cap
f'eff	Effective focal length
SF	Distance between vertex of first lens surface and object space focal point
S'F'	Distance between vertex of last lens surface and image space focal point (back focal distance at infinity)
HH'	Distance between principal planes
ß'P	Pupil magnification (= exit pupil diameter / entrance pupil diameter)
SEP	Distance between vertex of first lens surface and entrance pupil
S'AP	Distance between vertex of last lens surface and exit pupil
Σ d	Distance between vertices of first and last lens surface
s'A	Flange focal distance (in air) for infinite object distance (depending on recommended magnification range either for infinity or respective fixed magnification)
ß'	Magnification (= image size / object size), negative value because image is inverted
OO'	Distance between object and image

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Xenon-Sapphire 4.5/95

This highspeed lens is optimized for 16k with 3.5 µm (57.3 mm) or 12k / 5µm (62.5 mm) line scan sensors or can also be used with area scan cameras. The lens provides high performance at 100 LP/mm and detects the smallest targets to solve the most challenging applications. The V-Mount interface makes it easy to install numerous mounts and allows to rotate the lens into the highest performance.

Key features

- For 16k / 3.5 µm (57.3 mm) or 12k / 5 µm (62.5 mm) line scan sensors
- Best azimuth marking
- 400 nm to 1000 nm broadband AR-coating
- Lockable distance and aperture settings

Applications

- FPD inspection
- PCB inspection
- High resolution defect detection
- Quality assurance systems

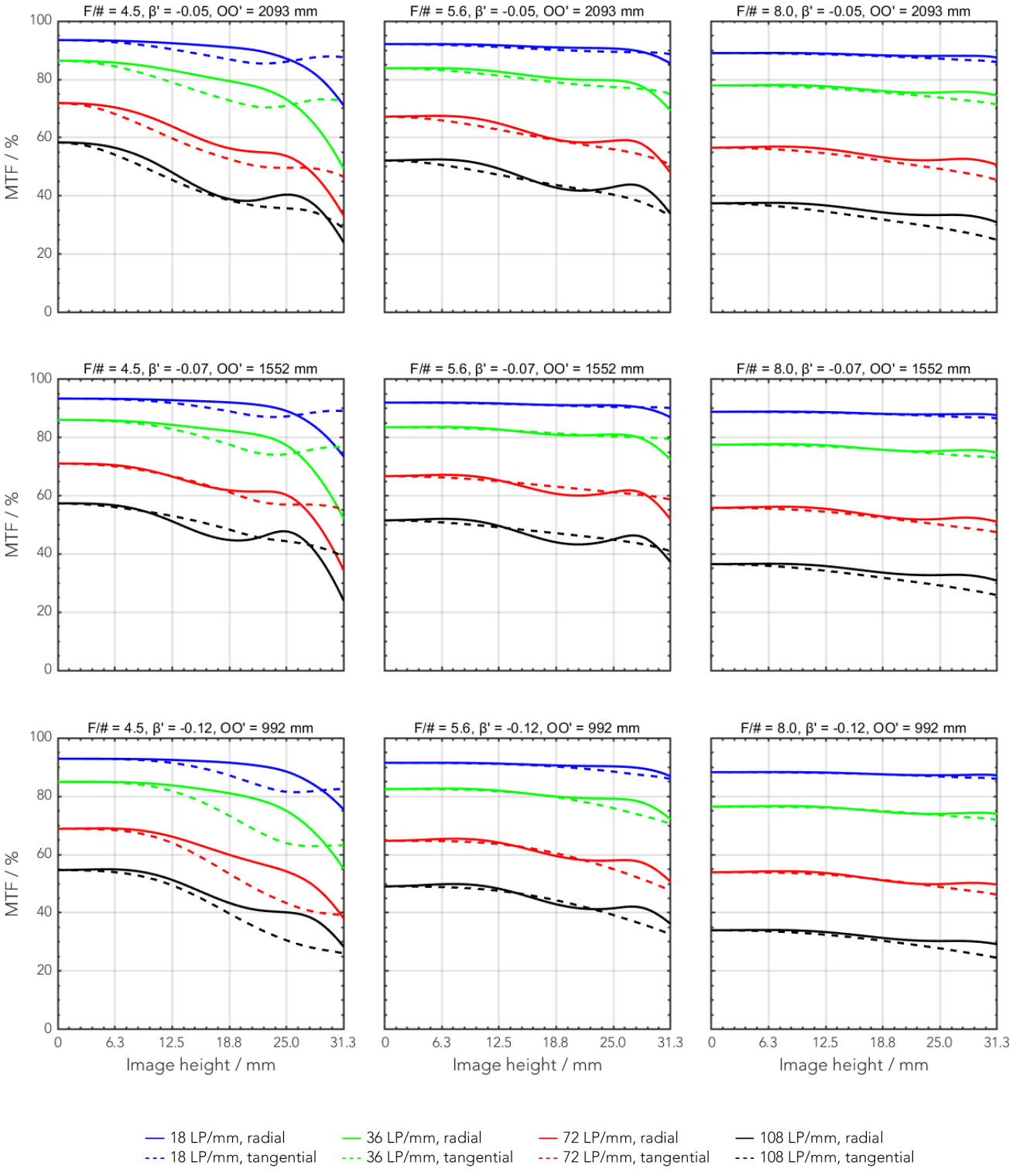
Technical specifications

Type	-0001
ID	1068013
Interface	V70-Mount
Focal length [mm]	95
F/# range	F/4.5 ... F/8
Numerical aperture	0.05
Max. sensor size [mm]	62.5
Max. angle of view [°]	34
Rec. magnification range	-0.07 (-0.17 ... -0.03)
Rec. working distance range [mm]	601 ... 3209
Max. mechanical focus travel [mm]	23.9
Filter thread [mm]	M52 x 0.75
Storage temperature [°C]	-25 … +70
Net. weight [g]	735
Additional info	-
f'eff [mm]	95.00
SF [mm]	-50.28
S'F' [mm]	53.16
HH' [mm]	-1.92
ß'P	1.00
SEP [mm]	44.59
S'AP [mm]	-41.96
Σd [mm]	84.63

Xenon-Sapphire 4.5/95

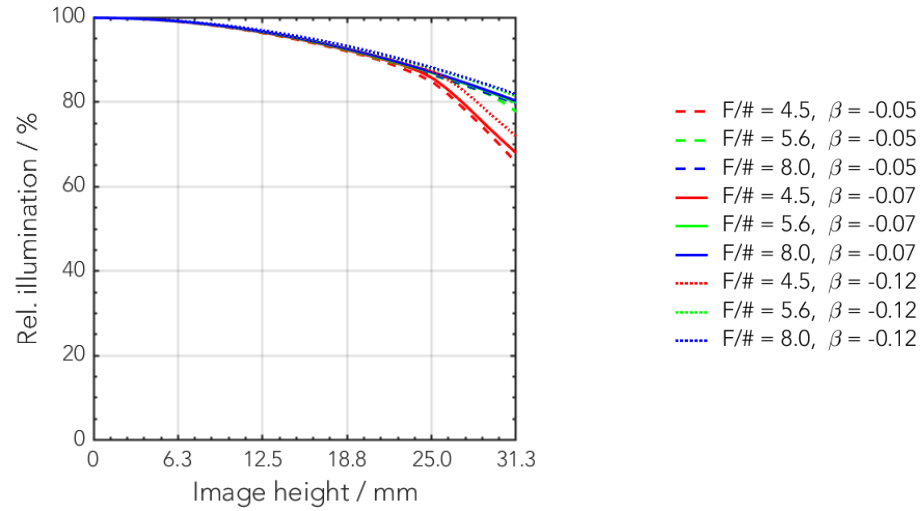
MTF charts

Spectrum name	VIS					
Wavelengths [nm]	425	475	525	575	625	675
Rel. weights [%]	8	16	23	22	19	13

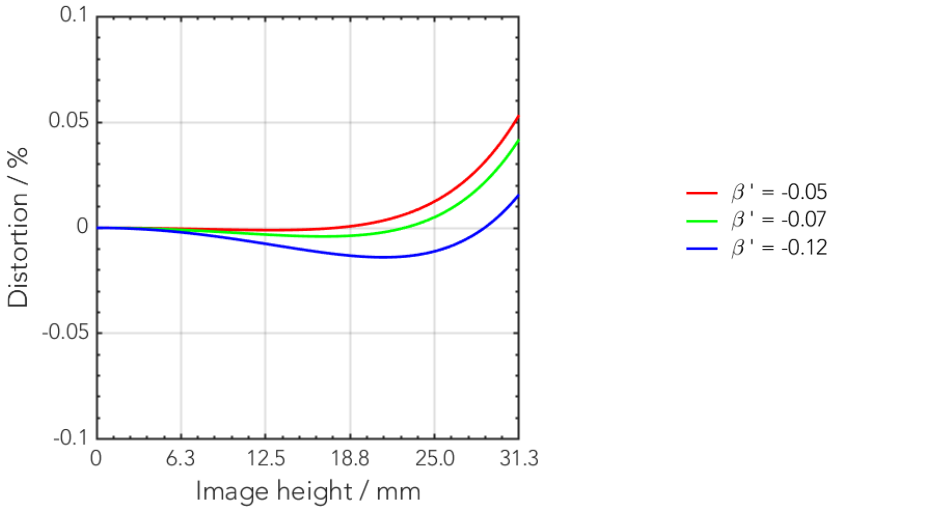


Xenon-Sapphire 4.5/95

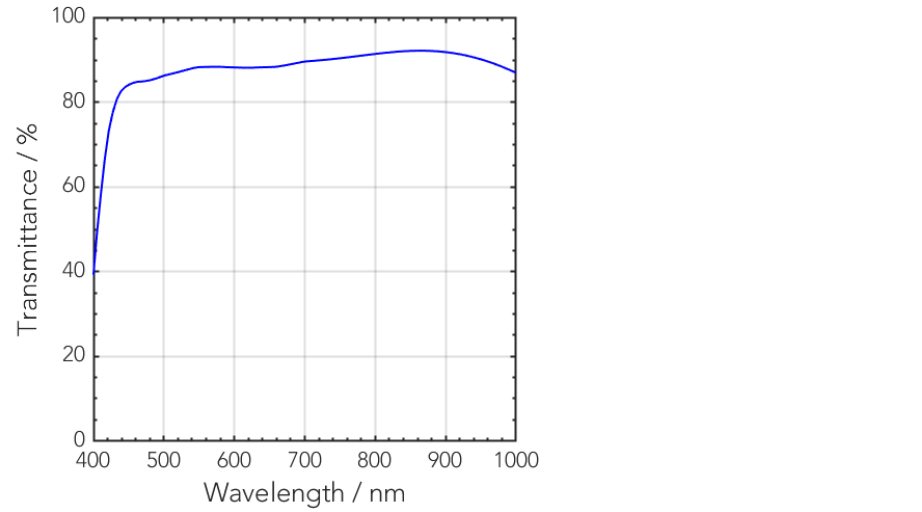
Rel. illumination vs. image height



Distortion vs. image height

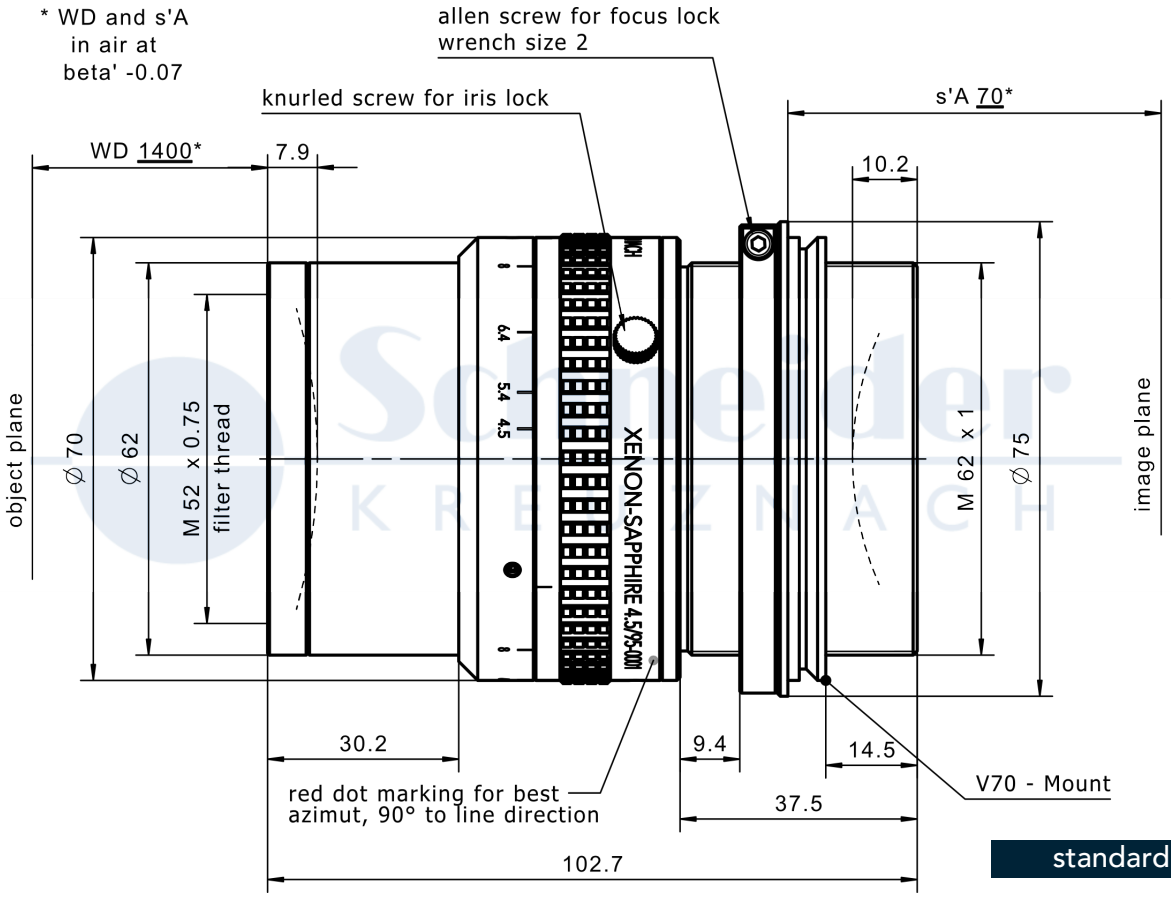


Transmittance vs. wavelength



Xenon-Sapphire 4.5/95

Technical drawings



standard

Xenon-Sapphire 4.5/95

Accessories	Mount	Eff. length	ID
Adapter	V70 / M72 x 0.75	10 mm	1072419
Extension tube	M72 x 0.75 / M72 x 0.75	5 mm	1072420
	M72 x 0.75 / M72 x 0.75	10 mm	1072421
	M72 x 0.75 / M72 x 0.75	25 mm	26406
	M72 x 0.75 / M72 x 0.75	50 mm	1054733

Annotation	
Focal length	Nominal focal length
F/# range	Image space F-number range for infinity focus position
Numerical aperture	Maximum real numerical aperture (depending on recommended magnification range either for infinity or respective fixed magnification)
Max. sensor size	Image circle diameter
Max. angle of view	Angle of view associated with maximum sensor size (depending on recommended magnification range either for infinity or respective fixed magnification)
Rec. magnification range	Magnification range as recommended by Schneider-Kreuznach
Rec. working distance range	Working distance, i.e. distance between object and first mechanical element, associated with recommended magnification range
Max. mechanical focus travel	Maximum possible movement of the lens from infinity position (depending on recommended magnification range either for infinity or respective fixed magnification)
Net weight	weight of unpacked lens without lens cap
f'eff	Effective focal length
SF	Distance between vertex of first lens surface and object space focal point
S'F'	Distance between vertex of last lens surface and image space focal point (back focal distance at infinity)
HH'	Distance between principal planes
ß'P	Pupil magnification (= exit pupil diameter / entrance pupil diameter)
SEP	Distance between vertex of first lens surface and entrance pupil
S'AP	Distance between vertex of last lens surface and exit pupil
Σ d	Distance between vertices of first and last lens surface
s'A	Flange focal distance (in air) for infinite object distance (depending on recommended magnification range either for infinity or respective fixed magnification)
ß'	Magnification (= image size / object size), negative value because image is inverted
OO'	Distance between object and image

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Xenon-Sapphire 3.9/95

This highspeed lens is optimized for 16k with 3.5 µm (57.3 mm) or 12k / 5µm (62.5 mm) line scan sensors or can also be used with area scan cameras. The lens provides high performance at 100 LP/mm and detects the smallest targets to solve the most challenging applications. The V-Mount interface makes it easy to install numerous mounts and allows to rotate the lens into the highest performance.

Key features

- For 16k / 3.5 µm (57.3 mm) or 12k / 5 µm (62.5 mm) line scan sensors
- Best azimuth marking
- 400 nm to 1000 nm broadband AR-coating
- Lockable distance and aperture settings

Applications

- FPD inspection
- PCB inspection
- High resolution defect detection
- Quality assurance systems

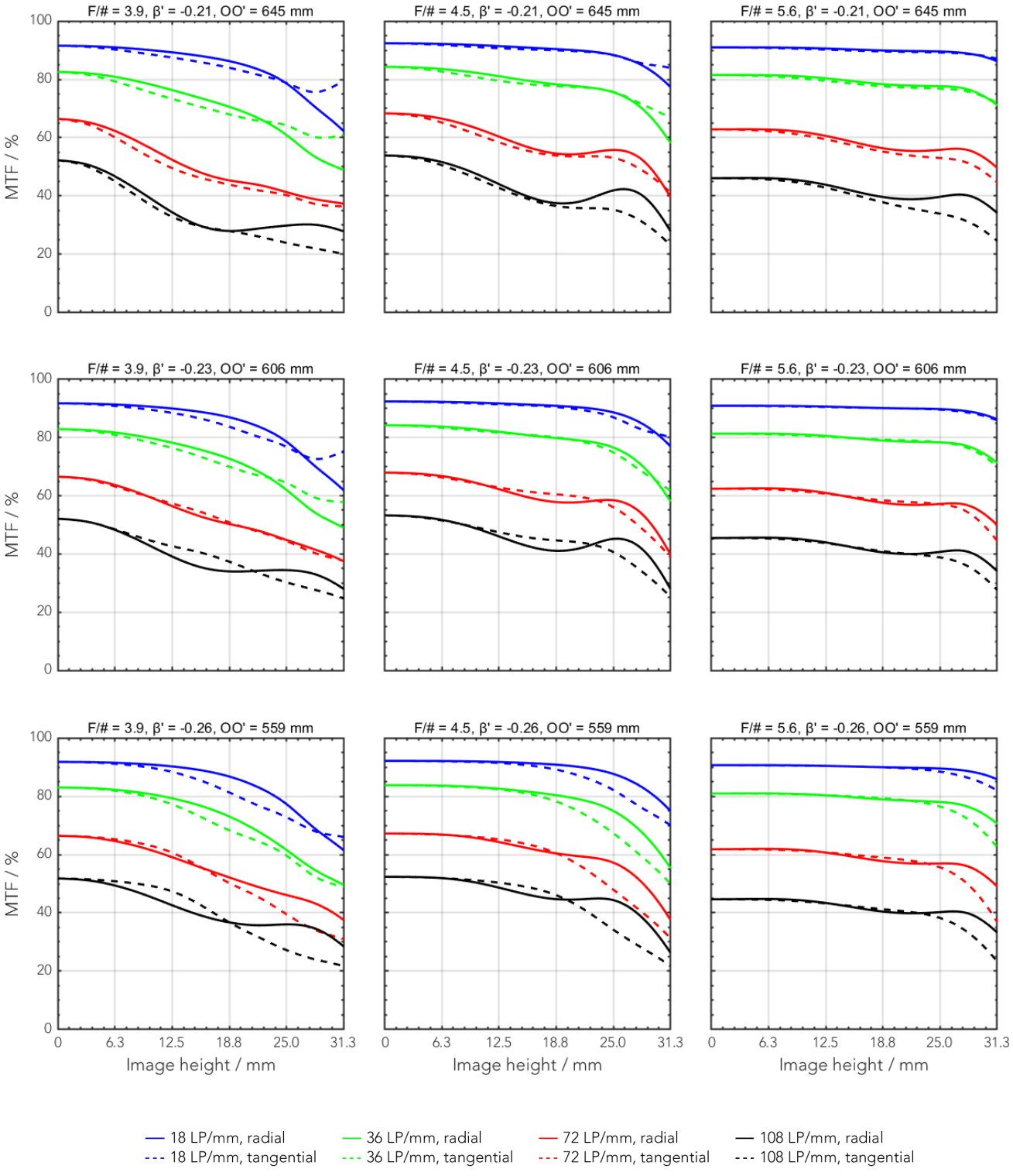
Technical specifications

Type	-0001
ID	1071819
Interface	V70-Mount
Focal length [mm]	95
F/# range	F/3.9 ... F/8
Numerical aperture	0.11
Max. sensor size [mm]	62.5
Max. angle of view [°]	30
Rec. magnification range	-0.23 (-0.28 ... -0.2)
Rec. working distance range [mm]	379 ... 515
Max. mechanical focus travel [mm]	23.9
Filter thread [mm]	M52 x 0.75
Storage temperature [°C]	-25 … +70
Net. weight [g]	700
Additional info	-
f'eff [mm]	95.16
SF [mm]	-46.21
S'F' [mm]	54.48
HH' [mm]	-8.79
ß'P	1.08
SEP [mm]	42.17
S'AP [mm]	-47.98
Σd [mm]	80.84

Xenon-Sapphire 3.9/95

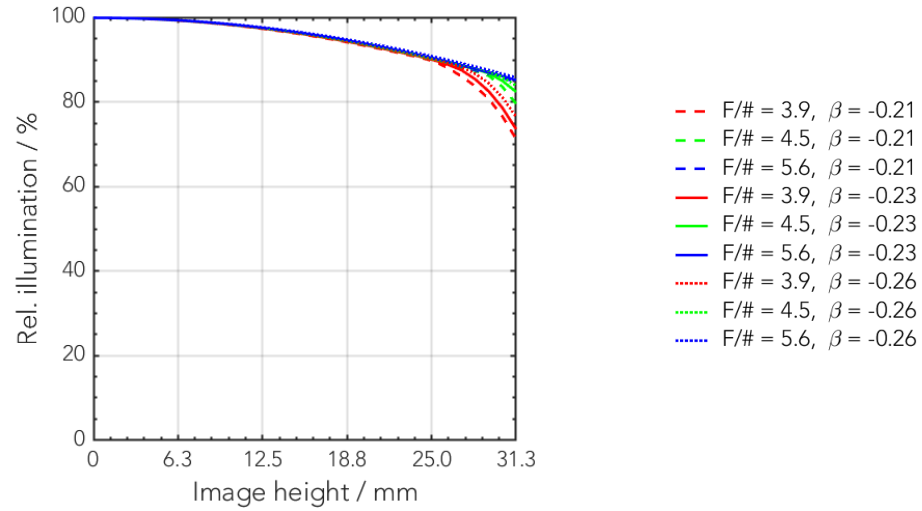
MTF charts

Spectrum name	VIS					
Wavelengths [nm]	425	475	525	575	625	675
Rel. weights [%]	8	16	23	22	19	13

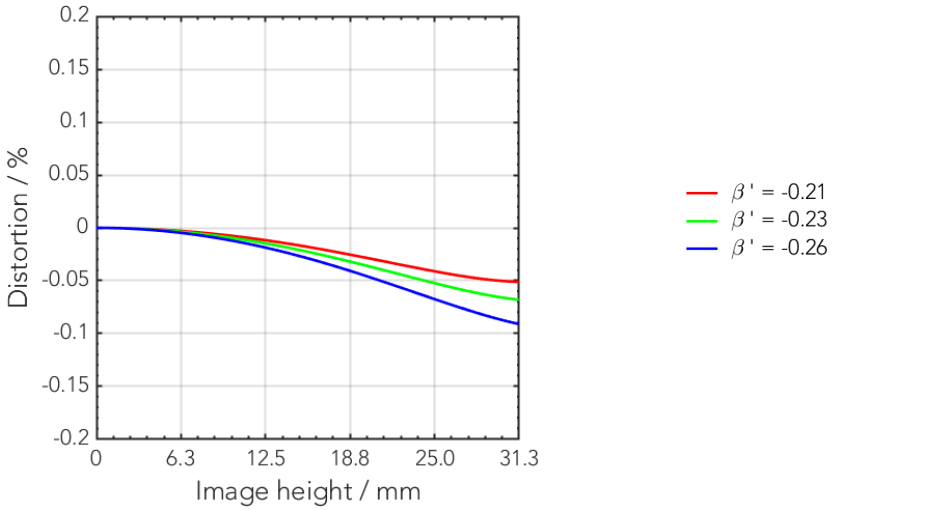


Xenon-Sapphire 3.9/95

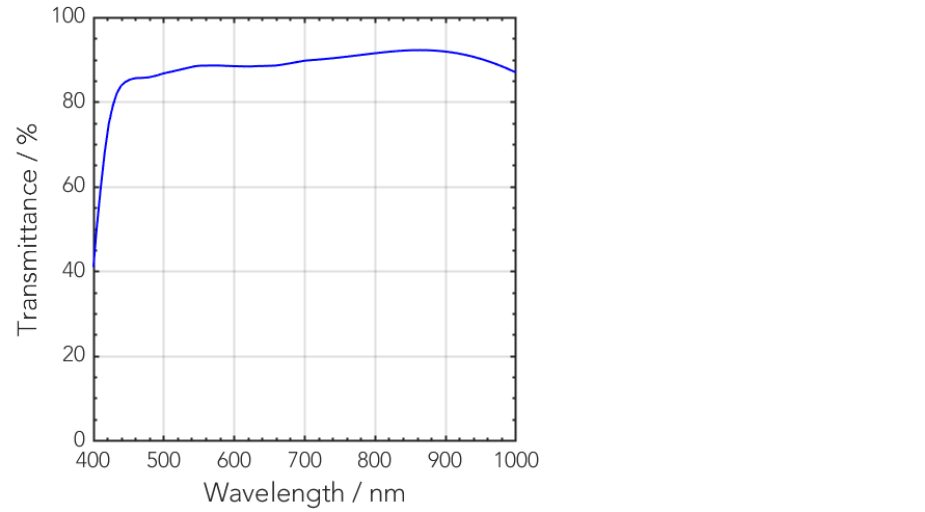
Rel. illumination vs. image height



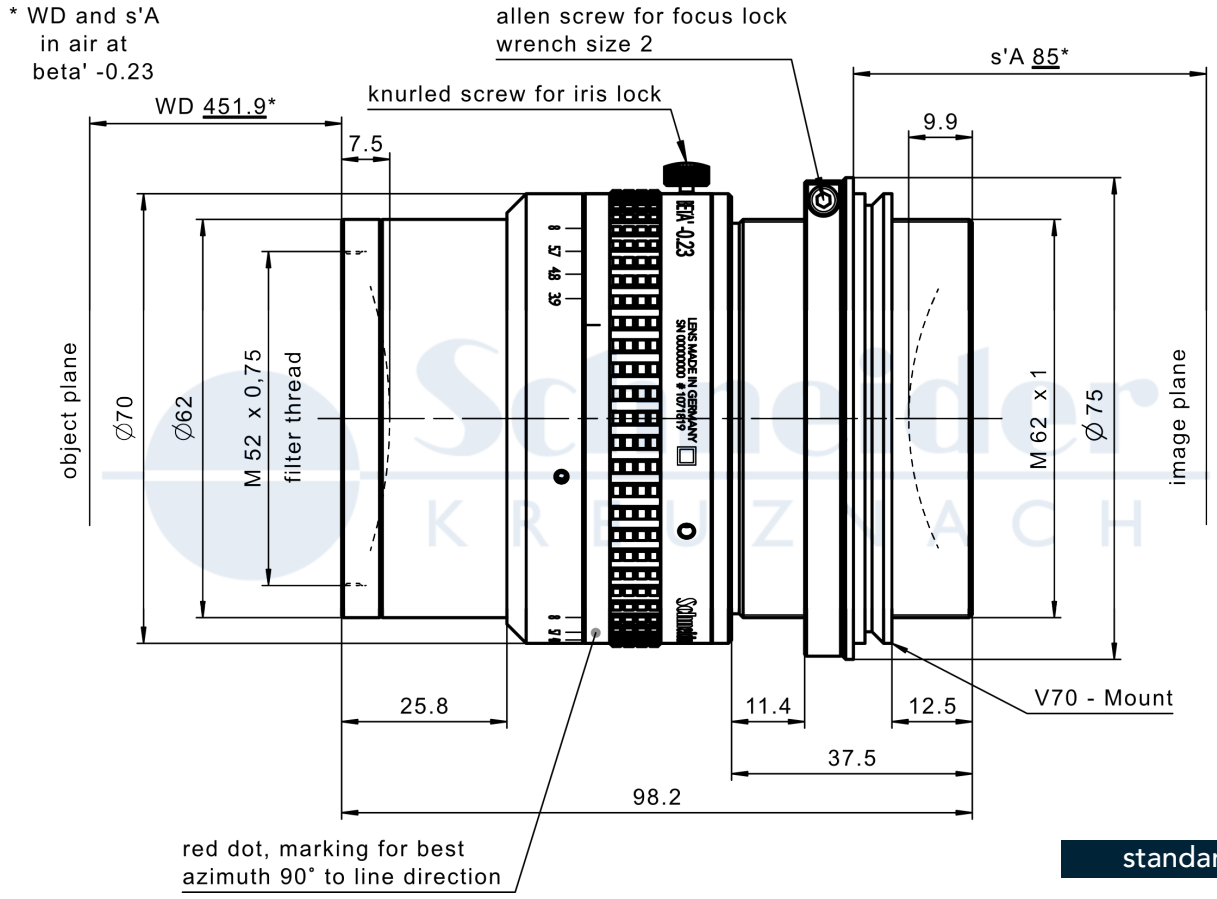
Distortion vs. image height



Transmittance vs. wavelength



Technical drawings



standard

Xenon-Sapphire 3.9/95

Accessories	Mount	Eff. length	ID
Adapter	V70 / M72 x 0.75	10 mm	1072419
Extension tube	M72 x 0.75 / M72 x 0.75	5 mm	1072420
	M72 x 0.75 / M72 x 0.75	10 mm	1072421
	M72 x 0.75 / M72 x 0.75	25 mm	26406
	M72 x 0.75 / M72 x 0.75	50 mm	1054733

Annotation	
Focal length	Nominal focal length
F/# range	Image space F-number range for infinity focus position
Numerical aperture	Maximum real numerical aperture (depending on recommended magnification range either for infinity or respective fixed magnification)
Max. sensor size	Image circle diameter
Max. angle of view	Angle of view associated with maximum sensor size (depending on recommended magnification range either for infinity or respective fixed magnification)
Rec. magnification range	Magnification range as recommended by Schneider-Kreuznach
Rec. working distance range	Working distance, i.e. distance between object and first mechanical element, associated with recommended magnification range
Max. mechanical focus travel	Maximum possible movement of the lens from infinity position (depending on recommended magnification range either for infinity or respective fixed magnification)
Net weight	weight of unpacked lens without lens cap
f'eff	Effective focal length
SF	Distance between vertex of first lens surface and object space focal point
S'F'	Distance between vertex of last lens surface and image space focal point (back focal distance at infinity)
HH'	Distance between principal planes
ß'P	Pupil magnification (= exit pupil diameter / entrance pupil diameter)
SEP	Distance between vertex of first lens surface and entrance pupil
S'AP	Distance between vertex of last lens surface and exit pupil
Σ d	Distance between vertices of first and last lens surface
s'A	Flange focal distance (in air) for infinite object distance (depending on recommended magnification range either for infinity or respective fixed magnification)
ß'	Magnification (= image size / object size), negative value because image is inverted
OO'	Distance between object and image

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Xenon-Sapphire 3.7/96

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Key features

- For 16k / 3.5 µm (57.3 mm) or 12k / 5 µm (62.5 mm) line scan sensors
- Best azimuth marking
- 400 nm to 1000 nm broadband AR-coating
- Lockable distance and aperture settings

Applications

- FPD inspection
- PCB inspection
- High resolution defect detection
- Quality assurance systems

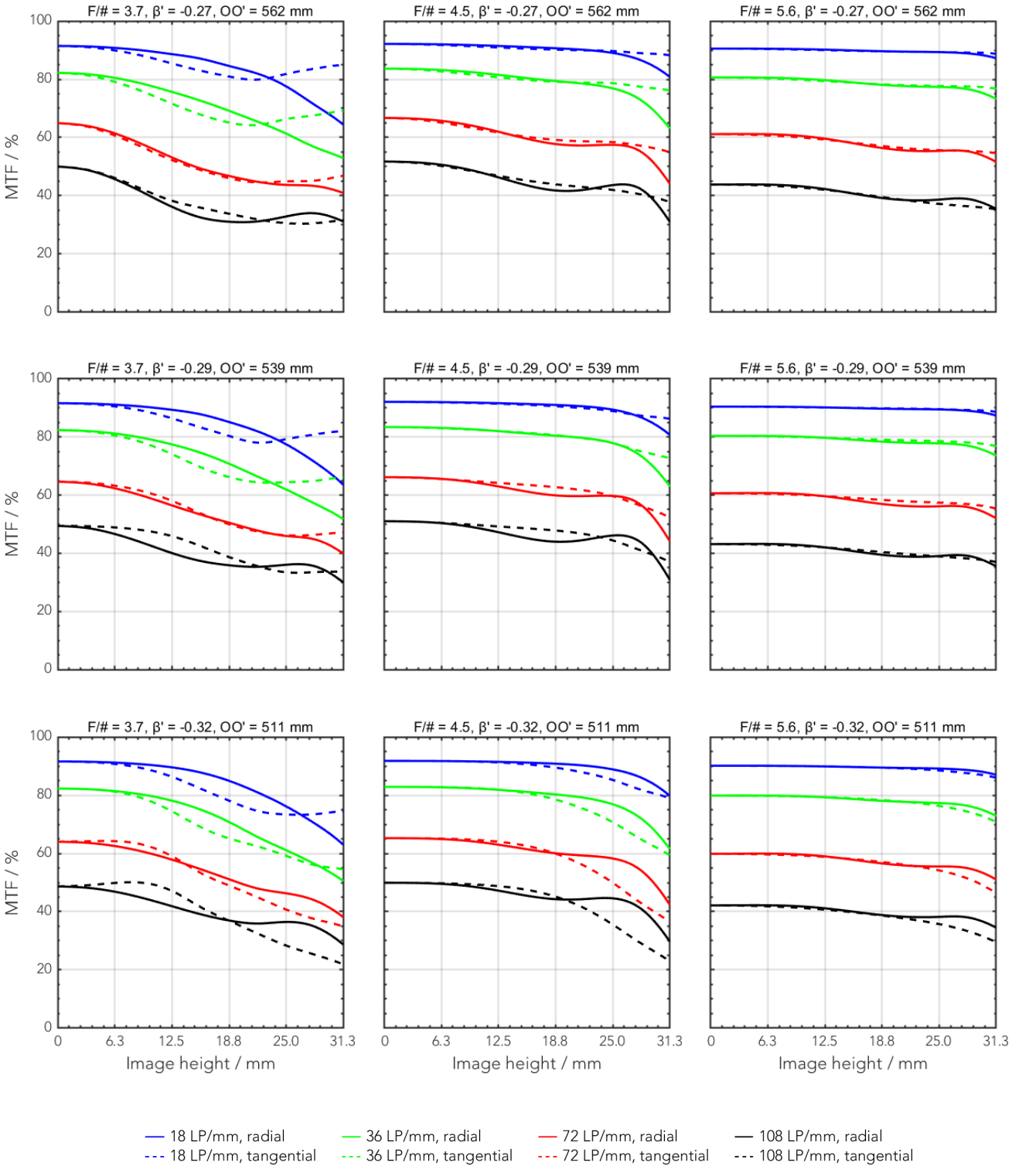
Technical specifications

Type	-0001
ID	1071818
Interface	V70-Mount
Focal length [mm]	96
F/# range	F/3.7 ... F/8
Numerical aperture	0.11
Max. sensor size [mm]	62.5
Max. angle of view [°]	29
Rec. magnification range	-0.29 (-0.33 ... -0.27)
Rec. working distance range [mm]	330 ... 394
Max. mechanical focus travel [mm]	23.9
Filter thread [mm]	M52 x 0.75
Storage temperature [°C]	-25 … +70
Net. weight [g]	700
Additional info	-
f'eff [mm]	95.50
SF [mm]	-47.86
S'F' [mm]	53.63
HH' [mm]	-9.19
ß'P	1.05
SEP [mm]	43.52
S'AP [mm]	-46.18
Σd [mm]	80.33

Xenon-Sapphire 3.7/96

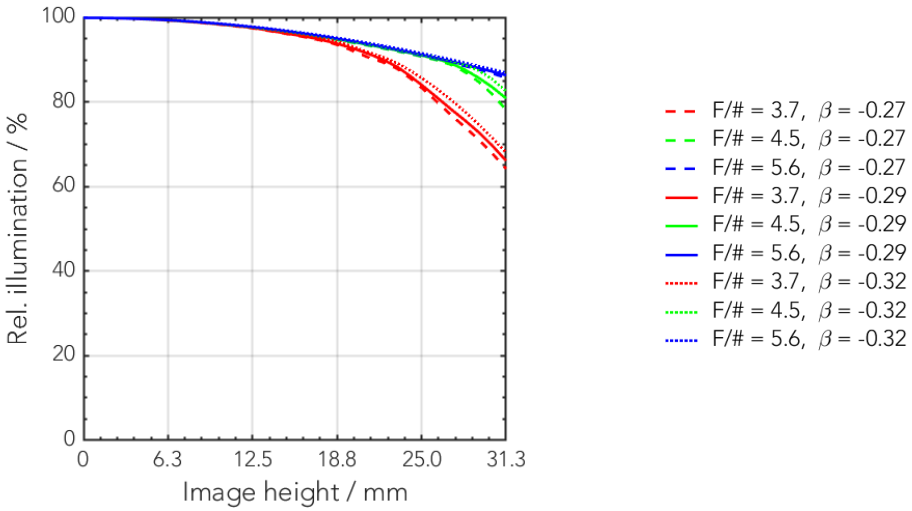
MTF charts

Spectrum name	VIS					
Wavelengths [nm]	425	475	525	575	625	675
Rel. weights [%]	8	16	23	22	19	13

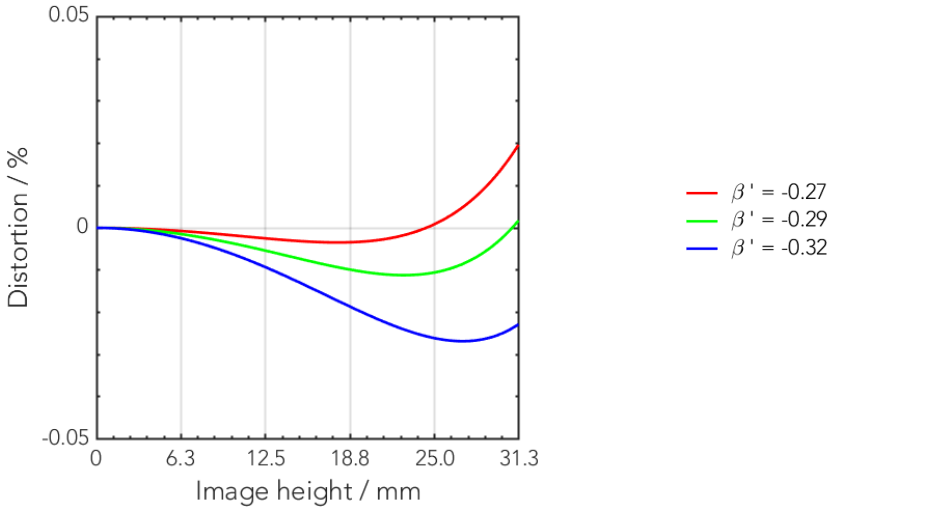


Xenon-Sapphire 3.7/96

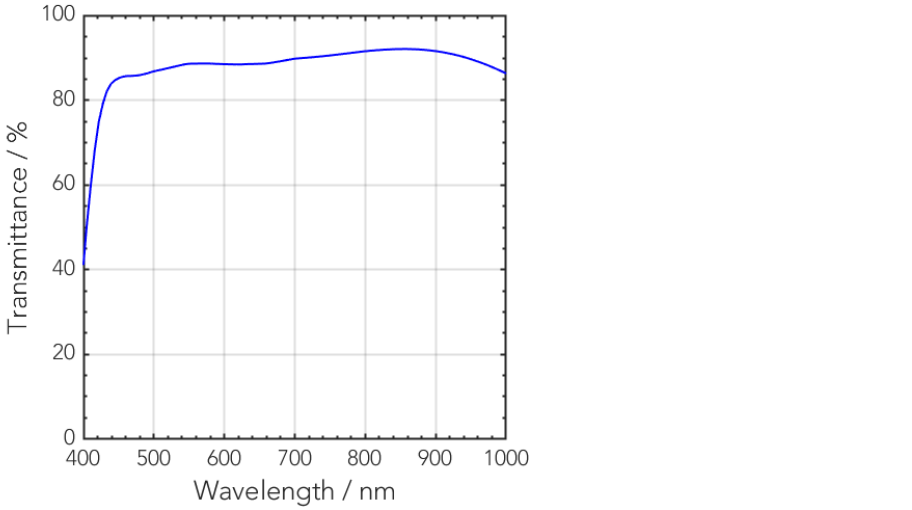
Rel. illumination vs. image height



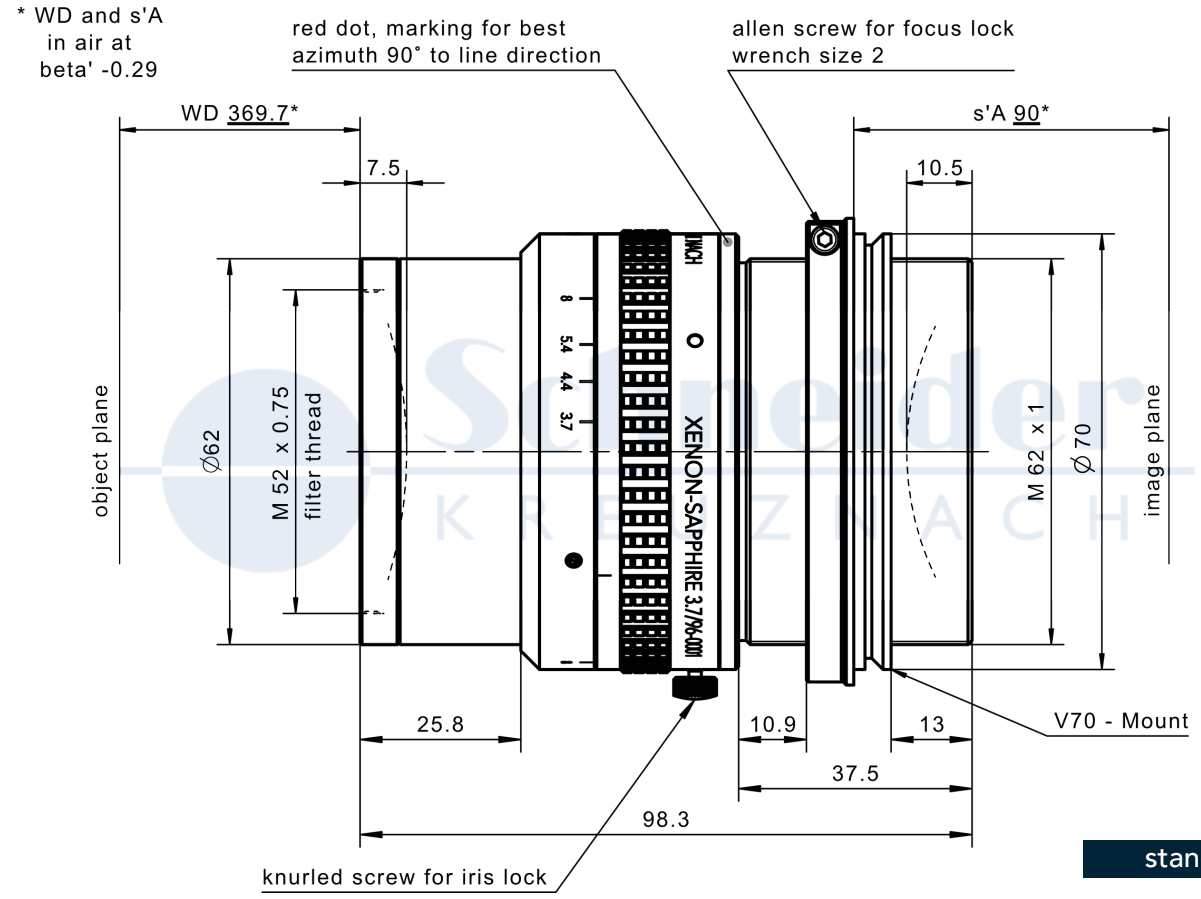
Distortion vs. image height



Transmittance vs. wavelength



Technical drawings



standard

Xenon-Sapphire 3.7/96

Accessories	Mount	Eff. length	ID
Adapter	V70 / M72 x 0.75	10 mm	1072419
Extension tube	M72 x 0.75 / M72 x 0.75	5 mm	1072420
	M72 x 0.75 / M72 x 0.75	10 mm	1072421
	M72 x 0.75 / M72 x 0.75	25 mm	26406
	M72 x 0.75 / M72 x 0.75	50 mm	1054733

Annotation	
Focal length	Nominal focal length
F/# range	Image space F-number range for infinity focus position
Numerical aperture	Maximum real numerical aperture (depending on recommended magnification range either for infinity or respective fixed magnification)
Max. sensor size	Image circle diameter
Max. angle of view	Angle of view associated with maximum sensor size (depending on recommended magnification range either for infinity or respective fixed magnification)
Rec. magnification range	Magnification range as recommended by Schneider-Kreuznach
Rec. working distance range	Working distance, i.e. distance between object and first mechanical element, associated with recommended magnification range
Max. mechanical focus travel	Maximum possible movement of the lens from infinity position (depending on recommended magnification range either for infinity or respective fixed magnification)
Net weight	weight of unpacked lens without lens cap
f'eff	Effective focal length
SF	Distance between vertex of first lens surface and object space focal point
S'F'	Distance between vertex of last lens surface and image space focal point (back focal distance at infinity)
HH'	Distance between principal planes
ß'P	Pupil magnification (= exit pupil diameter / entrance pupil diameter)
SEP	Distance between vertex of first lens surface and entrance pupil
S'AP	Distance between vertex of last lens surface and exit pupil
Σ d	Distance between vertices of first and last lens surface
s'A	Flange focal distance (in air) for infinite object distance (depending on recommended magnification range either for infinity or respective fixed magnification)
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OO'	Distance between object and image

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