# Black-Diamond 1.6/82 | 5.0x | BS

This lens with beam splitter for axial illumination is optimized for 16k / 5µm (82 mm) line scan sensors. The lens provides high performance at >72 LP/mm with low color shift 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

- High resolution over the entire field
- Low chromatic focal shift
- No rel. illumination loss at the edge
- Axial In-line Illumination

## Applications

- PCB inspection
- Flat Panel inspection
- LCD inspection
- Alignment tasks

## Technical specifications

| | |
|---|---|
| Type | -0013 |
| ID | 1099014 |
| Interface | V70-Mount |
| Focal length [mm] | 82 |
| F/# range | F/1.6 ... F/11 |
| Numerical aperture | 0.21 |
| Max. sensor size [mm] | 82 |
| Max. angle of view [°] | 8 |
| Rec. magnification range | -5 (-4.9 ... -5.1) |
| Rec. working distance range [mm] | 35.1 (35.5... 34.8) |
| Max. mechanical focus travel [mm] | 24 |
| Filter thread [mm] | M58x0,75 |
| Storage temperature [°C] | 0 … +50 |
| Net. weight [g] | 1170 |
| Additional info | Max. chief ray angle in object space = 2.9° |
| f'eff [mm] | 81.82 |
| SF [mm] | -18.79 |
| S'F' [mm] | -29.60 |
| HH' [mm] | -16.10 |
| ß'P | 0.81 |
| SEP [mm] | 82.70 |
| S'AP [mm] | -95.57 |
| Σd [mm] | 160,10 |

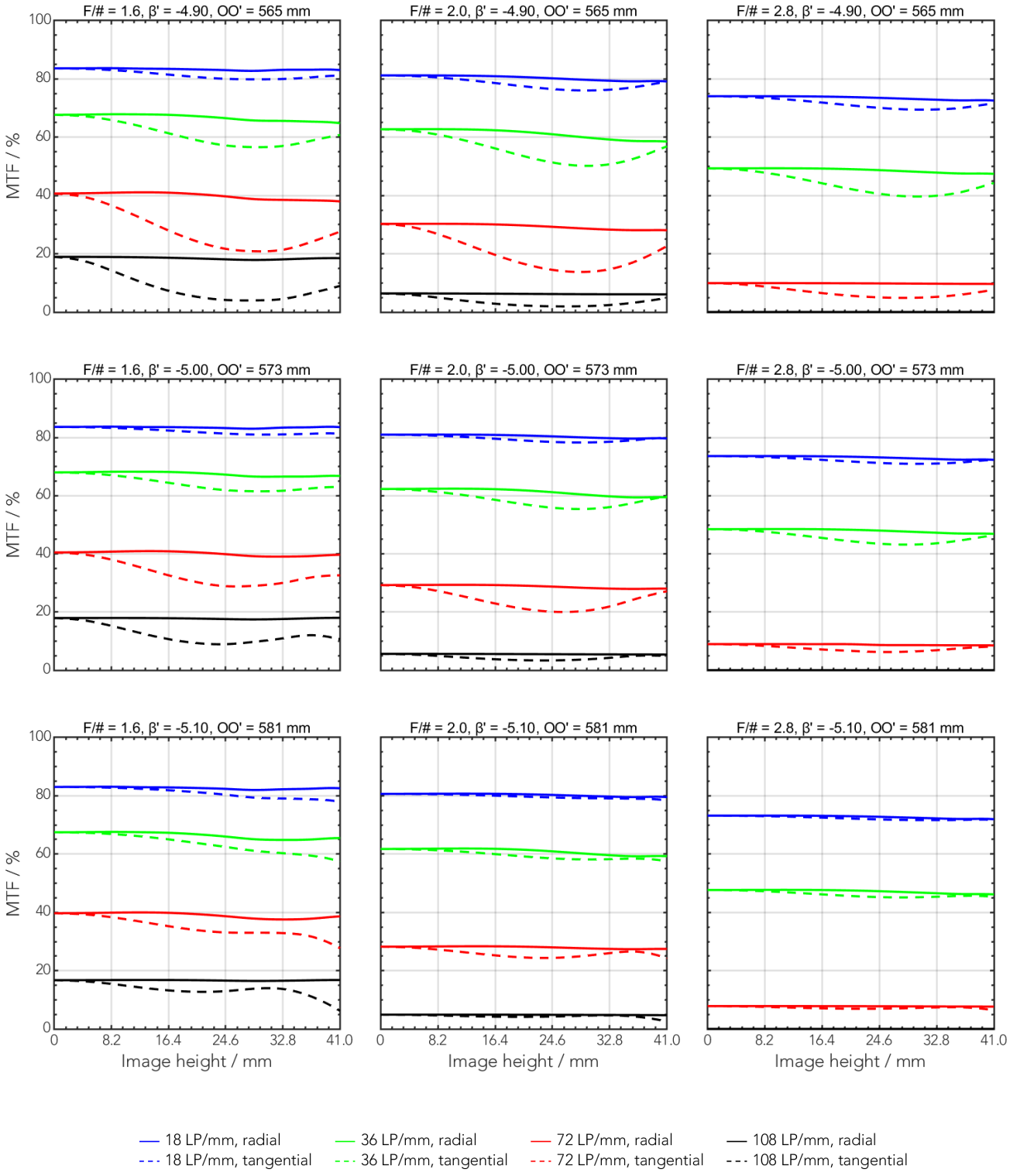
© Jos. Schneider Optische Werke
We accept no responsibility for an

ADEPT TURNKEY
SMARTER IMAGING FOR BETTER LIVES
Perth: (08) 9242 5411 Melbourne: (03) 9384 1775 Sydney: (02) 9905 1551
Email: sales@adeptturnkey.com.au
Web site: www.adept.net.au

# Black-Diamond 1.6/82 | 5.0x | BS

## MTF charts

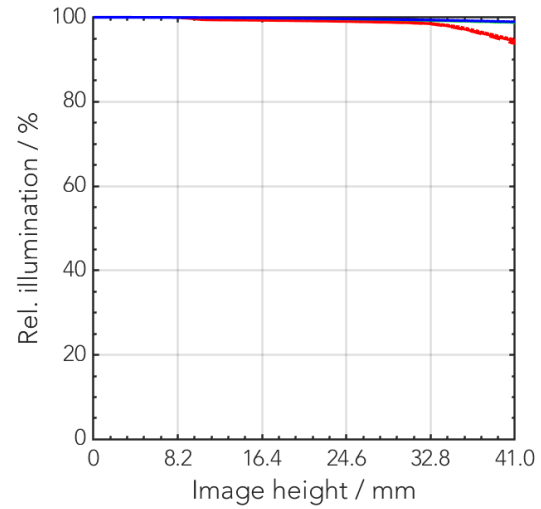
| Spectrum name | VIS LED | | | | | |
|---|---|---|---|---|---|---|
| Wavelengths [nm] | 425 | 475 | 525 | 575 | 625 | 675 |
| Rel. weights [%] | 1.5 | 13.6 | 26.5 | 27.8 | 24.2 | 6.4 |




© Jos. Schneider Optische Werke GmbH | 7/2020 | Jos. Schneider Optische Werke GmbH is certified ISO 9001.
We accept no responsibility for any errors and reserve the right of modification without further notice.

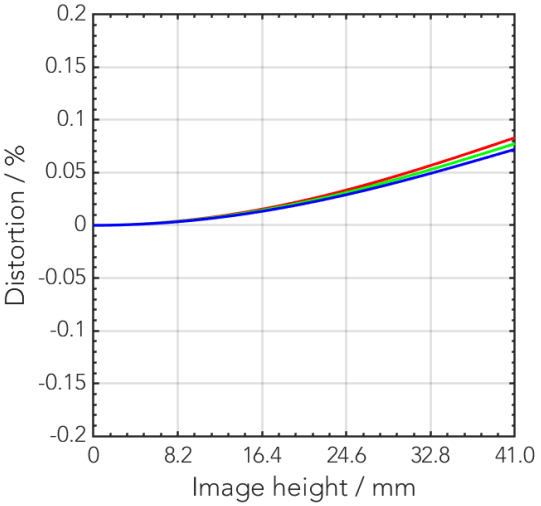
# Black-Diamond 1.6/82 | 5.0x | BS

## Rel. illumination vs. image height



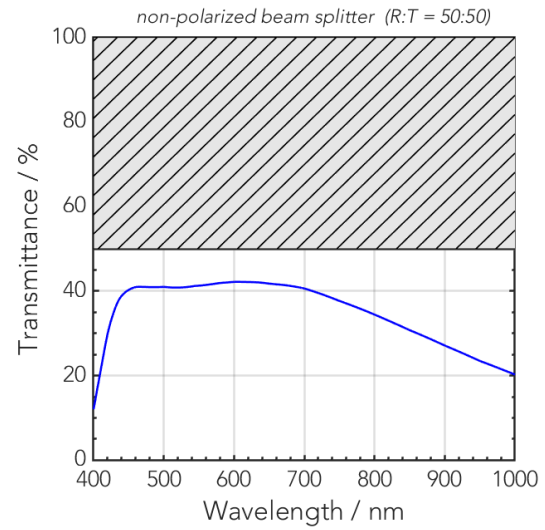

F/# = 1.6, β = -4.90
F/# = 2.0, β = -4.90
F/# = 2.8, β = -4.90
F/# = 1.6, β = -5.00
F/# = 2.0, β = -5.00
F/# = 2.8, β = -5.00
F/# = 1.6, β = -5.10
F/# = 2.0, β = -5.10
F/# = 2.8, β = -5.10

## Distortion vs. image height



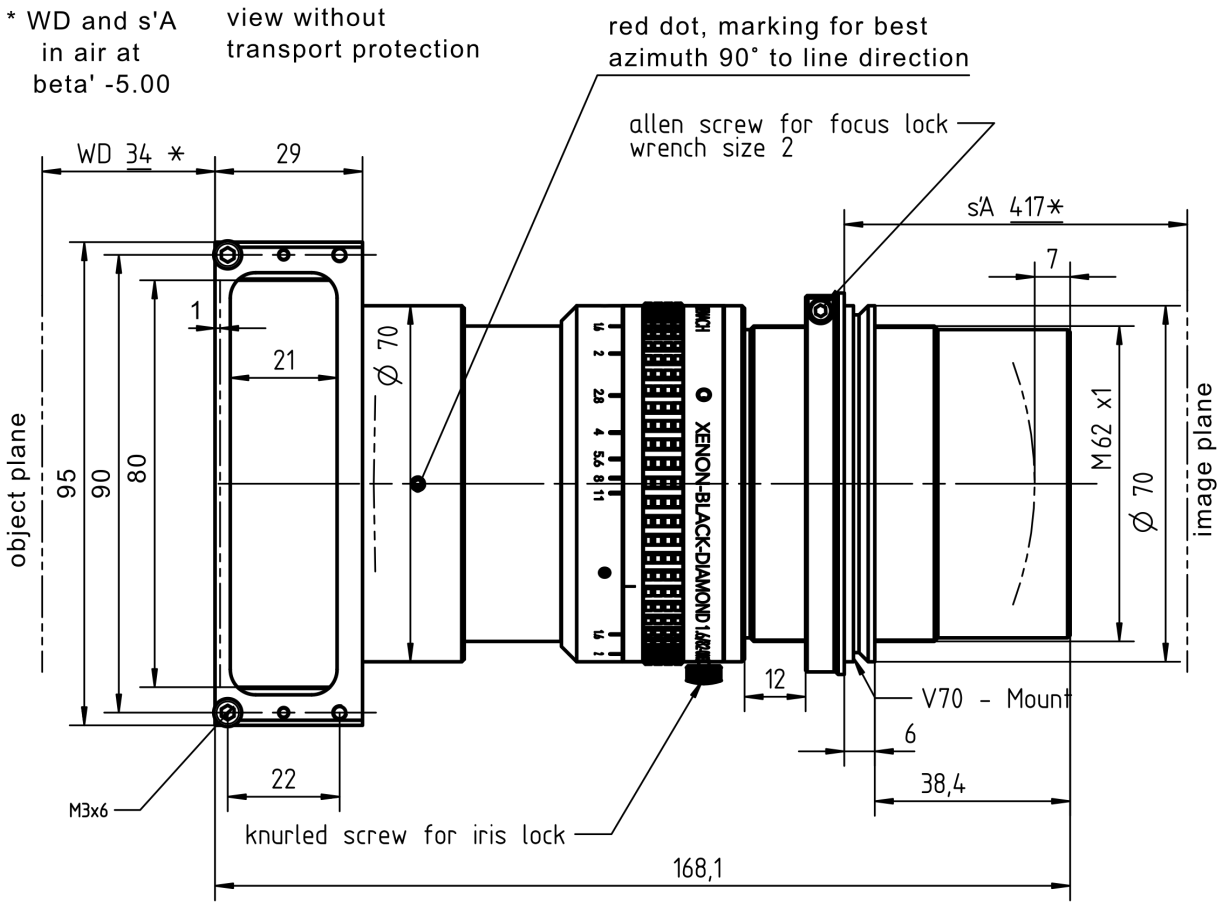

β ' = -4.90
β ' = -5.00
β ' = -5.10

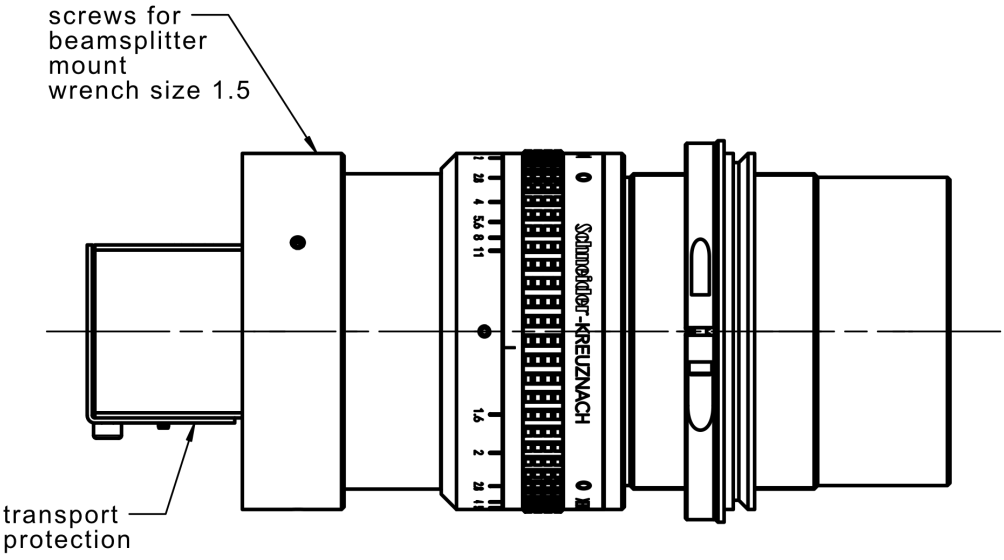
## Transmittance vs. wavelength




© Jos. Schneider Optische Werke GmbH | 7/2020 | Jos. Schneider Optische Werke GmbH is certified ISO 9001.
We accept no responsibility for any errors and reserve the right of modification without further notice.

## Technical drawings




standard

© Jos. Schneider Optische Werke GmbH | 7/2020 | Jos. Schneider Optische Werke GmbH is certified ISO 9001.
We accept no responsibility for any errors and reserve the right of modification without further notice.

# Black-Diamond 1.6/82 | 5.0x | 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 |

© Jos. Schneider Optische Werke GmbH | 7/2020 | Jos. Schneider Optische Werke GmbH is certified ISO 9001.
We accept no responsibility for any errors and reserve the right of modification without further notice.

| 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 |

Unless otherwise stated all dimensions in this data sheet are in mm.

© Jos. Schneider Optische Werke GmbH | 7/2020 | Jos. Schneider Optische Werke GmbH is certified ISO 9001.
We accept no responsibility for any errors and reserve the right of modification without further notice.

## Headquarters Europe

**Jos. Schneider Optische Werke GmbH**

Ringstraße 132

55543 Bad Kreuznach

✆ +49 671 601 205

✉ cs@schneiderkreuznach.com

www.schneiderkreuznach.com

## Offices Worldwide

**America**

✆ +1 800 645 7239 (East Coast)

✆ +1 800 228 1254 (West Coast)

✉ info@schneideroptics.com

**Asia**

✆ +86 755 8832 1170

✉ info@schneider-asiapacific.com

ADEPT TURNKEY

SMARTER IMAGING FOR BETTER LIVES

**Perth:** (08) 9242 5411 **Melbourne:** (03) 9384 1775 **Sydney: (02)** 9905 1551

**Email**: sales@adeptturnkey.com.au
**Web site**: www.adept.net.au

© Jos. Schneider Optische Werke GmbH | 7/2020 | Jos. Schneider Optische Werke GmbH is certified ISO 9001.
We accept no responsibility for any errors and reserve the right of modification without further notice.