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TECHSPEC<sup>®</sup> 4.5mm Dia. x 9mm FL VIS-EXT Coated, Double-Convex Lens



Stock #89-123 5 In Stock

☐ Other Coating Options

-

1

+

€74.<sup>00</sup>

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| Volume Pricing |                               |
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| Qty 1-9        | €74,00 each                   |
| Qty 10-24      | €67,00 each                   |
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Product Downloads

| General                          |       |
|----------------------------------|-------|
| Double-Convex Lens               | Type: |
| Physical & Mechanical Properties |       |

|                      |                                  |
|----------------------|----------------------------------|
| 4.50 +0.000/-0.025   | Diameter (mm):                   |
| <3                   | Centering (arcmin):              |
| Protective as needed | Bevel:                           |
| 2.38                 | Center Thickness CT (mm):        |
| ±0.05                | Center Thickness Tolerance (mm): |
| 1.8                  | Edge Thickness ET (mm):          |
| 4.05                 | Clear Aperture CA (mm):          |

Optical Properties

|                                      |                                             |
|--------------------------------------|---------------------------------------------|
| 8.16                                 | Back Focal Length BFL (mm):                 |
| 9.00                                 | Effective Focal Length EFL (mm):            |
| VIS-EXT (350-700nm)                  | Coating:                                    |
| R <sub>avg</sub> <0.5% @ 350 - 700nm | Coating Specification:                      |
| N-BK7                                | Substrate: <input type="checkbox"/>         |
| 40-20                                | Surface Quality:                            |
| 1.5λ                                 | Power (P-V) @ 632.8nm:                      |
| λ/4                                  | Irregularity (P-V) @ 632.8nm:               |
| 8.88                                 | Radius R <sub>1</sub> =R <sub>2</sub> (mm): |
| 2.00                                 | f/#:                                        |
| 587.6                                | Focal Length Specification Wavelength (nm): |
| ±1                                   | Focal Length Tolerance (%):                 |
| 0.25                                 | Numerical Aperture NA:                      |
| 350 - 700                            | Wavelength Range (nm):                      |

Regulatory Compliance

|           |                             |
|-----------|-----------------------------|
| Compliant | RoHS 2015:                  |
| View      | Certificate of Conformance: |
| Compliant | Reach 235:                  |

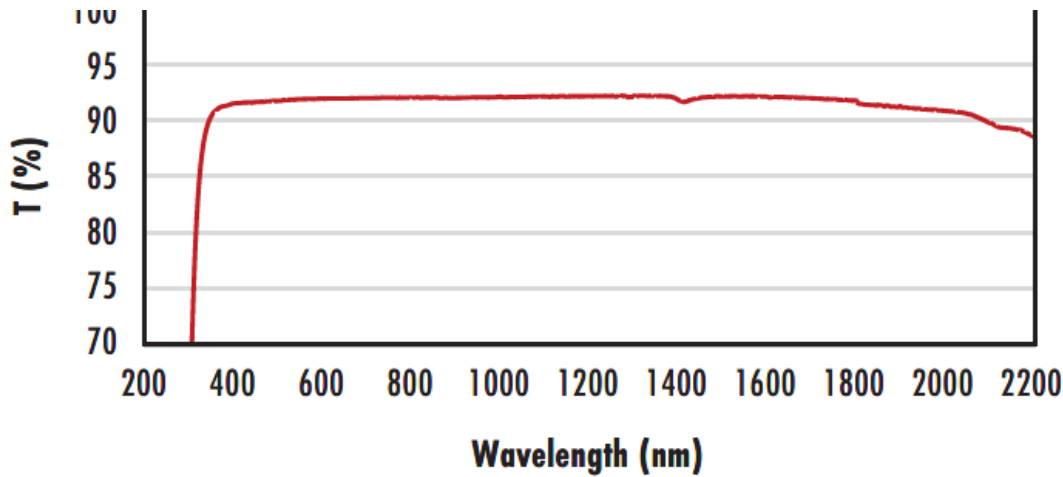
## Product Details

- AR Coated to Provide <0.5% Reflectance per Surface for 350 - 700nm
- Minimize Aberrations Including Spherical and Coma
- [UV Fused Silica DCX Lenses](#) Available
- Other Coating Options Available: [Uncoated](#), [MgF<sub>2</sub>](#), [VIS 0°](#), [NIR I](#), [NIR II](#), [VIS-NIR](#), and [YAG-BBAR](#)

TECHSPEC® VIS-EXT Coated Double-Convex (DCX) Lenses, also referred to as bi-convex lenses, have two positive, symmetrical faces with equal radii on both sides. These lenses are generally recommended for finite imaging applications with a conjugate ratio (ratio between object distance and image distance) between 0.2 and 5. At a conjugate ratio of 1, aberrations such as spherical aberration, chromatic aberration, coma, and distortion are minimized or cancelled due to the symmetric lens design. TECHSPEC VIS-EXT Coated Double-Convex Lenses are available in a variety of substrates and coating options for the visible and NIR spectra.

## Technical Information

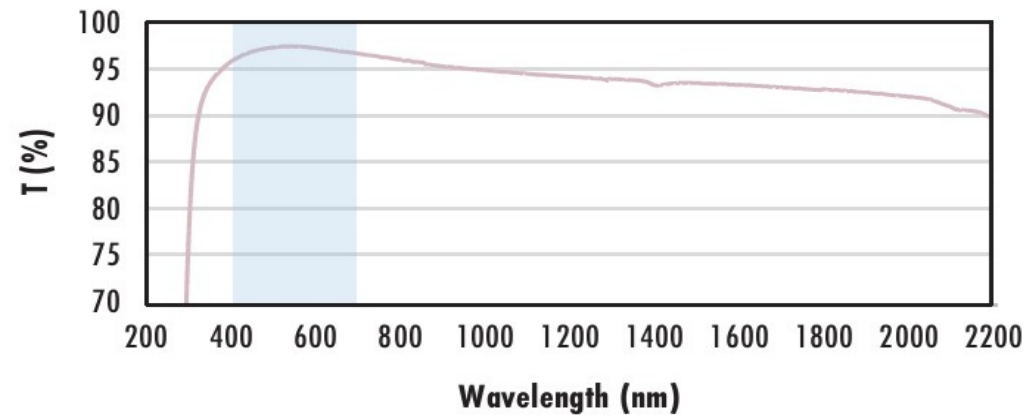




Typical transmission of a 3mm thick, uncoated N-BK7 window across the UV - NIR spectra.

[Click Here to Download Data](#)

**N-BK7 with MgF<sub>2</sub> Coating  
Typical Transmission**



Typical transmission of a 3mm thick N-BK7 window with MgF<sub>2</sub> (400-700nm) coating at 0° AOI.

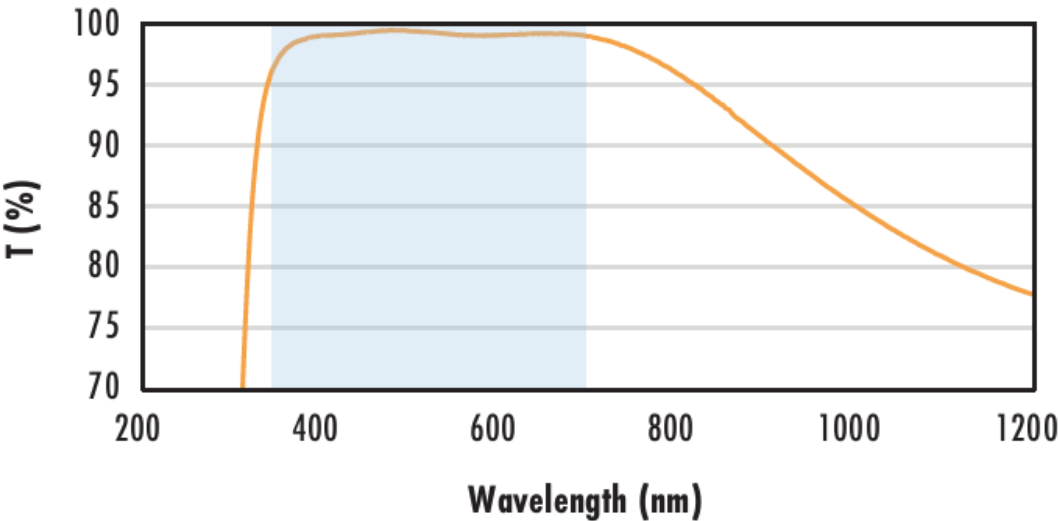
The blue shaded region indicates the coating design wavelength range, with the following specification:

$$R_{avg} \leq 1.75\% @ 400 - 700\text{nm (N-BK7)}$$

Data outside this range is not guaranteed and is for reference only.

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**N-BK7 with VIS-EXT Coating  
Typical Transmission**



Typical transmission of a 3mm thick N-BK7 window with VIS-EXT (350-700nm) coating at 0° AOI.

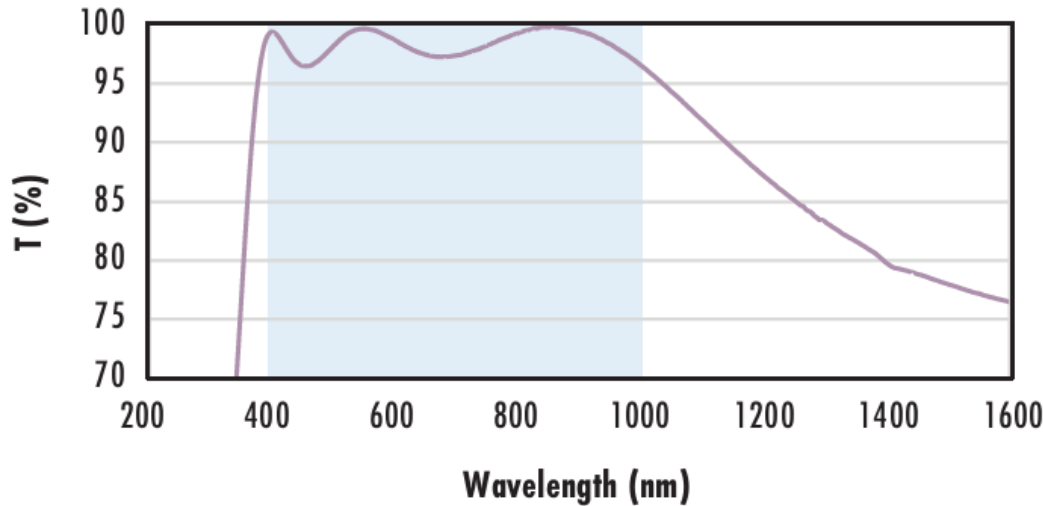
The blue shaded region indicates the coating design wavelength range, with the following specification:

$$R_{avg} \leq 0.5\% @ 350 - 700\text{nm}$$

Data outside this range is not guaranteed and is for reference only.

[Click Here to Download Data](#)

**N-BK7 with VIS-NIR Coating  
Typical Transmission**



Typical transmission of a 3mm thick N-BK7 window with VIS-NIR (400-1000nm) coating at 0° AOI.

The blue shaded region indicates the coating design wavelength range, with the following specification:

$$R_{abs} \leq 0.25\% @ 880\text{nm}$$

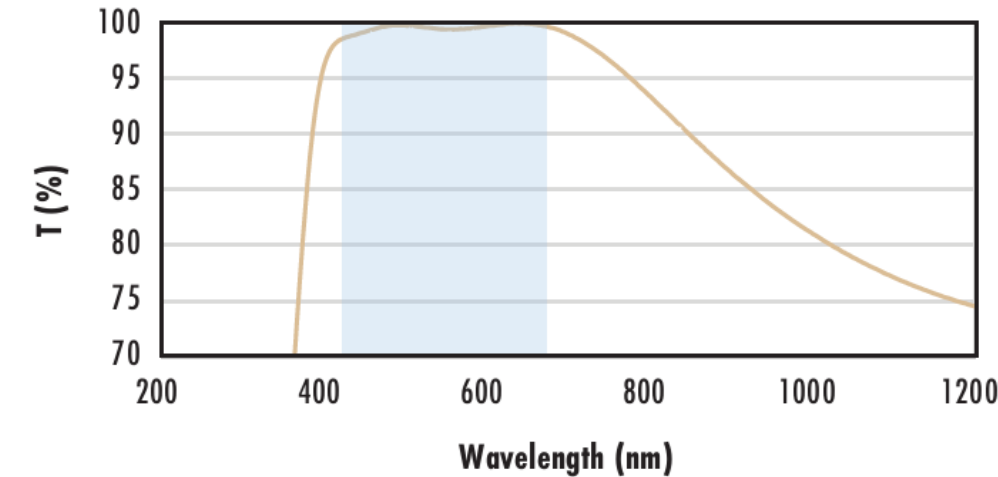
$$R_{avg} \leq 1.25\% @ 400 - 870\text{nm}$$

$$R_{avg} \leq 1.25\% @ 890 - 1000\text{nm}$$

Data outside this range is not guaranteed and is for reference only.

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**N-BK7 with VIS 0° Coating  
Typical Transmission**



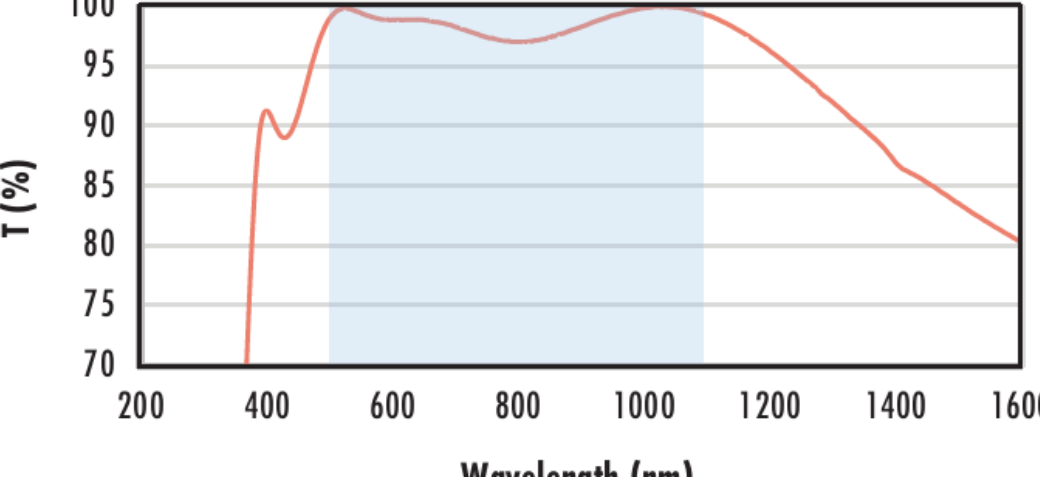
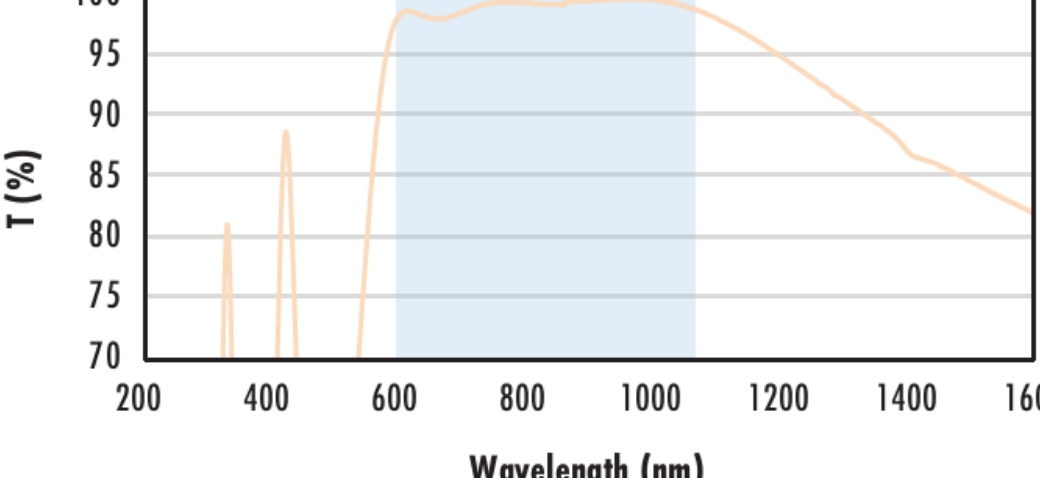
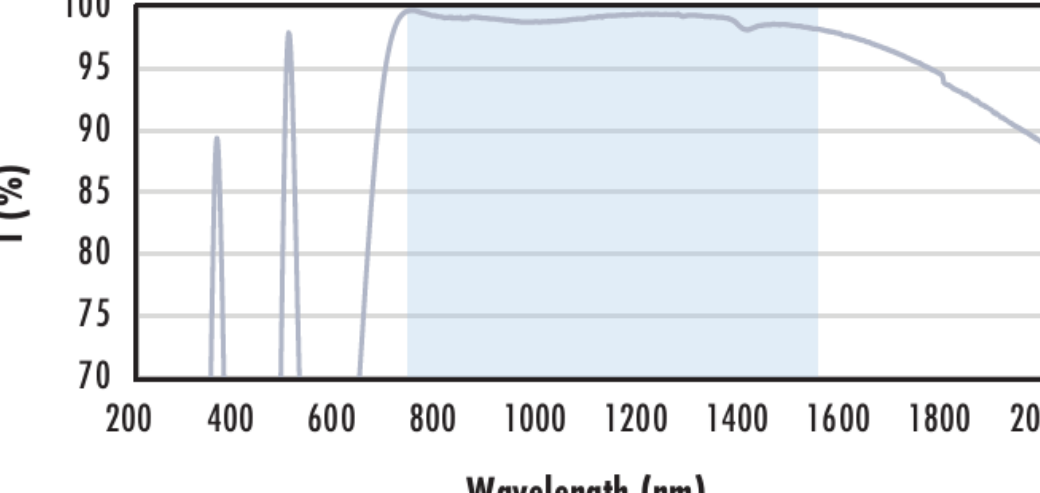
Typical transmission of a 3mm thick N-BK7 window with VIS 0° (425-675nm) coating at 0° AOI.

The blue shaded region indicates the coating design wavelength range, with the following specification:

$$R_{avg} \leq 0.4\% @ 425 - 675\text{nm}$$

Data outside this range is not guaranteed and is for reference only.

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|                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div data-bbox="247 127 1249 706"><h3>N-BK7 with YAG-BBAR Coating<br/>Typical Transmission</h3></div>   | <div data-bbox="1339 261 1839 557"><p>Typical transmission of a 3mm thick N-BK7 window with YAG-BBAR (500-1100nm) coating at 0° AOI.</p><p>The blue shaded region indicates the coating design wavelength range, with the following specification:</p><div data-bbox="1467 388 1709 457"><p><math>R_{abs} \leq 0.25\%</math> @ 532nm<br/><math>R_{abs} \leq 0.25\%</math> @ 1064nm<br/><math>R_{avg} \leq 1.0\%</math> @ 500 - 1100nm</p></div><p>Data outside this range is not guaranteed and is for reference only.</p><p><a href="#">Click Here to Download Data</a></p></div>               |
| <div data-bbox="247 765 1249 1344"><h3>N-BK7 with NIR I Coating<br/>Typical Transmission</h3></div>    | <div data-bbox="1339 923 1839 1175"><p>Typical transmission of a 3mm thick N-BK7 window with NIR I (600 - 1050nm) coating at 0° AOI.</p><p>The blue shaded region indicates the coating design wavelength range, with the following specification:</p><div data-bbox="1467 1050 1709 1071"><p><math>R_{avg} \leq 0.5\%</math> @ 600 - 1050nm</p></div><p>Data outside this range is not guaranteed and is for reference only.</p><p><a href="#">Click Here to Download Data</a></p></div>                                                                                                        |
| <div data-bbox="247 1403 1249 1997"><h3>N-BK7 with NIR II Coating<br/>Typical Transmission</h3></div> | <div data-bbox="1339 1531 1839 1857"><p>Typical transmission of a 3mm thick N-BK7 window with NIR II (750 - 1550nm) coating at 0° AOI.</p><p>The blue shaded region indicates the coating design wavelength range, with the following specification:</p><div data-bbox="1467 1659 1709 1727"><p><math>R_{abs} \leq 1.5\%</math> @ 750 - 800nm<br/><math>R_{abs} \leq 1.0\%</math> @ 800 - 1550nm<br/><math>R_{avg} \leq 0.7\%</math> @ 750 - 1550nm</p></div><p>Data outside this range is not guaranteed and is for reference only.</p><p><a href="#">Click Here to Download Data</a></p></div> |