

# Nd:YAG Laserline Components

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# Nd:YAG Laser Optics

## LASER MIRRORS

Our Nd:YAG laser mirrors are suitable for fundamental Nd:YAG laser 1064 nm, frequency-doubled 532 nm, frequency-tripled 355 nm and frequency quadrupled 266 nm wavelength application. Two kinds of substrate material are available. Laser line mirrors are designed for 45°

angle of incidence. Featuring high polishing quality, low scattering and high damage threshold, our dielectric reflectors enables perfect beam steering for Nd:YAG lasers.

### Substrate

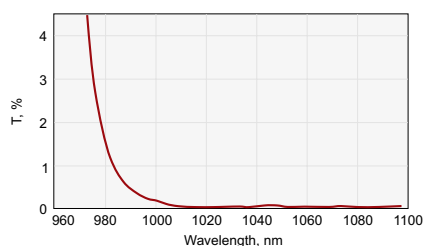
| Material            | UV grade Fused Silica or BK7 glass   |
|---------------------|--------------------------------------|
| S1 Surface Flatness | $\lambda/10$ at 633 nm               |
| S1 Surface Quality  | 20–10 scratch & dig (MIL-PRF-13830B) |
| S2 Surface Quality  | Commercial polish                    |
| Diameter Tolerance  | +0.00 mm -0.12 mm                    |
| Thickness Tolerance | $\pm 0.25$ mm                        |
| Wedge               | < 3 min                              |
| Chamfer             | 0.3 mm at 45° typical                |

### Coating

| Technology               | Electron beam multilayer dielectric or Ion Beam Sputtering |
|--------------------------|------------------------------------------------------------|
| Adhesion and Durability  | Per MIL-C-675A. Insoluble in lab solvents                  |
| Clear Aperture           | Exceeds central 85% of diameter                            |
| Damage Threshold:        |                                                            |
| BK7 laser line mirrors   | 5 J/cm <sup>2</sup> , 8 nsec pulse, 1064 nm typical        |
| UV FS laser line mirrors | 8 J/cm <sup>2</sup> , 8 nsec pulse, 1064 nm typical        |
| BK7 dual line mirrors    | 1 J/cm <sup>2</sup> , 8 nsec pulse, 1064 nm typical        |
| UV FS dual line mirrors  | 2 J/cm <sup>2</sup> , 8 nsec pulse, 1064 nm typical        |
| Coated Surface Flatness  | $\lambda/10$ at 633 nm over clear aperture                 |
| Angle of Incidence       | 0 or 45°                                                   |

## LASER LINE MIRRORS

Substrate material: **BK7 grade A**

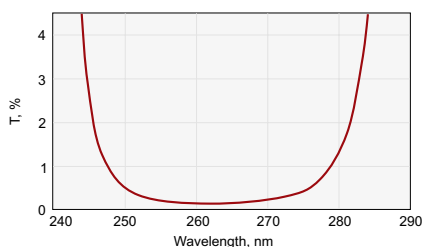


HR 1064 nm, AOI = 45°

| Wavelength, nm         | AOI=0°       |                               |            | AOI=45°      |                            |            |
|------------------------|--------------|-------------------------------|------------|--------------|----------------------------|------------|
|                        | R, % (s+p)/2 | Catalogue number              | Price, EUR | R, % (s+p)/2 | Catalogue number           | Price, EUR |
| Size – Ø12.7 × 3 mm    |              |                               |            |              |                            |            |
| 351–361                | 99.7         | <a href="#">031-0350-i0</a>   | 65         | 99.5         | <a href="#">031-0350</a>   | 65         |
| 527–532                | 99.7         | <a href="#">031-0530-i0</a>   | 62         | 99.5         | <a href="#">031-0530</a>   | 62         |
| 1047–1064              | 99.7         | <a href="#">031-1060-i0</a>   | 63         | 99.5         | <a href="#">031-1060</a>   | 63         |
| Size – Ø12.7 × 6 mm    |              |                               |            |              |                            |            |
| 351–361                | 99.7         | <a href="#">031-0350T6-i0</a> | 65         | 99.5         | <a href="#">031-0350T6</a> | 65         |
| 527–532                | 99.7         | <a href="#">031-0530T6-i0</a> | 62         | 99.5         | <a href="#">031-0530T6</a> | 62         |
| 1047–1064              | 99.7         | <a href="#">031-1060T6-i0</a> | 63         | 99.5         | <a href="#">031-1060T6</a> | 63         |
| Size – Ø25.4 × 6 mm    |              |                               |            |              |                            |            |
| 351–361                | 99.7         | <a href="#">032-0350-i0</a>   | 99         | 99.5         | <a href="#">032-0350</a>   | 99         |
| 527–532                | 99.7         | <a href="#">032-0530-i0</a>   | 81         | 99.5         | <a href="#">032-0530</a>   | 81         |
| 1047–1064              | 99.7         | <a href="#">032-1060-i0</a>   | 83         | 99.5         | <a href="#">032-1060</a>   | 83         |
| Size – Ø50.8 × 8 mm    |              |                               |            |              |                            |            |
| 351–361                | 99.7         | <a href="#">035-0350-i0</a>   | 141        | 99.5         | <a href="#">035-0350</a>   | 141        |
| 527–532                | 99.7         | <a href="#">035-0530-i0</a>   | 121        | 99.5         | <a href="#">035-0530</a>   | 121        |
| 1047–1064              | 99.7         | <a href="#">035-1060-i0</a>   | 121        | 99.5         | <a href="#">035-1060</a>   | 121        |
| Size – Ø76.2 × 12.7 mm |              |                               |            |              |                            |            |
| 527–532                | 99.7         | <a href="#">037-0530-i0</a>   | 204        | 99.5         | <a href="#">037-0530</a>   | 204        |
| 1047–1064              | 99.7         | <a href="#">037-1060-i0</a>   | 204        | 99.5         | <a href="#">037-1060</a>   | 204        |

## LASER LINE MIRRORS

Substrate material: **UV grade Fused Silica**



HR 266 nm, AOI = 45°

| Wavelength, nm | AOI=0°       |                  |            | AOI=45°      |                  |            |
|----------------|--------------|------------------|------------|--------------|------------------|------------|
|                | R, % (s+p)/2 | Catalogue number | Price, EUR | R, % (s+p)/2 | Catalogue number | Price, EUR |

### Size – Ø12.7 × 3 mm

|           |      |                             |    |      |                          |    |
|-----------|------|-----------------------------|----|------|--------------------------|----|
| 262–266   | 99   | <a href="#">041-0260-i0</a> | 78 | 99   | <a href="#">041-0260</a> | 78 |
| 351–361   | 99.7 | <a href="#">041-0350-i0</a> | 74 | 99.5 | <a href="#">041-0350</a> | 74 |
| 527–532   | 99.7 | <a href="#">041-0530-i0</a> | 68 | 99.5 | <a href="#">041-0530</a> | 68 |
| 1047–1064 | 99.7 | <a href="#">041-1060-i0</a> | 68 | 99.5 | <a href="#">041-1060</a> | 68 |

### Size – Ø12.7 × 6 mm

|           |      |                               |    |      |                            |    |
|-----------|------|-------------------------------|----|------|----------------------------|----|
| 262–266   | 99   | <a href="#">041-0260T6-i0</a> | 78 | 99   | <a href="#">041-0260T6</a> | 78 |
| 351–361   | 99.7 | <a href="#">041-0350T6-i0</a> | 74 | 99.5 | <a href="#">041-0350T6</a> | 74 |
| 527–532   | 99.7 | <a href="#">041-0530T6-i0</a> | 68 | 99.5 | <a href="#">041-0530T6</a> | 68 |
| 1047–1064 | 99.7 | <a href="#">041-1060T6-i0</a> | 68 | 99.5 | <a href="#">041-1060T6</a> | 68 |

### Size – Ø25.4 × 6 mm

|           |      |                             |     |      |                          |     |
|-----------|------|-----------------------------|-----|------|--------------------------|-----|
| 262–266   | 99   | <a href="#">042-0260-i0</a> | 109 | 99   | <a href="#">042-0260</a> | 109 |
| 351–361   | 99.7 | <a href="#">042-0350-i0</a> | 105 | 99.5 | <a href="#">042-0350</a> | 105 |
| 527–532   | 99.7 | <a href="#">042-0530-i0</a> | 99  | 99.5 | <a href="#">042-0530</a> | 99  |
| 1047–1064 | 99.7 | <a href="#">042-1060-i0</a> | 99  | 99.5 | <a href="#">042-1060</a> | 99  |

### Size – Ø50.8 × 8 mm

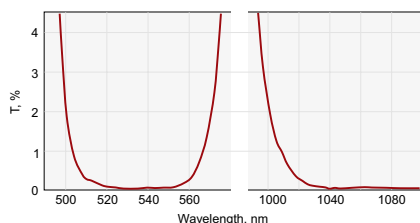
|           |      |                             |     |      |                          |     |
|-----------|------|-----------------------------|-----|------|--------------------------|-----|
| 262–266   | 99   | <a href="#">045-0260-i0</a> | 228 | 99   | <a href="#">045-0260</a> | 228 |
| 351–361   | 99.7 | <a href="#">045-0350-i0</a> | 206 | 99.5 | <a href="#">045-0350</a> | 206 |
| 527–532   | 99.7 | <a href="#">045-0530-i0</a> | 186 | 99.5 | <a href="#">045-0530</a> | 186 |
| 1047–1064 | 99.7 | <a href="#">045-1060-i0</a> | 186 | 99.5 | <a href="#">045-1060</a> | 186 |

### Size – Ø76.2 × 12.7 mm

|           |      |                             |     |      |                          |     |
|-----------|------|-----------------------------|-----|------|--------------------------|-----|
| 351–361   | 99.7 | <a href="#">047-0350-i0</a> | 309 | 99.5 | <a href="#">047-0350</a> | 309 |
| 527–532   | 99.7 | <a href="#">047-0530-i0</a> | 284 | 99.5 | <a href="#">047-0530</a> | 284 |
| 1047–1064 | 99.7 | <a href="#">047-1060-i0</a> | 284 | 99.5 | <a href="#">047-1060</a> | 284 |

## DUAL BAND MIRRORS

Substrate material: **BK7 grade A**



HR 532+1064 nm, AOI = 45°

| Wavelength, nm | AOI=0°       |                  |            | AOI=45°      |                  |            |
|----------------|--------------|------------------|------------|--------------|------------------|------------|
|                | R, % (s+p)/2 | Catalogue number | Price, EUR | R, % (s+p)/2 | Catalogue number | Price, EUR |

### Size – Ø12.7 × 3 mm

|          |      |                             |    |      |                          |    |
|----------|------|-----------------------------|----|------|--------------------------|----|
| 532+1064 | 99.7 | <a href="#">051-5306-i0</a> | 94 | 99.5 | <a href="#">051-5306</a> | 94 |
| 633+1064 | 99.7 | <a href="#">051-6306-i0</a> | 94 | 99.5 | <a href="#">051-6306</a> | 94 |

### Size – Ø12.7 × 6 mm

|          |      |                               |    |      |                            |    |
|----------|------|-------------------------------|----|------|----------------------------|----|
| 532+1064 | 99.7 | <a href="#">051-5306T6-i0</a> | 94 | 99.5 | <a href="#">051-5306T6</a> | 94 |
| 633+1064 | 99.7 | <a href="#">051-6306T6-i0</a> | 94 | 99.5 | <a href="#">051-6306T6</a> | 94 |

### Size – Ø25.4 × 6 mm

|          |      |                             |     |      |                          |     |
|----------|------|-----------------------------|-----|------|--------------------------|-----|
| 532+1064 | 99.7 | <a href="#">052-5306-i0</a> | 113 | 99.5 | <a href="#">052-5306</a> | 113 |
| 633+1064 | 99.7 | <a href="#">052-6306-i0</a> | 113 | 99.5 | <a href="#">052-6306</a> | 113 |

### Size – Ø50.8 × 8 mm

|          |      |                             |     |      |                          |     |
|----------|------|-----------------------------|-----|------|--------------------------|-----|
| 532+1064 | 99.7 | <a href="#">055-5306-i0</a> | 166 | 99.5 | <a href="#">055-5306</a> | 166 |
| 633+1064 | 99.7 | <a href="#">055-6306-i0</a> | 166 | 99.5 | <a href="#">055-6306</a> | 166 |

### Size – Ø76.2 × 12.7 mm

|          |      |                             |     |      |                          |     |
|----------|------|-----------------------------|-----|------|--------------------------|-----|
| 532+1064 | 99.7 | <a href="#">057-5306-i0</a> | 250 | 99.5 | <a href="#">057-5306</a> | 250 |
| 633+1064 | 99.7 | <a href="#">057-6306-i0</a> | 250 | 99.5 | <a href="#">057-6306</a> | 250 |

## Related Products

Prisms See page 1.50

Kinematic Mirror/Beamsplitter Mounts 840-0056

Find more at [EksmaOptics.com](http://EksmaOptics.com)



## DUAL BAND MIRRORS

Substrate material: **UV grade Fused Silica**

| Wavelength, nm                | AOI=0°       |                      |            | AOI=45°      |                   |            |
|-------------------------------|--------------|----------------------|------------|--------------|-------------------|------------|
|                               | R, % (s+p)/2 | Catalogue number     | Price, EUR | R, % (s+p)/2 | Catalogue number  | Price, EUR |
| <b>Size – Ø12.7 × 3 mm</b>    |              |                      |            |              |                   |            |
| 532+1064                      | 99.7         | <b>061-5306-i0</b>   | 120        | 99.5         | <b>061-5306</b>   | 120        |
| 633+1064                      | 99.7         | <b>061-6306-i0</b>   | 120        | 99.5         | <b>061-6306</b>   | 120        |
| 355+532                       | 99.7         | <b>061-3553-i0</b>   | 127        | 99.5         | <b>061-3553</b>   | 127        |
| <b>Size – Ø12.7 × 6 mm</b>    |              |                      |            |              |                   |            |
| 532+1064                      | 99.7         | <b>061-5306T6-i0</b> | 120        | 99.5         | <b>061-5306T6</b> | 120        |
| 633+1064                      | 99.7         | <b>061-6306T6-i0</b> | 120        | 99.5         | <b>061-6306T6</b> | 120        |
| 355+532                       | 99.7         | <b>061-3553T6-i0</b> | 127        | 99.5         | <b>061-3553T6</b> | 127        |
| <b>Size – Ø25.4 × 6 mm</b>    |              |                      |            |              |                   |            |
| 532+1064                      | 99.7         | <b>062-5306-i0</b>   | 147        | 99.5         | <b>062-5306</b>   | 147        |
| 633+1064                      | 99.7         | <b>062-6306-i0</b>   | 147        | 99.5         | <b>062-6306</b>   | 147        |
| 355+532                       | 99.7         | <b>062-3553-i0</b>   | 153        | 99.5         | <b>062-3553</b>   | 153        |
| <b>Size – Ø50.8 × 8 mm</b>    |              |                      |            |              |                   |            |
| 532+1064                      | 99.7         | <b>065-5306-i0</b>   | 230        | 99.5         | <b>065-5306</b>   | 230        |
| 633+1064                      | 99.7         | <b>065-6306-i0</b>   | 230        | 99.5         | <b>065-6306</b>   | 230        |
| 355+532                       | 99.7         | <b>065-3553-i0</b>   | 237        | 99.5         | <b>065-3553</b>   | 237        |
| <b>Size – Ø76.2 × 12.7 mm</b> |              |                      |            |              |                   |            |
| 532+1064                      | 99.7         | <b>067-5306-i0</b>   | 350        | 99.5         | <b>067-5306</b>   | 350        |
| 633+1064                      | 99.7         | <b>067-6306-i0</b>   | 350        | 99.5         | <b>067-6306</b>   | 350        |
| 355+532                       | 99.7         | <b>067-3553-i0</b>   | 355        | 99.5         | <b>067-3553</b>   | 355        |

## Related Products

Laser Line and Dual Laser Line Mirrors of other wavelengths

See page 1.19

Metal Coated Mirrors

See page 1.25



## HIGH POWER IBS COATED LASER MIRRORS

### Substrate

|                     |                                        |
|---------------------|----------------------------------------|
| Material            | UV grade fused silica                  |
| S1 Surface Flatness | $\lambda/10$ at 633 nm                 |
| S1 Surface Quality  | 20 – 10 scratch & dig (MIL-PRF-13830B) |
| S2 Surface Quality  | Commercial polish                      |
| Diameter Tolerance  | +0.00 mm / -0.12 mm                    |
| Thickness Tolerance | $\pm 0.25$ mm                          |
| Wedge               | < 3 min                                |
| Chamfer             | 0.3 mm at 45° typical                  |

### Coating

|                         |                                            |
|-------------------------|--------------------------------------------|
| Technology              | Ion Beam Sputtering (IBS)                  |
| Adhesion and Durability | Per MIL-C-675A, Insoluble in lab solvents  |
| Clear Aperture          | Exceeds central 85% of diameter            |
| Coated Surface Flatness | $\lambda/10$ at 633 nm over clear aperture |

**Design wavelength – 266 nm.** LIDT > 6 J/cm<sup>2</sup>, 10 ns pulse, 100 Hz, 266 nm typical

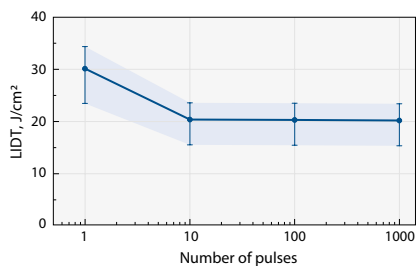
| Wavelength, nm | AOI, deg | R, % (s+p)/2 | Ø 12.7 x 6 mm         |            | Ø 25.4 x 6 mm         |            | Ø 50.8 x 12 mm        |            |
|----------------|----------|--------------|-----------------------|------------|-----------------------|------------|-----------------------|------------|
|                |          |              | Catalogue number      | Price, EUR | Catalogue number      | Price, EUR | Catalogue number      | Price, EUR |
| 266            | 45       | 99.5         | <b>041-0266HHR</b>    | 160        | <b>042-0266HHR</b>    | 209        | <b>045-0266HHR</b>    | 645        |
| 266            | 0        | 99.5         | <b>041-0266HHR-i0</b> | 160        | <b>042-0266HHR-i0</b> | 209        | <b>045-0266HHR-i0</b> | 645        |

**Design wavelength – 355 nm.** LIDT > 10 J/cm<sup>2</sup>, 10 ns pulse, 100 Hz, 355 nm typical

| Wavelength, nm | AOI, deg | R, % (s+p)/2 | Ø 12.7 x 6 mm            |            | Ø 25.4 x 6 mm          |            | Ø 50.8 x 12 mm         |            |
|----------------|----------|--------------|--------------------------|------------|------------------------|------------|------------------------|------------|
|                |          |              | Catalogue number         | Price, EUR | Catalogue number       | Price, EUR | Catalogue number       | Price, EUR |
| 355            | 45       | 99.8         | <b>041-0350T6UHHR</b>    | 149        | <b>042-0350UHHR</b>    | 198        | <b>045-0350UHHR</b>    | 635        |
| 355            | 0        | 99.8         | <b>041-0350T6UHHR-i0</b> | 149        | <b>042-0350UHHR-i0</b> | 198        | <b>045-0350UHHR-i0</b> | 635        |

**Design wavelength – 532 nm.** LIDT > 10 J/cm<sup>2</sup>, 10 ns pulse, 100 Hz, 532 nm typical.

| Wavelength, nm | AOI, deg | R, % (s+p)/2 | Ø 12.7 x 6 mm              |            | Ø 25.4 x 6 mm            |            | Ø 50.8 x 12 mm              |            |
|----------------|----------|--------------|----------------------------|------------|--------------------------|------------|-----------------------------|------------|
|                |          |              | Catalogue number           | Price, EUR | Catalogue number         | Price, EUR | Catalogue number            | Price, EUR |
| 532            | 45       | 99.9         | <b>041-0530T6HHR</b>       | 83         | <b>042-0530HHR</b>       | 116        | <b>045-0530T12HHR</b>       | 410        |
| 532            | 0        | 99.95        | <b>041-0530T6HHR-i0</b>    | 83         | <b>042-0530HHR-i0</b>    | 116        | <b>045-0530T12HHR-i0</b>    | 410        |
| 532            | 0-45     | 99.9         | <b>041-0530T6HHR-i0-45</b> | 99         | <b>042-0530HHR-i0-45</b> | 132        | <b>045-0530T12HHR-i0-45</b> | 470        |



LIDT of High Power Laser Mirrors @ 532 nm

Test conditions:

|                      |                  |
|----------------------|------------------|
| Wavelength           | 532 nm           |
| Pulse duration       | (5.4 ± 0.3) ns   |
| Repetition rate      | 100 Hz           |
| AOI                  | 45°              |
| Polarization         | linear P         |
| Beam diameter (1/e²) | (206.0 ± 6.7) µm |

**Design wavelength – 532 nm.** LIDT >20 J/cm², 10 ns pulse, 100 Hz, 532 nm typical.

| Wavelength, nm | AOI, deg | R, % (s+p)/2 | Ø 12.7 x 6 mm     |            | Ø 25.4 x 6 mm    |            | Ø 50.8 x 12 mm     |            |
|----------------|----------|--------------|-------------------|------------|------------------|------------|--------------------|------------|
|                |          |              | Catalogue number  | Price, EUR | Catalogue number | Price, EUR | Catalogue number   | Price, EUR |
| 532            | 45       | 99.9         | 041-0530T6UHHR    | 121        | 042-0530UHHR     | 171        | 045-0530T12UHHR    | 530        |
| 532            | 0        | 99.95        | 041-0530T6UHHR-i0 | 121        | 042-0530UHHR-i0  | 171        | 045-0530T12UHHR-i0 | 530        |

**Design wavelength – 800 nm.** LIDT >30 J/cm², 10 ns pulse, 100 Hz, 800 nm typical.

| Wavelength, nm | AOI, deg | R, % (s+p)/2 | Ø 12.7 x 6 mm      |            | Ø 25.4 x 6 mm    |            | Ø 50.8 x 12 mm      |            |
|----------------|----------|--------------|--------------------|------------|------------------|------------|---------------------|------------|
|                |          |              | Catalogue number   | Price, EUR | Catalogue number | Price, EUR | Catalogue number    | Price, EUR |
| 800            | 45       | 99.9         | 041-0800NT6UHHR    | 127        | 042-0800NUHHR    | 182        | 045-0800NT12UHHR    | 550        |
| 800            | 0        | 99.95        | 041-0800NT6UHHR-i0 | 127        | 042-0800NUHHR-i0 | 182        | 045-0800NT12UHHR-i0 | 550        |

**Design wavelength – 1064 nm.** LIDT >20 J/cm², 10 ns pulse, 100 Hz, 1064 nm typical.

| Wavelength, nm | AOI, deg | R, % (s+p)/2 | Ø 12.7 x 6 mm       |            | Ø 25.4 x 6 mm     |            | Ø 50.8 x 12 mm       |            |
|----------------|----------|--------------|---------------------|------------|-------------------|------------|----------------------|------------|
|                |          |              | Catalogue number    | Price, EUR | Catalogue number  | Price, EUR | Catalogue number     | Price, EUR |
| 1064           | 45       | 99.9         | 041-1060T6HHR       | 83         | 042-1060HHR       | 116        | 045-1060T12HHR       | 410        |
| 1064           | 0        | 99.95        | 041-1060T6HHR-i0    | 83         | 042-1060HHR-i0    | 116        | 045-1060T12HHR-i0    | 410        |
| 1064           | 0-45     | 99.9         | 041-1060T6HHR-i0-45 | 99         | 042-1060HHR-i0-45 | 132        | 045-1060T12HHR-i0-45 | 470        |

**Design wavelength – 1064 nm.** LIDT >40 J/cm², 10 ns pulse, 100 Hz, 1064 nm typical.

| Wavelength, nm | AOI, deg | R, % (s+p)/2 | Ø 12.7 x 6 mm      |            | Ø 25.4 x 6 mm    |            | Ø 50.8 x 12 mm      |            |
|----------------|----------|--------------|--------------------|------------|------------------|------------|---------------------|------------|
|                |          |              | Catalogue number   | Price, EUR | Catalogue number | Price, EUR | Catalogue number    | Price, EUR |
| 1064           | 45       | 99.9         | 041-1060NT6UHHR    | 127        | 042-1060NUHHR    | 182        | 045-1060NT12UHHR    | 550        |
| 1064           | 0        | 99.95        | 041-1060NT6UHHR-i0 | 127        | 042-1060NUHHR-i0 | 182        | 045-1060NT12UHHR-i0 | 550        |

**Design wavelength – 532+1064 nm.** LIDT >15 J/cm² at 1064 nm and LIDT >5 J/cm² at 532 nm, 10 ns pulse, 10 Hz typical.

| Wavelength, nm | AOI, deg | R, % (s+p)/2 | Ø 12.7 x 6 mm    |            | Ø 25.4 x 6 mm    |            | Ø 50.8 x 12 mm   |            |
|----------------|----------|--------------|------------------|------------|------------------|------------|------------------|------------|
|                |          |              | Catalogue number | Price, EUR | Catalogue number | Price, EUR | Catalogue number | Price, EUR |
| 532+1064       | 45       | 99.5         | 061-5306HHR      | 149        | 062-5306HHR      | 198        | 065-5306HHR      | 750        |
| 532+1064       | 0        | 99.5         | 061-5306HHR-i0   | 149        | 062-5306HHR-i0   | 198        | 065-5306HHR-i0   | 750        |

**Design wavelength – 532+1064 nm.** LIDT >30 J/cm² at 1064 nm and LIDT >10 J/cm² at 532 nm, 10 ns pulse, 10 Hz typical.

| Wavelength, nm | AOI, deg | R, % (s+p)/2 | Ø 12.7 x 6 mm    |            | Ø 25.4 x 6 mm    |            | Ø 50.8 x 12 mm   |            |
|----------------|----------|--------------|------------------|------------|------------------|------------|------------------|------------|
|                |          |              | Catalogue number | Price, EUR | Catalogue number | Price, EUR | Catalogue number | Price, EUR |
| 532+1064       | 45       | 99.5         | 061-5306UHHR     | 191        | 062-5306UHHR     | 270        | 065-5306UHHR     | 790        |
| 532+1064       | 0        | 99.5         | 061-5306UHHR-i0  | 191        | 062-5306UHHR-i0  | 270        | 065-5306UHHR-i0  | 790        |

## LASER HARMONIC SEPARATORS

### Features

- Offered on Ø 0.5 or 1 inch substrates of BK7 or UV FS with surface flatness  $\lambda/10$

Harmonic separators are dichroic beamsplitters that reflect one wavelength and transmit the others. Reflectance is higher than 99.5% for the wavelength of interest and transmittance is at least 90% for the rejected wavelengths. The rear surface of harmonic separators is antireflection coated.

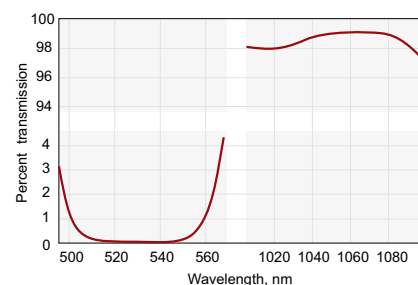
### Substrate

|                     |                                      |
|---------------------|--------------------------------------|
| Material            | UV grade Fused Silica or BK7 glass   |
| S1 Surface Flatness | $\lambda/10$ typical at 633 nm       |
| S1 Surface Quality  | 20–10 scratch & dig (MIL-PRF-13830B) |
| S2 Surface Flatness | $\lambda/10$ typical at 633 nm       |
| S2 Surface Quality  | 20–10 scratch & dig (MIL-PRF-13830B) |
| Diameter Tolerance  | +0.00 mm -0.12 mm                    |
| Thickness Tolerance | ±0.25 mm                             |
| Parallelism         | < 30 arcsec                          |
| Chamfer             | 0.3 mm at 45° typical                |

## LASER HARMONIC SEPARATORS WITH HIGH TRANSMISSION

### Coating

|                                  |                                                       |
|----------------------------------|-------------------------------------------------------|
| Technology                       | Ion Beam Sputtering (IBS)                             |
| Damage Threshold                 | >10 J/cm <sup>2</sup> , 8 nsec pulse, 1064 nm typical |
| Back side anti-reflection coated | AOI 45°, R<0.5%<br>AOI 0°, R<0.1%                     |



**041-5105HT.**

HR > 99.9% @ 532 nm, HT > 99% @ 1064 nm, AOI = 45°

| Reflected wavelength, nm | Reflection             | Transmission                                                   | AOI, deg | Ø12.7x3 mm                 |            | Ø25.4x6 mm                 |            |
|--------------------------|------------------------|----------------------------------------------------------------|----------|----------------------------|------------|----------------------------|------------|
|                          |                        |                                                                |          | Catalogue number           | Price, EUR | Catalogue number           | Price, EUR |
| 266                      | R <sub>sp</sub> >99.0% | T <sub>sp</sub> >98% @ 532 + 1064 nm                           | 0        | <a href="#">041-2510HT</a> | 215        | <a href="#">042-2510HT</a> | 270        |
| 266                      | R <sub>sp</sub> >99.0% | T <sub>sp</sub> >98% @ 532 + 1064 nm                           | 45       | <a href="#">041-2515HT</a> | 215        | <a href="#">042-2515HT</a> | 270        |
| 355                      | R <sub>sp</sub> >99.5% | T <sub>sp</sub> >98% @ 532 nm + T <sub>sp</sub> >99% @ 1064 nm | 0        | <a href="#">041-3510HT</a> | 205        | <a href="#">042-3510HT</a> | 260        |
| 355                      | R <sub>sp</sub> >99.5% | T <sub>sp</sub> >98% @ 532 nm + T <sub>sp</sub> >99% @ 1064 nm | 45       | <a href="#">041-3515HT</a> | 205        | <a href="#">042-3515HT</a> | 260        |
| 532                      | R <sub>sp</sub> >99.9% | T <sub>sp</sub> >99% @ 1064 nm                                 | 0        | <a href="#">041-5100HT</a> | 176        | <a href="#">042-5100HT</a> | 226        |
| 532                      | R <sub>sp</sub> >99.9% | T <sub>sp</sub> >99% @ 1064 nm                                 | 45       | <a href="#">041-5105HT</a> | 176        | <a href="#">042-5105HT</a> | 226        |
| 1064                     | R <sub>sp</sub> >99.5% | T <sub>sp</sub> >98% @ 532 nm                                  | 0        | <a href="#">041-6500HT</a> | 182        | <a href="#">042-6500HT</a> | 231        |
| 1064                     | R <sub>sp</sub> >99.5% | T <sub>sp</sub> >98% @ 532 nm                                  | 45       | <a href="#">041-6505HT</a> | 182        | <a href="#">042-6505HT</a> | 231        |

## STANDARD LASER HARMONIC SEPARATORS

### Coating

|                         |                                                      |
|-------------------------|------------------------------------------------------|
| Technology              | Electron beam multilayer dielectric                  |
| Adhesion and Durability | Per MIL-C-675A. Insoluble in lab solvents            |
| Damage Threshold: BK7   | >2 J/cm <sup>2</sup> , 8 nsec pulse, 1064 nm typical |
| Damage Threshold: UV FS | >5 J/cm <sup>2</sup> , 8 nsec pulse, 1064 nm typical |

|                                 |                                    |
|---------------------------------|------------------------------------|
| Clear Aperture                  | Exceeds central 85% of diameter    |
| Coated Surface Flatness         | λ/10 at 633 nm over clear aperture |
| Back side antireflection coated | AOI 45°, R<0.5%<br>AOI 0°, R<0.2%  |

| Reflected wavelength, nm,<br>R > 99.5% | Transmitted wavelength, nm | Transmission, % | AOI, deg | Substrate material | Ø12.7x3 mm               |            | Ø25.4x6 mm               |            |
|----------------------------------------|----------------------------|-----------------|----------|--------------------|--------------------------|------------|--------------------------|------------|
|                                        |                            |                 |          |                    | Catalogue number         | Price, EUR | Catalogue number         | Price, EUR |
| 266                                    | 355+532+1064               | >90             | 0        | UVFS               | <a href="#">041-2310</a> | 178        | <a href="#">042-2310</a> | 213        |
| 266                                    | 355+532+1064               | >90             | 45       | UVFS               | <a href="#">041-2315</a> | 178        | <a href="#">042-2315</a> | 213        |
| 266                                    | 532                        | >95             | 0        | UVFS               | <a href="#">041-2500</a> | 155        | <a href="#">042-2500</a> | 190        |
| 266                                    | 532                        | >95             | 45       | UVFS               | <a href="#">041-2505</a> | 155        | <a href="#">042-2505</a> | 190        |
| 355                                    | 1064                       | >95             | 0        | UVFS               | <a href="#">041-3100</a> | 132        | <a href="#">042-3100</a> | 167        |
| 355                                    | 1064                       | >95             | 45       | UVFS               | <a href="#">041-3105</a> | 132        | <a href="#">042-3105</a> | 167        |
| 355                                    | 532                        | >95             | 0        | UVFS               | <a href="#">041-3500</a> | 132        | <a href="#">042-3500</a> | 167        |
| 355                                    | 532                        | >95             | 45       | UVFS               | <a href="#">041-3505</a> | 132        | <a href="#">042-3505</a> | 167        |
| 355                                    | 532+1064                   | >95             | 0        | UVFS               | <a href="#">041-3510</a> | 144        | <a href="#">042-3510</a> | 178        |
| 355                                    | 532+1064                   | >95             | 45       | UVFS               | <a href="#">041-3515</a> | 144        | <a href="#">042-3515</a> | 178        |
| 532                                    | 1064                       | >95             | 0        | BK7                | <a href="#">031-5100</a> | 104        | <a href="#">032-5100</a> | 132        |
| 532                                    | 1064                       | >95             | 45       | BK7                | <a href="#">031-5105</a> | 104        | <a href="#">032-5105</a> | 132        |
| 532                                    | 1064                       | >95             | 0        | UVFS               | <a href="#">041-5100</a> | 132        | <a href="#">042-5100</a> | 167        |
| 532                                    | 1064                       | >95             | 45       | UVFS               | <a href="#">041-5105</a> | 132        | <a href="#">042-5105</a> | 167        |
| 532+1064                               | 355                        | >85             | 0        | UVFS               | <a href="#">041-5140</a> | 236        | <a href="#">042-5140</a> | 265        |
| 532+1064                               | 355                        | >85             | 45       | UVFS               | <a href="#">041-5145</a> | 236        | <a href="#">042-5145</a> | 265        |
| 1064                                   | 532                        | >93             | 0        | BK7                | <a href="#">031-6500</a> | 109        | <a href="#">032-6500</a> | 138        |
| 1064                                   | 532                        | >93             | 45       | BK7                | <a href="#">031-6505</a> | 109        | <a href="#">032-6505</a> | 138        |
| 1064                                   | 532                        | >93             | 0        | UVFS               | <a href="#">041-6500</a> | 138        | <a href="#">042-6500</a> | 173        |
| 1064                                   | 532                        | >93             | 45       | UVFS               | <a href="#">041-6505</a> | 138        | <a href="#">042-6505</a> | 173        |

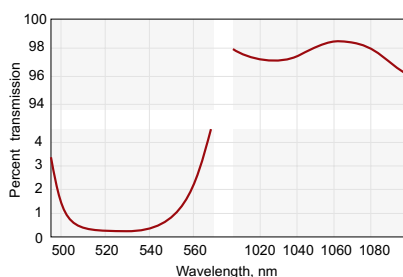
## Related Products

**Pellin-Broca Prisms**  
See page 1.52

## Housing accessories

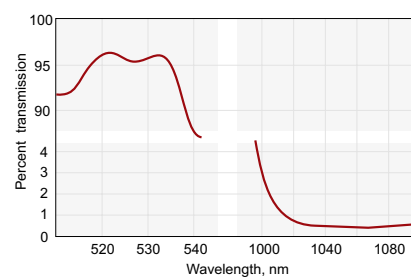
**Adapter for Beamsplitter at 45° 840-0116**  
Find more at EksmaOptics.com

**Kinematic Mirror and Beamsplitter Mount 840-0020**  
Find more at EksmaOptics.com



**031-5105.**

HR > 99.5% @ 532 nm, HT > 95% @ 1064 nm, AOI = 45°



**031-6500.**

HR > 99.5% @ 1064 nm, HT > 93% @ 532 nm, AOI = 0°

## LASER OUTPUT COUPLERS

An output coupler is a partially reflecting dielectric mirror used in a laser cavity. It transmits a part of the circulating intracavity power for generating a useful output from the laser.

A low transmission output coupler leads to a low laser threshold, but also possibly to poor laser efficiency if the losses due to output coupling do not dominate over other parasitic losses in the laser cavity. The

output coupler transmission is often chosen to maximize the achieved output power, although its optimum value may be lower or higher if there are other design purposes (minimizing the intracavity intensities or suppressing Q-switching instabilities in a passively mode-locked laser).

### Substrate

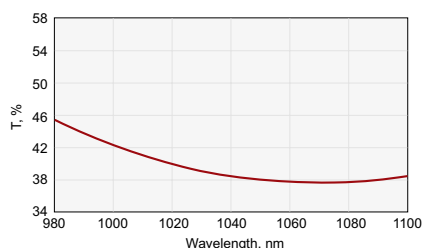
|                     |                                      |
|---------------------|--------------------------------------|
| Material            | UV grade Fused Silica or BK7 glass   |
| S1 Surface Flatness | $\lambda/10$ typical at 633 nm       |
| S1 Surface Quality  | 20–10 scratch & dig (MIL-PRF-13830B) |
| S2 Surface Flatness | $\lambda/10$ typical at 633 nm       |
| S2 Surface Quality  | 20–10 scratch & dig (MIL-PRF-13830B) |
| Diameter Tolerance  | +0.00 mm; -0.12 mm                   |
| Thickness Tolerance | $\pm 0.25$ mm                        |
| Parallelism         | 30 arcsec                            |
| Chamfer             | 0.3 mm at 45° typical                |

### Coating

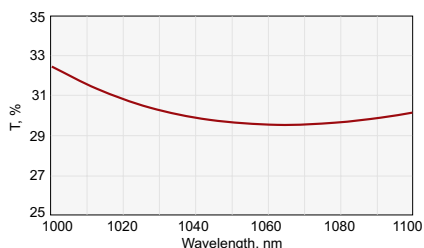
|                                 |                                                      |
|---------------------------------|------------------------------------------------------|
| Technology                      | Electron beam multilayer dielectric                  |
| Adhesion and Durability         | Per MIL-C-675A. Insoluble in lab solvents            |
| Clear Aperture                  | Exceeds central 85% of diameter                      |
| Damage Threshold:               |                                                      |
| BK7                             | >3 J/cm <sup>2</sup> , 8 nsec pulse, 1064 nm typical |
| UV FS                           | >6 J/cm <sup>2</sup> , 8 nsec pulse, 1064 nm typical |
| Coated Surface Flatness         | $\lambda/10$ at 633 nm over clear aperture           |
| Angle of Incidence              | 0–8° (normal)                                        |
| Back side antireflection coated | R < 0.2%                                             |

## LASER OUTPUT COUPLERS

Size –  $\varnothing 12.7 \times 3$  mm



**R = 60±2% @ 1064 nm, AOI=0°**

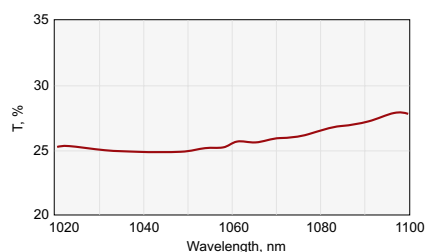
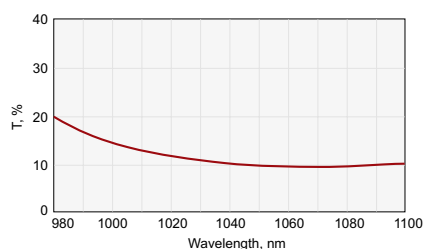


**R = 70±2% @ 1064 nm, AOI=0°**

| Wavelength, nm | Reflection, % | Transmission, % | Substrate material | Catalogue number         | Price, EUR |
|----------------|---------------|-----------------|--------------------|--------------------------|------------|
| 1064           | 15±3          | 85±3            | BK7                | <a href="#">031-0015</a> | 86         |
| 1064           | 20±3          | 80±3            | BK7                | <a href="#">031-0020</a> | 86         |
| 1064           | 25±3          | 75±3            | BK7                | <a href="#">031-0025</a> | 86         |
| 1064           | 30±3          | 70±3            | BK7                | <a href="#">031-0030</a> | 86         |
| 1064           | 40±3          | 60±3            | BK7                | <a href="#">031-0040</a> | 86         |
| 1064           | 50±3          | 50±3            | BK7                | <a href="#">031-0050</a> | 86         |
| 1064           | 60±3          | 40±3            | BK7                | <a href="#">031-0060</a> | 86         |
| 1064           | 65±3          | 35±3            | BK7                | <a href="#">031-0065</a> | 86         |
| 1064           | 70±3          | 30±3            | BK7                | <a href="#">031-0070</a> | 86         |
| 1064           | 75±3          | 25±3            | BK7                | <a href="#">031-0075</a> | 86         |
| 1064           | 80±3          | 20±3            | BK7                | <a href="#">031-0080</a> | 86         |
| 1064           | 85±3          | 15±3            | BK7                | <a href="#">031-0085</a> | 86         |
| 1064           | 90±2          | 10±2            | BK7                | <a href="#">031-0090</a> | 94         |
| 1064           | 95±2          | 5±2             | BK7                | <a href="#">031-0095</a> | 98         |
| 1064           | 97±1          | 3±1             | BK7                | <a href="#">031-0097</a> | 102        |
| 1064           | 98±1          | 2±1             | BK7                | <a href="#">031-0098</a> | 102        |
| 1064           | 99.0±0.5      | 1.0±0.5         | BK7                | <a href="#">031-0099</a> | 110        |

Size –  $\varnothing 12.7 \times 3$  mm

| Wavelength, nm | Reflection, % | Transmission, % | Substrate material | Catalogue number         | Price, EUR |
|----------------|---------------|-----------------|--------------------|--------------------------|------------|
| 1064           | 20±3          | 80±3            | UV FS              | <a href="#">041-0020</a> | 109        |
| 1064           | 30±3          | 70±3            | UV FS              | <a href="#">041-0030</a> | 109        |
| 1064           | 40±3          | 60±3            | UV FS              | <a href="#">041-0040</a> | 109        |
| 1064           | 50±3          | 50±3            | UV FS              | <a href="#">041-0050</a> | 109        |
| 1064           | 60±3          | 40±3            | UV FS              | <a href="#">041-0060</a> | 109        |
| 1064           | 65±3          | 35±3            | UV FS              | <a href="#">041-0065</a> | 109        |
| 1064           | 70±3          | 30±3            | UV FS              | <a href="#">041-0070</a> | 109        |
| 1064           | 75±3          | 25±3            | UV FS              | <a href="#">041-0075</a> | 109        |
| 1064           | 80±3          | 20±3            | UV FS              | <a href="#">041-0080</a> | 109        |
| 1064           | 85±3          | 15±3            | UV FS              | <a href="#">041-0085</a> | 109        |
| 1064           | 90±2          | 10±2            | UV FS              | <a href="#">041-0090</a> | 117        |
| 1064           | 95±2          | 5±2             | UV FS              | <a href="#">041-0095</a> | 117        |
| 1064           | 97±1          | 3±1             | UV FS              | <a href="#">041-0097</a> | 125        |
| 1064           | 98±1          | 2±1             | UV FS              | <a href="#">041-0098</a> | 125        |
| 1064           | 99.0±0.5      | 1.0±0.5         | UV FS              | <a href="#">041-0099</a> | 133        |


 $R = 75 \pm 3\%$  @ 1064 nm, AOI=0°

 $R = 90 \pm 2\%$  @ 1064 nm, AOI=0°

Size –  $\varnothing 25.4 \times 6$  mm

| Wavelength, nm | Reflection, % | Transmission, % | Substrate material | Catalogue number         | Price, EUR |
|----------------|---------------|-----------------|--------------------|--------------------------|------------|
| 1064           | 15±3          | 85±3            | BK7                | <a href="#">032-0015</a> | 109        |
| 1064           | 20±3          | 80±3            | BK7                | <a href="#">032-0020</a> | 109        |
| 1064           | 25±3          | 75±3            | BK7                | <a href="#">032-0025</a> | 109        |
| 1064           | 30±3          | 70±3            | BK7                | <a href="#">032-0030</a> | 109        |
| 1064           | 40±3          | 60±3            | BK7                | <a href="#">032-0040</a> | 109        |
| 1064           | 50±3          | 50±3            | BK7                | <a href="#">032-0050</a> | 109        |
| 1064           | 60±3          | 40±3            | BK7                | <a href="#">032-0060</a> | 109        |
| 1064           | 65±3          | 35±3            | BK7                | <a href="#">032-0065</a> | 109        |
| 1064           | 70±3          | 30±3            | BK7                | <a href="#">032-0070</a> | 109        |
| 1064           | 75±3          | 25±3            | BK7                | <a href="#">032-0075</a> | 109        |
| 1064           | 80±3          | 20±3            | BK7                | <a href="#">032-0080</a> | 109        |
| 1064           | 85±3          | 15±3            | BK7                | <a href="#">032-0085</a> | 109        |
| 1064           | 90±2          | 10±2            | BK7                | <a href="#">032-0090</a> | 117        |
| 1064           | 95±2          | 5±2             | BK7                | <a href="#">032-0095</a> | 117        |
| 1064           | 97±1          | 3±1             | BK7                | <a href="#">032-0097</a> | 125        |
| 1064           | 98±1          | 2±1             | BK7                | <a href="#">032-0098</a> | 125        |
| 1064           | 99.0±0.5      | 1.0±0.5         | BK7                | <a href="#">032-0099</a> | 133        |
| 1064           | 15±3          | 85±3            | UV FS              | <a href="#">042-0015</a> | 132        |
| 1064           | 20±3          | 80±3            | UV FS              | <a href="#">042-0020</a> | 132        |
| 1064           | 25±3          | 75±3            | UV FS              | <a href="#">042-0025</a> | 132        |
| 1064           | 30±3          | 70±3            | UV FS              | <a href="#">042-0030</a> | 132        |
| 1064           | 40±3          | 60±3            | UV FS              | <a href="#">042-0040</a> | 132        |
| 1064           | 50±3          | 50±3            | UV FS              | <a href="#">042-0050</a> | 132        |
| 1064           | 60±3          | 40±3            | UV FS              | <a href="#">042-0060</a> | 132        |
| 1064           | 65±3          | 35±3            | UV FS              | <a href="#">042-0065</a> | 132        |
| 1064           | 70±3          | 30±3            | UV FS              | <a href="#">042-0070</a> | 132        |
| 1064           | 75±3          | 25±3            | UV FS              | <a href="#">042-0075</a> | 132        |
| 1064           | 80±3          | 20±3            | UV FS              | <a href="#">042-0080</a> | 132        |
| 1064           | 85±3          | 15±3            | UV FS              | <a href="#">042-0085</a> | 132        |
| 1064           | 90±2          | 10±2            | UV FS              | <a href="#">042-0090</a> | 140        |
| 1064           | 95±2          | 5±2             | UV FS              | <a href="#">042-0095</a> | 140        |
| 1064           | 97±1          | 3±1             | UV FS              | <a href="#">042-0097</a> | 148        |
| 1064           | 98±1          | 2±1             | UV FS              | <a href="#">042-0098</a> | 148        |
| 1064           | 99.0±0.5      | 1.0±0.5         | UV FS              | <a href="#">042-0099</a> | 156        |

## Related Products

Uncoated Flat Windows See page 1.9

Kinematic Mirror and Beamsplitter Mount 840-0020

Find more at [EksmaOptics.com](https://www.eksmaoptics.com)



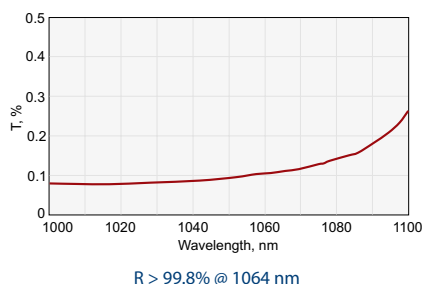

## LASER REAR MIRRORS

### Substrate

|                     |                                      |
|---------------------|--------------------------------------|
| Material            | UV grade Fused Silica or BK7 glass   |
| S1 Surface Flatness | $\lambda/10$ at 633 nm               |
| S1 Surface Quality  | 20–10 scratch & dig (MIL-PRF-13830B) |
| S2 Surface Quality  | Commercial polish                    |
| Diameter Tolerance  | +0.00 mm; -0.12 mm                   |
| Thickness Tolerance | $\pm 0.25$                           |
| Chamfer             | 0.3 mm at 45° typical                |

### Coating

|                         |                                              |
|-------------------------|----------------------------------------------|
| Technology              | Electron beam multilayer dielectric          |
| Adhesion and Durability | Per MIL-C-675A. Insoluble in lab solvents    |
| Clear Aperture          | Exceeds central 85% of diameter              |
| Damage Threshold:       |                                              |
| BK7                     | $> 2 \text{ J/cm}^2$ , 8 nsec pulse, 1064 nm |
| UV FS                   | $> 5 \text{ J/cm}^2$ , 8 nsec pulse, 1064 nm |
| Angle of Incidence      | 0 – 8° (normal)                              |
| Reflectivity            | R > 99.7%                                    |



Size –  $\varnothing 25.4 \times 6 \text{ mm}$

| Wavelength, nm | Substrate type | Radius, mm | Substrate material | Catalogue number            | Price, EUR |
|----------------|----------------|------------|--------------------|-----------------------------|------------|
| 1047–1064      | Plano          | $\infty$   | BK7                | <a href="#">032-1060-i0</a> | 86         |
| 1064           | Plano-concave  | -50        | BK7                | <a href="#">032-8005</a>    | 102        |
| 1064           | Plano-concave  | -100       | BK7                | <a href="#">032-8010</a>    | 102        |
| 1064           | Plano-concave  | -150       | BK7                | <a href="#">032-8015</a>    | 102        |
| 1064           | Plano-concave  | -200       | BK7                | <a href="#">032-8020</a>    | 102        |
| 1064           | Plano-concave  | -250       | BK7                | <a href="#">032-8025</a>    | 102        |
| 1064           | Plano-concave  | -500       | BK7                | <a href="#">032-8050</a>    | 102        |
| 1064           | Plano-concave  | -1000      | BK7                | <a href="#">032-8100</a>    | 102        |
| 1064           | Plano-concave  | -2000      | BK7                | <a href="#">032-8200</a>    | 102        |
| 1064           | Plano-concave  | -2500      | BK7                | <a href="#">032-8250</a>    | 102        |
| 1064           | Plano-concave  | -4000      | BK7                | <a href="#">032-8400</a>    | 102        |
| 1064           | Plano-concave  | -5000      | BK7                | <a href="#">032-8500</a>    | 102        |
| 1047–1064      | Plano          | $\infty$   | UV FS              | <a href="#">042-1060-i0</a> | 104        |
| 1064           | Plano-concave  | -50        | UV FS              | <a href="#">042-8005</a>    | 125        |
| 1064           | Plano-concave  | -100       | UV FS              | <a href="#">042-8010</a>    | 125        |
| 1064           | Plano-concave  | -150       | UV FS              | <a href="#">042-8015</a>    | 125        |
| 1064           | Plano-concave  | -200       | UV FS              | <a href="#">042-8020</a>    | 125        |
| 1064           | Plano-concave  | -250       | UV FS              | <a href="#">042-8025</a>    | 125        |
| 1064           | Plano-concave  | -500       | UV FS              | <a href="#">042-8050</a>    | 125        |
| 1064           | Plano-concave  | -1000      | UV FS              | <a href="#">042-8100</a>    | 125        |
| 1064           | Plano-concave  | -2000      | UV FS              | <a href="#">042-8200</a>    | 125        |
| 1064           | Plano-concave  | -2500      | UV FS              | <a href="#">042-8250</a>    | 125        |
| 1064           | Plano-concave  | -4000      | UV FS              | <a href="#">042-8400</a>    | 125        |
| 1064           | Plano-concave  | -5000      | UV FS              | <a href="#">042-8500</a>    | 125        |
| 1064           | Plano-convex   | +100       | BK7                | <a href="#">032-9010</a>    | 107        |
| 1064           | Plano-convex   | +200       | BK7                | <a href="#">032-9020</a>    | 107        |
| 1064           | Plano-convex   | +300       | BK7                | <a href="#">032-9030</a>    | 107        |
| 1064           | Plano-convex   | +500       | BK7                | <a href="#">032-9050</a>    | 107        |
| 1064           | Plano-convex   | +1000      | BK7                | <a href="#">032-9100</a>    | 107        |
| 1064           | Plano-convex   | +2000      | BK7                | <a href="#">032-9200</a>    | 107        |
| 1064           | Plano-convex   | +3000      | BK7                | <a href="#">032-9300</a>    | 107        |
| 1064           | Plano-convex   | +4000      | BK7                | <a href="#">032-9400</a>    | 107        |
| 1064           | Plano-convex   | +100       | UV FS              | <a href="#">042-9010</a>    | 130        |
| 1064           | Plano-convex   | +200       | UV FS              | <a href="#">042-9020</a>    | 130        |
| 1064           | Plano-convex   | +300       | UV FS              | <a href="#">042-9030</a>    | 130        |
| 1064           | Plano-convex   | +500       | UV FS              | <a href="#">042-9050</a>    | 130        |
| 1064           | Plano-convex   | +1000      | UV FS              | <a href="#">042-9100</a>    | 130        |
| 1064           | Plano-convex   | +2000      | UV FS              | <a href="#">042-9200</a>    | 130        |
| 1064           | Plano-convex   | +3000      | UV FS              | <a href="#">042-9300</a>    | 130        |
| 1064           | Plano-convex   | +4000      | UV FS              | <a href="#">042-9400</a>    | 130        |

### Related Products

Uncoated Curved Windows [See page 1.6](#)

Kinematic Mirror Mount 840-0010

[Find more at EksmaOptics.com](#)

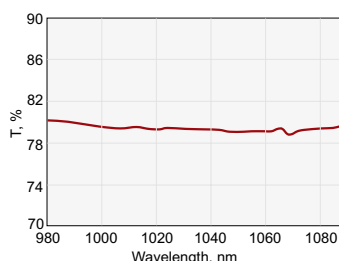


## LASER BEAMSPLITTERS

### Features

- Designed for average polarization:  $R=(R_s+R_p)/2$  and  $T=(T_s+T_p)/2$

Beamsplitter splits average polarized laser beam into two beams separated by 90° from each other.



042-7120A.

$R = 20 \pm 3\%$ ,  $T = 80 \pm 3\%$  @ 1064 nm

### Substrate

|                     |                                      |
|---------------------|--------------------------------------|
| Material            | UV grade Fused Silica or BK7 glass   |
| S1 Surface Flatness | $\lambda/10$ typical at 633 nm       |
| S1 Surface Quality  | 20–10 scratch & dig (MIL-PRF-13830B) |
| S2 Surface Flatness | $\lambda/10$ typical at 633 nm       |
| S2 Surface Quality  | 20–10 scratch & dig (MIL-PRF-13830B) |
| Diameter Tolerance  | +0.00 mm; -0.12 mm                   |
| Thickness Tolerance | $\pm 0.25$ mm                        |
| Parallelism         | 30 arcsec                            |
| Chamfer             | 0.3 mm at 45° typical                |

### Coating

|                                 |                                                        |
|---------------------------------|--------------------------------------------------------|
| Technology                      | Electron beam multilayer dielectric                    |
| Adhesion and Durability         | Per MIL-C-675A. Insoluble in lab solvents              |
| Clear Aperture                  | Exceeds central 85% of diameter                        |
| Damage Threshold:               |                                                        |
| BK7                             | $>5$ J/cm <sup>2</sup> , 8 nsec pulse, 1064 nm typical |
| UV FS                           | $>8$ J/cm <sup>2</sup> , 8 nsec pulse, 1064 nm typical |
| Angle of Incidence              | 45 $\pm$ 3 degrees                                     |
| Back side antireflection coated | $R < 0.5\%$                                            |

Designed for average polarization.  $R=(R_s+R_p)/2$  and  $T=(T_s+T_p)/2$

| Wavelength, nm | Reflection, % | Transmission, % | Substrate material | Ø12.7x3 mm       |            | Ø25.4x6 mm       |            |
|----------------|---------------|-----------------|--------------------|------------------|------------|------------------|------------|
|                |               |                 |                    | Catalogue number | Price, EUR | Catalogue number | Price, EUR |
| 1064           | 20 $\pm$ 3    | 80 $\pm$ 3      | BK7                | 031-7120A        | 86         | 032-7120A        | 109        |
| 1064           | 30 $\pm$ 3    | 70 $\pm$ 3      | BK7                | 031-7130A        | 86         | 032-7130A        | 109        |
| 1064           | 50 $\pm$ 3    | 50 $\pm$ 3      | BK7                | 031-7150A        | 86         | 032-7150A        | 109        |
| 1064           | 70 $\pm$ 3    | 30 $\pm$ 3      | BK7                | 031-7170A        | 86         | 032-7170A        | 109        |
| 1064           | 75 $\pm$ 3    | 25 $\pm$ 3      | BK7                | 031-7175A        | 86         | 032-7175A        | 109        |
| 1064           | 80 $\pm$ 3    | 20 $\pm$ 3      | BK7                | 031-7180A        | 86         | 032-7180A        | 109        |
| 1064           | 90 $\pm$ 3    | 10 $\pm$ 3      | BK7                | 031-7190A        | 86         | 032-7190A        | 109        |
| 532            | 20 $\pm$ 3    | 80 $\pm$ 3      | BK7                | 031-7220A        | 84         | 032-7220A        | 107        |
| 532            | 30 $\pm$ 3    | 70 $\pm$ 3      | BK7                | 031-7230A        | 84         | 032-7230A        | 107        |
| 532            | 50 $\pm$ 3    | 50 $\pm$ 3      | BK7                | 031-7250A        | 84         | 032-7250A        | 107        |
| 532            | 70 $\pm$ 3    | 30 $\pm$ 3      | BK7                | 031-7270A        | 84         | 032-7270A        | 107        |
| 532            | 80 $\pm$ 3    | 20 $\pm$ 3      | BK7                | 031-7280A        | 84         | 032-7280A        | 107        |
| 1064           | 20 $\pm$ 3    | 80 $\pm$ 3      | UV FS              | 041-7120A        | 109        | 042-7120A        | 132        |
| 1064           | 30 $\pm$ 3    | 70 $\pm$ 3      | UV FS              | 041-7130A        | 109        | 042-7130A        | 132        |
| 1064           | 50 $\pm$ 3    | 50 $\pm$ 3      | UV FS              | 041-7150A        | 109        | 042-7150A        | 132        |
| 1064           | 70 $\pm$ 3    | 30 $\pm$ 3      | UV FS              | 041-7170A        | 109        | 042-7170A        | 132        |
| 1064           | 75 $\pm$ 3    | 25 $\pm$ 3      | UV FS              | 041-7175A        | 109        | 042-7175A        | 132        |
| 1064           | 80 $\pm$ 3    | 20 $\pm$ 3      | UV FS              | 041-7180A        | 109        | 042-7180A        | 132        |
| 1064           | 90 $\pm$ 3    | 10 $\pm$ 3      | UV FS              | 041-7190A        | 109        | 042-7190A        | 132        |
| 532            | 20 $\pm$ 3    | 80 $\pm$ 3      | UV FS              | 041-7220A        | 107        | 042-7220A        | 130        |
| 532            | 30 $\pm$ 3    | 70 $\pm$ 3      | UV FS              | 041-7230A        | 107        | 042-7230A        | 130        |
| 532            | 50 $\pm$ 3    | 50 $\pm$ 3      | UV FS              | 041-7250A        | 107        | 042-7250A        | 130        |
| 532            | 70 $\pm$ 3    | 30 $\pm$ 3      | UV FS              | 041-7270A        | 107        | 042-7270A        | 130        |
| 532            | 80 $\pm$ 3    | 20 $\pm$ 3      | UV FS              | 041-7280A        | 107        | 042-7280A        | 130        |
| 355            | 20 $\pm$ 3    | 80 $\pm$ 3      | UV FS              | 041-7320A        | 121        | 042-7320A        | 155        |
| 355            | 30 $\pm$ 3    | 70 $\pm$ 3      | UV FS              | 041-7330A        | 121        | 042-7330A        | 155        |
| 355            | 50 $\pm$ 3    | 50 $\pm$ 3      | UV FS              | 041-7350A        | 121        | 042-7350A        | 155        |
| 355            | 70 $\pm$ 3    | 30 $\pm$ 3      | UV FS              | 041-7370A        | 121        | 042-7370A        | 155        |
| 355            | 80 $\pm$ 3    | 20 $\pm$ 3      | UV FS              | 041-7380A        | 121        | 042-7380A        | 155        |
| 266            | 20 $\pm$ 3    | 80 $\pm$ 3      | UV FS              | 041-7920A        | 132        | 042-7920A        | 167        |
| 266            | 30 $\pm$ 3    | 70 $\pm$ 3      | UV FS              | 041-7930A        | 132        | 042-7930A        | 167        |
| 266            | 50 $\pm$ 3    | 50 $\pm$ 3      | UV FS              | 041-7950A        | 132        | 042-7950A        | 167        |
| 266            | 70 $\pm$ 3    | 30 $\pm$ 3      | UV FS              | 041-7970A        | 132        | 042-7970A        | 167        |
| 266            | 80 $\pm$ 3    | 20 $\pm$ 3      | UV FS              | 041-7980A        | 132        | 042-7980A        | 167        |

### Related Products

Uncoated Flat Windows

See page 1.9

## Designed for S- polarization

| Wavelength, nm | Reflection, % | Transmission, % | Substrate material | Ø12.7x3 mm       |            | Ø25.4x6 mm       |            |
|----------------|---------------|-----------------|--------------------|------------------|------------|------------------|------------|
|                |               |                 |                    | Catalogue number | Price, EUR | Catalogue number | Price, EUR |
| 1064           | 20±3          | 80±3            | BK7                | 031-7120S        | 86         | 032-7120S        | 109        |
| 1064           | 30±3          | 70±3            | BK7                | 031-7130S        | 86         | 032-7130S        | 109        |
| 1064           | 50±3          | 50±3            | BK7                | 031-7150S        | 86         | 032-7150S        | 109        |
| 1064           | 70±3          | 30±3            | BK7                | 031-7170S        | 86         | 032-7170S        | 109        |
| 1064           | 80±3          | 20±3            | BK7                | 031-7180S        | 86         | 032-7180S        | 109        |
| 532            | 20±3          | 80±3            | BK7                | 031-7220S        | 84         | 032-7220S        | 107        |
| 532            | 30±3          | 70±3            | BK7                | 031-7230S        | 84         | 032-7230S        | 107        |
| 532            | 50±3          | 50±3            | BK7                | 031-7250S        | 84         | 032-7250S        | 107        |
| 532            | 70±3          | 30±3            | BK7                | 031-7270S        | 84         | 032-7270S        | 107        |
| 532            | 80±3          | 20±3            | BK7                | 031-7280S        | 84         | 032-7280S        | 107        |
| 1064           | 20±3          | 80±3            | UV FS              | 041-7120S        | 109        | 042-7120S        | 132        |
| 1064           | 30±3          | 70±3            | UV FS              | 041-7130S        | 109        | 042-7130S        | 132        |
| 1064           | 50±3          | 50±3            | UV FS              | 041-7150S        | 109        | 042-7150S        | 132        |
| 1064           | 70±3          | 30±3            | UV FS              | 041-7170S        | 109        | 042-7170S        | 132        |
| 1064           | 80±3          | 20±3            | UV FS              | 041-7180S        | 109        | 042-7180S        | 132        |
| 532            | 20±3          | 80±3            | UV FS              | 041-7220S        | 107        | 042-7220S        | 130        |
| 532            | 30±3          | 70±3            | UV FS              | 041-7230S        | 107        | 042-7230S        | 130        |
| 532            | 50±3          | 50±3            | UV FS              | 041-7250S        | 107        | 042-7250S        | 130        |
| 532            | 70±3          | 30±3            | UV FS              | 041-7270S        | 107        | 042-7270S        | 130        |
| 532            | 80±3          | 20±3            | UV FS              | 041-7280S        | 107        | 042-7280S        | 130        |
| 355            | 20±3          | 80±3            | UV FS              | 041-7320S        | 121        | 042-7320S        | 155        |
| 355            | 30±3          | 70±3            | UV FS              | 041-7330S        | 121        | 042-7330S        | 155        |
| 355            | 50±3          | 50±3            | UV FS              | 041-7350S        | 121        | 042-7350S        | 155        |
| 355            | 70±3          | 30±3            | UV FS              | 041-7370S        | 121        | 042-7370S        | 155        |
| 355            | 80±3          | 20±3            | UV FS              | 041-7380S        | 121        | 042-7380S        | 155        |
| 266            | 20±3          | 80±3            | UV FS              | 041-7920S        | 132        | 042-7920S        | 167        |
| 266            | 30±3          | 70±3            | UV FS              | 041-7930S        | 132        | 042-7930S        | 167        |
| 266            | 50±3          | 50±3            | UV FS              | 041-7950S        | 132        | 042-7950S        | 167        |
| 266            | 70±3          | 30±3            | UV FS              | 041-7970S        | 132        | 042-7970S        | 167        |
| 266            | 80±3          | 20±3            | UV FS              | 041-7980S        | 132        | 042-7980S        | 167        |

## Housing accessories

Kinematic Mirror and Beamsplitter Mount  
840-0030-02



Adapter for Beamsplitter at 45° 840-0116



Flipping Mirror/ Beamsplitter Mount 840-0155



Find more at [EksmaOptics.com](http://EksmaOptics.com)

## Designed for P- polarization

| Wavelength, nm | Reflection, % | Transmission, % | Substrate material | Ø12.7x3 mm       |            | Ø25.4x6 mm       |            |
|----------------|---------------|-----------------|--------------------|------------------|------------|------------------|------------|
|                |               |                 |                    | Catalogue number | Price, EUR | Catalogue number | Price, EUR |
| 1064           | 20±3          | 80±3            | BK7                | 031-7120P        | 86         | 032-7120P        | 109        |
| 1064           | 30±3          | 70±3            | BK7                | 031-7130P        | 86         | 032-7130P        | 109        |
| 1064           | 50±3          | 50±3            | BK7                | 031-7150P        | 86         | 032-7150P        | 109        |
| 1064           | 70±3          | 30±3            | BK7                | 031-7170P        | 86         | 032-7170P        | 109        |
| 1064           | 80±3          | 20±3            | BK7                | 031-7180P        | 86         | 032-7180P        | 109        |
| 532            | 20±3          | 80±3            | BK7                | 031-7220P        | 84         | 032-7220P        | 107        |
| 532            | 30±3          | 70±3            | BK7                | 031-7230P        | 84         | 032-7230P        | 107        |
| 532            | 50±3          | 50±3            | BK7                | 031-7250P        | 84         | 032-7250P        | 107        |
| 532            | 70±3          | 30±3            | BK7                | 031-7270P        | 84         | 032-7270P        | 107        |
| 532            | 80±3          | 20±3            | BK7                | 031-7280P        | 84         | 032-7280P        | 107        |
| 1064           | 20±3          | 80±3            | UV FS              | 041-7120P        | 109        | 042-7120P        | 132        |
| 1064           | 30±3          | 70±3            | UV FS              | 041-7130P        | 109        | 042-7130P        | 132        |
| 1064           | 50±3          | 50±3            | UV FS              | 041-7150P        | 109        | 042-7150P        | 132        |
| 1064           | 70±3          | 30±3            | UV FS              | 041-7170P        | 109        | 042-7170P        | 132        |
| 1064           | 80±3          | 20±3            | UV FS              | 041-7180P        | 109        | 042-7180P        | 132        |
| 532            | 20±3          | 80±3            | UV FS              | 041-7220P        | 107        | 042-7220P        | 130        |
| 532            | 30±3          | 70±3            | UV FS              | 041-7230P        | 107        | 042-7230P        | 130        |
| 532            | 50±3          | 50±3            | UV FS              | 041-7250P        | 107        | 042-7250P        | 130        |
| 532            | 70±3          | 30±3            | UV FS              | 041-7270P        | 107        | 042-7270P        | 130        |
| 532            | 80±3          | 20±3            | UV FS              | 041-7280P        | 107        | 042-7280P        | 130        |
| 355            | 20±3          | 80±3            | UV FS              | 041-7320P        | 121        | 042-7320P        | 155        |
| 355            | 30±3          | 70±3            | UV FS              | 041-7330P        | 121        | 042-7330P        | 155        |
| 355            | 50±3          | 50±3            | UV FS              | 041-7350P        | 121        | 042-7350P        | 155        |
| 355            | 70±3          | 30±3            | UV FS              | 041-7370P        | 121        | 042-7370P        | 155        |
| 355            | 80±3          | 20±3            | UV FS              | 041-7380P        | 121        | 042-7380P        | 155        |
| 266            | 20±3          | 80±3            | UV FS              | 041-7920P        | 132        | 042-7920P        | 167        |
| 266            | 30±3          | 70±3            | UV FS              | 041-7930P        | 132        | 042-7930P        | 167        |
| 266            | 50±3          | 50±3            | UV FS              | 041-7950P        | 132        | 042-7950P        | 167        |
| 266            | 70±3          | 30±3            | UV FS              | 041-7970P        | 132        | 042-7970P        | 167        |
| 266            | 80±3          | 20±3            | UV FS              | 041-7980P        | 132        | 042-7980P        | 167        |

## LASER LINE ANTI-REFLECTION COATED PRECISION WINDOWS

### Features

- Made of premium quality UV FS and BK7
- AR coated at 266 nm, 355 nm, 532 nm, 1064 nm

Precision windows are mostly used in laser systems. High quality AR multilayer coatings are applied on windows for fundamental Nd:YAG laser 1064 nm, frequency-doubled 532 nm, frequency-tripled 355 nm and

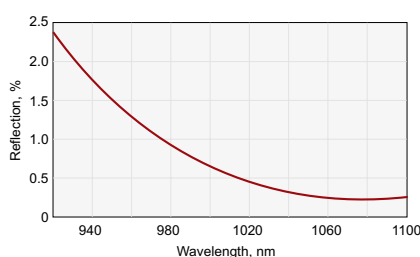
frequency-quadrupled 266 nm applications. Featuring high optical transmission with little distortion of the transmitted signal, precision windows are a good solution for applications that require protective windows.

### Specifications

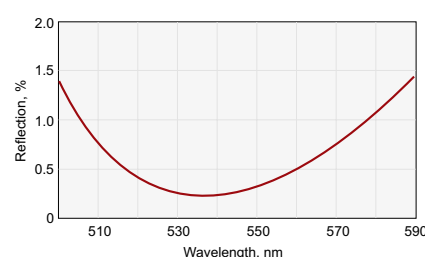
|                     |                                       |
|---------------------|---------------------------------------|
| Material            | BK7, UV FS                            |
| Surface quality     | 20 –10 scratch & dig (MIL-PRF-13830B) |
| Clear aperture      | 90% of the diameter                   |
| Diameter tolerance  | +0.00; -0.12 mm                       |
| Thickness tolerance | ±0.2 mm                               |
| Surface flatness    | $\lambda/10$ @ 633 nm                 |
| Parallelism         | 30 arcsec or 3 arcsec                 |

### Coating

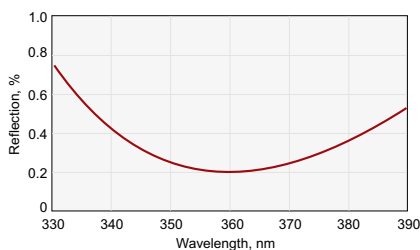
|                         |                                              |
|-------------------------|----------------------------------------------|
| Technology              | Electron beam multilayer dielectric          |
| Adhesion and Durability | Per MIL-C-675A. Insoluble in lab solvents    |
| Clear Aperture          | Exceeds central 85% of diameter              |
| Damage Threshold:       |                                              |
| BK7                     | $>5 \text{ J/cm}^2$ , 8 nsec pulse, 1064 nm  |
| UV FS                   | $>10 \text{ J/cm}^2$ , 8 nsec pulse, 1064 nm |
| Angle of Incidence      | 0 degrees                                    |
| Coated Surface Flatness | $\lambda/10$ at 633 nm over clear aperture   |



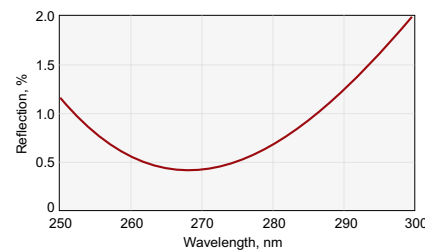
$R < 0.25\%$  @ 1064 nm AOI = 0°



$R < 0.25\%$  @ 532 nm AOI = 0°



$R < 0.25\%$  @ 355 nm, AOI = 0°



$R < 0.4\%$  @ 266 nm, AOI = 0°

### PARALLELISM 30 arcsec

| Wavelength, nm | Diameter D, mm | Thickness T, mm | BK7              |            | UV FS            |            |
|----------------|----------------|-----------------|------------------|------------|------------------|------------|
|                |                |                 | Catalogue number | Price, EUR | Catalogue number | Price, EUR |
| 266            | 12.7           | 3.0             | –                |            | 224-1101E        | 79         |
| 355            | 12.7           | 3.0             | –                |            | 223-1101E        | 65         |
| 532            | 12.7           | 3.0             | 222-0101E        | 51         | 222-1101E        | 65         |
| 1064           | 12.7           | 3.0             | 221-0101E        | 51         | 221-1101E        | 65         |
| 266            | 25.4           | 6.0             | –                |            | 224-1201E        | 85         |
| 355            | 25.4           | 6.0             | –                |            | 223-1201E        | 70         |
| 532            | 25.4           | 6.0             | 222-0201E        | 61         | 222-1201E        | 70         |
| 1064           | 25.4           | 6.0             | 221-0201E        | 61         | 221-1201E        | 70         |
| 266            | 38.1           | 8.0             | –                |            | 224-1402E        | 131        |
| 355            | 38.1           | 8.0             | –                |            | 223-1402E        | 126        |
| 532            | 38.1           | 8.0             | 222-0402E        | 86         | 222-1402E        | 126        |
| 1064           | 38.1           | 8.0             | 221-0402E        | 86         | 221-1402E        | 126        |
| 266            | 50.8           | 10.0            | –                |            | 224-1502E        | 181        |
| 355            | 50.8           | 10.0            | –                |            | 223-1502E        | 176        |
| 532            | 50.8           | 10.0            | 222-0502E        | 99         | 222-1502E        | 176        |
| 1064           | 50.8           | 10.0            | 221-0502E        | 99         | 221-1502E        | 176        |

## PARALLELISM 3 arcsec

| Wavelength, nm | Diameter D, mm | Thickness T, mm | BK7                       |            | UV FS                     |            |
|----------------|----------------|-----------------|---------------------------|------------|---------------------------|------------|
|                |                |                 | Catalogue number          | Price, EUR | Catalogue number          | Price, EUR |
| 266            | 12.7           | 3.0             | –                         |            | <a href="#">224-1103E</a> | 96         |
| 355            | 12.7           | 3.0             | –                         |            | <a href="#">223-1103E</a> | 82         |
| 532            | 12.7           | 3.0             | <a href="#">222-0103E</a> | 66         | <a href="#">222-1103E</a> | 82         |
| 1064           | 12.7           | 3.0             | <a href="#">221-0103E</a> | 66         | <a href="#">221-1103E</a> | 82         |
| 266            | 25.4           | 6.0             | –                         |            | <a href="#">224-1203E</a> | 125        |
| 355            | 25.4           | 6.0             | –                         |            | <a href="#">223-1203E</a> | 111        |
| 532            | 25.4           | 6.0             | <a href="#">222-0203E</a> | 88         | <a href="#">222-1203E</a> | 111        |
| 1064           | 25.4           | 6.0             | <a href="#">221-0203E</a> | 88         | <a href="#">221-1203E</a> | 111        |
| 266            | 38.1           | 10.0            | –                         |            | <a href="#">224-1403E</a> | 176        |
| 355            | 38.1           | 10.0            | –                         |            | <a href="#">223-1403E</a> | 170        |
| 532            | 38.1           | 10.0            | <a href="#">222-0403E</a> | 121        | <a href="#">222-1403E</a> | 170        |
| 1064           | 38.1           | 10.0            | <a href="#">221-0403E</a> | 121        | <a href="#">221-1403E</a> | 170        |
| 266            | 50.8           | 12.0            | –                         |            | <a href="#">224-1503E</a> | 217        |
| 355            | 50.8           | 12.0            | –                         |            | <a href="#">223-1503E</a> | 212        |
| 532            | 50.8           | 12.0            | <a href="#">222-0503E</a> | 148        | <a href="#">222-1503E</a> | 212        |
| 1064           | 50.8           | 12.0            | <a href="#">221-0503E</a> | 148        | <a href="#">221-1503E</a> | 212        |

### Related Products

Uncoated Precision Windows

See page 1.10

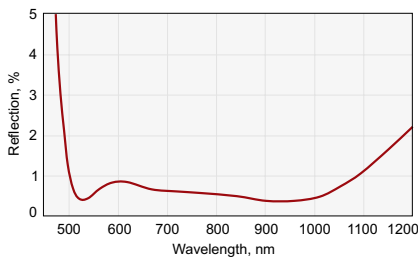
## AR COATED LENS KITS



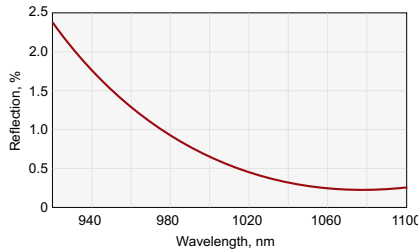
Lens kits contain different types of spherical (plano-convex, biconvex, plano-concave, biconcave) or cylindrical (plano-convex, plano-concave) lenses with various focal lengths. Kits are packed into foam lined plastic boxes for safe handling and storage. Kits are available with laser line and broadband multilayer anti-reflection coatings.

Spherical lens kits consist of 40 (large kit) or 15 (small kit) Ø25.4 mm lenses made of UVFS or N-BK7.

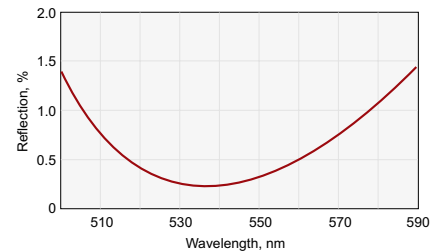
Cylindrical lens kits consist of 12 rectangular lenses (25.4 x 50.8 mm) made of UVFS or N-BK7.



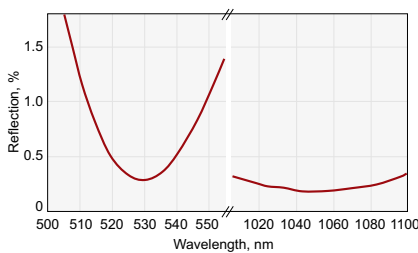
R<1.5% @ 500-1100 nm, AOI=0°



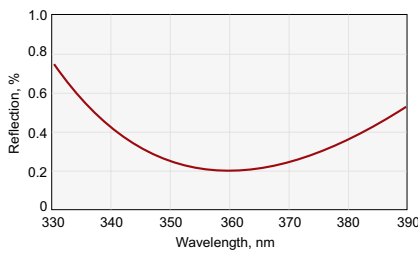
R<0.25% @ 1064 nm AOI=0°



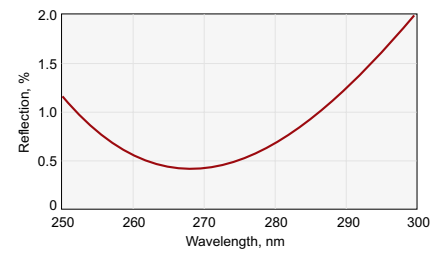
R<0.25% @ 532 nm AOI=0°



R<0.5% @ 532 nm+1064 nm, AOI=0°



R<0.25% @ 355 nm, AOI=0°



R<0.4% @ 266 nm, AOI=0°

## BK7 LENS KITS



Small Lens Kit

### Large N-BK7 Spherical Lens Kit (40 pcs.)

| Coating                       | Catalogue number                     | Price, EUR |
|-------------------------------|--------------------------------------|------------|
| BBAR @ 400 – 700 nm, R<0.9%   | <a href="#">140-0240-AR400-700</a>   | 2002       |
| BBAR @ 650 – 1100 nm, R<1.0%  | <a href="#">140-0240-AR650-1100</a>  | 2123       |
| BBAR @ 1050 – 1700 nm, R<1.0% | <a href="#">140-0240-AR1050-1700</a> | 2233       |
| AR @ 532 + 1064 nm, R<0.5%    | <a href="#">140-0240-AR532+1064</a>  | 1925       |
| AR @ 1064 nm, R<0.25%         | <a href="#">140-0240-AR1064</a>      | 1705       |
| AR @ 532 nm, R<0.25%          | <a href="#">140-0240-AR532</a>       | 1705       |

### Large BK7 Lens Kit

| Type  | Dia, mm | F, mm | Catalogue number          |
|-------|---------|-------|---------------------------|
| pl/cx | 25.4    | 30    | <a href="#">110-0205E</a> |
| pl/cx | 25.4    | 40    | <a href="#">110-0207E</a> |
| pl/cx | 25.4    | 50    | <a href="#">110-0209E</a> |
| pl/cx | 25.4    | 60    | <a href="#">110-0211E</a> |
| pl/cx | 25.4    | 75    | <a href="#">110-0215E</a> |
| pl/cx | 25.4    | 100   | <a href="#">110-0219E</a> |
| pl/cx | 25.4    | 125   | <a href="#">110-0223E</a> |
| pl/cx | 25.4    | 150   | <a href="#">110-0227E</a> |
| pl/cx | 25.4    | 200   | <a href="#">110-0231E</a> |
| pl/cx | 25.4    | 250   | <a href="#">110-0235E</a> |
| pl/cx | 25.4    | 300   | <a href="#">110-0239E</a> |
| pl/cx | 25.4    | 350   | <a href="#">110-0241E</a> |
| pl/cx | 25.4    | 400   | <a href="#">110-0243E</a> |
| pl/cx | 25.4    | 500   | <a href="#">110-0247E</a> |
| pl/cx | 25.4    | 700   | <a href="#">110-0251E</a> |
| pl/cx | 25.4    | 1000  | <a href="#">110-0259E</a> |
| bi/cx | 25.4    | 25    | <a href="#">111-0204E</a> |
| bi/cx | 25.4    | 30    | <a href="#">111-0206E</a> |
| bi/cx | 25.4    | 40    | <a href="#">111-0208E</a> |
| bi/cx | 25.4    | 50    | <a href="#">111-0210E</a> |

| Type  | Dia, mm | F, mm | Catalogue number          |
|-------|---------|-------|---------------------------|
| bi/cx | 25.4    | 60    | <a href="#">111-0214E</a> |
| bi/cx | 25.4    | 75    | <a href="#">111-0216E</a> |
| bi/cx | 25.4    | 100   | <a href="#">111-0218E</a> |
| bi/cx | 25.4    | 150   | <a href="#">111-0222E</a> |
| bi/cx | 25.4    | 200   | <a href="#">111-0226E</a> |
| bi/cx | 25.4    | 250   | <a href="#">111-0228E</a> |
| bi/cx | 25.4    | 500   | <a href="#">111-0234E</a> |
| bi/cx | 25.4    | 1000  | <a href="#">111-0250E</a> |
| pl/cv | 25.4    | -40   | <a href="#">112-0207E</a> |
| pl/cv | 25.4    | -50   | <a href="#">112-0209E</a> |
| pl/cv | 25.4    | -75   | <a href="#">112-0215E</a> |
| pl/cv | 25.4    | -100  | <a href="#">112-0219E</a> |
| pl/cv | 25.4    | -150  | <a href="#">112-0227E</a> |
| pl/cv | 25.4    | -200  | <a href="#">112-0231E</a> |
| bi/cv | 25.4    | -25   | <a href="#">114-0204E</a> |
| bi/cv | 25.4    | -50   | <a href="#">114-0208E</a> |
| bi/cv | 25.4    | -75   | <a href="#">114-0212E</a> |
| bi/cv | 25.4    | -100  | <a href="#">114-0214E</a> |
| bi/cv | 25.4    | -150  | <a href="#">114-0220E</a> |
| bi/cv | 25.4    | -200  | <a href="#">114-0224E</a> |

### Small N-BK7 Spherical Lens Kit (15 pcs.)

| Coating                       | Catalogue number                     | Price, EUR |
|-------------------------------|--------------------------------------|------------|
| BBAR @ 400 – 700 nm, R<0.9%   | <a href="#">140-0215-AR400-700</a>   | 1089       |
| BBAR @ 650 – 1100 nm, R<1.0%  | <a href="#">140-0215-AR650-1100</a>  | 1155       |
| BBAR @ 1050 – 1700 nm, R<1.0% | <a href="#">140-0240-AR1050-1700</a> | 1265       |
| AR @ 532 + 1064 nm, R<0.5%    | <a href="#">140-0215-AR532+1064</a>  | 847        |
| AR @ 1064 nm, R<0.25%         | <a href="#">140-0215-AR1064</a>      | 770        |
| AR @ 532 nm, R<0.25%          | <a href="#">140-0215-AR532</a>       | 770        |

### Small BK7 Lens Kit

| Type  | Dia, mm | F, mm | Catalogue number          |
|-------|---------|-------|---------------------------|
| pl/cx | 25.4    | 30    | <a href="#">110-0205E</a> |
| pl/cx | 25.4    | 40    | <a href="#">110-0207E</a> |
| pl/cx | 25.4    | 50    | <a href="#">110-0209E</a> |
| pl/cx | 25.4    | 60    | <a href="#">110-0211E</a> |
| pl/cx | 25.4    | 75    | <a href="#">110-0215E</a> |
| pl/cx | 25.4    | 100   | <a href="#">110-0219E</a> |
| pl/cx | 25.4    | 150   | <a href="#">110-0227E</a> |
| pl/cx | 25.4    | 200   | <a href="#">110-0231E</a> |

| Type  | Dia, mm | F, mm | Catalogue number          |
|-------|---------|-------|---------------------------|
| pl/cx | 25.4    | 500   | <a href="#">110-0247E</a> |
| pl/cx | 25.4    | 1000  | <a href="#">110-0259E</a> |
| pl/cv | 25.4    | -40   | <a href="#">112-0207E</a> |
| pl/cv | 25.4    | -50   | <a href="#">112-0209E</a> |
| pl/cv | 25.4    | -75   | <a href="#">112-0215E</a> |
| pl/cv | 25.4    | -100  | <a href="#">112-0219E</a> |
| pl/cv | 25.4    | -150  | <a href="#">112-0227E</a> |

### N-BK7 Cylindrical Lens Kit (12 pcs.)

| Coating                     | Catalogue number            | Price, EUR |
|-----------------------------|-----------------------------|------------|
| BBAR @ 400-700 nm, R<0.9%   | <b>140-0212-AR400-700</b>   | 1925       |
| BBAR @ 650-1100 nm, R<0.7%  | <b>140-0212-AR650-1100</b>  | 1997       |
| BBAR @ 1050-1700 nm, R<0.7% | <b>140-0212-AR1050-1700</b> | 2222       |
| AR @ 532+1064 nm, R<0.5%    | <b>140-0212-ARD1064</b>     | 1782       |
| AR @ 1064 nm, R<0.25%       | <b>140-0212-AR1064</b>      | 1705       |

### N-BK7 Cylindrical Lens Kit

| Type  | Size, mm    | F, mm | Catalogue number |
|-------|-------------|-------|------------------|
| pl/cx | 25.4 × 50.8 | 50    | <b>120-0205E</b> |
| pl/cx | 25.4 × 50.8 | 75    | <b>120-0210E</b> |
| pl/cx | 25.4 × 50.8 | 100   | <b>120-0215E</b> |
| pl/cx | 25.4 × 50.8 | 150   | <b>120-0220E</b> |
| pl/cx | 25.4 × 50.8 | 200   | <b>120-0225E</b> |
| pl/cx | 25.4 × 50.8 | 300   | <b>120-0230E</b> |

| Type  | Size, mm    | F, mm | Catalogue number |
|-------|-------------|-------|------------------|
| pl/cx | 25.4 × 50.8 | 500   | <b>120-0235E</b> |
| pl/cx | 25.4 × 50.8 | 1000  | <b>120-0240E</b> |
| pl/cv | 25.4 × 50.8 | -50   | <b>122-0205E</b> |
| pl/cv | 25.4 × 50.8 | -75   | <b>122-0210E</b> |
| pl/cv | 25.4 × 50.8 | -100  | <b>122-0215E</b> |
| pl/cv | 25.4 × 50.8 | -150  | <b>122-0220E</b> |

## UV FS LENS KITS



Large Lens Kit

### Large UV FS Spherical Lens Kit (40 pcs.)

| Coating                      | Catalogue number           | Price, EUR |
|------------------------------|----------------------------|------------|
| BBAR @ 210 – 400 nm, R<2%    | <b>140-1240-AR210-400</b>  | 3839       |
| BBAR @ 350 – 900 nm, R<1.5%  | <b>140-1240-AR350-900</b>  | 3619       |
| BBAR @ 650 – 1100 nm, R<1.0% | <b>140-1240-AR650-1100</b> | 3641       |
| AR @ 532 + 1064 nm, R<0.5%   | <b>140-1240-AR532+1064</b> | 3443       |
| AR @ 1064 nm, R<0.25%        | <b>140-1240-AR1064</b>     | 3223       |
| AR @ 532 nm, R<0.25%         | <b>140-1240-AR532</b>      | 3223       |
| AR @ 355 nm, R<0.25%         | <b>140-1240-AR355</b>      | 3333       |
| AR @ 266 nm, R<0.4%          | <b>140-1240-AR266</b>      | 3443       |

### Large UV FS Lens Kit

| Type  | Dia, mm | F, mm | Catalogue number |
|-------|---------|-------|------------------|
| pl/cx | 25.4    | 30    | <b>110-1203E</b> |
| pl/cx | 25.4    | 50    | <b>110-1205E</b> |
| pl/cx | 25.4    | 75    | <b>110-1209E</b> |
| pl/cx | 25.4    | 80    | <b>110-1210E</b> |
| pl/cx | 25.4    | 100   | <b>110-1211E</b> |
| pl/cx | 25.4    | 125   | <b>110-1216E</b> |
| pl/cx | 25.4    | 150   | <b>110-1217E</b> |
| pl/cx | 25.4    | 200   | <b>110-1219E</b> |
| pl/cx | 25.4    | 250   | <b>110-1221E</b> |
| pl/cx | 25.4    | 300   | <b>110-1223E</b> |
| pl/cx | 25.4    | 350   | <b>110-1225E</b> |
| pl/cx | 25.4    | 400   | <b>110-1227E</b> |
| pl/cx | 25.4    | 500   | <b>110-1233E</b> |
| pl/cx | 25.4    | 600   | <b>110-1235E</b> |
| pl/cx | 25.4    | 750   | <b>110-1239E</b> |
| pl/cx | 25.4    | 1000  | <b>110-1245E</b> |
| bi/cx | 25.4    | 25    | <b>111-1204E</b> |
| bi/cx | 25.4    | 40    | <b>111-1207E</b> |
| bi/cx | 25.4    | 50    | <b>111-1210E</b> |
| bi/cx | 25.4    | 75    | <b>111-1214E</b> |

| Type  | Dia, mm | F, mm | Catalogue number |
|-------|---------|-------|------------------|
| bi/cx | 25.4    | 100   | <b>111-1218E</b> |
| bi/cx | 25.4    | 150   | <b>111-1222E</b> |
| bi/cx | 25.4    | 200   | <b>111-1226E</b> |
| bi/cx | 25.4    | 250   | <b>111-1230E</b> |
| bi/cx | 25.4    | 300   | <b>111-1234E</b> |
| bi/cx | 25.4    | 400   | <b>111-1238E</b> |
| bi/cx | 25.4    | 500   | <b>111-1240E</b> |
| bi/cx | 25.4    | 1000  | <b>111-1260E</b> |
| pl/cv | 25.4    | -50   | <b>112-1205E</b> |
| pl/cv | 25.4    | -75   | <b>112-1209E</b> |
| pl/cv | 25.4    | -100  | <b>112-1211E</b> |
| pl/cv | 25.4    | -150  | <b>112-1217E</b> |
| pl/cv | 25.4    | -200  | <b>112-1219E</b> |
| pl/cv | 25.4    | -300  | <b>112-1223E</b> |
| bi/cv | 25.4    | -25   | <b>114-1204E</b> |
| bi/cv | 25.4    | -50   | <b>114-1208E</b> |
| bi/cv | 25.4    | -75   | <b>114-1212E</b> |
| bi/cv | 25.4    | -100  | <b>114-1216E</b> |
| bi/cv | 25.4    | -150  | <b>114-1220E</b> |
| bi/cv | 25.4    | -200  | <b>114-1224E</b> |



### Small UV FS Spherical Lens Kit (15 pcs.)

| Coating                      | Catalogue number                    | Price, EUR |
|------------------------------|-------------------------------------|------------|
| BBAR @ 210 – 400 nm, R<2%    | <a href="#">140-1215-AR210-400</a>  | 2013       |
| BBAR @ 350 – 900 nm, R<1.5%  | <a href="#">140-1215-AR350-900</a>  | 1826       |
| BBAR @ 650 – 1100 nm, R<1.0% | <a href="#">140-1215-AR650-1100</a> | 1837       |
| AR @ 532 + 1064 nm, R<0.5%   | <a href="#">140-1215-AR532+1064</a> | 1529       |
| AR @ 1064 nm, R<0.25%        | <a href="#">140-1215-AR1064</a>     | 1452       |
| AR @ 532 nm, R<0.25%         | <a href="#">140-1215-AR532</a>      | 1452       |
| AR @ 355 nm, R<0.25%         | <a href="#">140-1215-AR355</a>      | 1485       |
| AR @ 266 nm, R<0.4%          | <a href="#">140-1215-AR266</a>      | 1518       |

### Small UV FS Lens Kit

| Type  | Dia, mm | F, mm | Catalogue number          |
|-------|---------|-------|---------------------------|
| pl/cx | 25.4    | 30    | <a href="#">110-1203E</a> |
| pl/cx | 25.4    | 50    | <a href="#">110-1205E</a> |
| pl/cx | 25.4    | 75    | <a href="#">110-1209E</a> |
| pl/cx | 25.4    | 100   | <a href="#">110-1211E</a> |
| pl/cx | 25.4    | 125   | <a href="#">110-1216E</a> |
| pl/cx | 25.4    | 150   | <a href="#">110-1217E</a> |
| pl/cx | 25.4    | 200   | <a href="#">110-1219E</a> |
| pl/cx | 25.4    | 300   | <a href="#">110-1223E</a> |

| Type  | Dia, mm | F, mm | Catalogue number          |
|-------|---------|-------|---------------------------|
| pl/cx | 25.4    | 500   | <a href="#">110-1233E</a> |
| pl/cx | 25.4    | 1000  | <a href="#">110-1245E</a> |
| pl/cv | 25.4    | -50   | <a href="#">112-1205E</a> |
| pl/cv | 25.4    | -75   | <a href="#">112-1209E</a> |
| pl/cv | 25.4    | -100  | <a href="#">112-1211E</a> |
| pl/cv | 25.4    | -125  | <a href="#">112-1215E</a> |
| pl/cv | 25.4    | -150  | <a href="#">112-1217E</a> |

### UV FS Cylindrical Lens Kit (12 pcs.)

| Coating                    | Catalogue number                | Price, EUR |
|----------------------------|---------------------------------|------------|
| BBAR @ 210-400 nm, R<2%    | <a href="#">140-0212-ARB300</a> | 2992       |
| BBAR @ 350-900 nm, R<1.5%  | <a href="#">140-0212-ARB625</a> | 2893       |
| BBAR @ 650-1100 nm, R<0.7% | <a href="#">140-0212-ARB825</a> | 2805       |

### UV FS Cylindrical Lens Kit

| Type  | Size, mm    | F, mm | Catalogue number          |
|-------|-------------|-------|---------------------------|
| pl/cx | 25.4 × 50.8 | 50    | <a href="#">120-1205E</a> |
| pl/cx | 25.4 × 50.8 | 75    | <a href="#">120-1210E</a> |
| pl/cx | 25.4 × 50.8 | 100   | <a href="#">120-1215E</a> |
| pl/cx | 25.4 × 50.8 | 150   | <a href="#">120-1220E</a> |
| pl/cx | 25.4 × 50.8 | 200   | <a href="#">120-1225E</a> |
| pl/cx | 25.4 × 50.8 | 300   | <a href="#">120-1230E</a> |

| Type  | Size, mm    | F, mm | Catalogue number          |
|-------|-------------|-------|---------------------------|
| pl/cx | 25.4 × 50.8 | 500   | <a href="#">120-1235E</a> |
| pl/cx | 25.4 × 50.8 | 1000  | <a href="#">120-1240E</a> |
| pl/cv | 25.4 × 50.8 | -50   | <a href="#">122-1205E</a> |
| pl/cv | 25.4 × 50.8 | -75   | <a href="#">122-1210E</a> |
| pl/cv | 25.4 × 50.8 | -100  | <a href="#">122-1215E</a> |
| pl/cv | 25.4 × 50.8 | -150  | <a href="#">122-1220E</a> |

## Related Products

### Uncoated Lens Kits

See page 1.47



### Beam Expanders

See page 5.4



### Self-Centring Lens Mounts 830-0010

Find more at [EksmaOptics.com](http://EksmaOptics.com)



### Tweezers/Forceps for Optical Components 260-1050

See page A.4





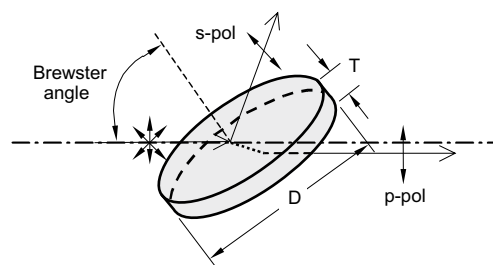
## THIN FILM LASER POLARIZERS (56° ANGLE OF INCIDENCE)

Thin film polarizers separate s- and p- polarization components. Due to their high laser damage threshold, thin film polarizers can be used as an alternative to Glan-Taylor laser polarizing prisms or cube polarizing beamsplitters.

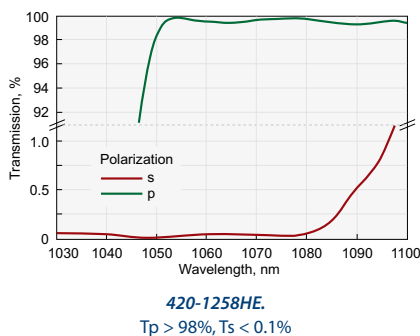
Nd:YAG Laser Line thin film polarizers are used in high energy lasers. They can be used as extracavity attenuators for Nd:YAG laser fundamental and its harmonics or intracavity Q-switch hold-off polarizers. The most efficient way to use these polarizers is at Brewster's angle –  $56 \pm 2^\circ$ .

### Specifications

|                                  |                                                      |
|----------------------------------|------------------------------------------------------|
| Material                         | BK7, UV FS                                           |
| Surface quality                  | 20–10 scratch & dig (MIL-PRF-13830B)                 |
| Transmitted wavefront distortion | $\lambda/10$ @ 633 nm                                |
| Parallelism                      | <30 arcsec                                           |
| Clear aperture                   | >90%                                                 |
| Angle of incidence (AOI)         | $56 \pm 2^\circ$                                     |
| Diameter tolerance               | +0.0; -0.12 mm                                       |
| Thickness tolerance              | $\pm 0.2$ mm                                         |
| Laser damage threshold           | 6 J/cm <sup>2</sup> 10 nsec pulse at 1064 nm typical |



### HIGH EXTINCTION RATIO POLARIZERS



#### Round Polarizers

Material – UV FS; Tp > 98%, Ts < 0.1%; extinction ratio for transmitted light Tp/Ts: >1000:1

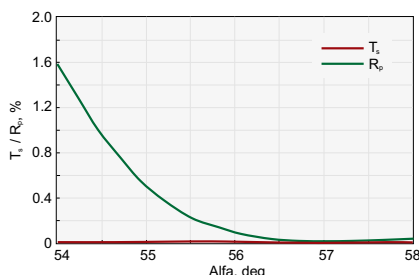
| Wavelength, nm | Diameter D, mm | Thickness T, mm | Catalogue number  | Price, EUR |
|----------------|----------------|-----------------|-------------------|------------|
| 355            | 25.4           | 3               | <b>420-1252HE</b> | 251        |
| 532            | 25.4           | 3               | <b>420-1254HE</b> | 213        |
| 1064           | 25.4           | 3               | <b>420-1258HE</b> | 248        |

#### Rectangular Polarizers

Material – UV FS; Tp > 98%, Ts < 0.1%; extinction ratio for transmitted light Tp/Ts: >1000:1

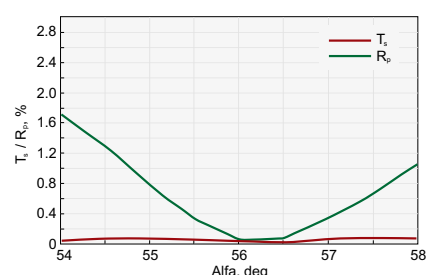
| Wavelength, nm | Rectangular dimensions |           | Thickness T, mm | Catalogue number  | Price, EUR |
|----------------|------------------------|-----------|-----------------|-------------------|------------|
|                | Length, mm             | Width, mm |                 |                   |            |
| 532            | 20                     | 15        | 6               | <b>420-1484HE</b> | 178        |
| 532            | 30                     | 20        | 6               | <b>420-1584HE</b> | 242        |
| 1064           | 20                     | 15        | 6               | <b>420-1488HE</b> | 190        |
| 1064           | 30                     | 20        | 6               | <b>420-1588HE</b> | 253        |

### ULTRA HIGH TRANSMISSION THIN FILM POLARIZERS



**420-1254UHT.**

Ultra High Transmission @ 532 nm,  
Ts < 0.2%, Rp < 0.2%, AOI = 56°



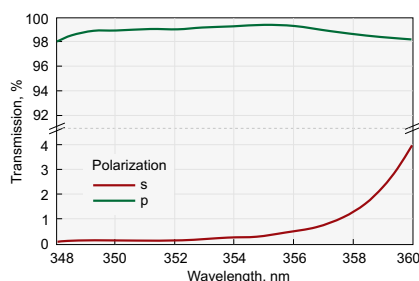
**420-1258UHT.**

Ultra High Transmission @ 1064 nm,  
Ts < 0.2%, Rp < 0.2%, AOI = 56°

**Round Polarizers.** Material – UV FS; Ts < 0.2 %, Rp < 0.2 %; extinction ratio for transmitted light Tp/Ts > 500:1

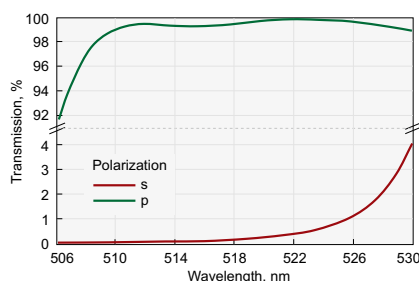
| Wavelength, nm | Diameter D, mm | Thickness T, mm | Catalogue number   | Price, EUR |
|----------------|----------------|-----------------|--------------------|------------|
| 532            | 25.4           | 3               | <b>420-1254UHT</b> | 299        |
| 1064           | 25.4           | 3               | <b>420-1258UHT</b> | 350        |

## HIGH TRANSMISSION THIN FILM POLARIZERS



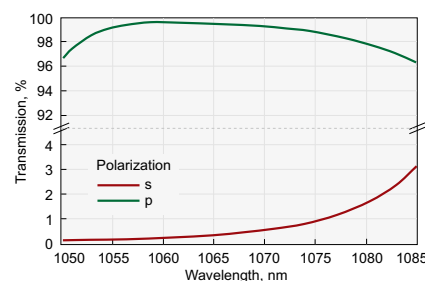
**420-1252HT.**

High Transmission @ 355 nm, Rs/Tp > 99.5/99.0 %



**420-1254HT.**

High Transmission @ 532 nm, Rs/Tp > 99.5/99.0 %



**420-1258HT.**

High Transmission @ 1064 nm, Rs/Tp > 99.5/99.0 %

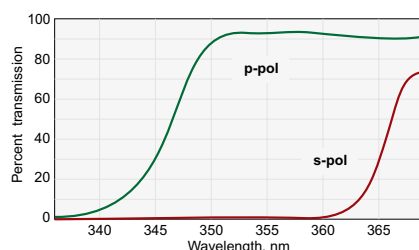
**Round Polarizers.** Material - UV FS. Rs / Tp > 99.5 / 99.0 %; extinction ratio for transmitted light Tp / Ts > 200:1

| Wavelength, nm | Diameter D, mm | Thickness T, mm | Catalogue number           | Price, EUR |
|----------------|----------------|-----------------|----------------------------|------------|
| 355            | 25.4           | 3.0             | <a href="#">420-1252HT</a> | 273        |
| 532            | 25.4           | 3.0             | <a href="#">420-1254HT</a> | 230        |
| 1064           | 25.4           | 3.0             | <a href="#">420-1258HT</a> | 269        |

**Rectangular Polarizers.** Material - UV FS. Rs / Tp > 99.5 / 99.0 %; extinction ratio for transmitted light Tp / Ts > 200:1

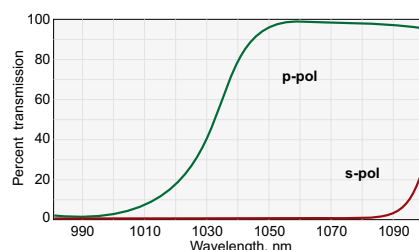
| Wavelength, nm | Rectangular dimensions<br>Length, mm Width, mm | Thickness T, mm | Catalogue number           | Price, EUR |
|----------------|------------------------------------------------|-----------------|----------------------------|------------|
| 1064           | 28.6 14.3                                      | 3.0             | <a href="#">420-1288HT</a> | 311        |

## STANDARD THIN FILM POLARIZERS



**420-1252.**

Transmission @ 355 nm, Rs/Tp > 99.5/95 %



**420-1258.**

Transmission @ 1064 nm, Rs/Tp > 99.5/95 %

**Round Polarizers.** Material – BK7; Rs / Tp > 99.5 / 95.0 %; extinction ratio for transmitted light Tp/Ts > 200:1

| Wavelength, nm | Diameter D, mm | Thickness T, mm | Catalogue number          | Price, EUR |
|----------------|----------------|-----------------|---------------------------|------------|
| 532            | 12.7           | 3.0             | <a href="#">420-0124E</a> | 124        |
| 1064           | 12.7           | 3.0             | <a href="#">420-0128E</a> | 132        |
| 532            | 25.4           | 3.0             | <a href="#">420-0254E</a> | 147        |
| 1064           | 25.4           | 3.0             | <a href="#">420-0258E</a> | 178        |
| 532            | 50.8           | 6.0             | <a href="#">420-0504E</a> | 237        |
| 1064           | 50.8           | 6.0             | <a href="#">420-0508E</a> | 293        |

**Rectangular Polarizers.** Material – BK7; Rs / Tp > 99.5 / 95.0 %; extinction ratio for transmitted light Tp/Ts > 200:1

| Wavelength, nm | Rectangular dimensions<br>Length, mm Width, mm | Thickness T, mm | Catalogue number         | Price, EUR |
|----------------|------------------------------------------------|-----------------|--------------------------|------------|
| 532            | 28.6 14.3                                      | 3.0             | <a href="#">420-0284</a> | 163        |
| 1064           | 28.6 14.3                                      | 3.0             | <a href="#">420-0288</a> | 196        |

**Round Polarizers.** Material – UV FS; Rs / Tp > 99.5 / 95.0 %; extinction ratio for transmitted light Tp/Ts > 200:1

| Wavelength, nm | Diameter D, mm | Thickness T, mm | Catalogue number          | Price, EUR |
|----------------|----------------|-----------------|---------------------------|------------|
| 355            | 12.7           | 3.0             | <a href="#">420-1122E</a> | 189        |
| 532            | 12.7           | 3.0             | <a href="#">420-1124E</a> | 151        |
| 1064           | 12.7           | 3.0             | <a href="#">420-1128E</a> | 167        |
| 355            | 25.4           | 3.0             | <a href="#">420-1252E</a> | 209        |
| 532            | 25.4           | 3.0             | <a href="#">420-1254E</a> | 177        |
| 1064           | 25.4           | 3.0             | <a href="#">420-1258E</a> | 207        |
| 355            | 50.8           | 6.0             | <a href="#">420-1502E</a> | 374        |
| 532            | 50.8           | 6.0             | <a href="#">420-1504E</a> | 339        |
| 1064           | 50.8           | 6.0             | <a href="#">420-1508E</a> | 362        |

**Rectangular Polarizers.** Material – UV FS; Rs / Tp > 99.5 / 95.0 %; extinction ratio for transmitted light Tp/Ts > 200:1

| Wavelength, nm | Rectangular dimensions<br>Length, mm Width, mm | Thickness T, mm | Catalogue number         | Price, EUR |
|----------------|------------------------------------------------|-----------------|--------------------------|------------|
| 355            | 28.6 14.3                                      | 3.0             | <a href="#">420-1282</a> | 293        |
| 532            | 28.6 14.3                                      | 3.0             | <a href="#">420-1284</a> | 247        |
| 1064           | 28.6 14.3                                      | 3.0             | <a href="#">420-1288</a> | 259        |

## Related Products

Thin Film Laser Polarizers of other wavelengths

See page 1.55

Glan and Wollaston Prisms

See page 1.62

Adapters for Polarizer at 56° 840-0117, 840-0118

Find more at EksmaOptics.com



Variable Attenuator for Nd:YAG linearly Polarized Laser Beam 990-0070

Find more at EksmaOptics.com

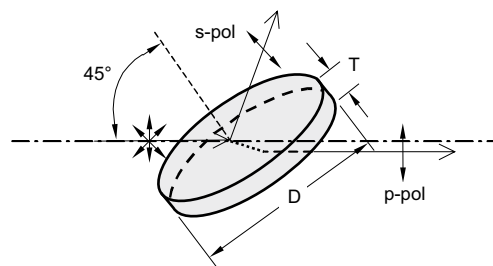


## THIN FILM LASER POLARIZERS (45° ANGLE OF INCIDENCE)

These thin film polarizers separate or combine the s- and p-polarization components at 45° angle of incidence. They are designed for use in high energy lasers. Polarizers are made from UV FS and feature high laser damage threshold reaching 10 J/cm<sup>2</sup> at 1064 nm.

### Specifications

|                                  |                                        |
|----------------------------------|----------------------------------------|
| Substrate material               | UV FS                                  |
| Surface quality                  | 20 – 10 scratch & dig (MIL-PRF-13830B) |
| Transmitted wavefront distortion | $\lambda/10$ @ 633 nm                  |
| Clear aperture                   | > 90% of diameter                      |
| Angle of Incidence (AOI)         | 45 ± 2°                                |
| Parallelism                      | < 30 arcsec                            |



## THIN FILM POLARIZERS WITH HIGH EXTINCTION RATIO

### Round Polarizers

Material – UV FS.  $T_p > 98\%$ ,  $T_s < 0.1\%$ ; extinction ratio for transmitted light  $T_p/T_s > 1000:1$

| Wavelength, nm | Diameter D, mm | Thickness T, mm | Catalogue number              | Price, EUR |
|----------------|----------------|-----------------|-------------------------------|------------|
| 355            | 25.4           | 3               | <a href="#">420-1252i45HE</a> | 377        |
| 532            | 25.4           | 3               | <a href="#">420-1254i45HE</a> | 339        |
| 1064           | 25.4           | 3               | <a href="#">420-1258i45HE</a> | 362        |
| 355            | 50.8           | 6               | <a href="#">420-1502i45HE</a> | 736        |
| 532            | 50.8           | 6               | <a href="#">420-1504i45HE</a> | 638        |
| 1064           | 50.8           | 6               | <a href="#">420-1508i45HE</a> | 713        |

## STANDARD THIN FILM POLARIZERS

### Round Polarizers

Material – UV FS.  $R_s / T_p > 99.5 / 95.0\%$ . Extinction ratio for transmitted light  $T_p/T_s > 200:1$

| Wavelength, nm | Diameter D, mm | Thickness T, mm | Catalogue number            | Price, EUR |
|----------------|----------------|-----------------|-----------------------------|------------|
| 355            | 25.4           | 3               | <a href="#">420-1252i45</a> | 274        |
| 532            | 25.4           | 3               | <a href="#">420-1254i45</a> | 230        |
| 1064           | 25.4           | 3               | <a href="#">420-1258i45</a> | 259        |
| 355            | 50.8           | 6               | <a href="#">420-1502i45</a> | 523        |
| 532            | 50.8           | 6               | <a href="#">420-1504i45</a> | 454        |
| 1064           | 50.8           | 6               | <a href="#">420-1508i45</a> | 506        |

## QUARTZ RETARDATION PLATES

Quartz Retardation Plates are made of material enabling linear birefringence. These plates are made of high quality optical grade crystalline quartz, featuring high damage threshold. Retardation

plates rotate polarization's direction ( $\lambda/2$ ) or convert linear into circular polarization or vice versa ( $\lambda/4$ ). Quartz retardation plates are supplied mounted and AR coated.

## ZERO ORDER OPTICALLY CONTACTED WAVEPLATES

### Features

- Zero Order Waveplates for Nd:YAG fundamental and its harmonics
- Easily aligned
- Temperature insensitive
- Moderately insensitive to wavelength

Zero order plates are comprised of two different plates cut parallel to their optical axis. This construction make plates less dependent on temperature. The plates are polished to different thicknesses enabling to achieve required retardation difference. These component plates have orthogonal optic axis directions, so that the roles of the ordinary and extraordinary rays are interchanged in passing from one plate to another. The thickness of the plate determines the phase shift between the ordinary and extraordinary beams for any specific wavelength.

**Ø12.7 mm waveplates.** Clear aperture Ø11 mm, unmounted

| Wavelength, nm | Retardation $\lambda/2$     |            | Retardation $\lambda/4$     |            |
|----------------|-----------------------------|------------|-----------------------------|------------|
|                | Catalogue number            | Price, EUR | Catalogue number            | Price, EUR |
| 1064           | <a href="#">460-4205D12</a> | 165        | <a href="#">460-4405D12</a> | 165        |
| 532            | <a href="#">460-4230D12</a> | 165        | <a href="#">460-4430D12</a> | 165        |
| 355            | <a href="#">460-4240D12</a> | 175        | <a href="#">460-4440D12</a> | 175        |
| 266            | <a href="#">460-4245D12</a> | 185        | <a href="#">460-4445D12</a> | 185        |

### Related Products

Zero Order Optically Contacted Plates of other wavelengths. See page 1.65



### Specifications

|                                |                                                          |
|--------------------------------|----------------------------------------------------------|
| Material                       | Single crystal quartz                                    |
| Optical axis                   | normal to facet on circumference of retarder             |
| Clear aperture                 | Ø17 mm (other dimensions on request)                     |
| Ring mount outer diameter      | 25.4 +0.0 / -0.12 mm                                     |
| Nominal thickness of waveplate | 1.5 – 2.5 mm                                             |
| Surface quality                | 20 – 10 scratch & dig (MIL-PRF-13830B)                   |
| Wavefront distortion           | $\lambda/10$ @ 633 nm                                    |
| Parallelism                    | < 10 arcsec                                              |
| AR coating                     | R < 0.4%                                                 |
| Damage threshold               | > 0.5 J/cm <sup>2</sup> , 10 nsec pulse, 1064 nm typical |

**Ø20 mm waveplates.** Clear aperture Ø17 mm, mounted into Ø25.4 mm ring holder

| Wavelength, nm | Retardation $\lambda/2$  |            | Retardation $\lambda/4$  |            |
|----------------|--------------------------|------------|--------------------------|------------|
|                | Catalogue number         | Price, EUR | Catalogue number         | Price, EUR |
| 1064           | <a href="#">460-4205</a> | 245        | <a href="#">460-4405</a> | 245        |
| 532            | <a href="#">460-4230</a> | 245        | <a href="#">460-4430</a> | 245        |
| 355            | <a href="#">460-4240</a> | 270        | <a href="#">460-4440</a> | 270        |
| 266            | <a href="#">460-4245</a> | 280        | <a href="#">460-4445</a> | 280        |

Achromatic Air-Spaced Waveplates. See page 1.67

## ZERO ORDER AIR-SPACED WAVEPLATES

### Features

- For high power laser application



| Wavelength, nm | AR coating range, nm | Retardation $\lambda/2$  |            | Retardation $\lambda/4$  |            |
|----------------|----------------------|--------------------------|------------|--------------------------|------------|
|                |                      | Catalogue number         | Price, EUR | Catalogue number         | Price, EUR |
| 1064           | 1035–1095            | <a href="#">464-4205</a> | 310        | <a href="#">464-4405</a> | 310        |
| 532            | 515–545              | <a href="#">464-4230</a> | 310        | <a href="#">464-4430</a> | 310        |
| 355            | 345–365              | <a href="#">464-4240</a> | 335        | <a href="#">464-4440</a> | 335        |
| 266            | 257–275              | <a href="#">464-4245</a> | 345        | <a href="#">464-4445</a> | 345        |
| 213            | 210–216              | <a href="#">464-4253</a> | 420        | <a href="#">464-4453</a> | 420        |

### Specifications

|                           |                                                         |
|---------------------------|---------------------------------------------------------|
| Material                  | Single crystal quartz                                   |
| Optical axis              | normal to facet on circumference of retarder            |
| Clear aperture            | Ø17 mm                                                  |
| Ring mount outer diameter | 25.4 +0.0 / -0.12 mm                                    |
| Surface quality           | 20 – 10 scratch & dig (MIL-PRF-13830B)                  |
| Wavefront distortion      | $\lambda/10$ @ 633 nm                                   |
| Parallelism               | < 10 arcsec                                             |
| AR coating                | R < 0.5%                                                |
| Damage threshold          | > 10 J/cm <sup>2</sup> , 10 nsec pulse, 1064 nm typical |

### Related Products

Polarizer Holder 840-0180

Find more at [EksmaOptics.com](http://EksmaOptics.com)



## LOW ORDER WAVEPLATES

### Features

- Thickness 0.15–0.35 mm
- Thinner than multiple order

Low order plates are less temperature sensitive and temperature dependent than multiple order plates. These plates are suitable for high and low power applications.

**Ø12.7 mm waveplates.** Clear aperture Ø11 mm, unmounted

| Wavelength, nm | Retardation $\lambda/2$     |            | Retardation $\lambda/4$     |            |
|----------------|-----------------------------|------------|-----------------------------|------------|
|                | Catalogue number            | Price, EUR | Catalogue number            | Price, EUR |
| 1064           | <a href="#">461-4205D12</a> | 105        | <a href="#">461-4405D12</a> | 105        |
| 532            | <a href="#">461-4230D12</a> | 105        | <a href="#">461-4430D12</a> | 105        |
| 355            | <a href="#">461-4240D12</a> | 115        | <a href="#">461-4440D12</a> | 115        |

**Ø20 mm waveplates.** Clear aperture Ø17 mm, mounted into Ø25.4 mm ring holder

| Wavelength, nm | Retardation $\lambda/2$  |            | Retardation $\lambda/4$  |            |
|----------------|--------------------------|------------|--------------------------|------------|
|                | Catalogue number         | Price, EUR | Catalogue number         | Price, EUR |
| 1064           | <a href="#">461-4205</a> | 160        | <a href="#">461-4405</a> | 160        |
| 532            | <a href="#">461-4230</a> | 160        | <a href="#">461-4430</a> | 160        |
| 355            | <a href="#">461-4240</a> | 192        | <a href="#">461-4440</a> | 192        |

### Specifications

|                                |                                                       |
|--------------------------------|-------------------------------------------------------|
| Material                       | Single crystal quartz                                 |
| Optical axis                   | normal to facet on circumference of retarder          |
| Clear aperture                 | Ø17 mm (other dimensions on request)                  |
| Ring mount outer diameter      | 25.4 +0.0 / -0.12 mm                                  |
| Nominal thickness of waveplate | 0.15 – 0.35 mm                                        |
| Surface quality                | 20–10 scratch & dig (MIL-PRF-13830B)                  |
| Wavefront distortion           | $\lambda/10$ @ 633 nm                                 |
| Parallelism                    | < 10 arcsec                                           |
| AR coating                     | R < 0.4%                                              |
| Damage threshold               | 10 J/cm <sup>2</sup> , 10 nsec pulse, 1064 nm typical |

### Related Products

Low Order  
Plates of other  
wavelengths

See page 1.68

High Precision  
Rotation Polarizer,  
Waveplate Mount  
840-0186

Find more at EksmaOptics.com



## MULTIPLE ORDER WAVEPLATES

### Features

- Polished to 1 – 1.5 mm thickness
- Made from a single crystalline plate

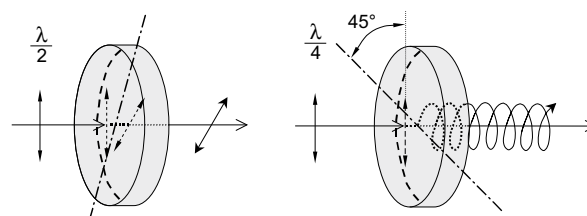
Multiple order plates are more dependent on the temperature changes than zero order plates. A change of  $\pm 1\%$  from the designed wavelength of multiple order plate can result in difficulties in retardation. Contrary, with zero order plates  $\pm 1\%$  and even  $\pm 2\%$  change from the designed wavelength can cause only small retardation change.

**Ø12.7 mm waveplates.** Clear aperture Ø11 mm, unmounted

| Wavelength, nm | Retardation $\lambda/2$     |            | Retardation $\lambda/4$     |            |
|----------------|-----------------------------|------------|-----------------------------|------------|
|                | Catalogue number            | Price, EUR | Catalogue number            | Price, EUR |
| 1064           | <a href="#">462-4205D12</a> | 90         | <a href="#">462-4405D12</a> | 90         |
| 532            | <a href="#">462-4230D12</a> | 90         | <a href="#">462-4430D12</a> | 90         |
| 355            | <a href="#">462-4240D12</a> | 95         | <a href="#">462-4440D12</a> | 95         |

**Ø20 mm waveplates.** Clear aperture Ø17 mm, mounted into Ø25.4 mm ring holder

| Wavelength, nm | Retardation $\lambda/2$  |            | Retardation $\lambda/4$  |            |
|----------------|--------------------------|------------|--------------------------|------------|
|                | Catalogue number         | Price, EUR | Catalogue number         | Price, EUR |
| 1064           | <a href="#">462-4205</a> | 138        | <a href="#">462-4405</a> | 138        |
| 532            | <a href="#">462-4230</a> | 138        | <a href="#">462-4430</a> | 138        |
| 355            | <a href="#">462-4240</a> | 143        | <a href="#">462-4440</a> | 143        |
| 266            | <a href="#">462-4245</a> | 153        | <a href="#">462-4445</a> | 153        |



### Specifications

|                                |                                                       |
|--------------------------------|-------------------------------------------------------|
| Material                       | Single crystal quartz                                 |
| Optical axis                   | normal to facet on circumference of retarder          |
| Clear aperture                 | Ø17 mm (other dimensions on request)                  |
| Ring mount outer diameter      | 25.4 +0.0 / -0.2 mm                                   |
| Nominal thickness of waveplate | 0.8 – 1.5 mm                                          |
| Surface quality                | 20–10 scratch & dig (MIL-PRF-13830B)                  |
| Wavefront distortion           | $\lambda/10$ @ 633 nm                                 |
| Parallelism                    | < 10 arcsec                                           |
| AR coating                     | R < 0.4%                                              |
| Damage threshold               | 10 J/cm <sup>2</sup> , 10 nsec pulse, 1064 nm typical |

### Related Products

Multiple Order Plates  
of other wavelengths

See page 1.69

Adjustable Polarizer  
Holder of Side  
Drive 840-0195

Find more at EksmaOptics.com



## MULTIPLE ORDER DUAL WAVELENGTH WAVEPLATES

### Features

- Operate at both first and second Nd:YAG laser harmonics
- Retardation tolerance  $< \lambda/300$

| Retardation and Wavelength                   | Catalogue number | Price, EUR |
|----------------------------------------------|------------------|------------|
| $\lambda$ @ 1064 nm + $\lambda/2$ @ 532 nm   | <b>463-4120</b>  | 215        |
| $\lambda$ @ 1064 nm + $\lambda/4$ @ 532 nm   | <b>463-4140</b>  | 215        |
| $\lambda/2$ @ 1064 nm + $\lambda$ @ 532 nm   | <b>463-4210</b>  | 215        |
| $\lambda/2$ @ 1064 nm + $\lambda/2$ @ 532 nm | <b>463-4220</b>  | 215        |
| $\lambda/2$ @ 1064 nm + $\lambda/4$ @ 532 nm | <b>463-4240</b>  | 215        |
| $\lambda/4$ @ 1064 nm + $\lambda$ @ 532 nm   | <b>463-4410</b>  | 215        |
| $\lambda/4$ @ 1064 nm + $\lambda/2$ @ 532 nm | <b>463-4420</b>  | 215        |
| $\lambda/4$ @ 1064 nm + $\lambda/4$ @ 532 nm | <b>463-4440</b>  | 215        |

### Specifications

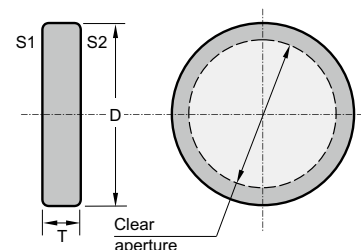
|                                |                                                      |
|--------------------------------|------------------------------------------------------|
| Material                       | Single crystal quartz                                |
| Optical axis                   | normal to facet on circumference of retarder         |
| Clear aperture                 | Ø17 mm                                               |
| Ring mount outer diameter      | 25.4 +0.0 / -0.2 mm                                  |
| Nominal thickness of waveplate | 0.2 – 1.2 mm                                         |
| Surface quality                | 20 – 10 scratch & dig (MIL-PRF-13830B)               |
| Wavefront distortion           | $\lambda/10$ @ 633 nm                                |
| Parallelism                    | $< 10$ arcsec                                        |
| AR coating                     | $R < 0.5\%$                                          |
| Damage threshold               | 5 J/cm <sup>2</sup> , 10 nsec pulse, 1064 nm typical |

## POLARIZATION PLANE ROTATORS

### Features

- Made of crystalline quartz
- Intended to rotate a beam polarization plane strictly to an appropriate angle using the circular birefringent effect

Compared to a waveplate, a rotator has an intrinsic advantage, being independent of rotation around its own optical axis. It needs no adjustment, only to be installed normal to incident radiation. A polarization plane rotator is normally used for the specific wavelength. It is only slightly dependent on ambient temperature.



Polarization plane rotators for any wavelength from 200 to 2300 nm are available.

### Specifications

|                           |                                                              |
|---------------------------|--------------------------------------------------------------|
| Material                  | Single crystal quartz                                        |
| Optical axis              | Normal to faces S1, S2 of rotator                            |
| Clear aperture            | 17 mm for 20 mm diameter                                     |
| Ring mount outer diameter | $D = 25.4 + 0.0 / - 0.2$ mm                                  |
| Mount Thickness           | $T = 6 - 20$ mm (depending on wavelength and rotation angle) |
| Surface quality           | 20-10 scratch & dig (MIL-PRF-13830B)                         |
| Wavefront distortion      | $\lambda/10$                                                 |
| Parallelism               | $< 10$ arcsec                                                |
| AR coating                | $R < 0.2\%$ both sides                                       |
| Damage threshold          | 5 J/cm <sup>2</sup> , 10 nsec pulse, 1064 nm typical         |

### Related Products

Polarization plane rotators of other wavelengths

See page 1.71

Kinematic Mirror and Beamsplitter Mount 840-0020

Find more at EksmaOptics.com



Kinematic Positioning Mount 840-0193

Find more at EksmaOptics.com

| Wavelength, nm | Rotation angle of polarization plane, deg | Catalogue number | Price, EUR |
|----------------|-------------------------------------------|------------------|------------|
| 266            | 45                                        | <b>470-4264</b>  | 282        |
| 266            | 90                                        | <b>470-4269</b>  | 282        |
| 355            | 45                                        | <b>470-4354</b>  | 224        |
| 355            | 90                                        | <b>470-4359</b>  | 224        |
| 532            | 45                                        | <b>470-4534</b>  | 224        |
| 532            | 90                                        | <b>470-4539</b>  | 224        |
| 1064           | 45                                        | <b>470-4644</b>  | 247        |
| 1064           | 90                                        | <b>470-4649</b>  | 247        |

Please contact us for other size or wavelengths requirements.

## VARIABLE ATTENUATOR FOR Nd:YAG LINEARLY POLARIZED LASER BEAM 990-0070

### Features

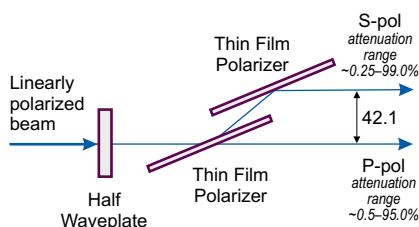
- Divides laser beam into two parallel beams of manually adjustable intensity ratio
- Large dynamic range
- Transmitted beam shift ~0.5 mm
- High Optical damage threshold



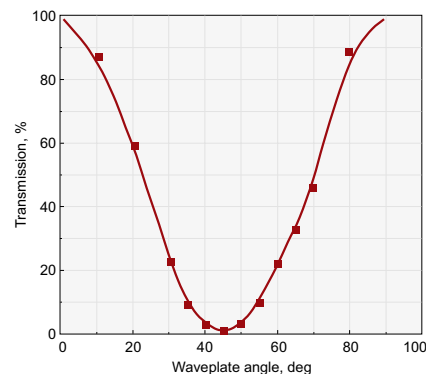
Note: Movable base **820-0090**, Rod Holder **820-0050-02** and standard rod should be ordered separately.

This variable attenuator/beamsplitter consists of special design opto-mechanical Adapter and precision opto-mechanical holder 840-0197. Two thin film brewster type polarizers, which reflect s-polarized light while transmitting p-polarized light, are housed into adapter. A quartz multiple order half waveplate is housed in rotating holder 840-0197.

The intensity ratio of those two beams may be continuously varied without alteration of other beam parameters by rotating the waveplate. The intensity of either exit beam,



or their intensity ratio, can be controlled over a wide dynamic range. P-polarization could be selected for maximum transmission, or high-purity s-polarization could be reflected when maximum attenuation of the transmitted beam takes place. The holder 840-0197 allows to adjust angle of incidence of the Thin Film Brewster type polarizers by  $\pm 2^\circ$  and to get the maximum polarization contrast.



### Specifications

|                                             |                                                |
|---------------------------------------------|------------------------------------------------|
| Aperture diameter                           | 17 mm                                          |
| Damage threshold                            | 5 J/cm <sup>2</sup> pulsed at 1064 nm, typical |
| Polarization Contrast (after 1st polarizer) | > 1:200                                        |
| Polarization Contrast (after 2nd polarizer) | > 1:500                                        |
| Weight                                      | 0.35 kg                                        |

| Wavelength, nm | Catalogue number                | Price, EUR |
|----------------|---------------------------------|------------|
| 266            | <a href="#">990-0070-266H *</a> | 1050       |
| 355            | <a href="#">990-0070-355</a>    | 780        |
| 532            | <a href="#">990-0070-532</a>    | 680        |
| 1064           | <a href="#">990-0070-1064</a>   | 680        |

\* With Zero Order Air-Spaced half waveplate.

### Related Products

#### Neutral Density Filters

See page 1.14

#### Motorized Variable Attenuator for Linearly Polarized Laser Beam 990-0070M

See page 5.10



#### Thin Film Laser Polarizers for Nd:YAG applications

See page 3.17

#### Beam dumps 990-0800, 990-0820

See page 5.19





## VARIABLE ATTENUATOR FOR Nd:YAG LINEARLY POLARIZED LASER BEAM 990-0071

### Features

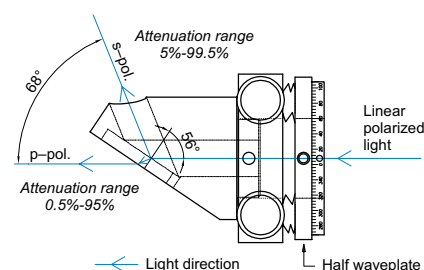
- Divides laser beam into separated by 68° angle two beams of manually adjustable intensity ratio
- Large dynamic range
- Transmitted beam shift ~0.5 mm
- High Optical damage threshold



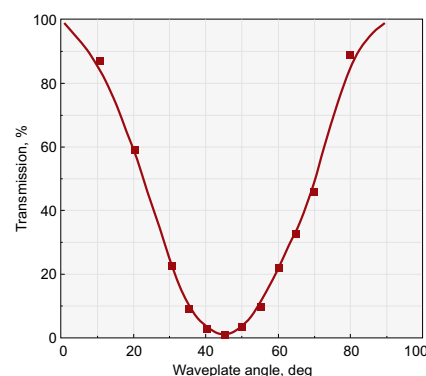
Note: Solid Base Height Extender **820-0210** and Standard Rod **820-0020-20** should be ordered separately

This variable attenuator/beamsplitter consists of special design opto-mechanical adapter for polarizer at 56° 840-0117A or 840-0118A and precision opto-mechanical holder 840-0197. Thin Film Brewster type polarizer, which reflect s-polarized light at 56° while transmitting p-polarized light, is housed into adapter for polarizer at 56°. Quartz multiple order half waveplate is housed in rotating holder 840-0197.

The intensity ratio of those two beams may be continuously varied without alteration of other beam parameters by rotating the



waveplate. The intensity of either exit beam, or their intensity ratio, can be controlled over a wide dynamic range. P-polarization could be selected for maximum transmission, or high-purity s-polarization could be reflected when maximum attenuation of the transmitted beam takes place. The holder 840-0197 allows to adjust Angle Of Incidence of the Thin Film Brewster type polarizer by  $\pm 2^\circ$  and to get the maximum polarization contrast.



### Specifications

|                       |                                                |
|-----------------------|------------------------------------------------|
| Aperture diameter     | 10 mm                                          |
| Damage threshold      | 5 J/cm <sup>2</sup> pulsed at 1064 nm, typical |
| Polarization Contrast | >1:200                                         |
| Weight                | 0.25 kg                                        |

| Wavelength, nm | Catalogue number       | Price, EUR |
|----------------|------------------------|------------|
| 266            | <b>990-0071-266H *</b> | 720        |
| 355            | <b>990-0071-355</b>    | 505        |
| 532            | <b>990-0071-532</b>    | 475        |
| 1064           | <b>990-0071-1064</b>   | 475        |

\* With Zero Order Air-Spaced half waveplate.

### Related Products

Motorized Variable Attenuator  
for Linearly Polarized Laser Beam  
990-0071M

See page 5.13



Multiple Order Plates for Nd:YAG applications

See page 3.21

Thin Film Laser Polarizers for Nd:YAG applications

See page 3.17



## VARIABLE ATTENUATOR FOR Nd:YAG LASER PULSES 990-0072

### Features

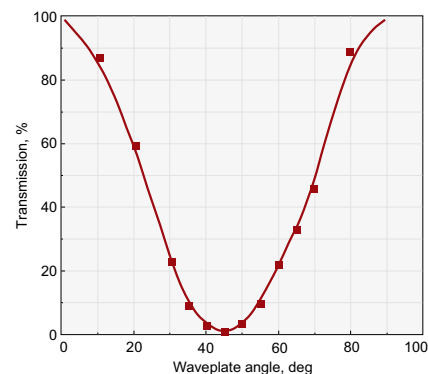
- Divides laser beam into two beams of manually adjustable intensity ratio separated by 68° angle
- Large dynamic range
- Transmitted beam shift ~1 mm
- High optical damage threshold
- Motorized version 990-0072M available online



This variable attenuator/beamsplitter consists of Polarizer Holder 840-0190-01 and Kinematic Mirror/Beamsplitter Mount 840-0056-12. UVFS Thin Film Brewster type polarizer diameter 50.8 mm, which reflect s-polarized light while transmitting p-polarized light, is housed into Beamsplitter Mount 840-0056-12. A quartz Multi Order Half Waveplate diameter 25.4 mm housed in rotating holder 840-0190-01 and placed in the incident linearly polarized laser beam.

The intensity ratio of those two separated and different polarized beams may be continuously varied without alteration of other beam parameters by rotating the waveplate. The intensity of either exit beam, or their intensity ratio, can be controlled over a wide dynamic range. P-polarization could be selected for maximum transmission, or high-purity s-polarization could be reflected when maximum attenuation of the transmitted beam takes place.

The holder 840-0056-12 allows to adjust Angle Of Incidence of the Thin Film Brewster type polarizers by  $\pm 4.5^\circ$  and to get the maximum extinction contrast. The mounts are on rods, rod holders and Movable Base 820-0090. The optical axis height from the table top can be adjusted in the range 78-88 mm. Other height can be offered as custom changing the standard rods and rod holders into higher.

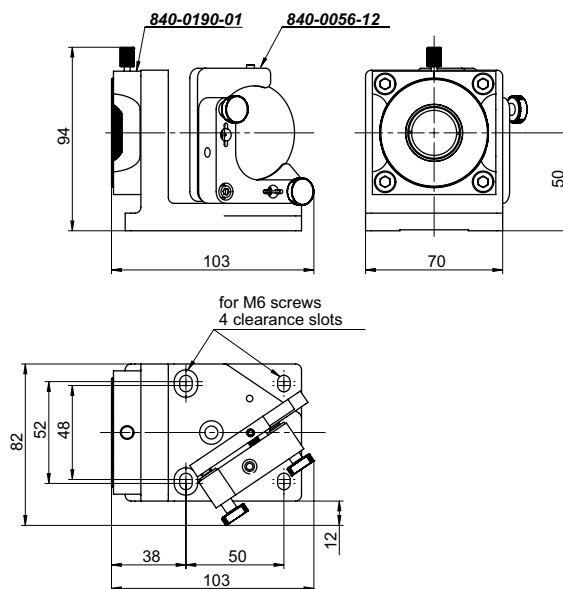


### Specifications

|                         |                                                               |
|-------------------------|---------------------------------------------------------------|
| Clear Aperture diameter | 22 mm                                                         |
| Damage threshold        | >5 J/cm <sup>2</sup> , 10 ns pulse, 10 Hz at 1064 nm, typical |
| Polarization Contrast   | >1:200                                                        |
| Transmitted beam shift  | ~1 mm                                                         |
| Weight                  | 0.45 kg                                                       |

| Wavelength, nm | Catalogue number                | Price, EUR |
|----------------|---------------------------------|------------|
| 266            | <a href="#">990-0072-266H *</a> | 1115       |
| 355            | <a href="#">990-0072-355</a>    | 795        |
| 532            | <a href="#">990-0072-532</a>    | 765        |
| 1064           | <a href="#">990-0072-1064</a>   | 785        |

\* With Zero Order Air-Spaced half waveplate.



## VARIABLE ATTENUATOR FOR Nd:YAG LASER PULSES 990-0073

### Features

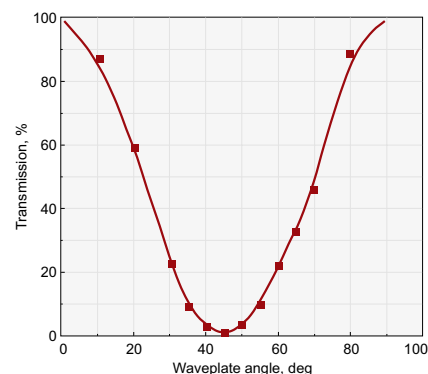
- Divides laser beam into two beams of manually adjustable intensity ratio separated by 68° angle
- Large dynamic range
- Transmitted beam shift ~1.4 mm
- High optical damage threshold



This variable attenuator/beamsplitter consists of Polarizer Holder 840-0180-A2 and Kinematic Mirror/Beamsplitter Mount 840-0056-13. UVFS Thin Film Brewster type polarizer Ø76.2 mm, which reflect s-polarized light while transmitting p-polarized light, is housed into Beamsplitter Mount 840-0056-13. A quartz Multi Order Half Waveplate Ø40 mm housed in rotating holder 840-0180-A2 and placed in the incident linearly polarized laser beam.

The intensity ratio of those two separated and different polarized beams may be continuously varied without alteration of other beam parameters by rotating the waveplate. The intensity of either exit beam, or their intensity ratio, can be controlled over a wide dynamic range. P-polarization could be selected for maximum transmission, or high-purity s-polarization could be reflected when maximum attenuation of the transmitted beam takes place.

The holder 840-0056-13 allows to adjust Angle Of Incidence of the Thin Film Brewster type polarizers by  $\pm 4.5^\circ$  and to get the maximum extinction contrast. The mounts are on rods, rod holders and Movable Base 820-0090. The optical axis height from the table top can be adjusted in the range 92-98 mm. Other height can be offered as custom changing the standard rods and rod holders into higher.

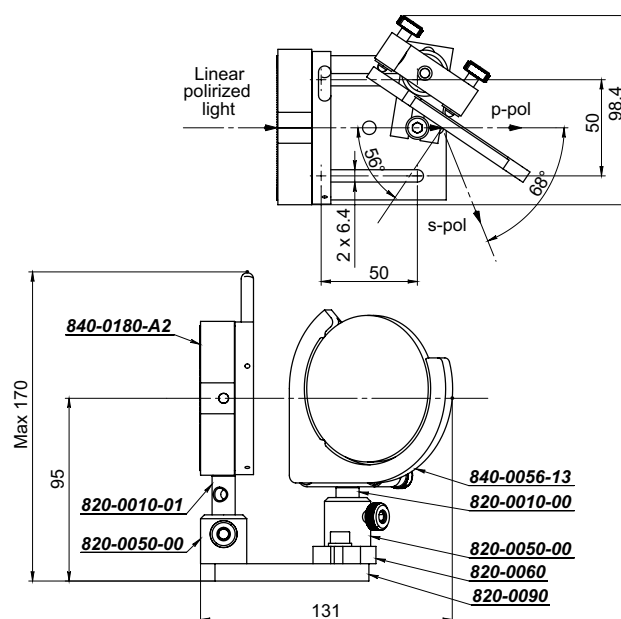


### Specifications

|                         |                                                               |
|-------------------------|---------------------------------------------------------------|
| Clear Aperture diameter | 36 mm                                                         |
| Damage threshold        | >5 J/cm <sup>2</sup> , 10 ns pulse, 10 Hz at 1064 nm, typical |
| Polarization Contrast   | >1:200                                                        |
| Transmitted beam shift  | ~1.4 mm                                                       |
| Weight                  | 0.6 kg                                                        |

| Wavelength, nm | Catalogue number | Price, EUR |
|----------------|------------------|------------|
| 266            | 990-0073-266H *  | 1820       |
| 355            | 990-0073-355     | 1490       |
| 532            | 990-0073-532     | 1470       |
| 1064           | 990-0073-1064    | 1545       |

\* With Zero Order Air-Spaced half waveplate.



# Nd:YAG Laser Crystals

## Nd:YAG CRYSTALS (STANDARD RODS)



### Specifications of standard Nd:YAG Laser Rods

|                    |                                                       |
|--------------------|-------------------------------------------------------|
| Nd Doping Level    | 0.8% or 1.1%                                          |
| Orientation        | <111> crystalline direction                           |
| Surface Quality    | 10 – 5 scratch & dig (MIL-PRF-13830B)                 |
| Surface Flatness   | $\lambda/10$ at 633 nm                                |
| Parallelism        | < 10 arcsec                                           |
| Perpendicularity   | < 5 arcmin for plano/plano ends                       |
| Diameter Tolerance | +0 / -0.05 mm                                         |
| Length Tolerance   | +1 / -0.5 mm                                          |
| Clear Aperture     | > 90 % of full aperture                               |
| Chamfers           | 0.1 mm at 45 deg                                      |
| Coating            | Both sides coated AR @ 1064 nm, R < 0.2%, AOI = 0 deg |
| Barrel Grooving    | All Ø6.35, 8, 10, 12 mm rods with barrel grooving     |

| Diameter, mm | Length, mm | Doping, % | Wedge of the ends, deg | Description | Coating         | Application          | Catalogue number                 | Price, EUR |
|--------------|------------|-----------|------------------------|-------------|-----------------|----------------------|----------------------------------|------------|
| 3            | 53         | 0.9       | 0/0                    | Nd:YAG      | AR/AR @ 1064 nm | Generation @ 1064 nm | <a href="#">E-Y-3-0.9-A/A</a>    | 215        |
| 3            | 65         | 0.8       | 0/0                    | Nd:YAG      | AR/AR @ 1064 nm | Generation @ 1064 nm | <a href="#">E-Y-3-0.8-A/A</a>    | 265        |
| 3            | 65         | 1.1       | 0/0                    | Nd:YAG      | AR/AR @ 1064 nm | Generation @ 1064 nm | <a href="#">E-Y-3-1.1-A/A</a>    | 325        |
| 4            | 65         | 0.8       | 3/3 parallel           | Nd:YAG      | AR/AR @ 1064 nm | Generation @ 1064 nm | <a href="#">E-Y-4-0.8-A/A</a>    | 530        |
| 4            | 65         | 1.1       | 3/3 parallel           | Nd:YAG      | AR/AR @ 1064 nm | Generation @ 1064 nm | <a href="#">E-Y-4-1.1-A/A</a>    | 530        |
| 6.35         | 85*        | 1.1       | 3/3 parallel           | Nd:YAG      | AR/AR @ 1064 nm | Generation @ 1064 nm | <a href="#">E-Y-6.35-1.1-A/A</a> | 890        |
| 8            | 85*        | 1.1       | 3/3 parallel           | Nd:YAG      | AR/AR @ 1064 nm | Generation @ 1064 nm | <a href="#">E-Y-8-1.1-A/A</a>    | 1340       |
| 10           | 85*        | 1.1       | 3/3 parallel           | Nd:YAG      | AR/AR @ 1064 nm | Generation @ 1064 nm | <a href="#">E-Y-10-1.1-A/A</a>   | 2200       |
| 12           | 100*       | 0.8       | 3/3 parallel           | Nd:YAG      | AR/AR @ 1064 nm | Generation @ 1064 nm | <a href="#">E-Y-12-0.8-A/A</a>   | 4740       |
| 12           | 100*       | 1.1       | 3/3 parallel           | Nd:YAG      | AR/AR @ 1064 nm | Generation @ 1064 nm | <a href="#">E-Y-12-1.1-A/A</a>   | 4740       |

\* Rods with barrel grooving, except 10 mm at both ends of the rod without grooving.

## Related Products

### Laser Safety Eyewear

See page 1.17



### Visualizator 990-0840

See page 1.17



### Pockels Cells for Q-Switching

Find more at [EksmaOptics.com](https://www.eksmaoptics.com)



## NONLINEAR CRYSTALS for SHG @ 1064 nm

### LBO CRYSTALS

LBO crystals feature the highest damage threshold, small walk-off and have high efficiency. These crystals are the best choice for harmonics generation of relatively high power and high repetition rate Q-switched or mode-locked lasers.

| Size, mm | Orientation |          | Type   | Coating             | Application                | Catalogue number        | Price, EUR |
|----------|-------------|----------|--------|---------------------|----------------------------|-------------------------|------------|
|          | Theta, deg  | Phi, deg |        |                     |                            |                         |            |
| 3x3x10   | 90          | 11.6     | Type 1 | AR/AR @ 1064+532 nm | SHG@1064 nm                | <a href="#">LBO-401</a> | 245        |
| 3x3x15   | 90          | 11.6     | Type 1 | AR/AR @ 1064+532 nm | SHG@1064 nm                | <a href="#">LBO-402</a> | 325        |
| 4x4x10   | 90          | 11.6     | Type 1 | AR/AR @ 1064+532 nm | SHG@1064 nm                | <a href="#">LBO-301</a> | 510        |
| 4x4x15   | 90          | 11.6     | Type 1 | AR/AR @ 1064+532 nm | SHG@1064 nm                | <a href="#">LBO-302</a> | 630        |
| 4x4x20   | 90          | 11.6     | Type 1 | AR/AR @ 1064+532 nm | SHG@1064 nm                | <a href="#">LBO-303</a> | 745        |
| 5x5x10   | 90          | 11.6     | Type 1 | AR/AR @ 1064+532 nm | SHG@1064 nm                | <a href="#">LBO-501</a> | 655        |
| 5x5x15   | 90          | 11.6     | Type 1 | AR/AR @ 1064+532 nm | SHG@1064 nm                | <a href="#">LBO-503</a> | 765        |
| 5x5x20   | 90          | 11.6     | Type 1 | AR/AR @ 1064+532 nm | SHG@1064 nm                | <a href="#">LBO-502</a> | 940        |
| 3x3x15   | 90          | 0        | Type 1 | AR/AR @ 1064+532 nm | NCPM SHG@1064 nm, T=149 °C | <a href="#">LBO-404</a> | 325        |
| 3x3x20   | 90          | 0        | Type 1 | AR/AR @ 1064+532 nm | NCPM SHG@1064 nm, T=149 °C | <a href="#">LBO-405</a> | 405        |
| 3x3x30   | 90          | 0        | Type 1 | AR/AR @ 1064+532 nm | NCPM SHG@1064 nm, T=149 °C | <a href="#">LBO-409</a> | 710        |
| 3x3x50   | 90          | 0        | Type 1 | AR/AR @ 1064+532 nm | NCPM SHG@1064 nm, T=149 °C | <a href="#">LBO-410</a> | 1300       |
| 4x4x10   | 90          | 0        | Type 1 | AR/AR @ 1064+532 nm | NCPM SHG@1064 nm, T=149 °C | <a href="#">LBO-304</a> | 510        |
| 4x4x15   | 90          | 0        | Type 1 | AR/AR @ 1064+532 nm | NCPM SHG@1064 nm, T=149 °C | <a href="#">LBO-305</a> | 630        |
| 4x4x20   | 90          | 0        | Type 1 | AR/AR @ 1064+532 nm | NCPM SHG@1064 nm, T=149 °C | <a href="#">LBO-306</a> | 745        |

### KTP CRYSTALS

KTP crystals feature the highest efficiency and are suited for low average power or CW lasers applications. These crystals are temperature change insensitive and operate with sharply focused or highly divergent laser beams.

| Size, mm | Orientation |          | Type   | Coating             | Application | Catalogue number        | Price, EUR |
|----------|-------------|----------|--------|---------------------|-------------|-------------------------|------------|
|          | Theta, deg  | Phi, deg |        |                     |             |                         |            |
| 3x3x5    | 90          | 23.5     | Type 2 | AR/AR @ 1064+532 nm | SHG@1064 nm | <a href="#">KTP-401</a> | 76         |
| 3x3x10   | 90          | 23.5     | Type 2 | AR/AR @ 1064+532 nm | SHG@1064 nm | <a href="#">KTP-402</a> | 109        |
| 4x4x6    | 90          | 23.5     | Type 2 | AR/AR @ 1064+532 nm | SHG@1064 nm | <a href="#">KTP-403</a> | 118        |
| 7x7x9    | 90          | 23.5     | Type 2 | AR/AR @ 1064+532 nm | SHG@1064 nm | <a href="#">KTP-404</a> | 529        |

### DKDP CRYSTALS

Large aperture DKDP crystals are used for high energy Q-switched lasers with large beam diameters.

| Size, mm | Orientation |          | Type   | Coating                  | Application | Catalogue number         | Price, EUR |
|----------|-------------|----------|--------|--------------------------|-------------|--------------------------|------------|
|          | Theta, deg  | Phi, deg |        |                          |             |                          |            |
| 15x15x13 | 36.5        | 45       | Type 1 | AR/AR @ 1064/1064+532 nm | SHG@1064 nm | <a href="#">DKDP-401</a> | 890        |
| 15x15x13 | 53.5        | 0        | Type 2 | AR/AR @ 1064/1064+532 nm | SHG@1064 nm | <a href="#">DKDP-402</a> | 890        |
| 12x12x20 | 53,5        | 0        | Type 2 | AR/AR @ 1064/1064+532 nm | SHG@1064 nm | <a href="#">DKDP-404</a> | 830        |
| 15x15x20 | 53,5        | 0        | Type 2 | AR/AR @ 1064/1064+532 nm | SHG@1064 nm | <a href="#">DKDP-405</a> | 950        |

Please contact EKSMA OPTICS for special OEM and large volume pricing.

### Related Products

Ovens with thermocontrollers and heaters for different crystal sizes  
See pages 2.28–2.29



## NONLINEAR CRYSTALS for THG @ 1064 nm

### LBO CRYSTALS

| Size, mm | Orientation |          | Type   | Coating                 | Application | Catalogue number        | Price, EUR |
|----------|-------------|----------|--------|-------------------------|-------------|-------------------------|------------|
|          | Theta, deg  | Phi, deg |        |                         |             |                         |            |
| 3x3x10   | 42.2        | 90       | Type 2 | AR/AR @ 1064+532/355 nm | THG@1064 nm | <a href="#">LBO-406</a> | 245        |
| 3x3x15   | 42.2        | 90       | Type 2 | AR/AR @ 1064+532/355 nm | THG@1064 nm | <a href="#">LBO-407</a> | 325        |
| 5x5x15   | 42.2        | 90       | Type 2 | AR/AR @ 1064+532/355 nm | THG@1064 nm | <a href="#">LBO-508</a> | 765        |

### DKDP CRYSTALS

| Size, mm | Orientation |          | Type   | Coating                 | Application | Catalogue number         | Price, EUR |
|----------|-------------|----------|--------|-------------------------|-------------|--------------------------|------------|
|          | Theta, deg  | Phi, deg |        |                         |             |                          |            |
| 12x12x20 | 59.3        | 0        | Type 2 | AR/AR @ 1064+532/355 nm | THG@1064 nm | <a href="#">DKDP-403</a> | 830        |
| 15x15x20 | 59.3        | 0        | Type 2 | AR/AR @ 1064+532/355 nm | THG@1064 nm | <a href="#">DKDP-406</a> | 950        |

## NONLINEAR CRYSTALS for 4HG @ 1064 nm

### BBO CRYSTALS

| Size, mm | Orientation |          | Type   | Coating          | Application | Catalogue number        | Price, EUR |
|----------|-------------|----------|--------|------------------|-------------|-------------------------|------------|
|          | Theta, deg  | Phi, deg |        |                  |             |                         |            |
| 7x7x6    | 47.6        | 90       | Type 1 | P/P @ 532/266 nm | SHG@532 nm  | <a href="#">BBO-700</a> | 925        |

### KDP CRYSTALS

| Size, mm | Orientation |          | Type   | Coating            | Application | Catalogue number        | Price, EUR |
|----------|-------------|----------|--------|--------------------|-------------|-------------------------|------------|
|          | Theta, deg  | Phi, deg |        |                    |             |                         |            |
| 12x12x5  | 76.5        | 45       | Type 1 | AR/AR @ 532/266 nm | SHG@532 nm  | <a href="#">KDP-401</a> | 408        |
| 15x15x7  | 76.5        | 45       | Type 1 | AR/AR @ 532/266 nm | SHG@532 nm  | <a href="#">KDP-402</a> | 480        |

## Housing Accessories

Ring Holders  
for Nonlinear Crystals

See page 2.27



Positioning Mount 840-0199 for  
Nonlinear Crystal Housing

See page 2.26

