

# Concave Grating Polychromator Mounting

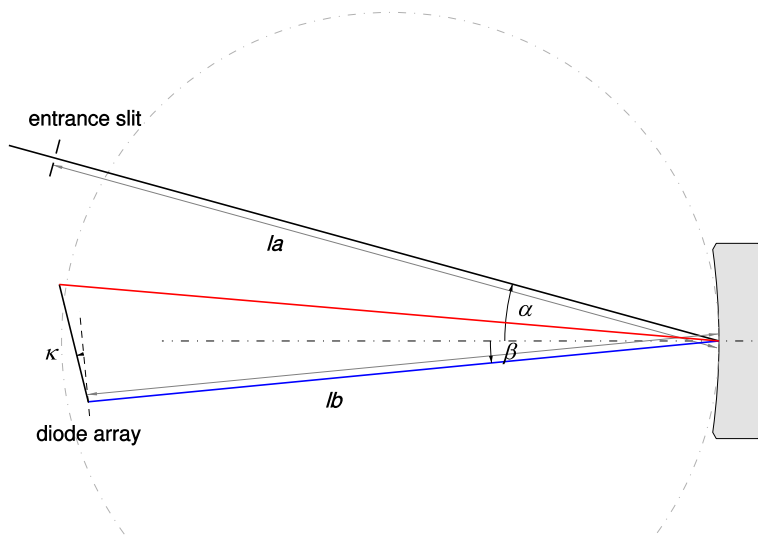


Order number 000000-1329-190

## Grating specification

Groove density	844.75 ± 0.75 l/mm
Groove profile	Blazed
Diffraction grating area	≥ Ø 34 mm
Reflective coating	Aluminum (unprotected)
Grating master type	Holographically recorded
Grating type	Epoxy replica (copy)
Storage and transport temperature	-40 °C ... +70 °C (non-condensing environment)
Relative humidity	≤ 93 % (non-condensing environment)

## Mounting specification (Schematic drawing)



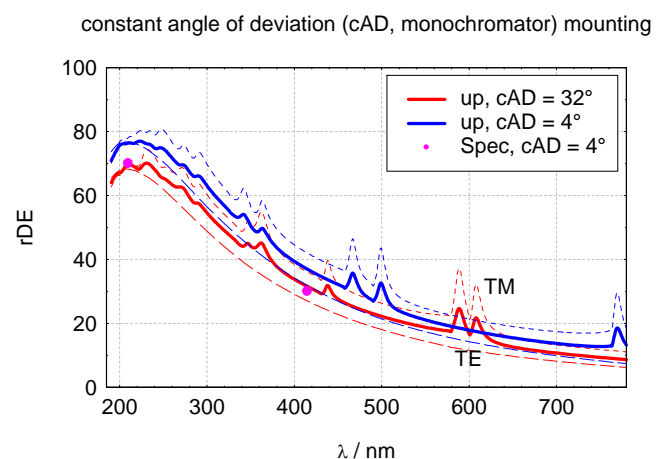
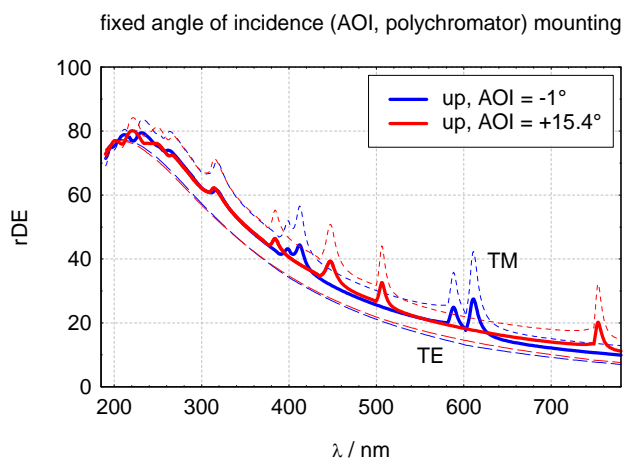
*By historic convention clockwise incident and diffraction angles are positive.*

## Optical grating characteristics

Diffraction efficiency (unpolarized @ cAD = 4°)

210 nm	≥ 70 %
415 nm	≥ 30 %

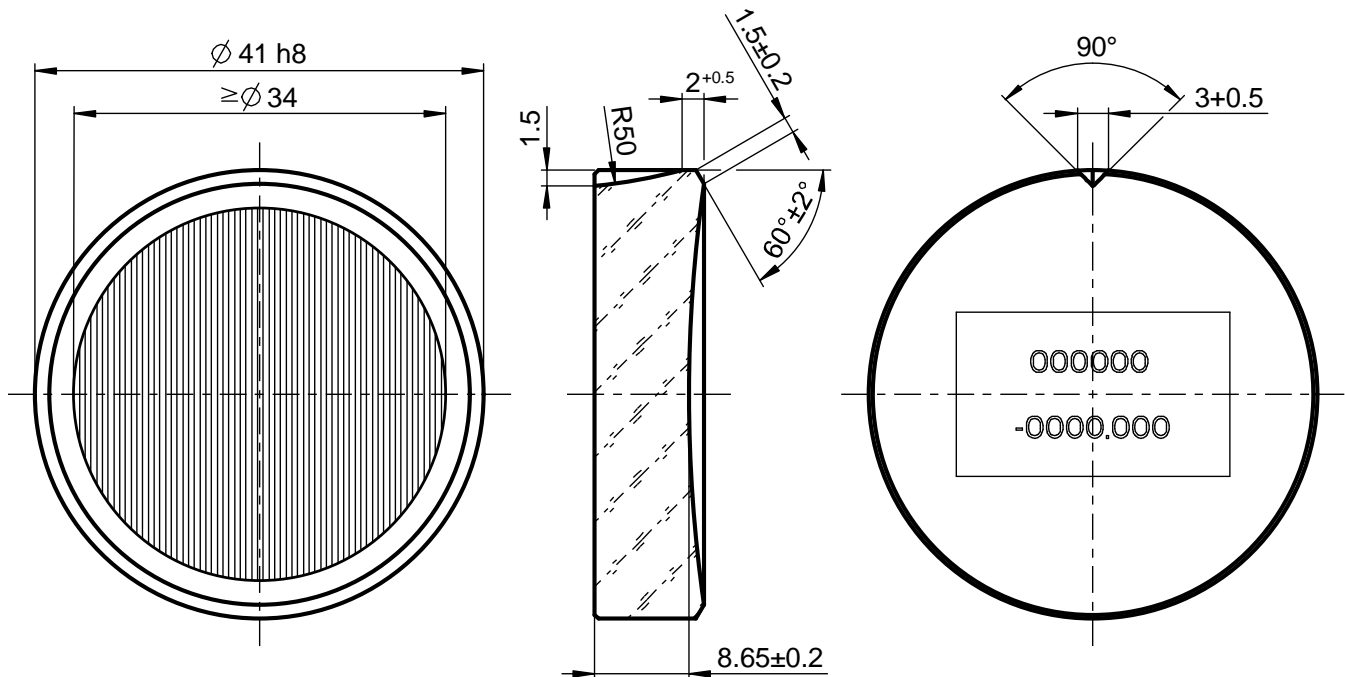
## Typical relative diffraction efficiency (rDE) in first diffraction order



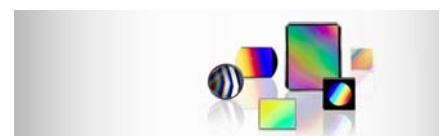
Typical efficiency curves based on rigorous electromagnetic modeling using measured AFM profiles. rDE refers to the ratio between diffracted power from the grating and reflected power from a mirror coated with the same material.

## Blank specification

Material	N-BK7 (optical glass)
Radius of curvature	138.099 mm
Protective bevel (left surface)	0.5 mm



Application range	200 – 415 nm		200 – 800 nm	
Object distance $l_A$	144.7 mm		111.1 mm	
Incidence angle $\alpha$	15.4°		-1.0°	
Spectrum length	25.4 mm		125.6 mm	
Reciprocal linear dispersion	8.5 nm/mm		4.8 nm/mm	
Astigmatism (point image extension)	< 0.9 mm		< 5.7 mm	
Point image resolution	< 1.4 nm		< 2.4 nm	
Relative aperture	1 : 4.3		1 : 4.1	
	$\lambda = 200 \text{ nm}$	$\lambda = 415 \text{ nm}$	$\lambda = 200 \text{ nm}$	$\lambda = 800 \text{ nm}$
Focal distance $l_B$	133.1 mm	—	193.1 mm	—
Diffraction angle $\beta$	-5.5°	4.9°	10.7°	43.9°
Tilt angle $k$ of the detector array	8.4°	—	-0.4°	—



# Concave Grating Polychromator & Monochromator Mounting

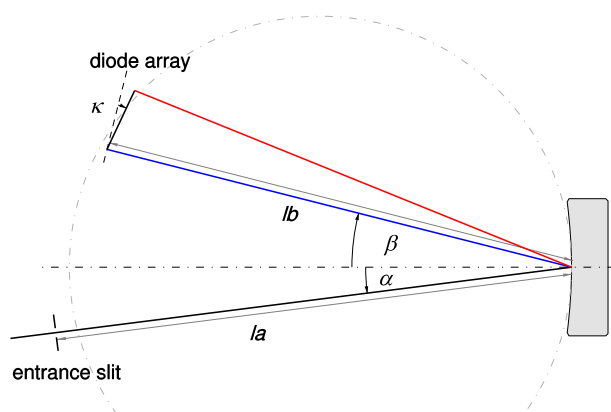


Order number 264510-2951-324

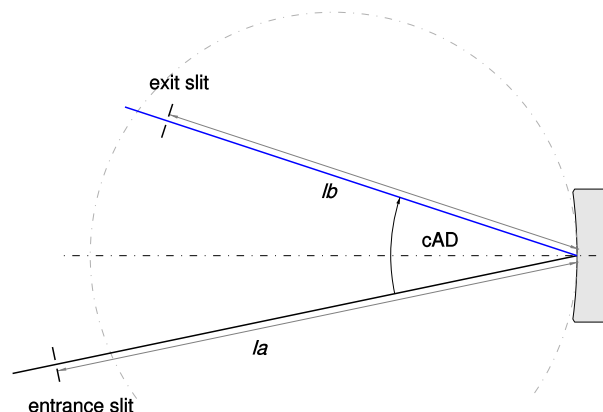
## Grating specification

Groove density	$600 \pm 1$ l/mm
Groove profile	Blazed
Diffraction grating area	$\geq \varnothing 24$ mm
Reflective coating	Aluminum (unprotected)
Grating master type	Holographically recorded
Grating type	Epoxy replica (copy)
Storage and transport temperature	-40 °C ... +60 °C (non-condensing environment)
Relative humidity	$\leq 93$ % (non-condensing environment)

## Mounting specification (Schematic drawing)



Polychromator mounting



Monochromator mounting

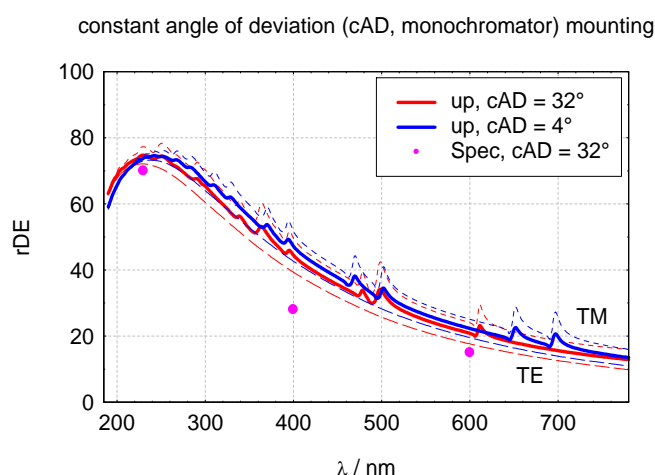
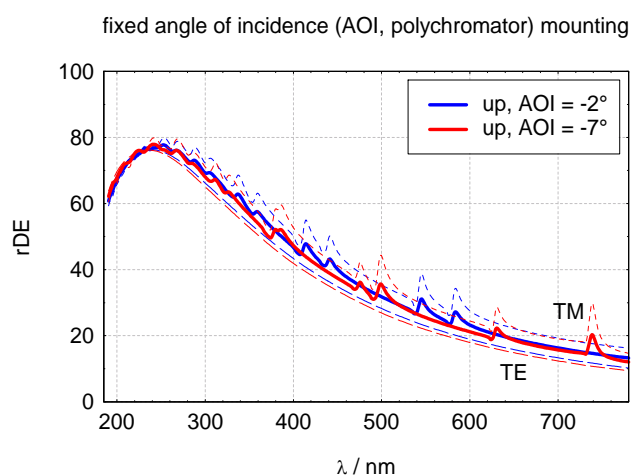
*By historic convention clockwise incident and diffraction angles are positive.*

## Optical grating characteristics

Diffraction efficiency (unpolarized @ cAD = 32°)

230 nm	$\geq 70$ %
400 nm	$\geq 28$ %
600 nm	$\geq 15$ %

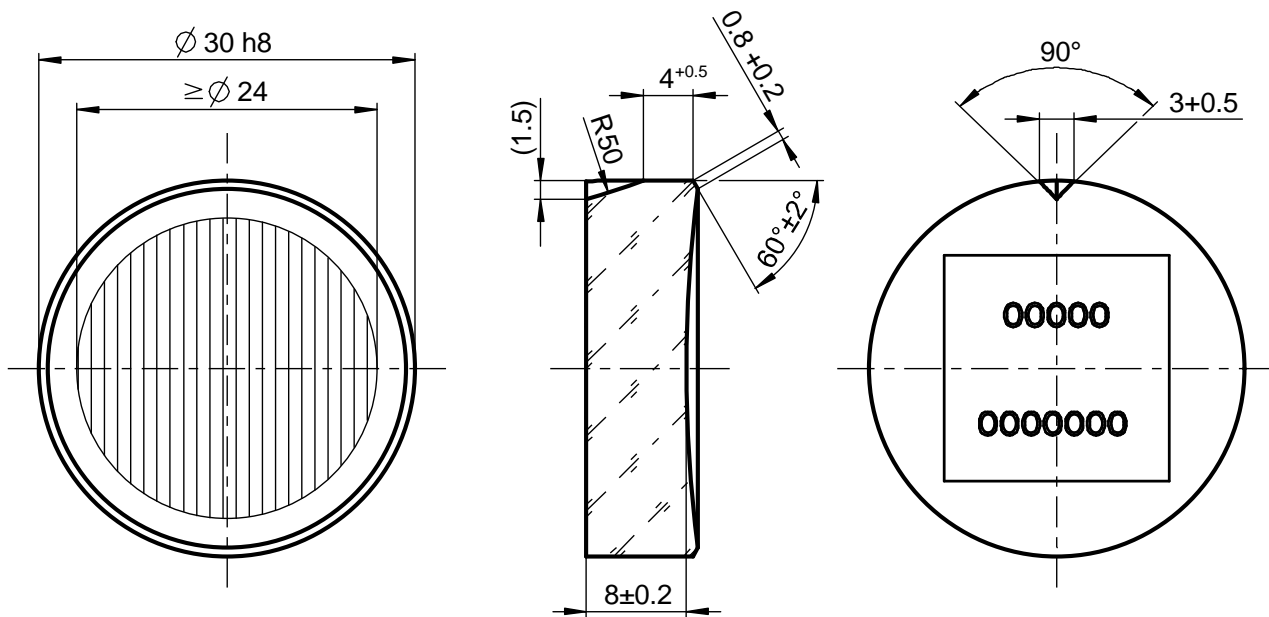
## Typical relative diffraction efficiency (rDE) in first diffraction order



Typical efficiency curves based on rigorous electromagnetic modeling using measured AFM profiles. rDE refers to the ratio between diffracted power from the grating and reflected power from a mirror coated with the same material.

## Blank specification

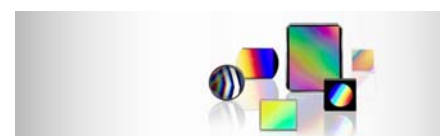
Material	N-BK7 (optical glass)
Radius of curvature	109.772 mm
Protective bevel (left surface)	0.5 mm



	Polychromator		Polychromator		Monochromator
Application range	200 – 415 nm		200 – 800 nm		180 – 800 nm
Monochromator angle	—		—		30°
Object distance $l_A$	113.64 mm		108.34 mm		120 mm
Incidence angle $\alpha$	-7.24°		-2°		—
Spectrum length	14.2 mm		43.2 mm		—
Reciprocal linear dispersion	15.1 nm/mm		13.9 nm/mm		—
Astigmatism (point image extension)	< 0.03 mm		< 1.7 mm		—
Point image resolution	< 0.65 nm		< 4.3 nm		—
	$\lambda = 200 \text{ nm}$	$\lambda = 415 \text{ nm}$	$\lambda = 200 \text{ nm}$	$\lambda = 800 \text{ nm}$	$\lambda = 200 \text{ nm}$
Relative aperture	1 : 4.7		1 : 4.5		1 : 5
Focal distance $l_B$	104.77 mm		114.3 mm		97.3 mm
Diffraction angle $\beta$	14.24°	22.03°	8.9°	30.99°	—
Tilt angle $k$ of the detector array	-10.95°		-16.53°		—

Carl Zeiss  
Spectroscopy GmbH  
07740 Jena  
Germany

Phone: + 49 (0) 3641 64-2838  
Fax: + 49 (0) 3641 64-2485  
E-mail: [info.spectroscopy@zeiss.com](mailto:info.spectroscopy@zeiss.com)  
Internet: [www.zeiss.com/spectroscopy](http://www.zeiss.com/spectroscopy)



# Concave Grating Polychromator Mounting

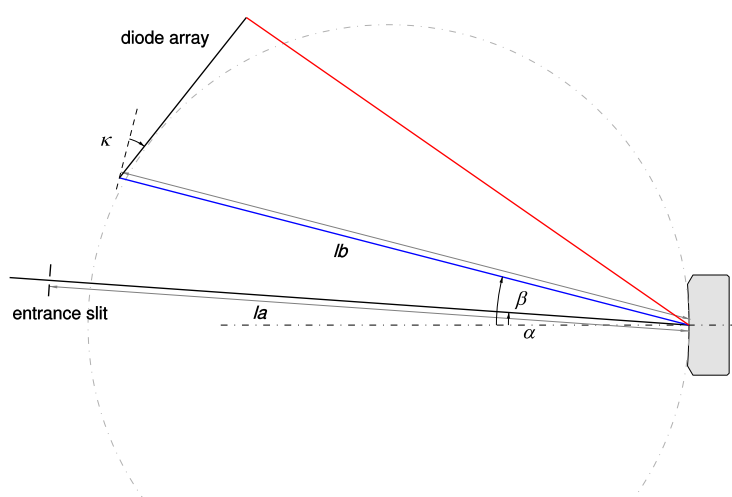


Order number 264510-2951-924

## Grating specification

Groove density	1600 ± 2 l/mm
Groove profile	Blazed
Diffraction grating area	≥ Ø 17 mm
Reflective coating	Aluminum (unprotected)
Grating master type	Holographically recorded
Grating type	Epoxy replica (copy)
Storage and transport temperature	-40 °C ... +60 °C (non-condensing environment)
Relative humidity	≤ 93 % (non-condensing environment)

## Mounting specification (Schematic drawing)



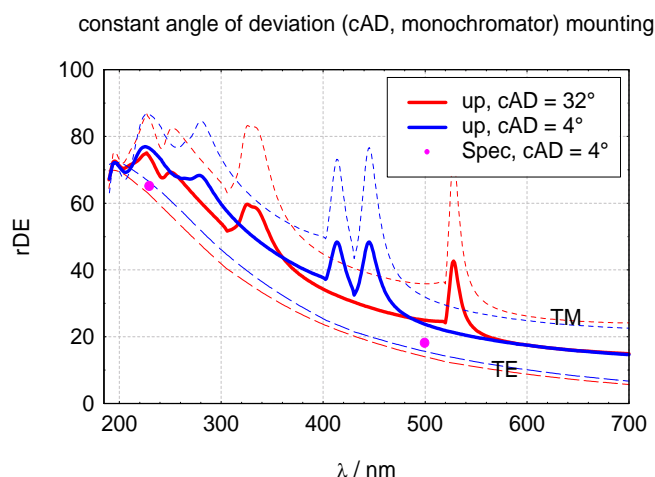
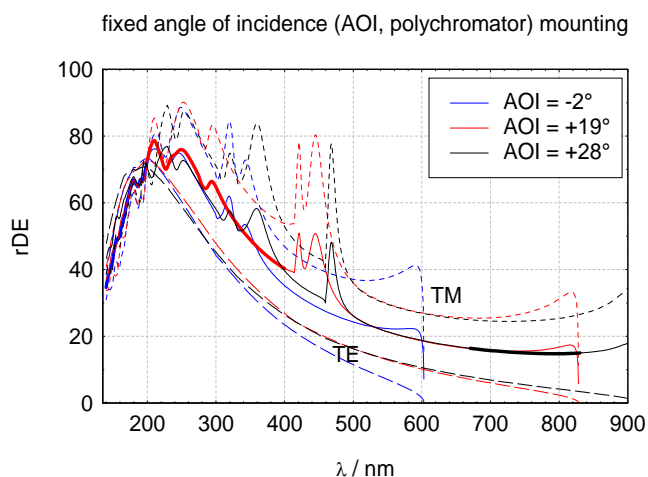
*By historic convention clockwise incident and diffraction angles are positive.*

## Optical grating characteristics

Diffraction efficiency (unpolarized @ cAD = 32°)

230 nm	≥ 65 %
500 nm	≥ 18 %

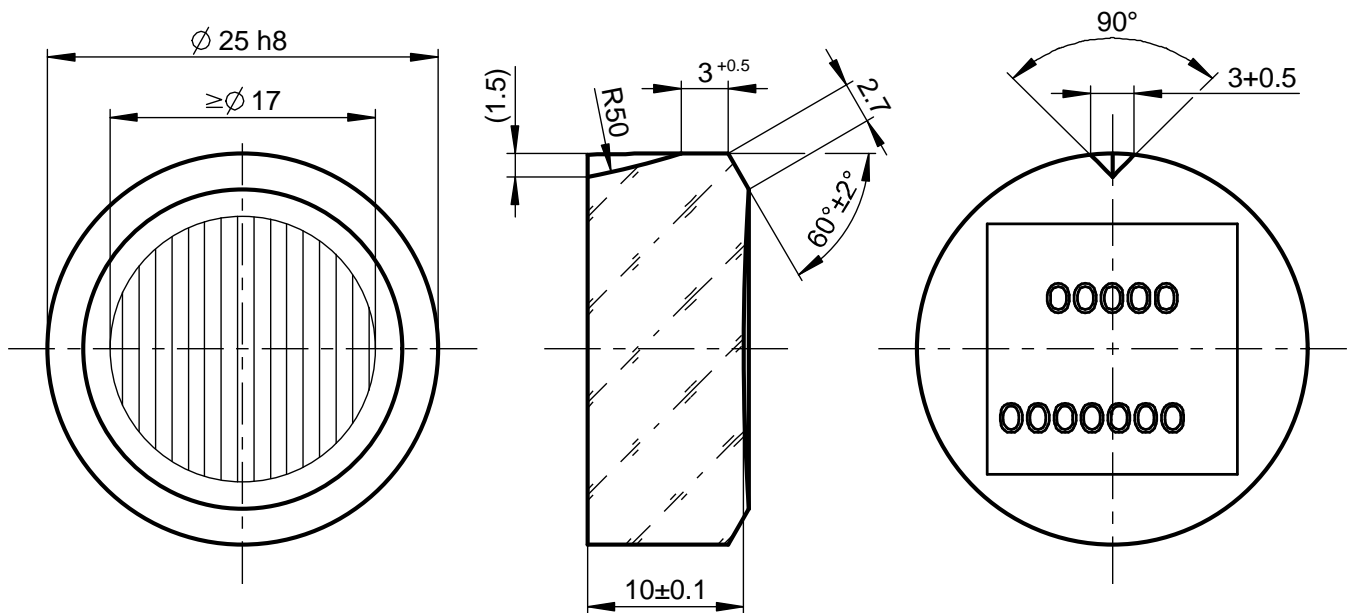
## Typical relative diffraction efficiency (rDE) in first diffraction order



Typical efficiency curves based on rigorous electromagnetic modeling using measured AFM profiles. rDE refers to the ratio between diffracted power from the grating and reflected power from a mirror coated with the same material.

## Blank specification

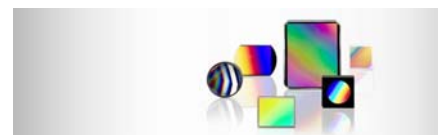
Material	N-BK7 (optical glass) or Fused Silica (PN 000000-1227-541)
Radius of curvature	149.732 mm
Protective bevel (left surface)	0.5 mm



Application range	140 – 200 nm		200 – 400 nm		670 – 830 nm	
Object distance $l_A$	144.7 mm		159.7 mm		128.8 mm	
Incidence angle $\alpha$	-2.4°		4.0°		28.0°	
Spectrum length	15.8 mm		50.9 mm		62.4 mm	
Reciprocal linear dispersion	3.8 nm/mm		3.9 nm/mm		2.6 nm/mm	
Astigmatism (point image extension)	< 0.3 mm		< 1.65 mm		< 8 mm	
Point image resolution	< 0.08 nm		< 0.95 nm		< 0.14 nm	
Relative aperture	1 : 8.5		1 : 9.4		1 : 7.6	
	$\lambda = 140 \text{ nm}$	$\lambda = 200 \text{ nm}$	$\lambda = 200 \text{ nm}$	$\lambda = 400 \text{ nm}$	$\lambda = 670 \text{ nm}$	$\lambda = 830 \text{ nm}$
Focal distance $l_B$	156.6 mm	—	146.6 mm	—	164.8 mm	—
Diffraction angle $\beta$	15.4°	21.2°	14.5°	34.8°	37.1°	59.2°
Tilt angle $k$ of the detector array	-7.4°	—	-23.9°	—	-15.3°	—

Carl Zeiss  
Spectroscopy GmbH  
07740 Jena  
Germany

Phone: + 49 (0) 3641 64-2838  
Fax: + 49 (0) 3641 64-2485  
E-mail: [info.spectroscopy@zeiss.com](mailto:info.spectroscopy@zeiss.com)  
Internet: [www.zeiss.com/spectroscopy](http://www.zeiss.com/spectroscopy)



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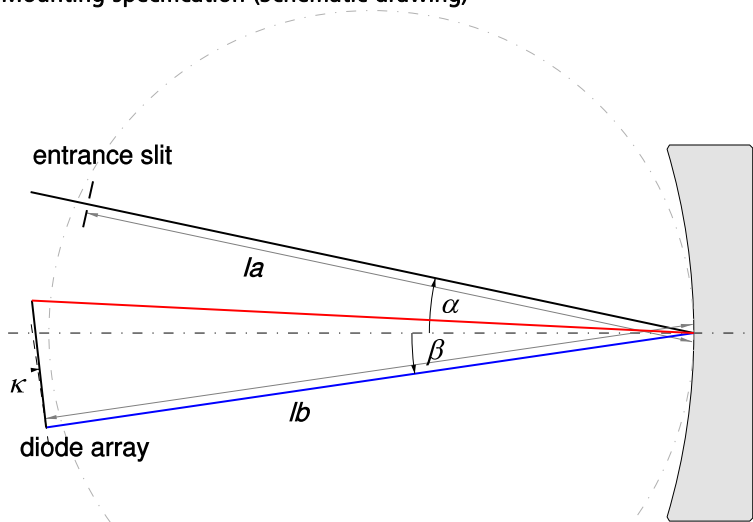


Order number 264510-2952-624

## Grating specification

Groove density	320 ± 2 l/mm
Groove profile	Blazed
Diffraction grating area	≥ Ø 39 mm
Reflective coating	Aluminum (unprotected)
Grating master type	Holographically recorded
Grating type	Epoxy replica (copy)
Storage and transport temperature	-40 °C ... +60 °C (non-condensing environment)
Relative humidity	≤ 93 % (non-condensing environment)

## Mounting specification (Schematic drawing)



By historic convention clockwise incident and diffraction angles are positive.

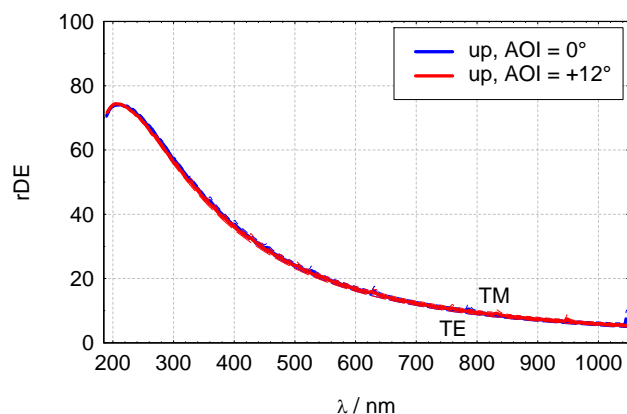
## Optical grating characteristics

Diffraction efficiency (unpolarized @ cAD = 32°)

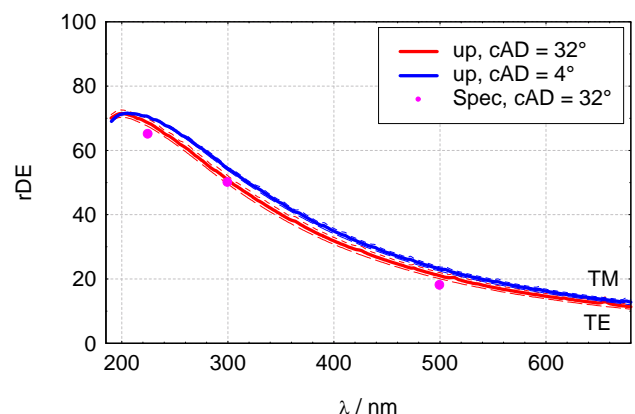
225 nm	≥ 65 %
300 nm	≥ 50 %
500 nm	≥ 18 %

## Typical relative diffraction efficiency (rDE) in first diffraction order

fixed angle of incidence (AOI, polychromator) mounting



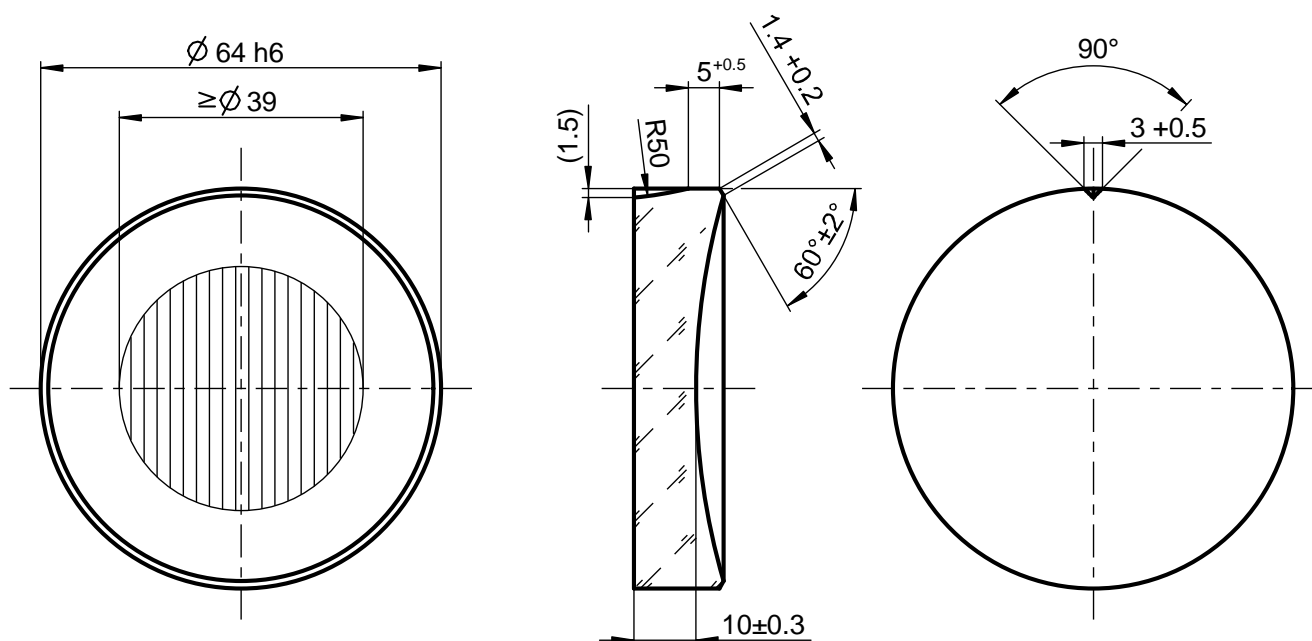
constant angle of deviation (cAD, monochromator) mounting



Typical efficiency curves based on rigorous electromagnetic modeling using measured AFM profiles. rDE refers to the ratio between diffracted power from the grating and reflected power from a mirror coated with the same material.

## Blank specification

Material	N-BK7 (optical glass)
Radius of curvature	109.772 mm
Protective bevel (left surface)	0.5 mm



Application range	200 – 800 nm		700 – 1050 nm	
	Object distance $l_a$	105.4 mm		113.9 mm
Incidence angle $\alpha$	12°		0.7°	
Spectrum length	21.6 mm		12.3 mm	
Reciprocal linear dispersion	27.8 nm/mm		28.4 nm/mm	
Astigmatism (point image extension)	< 2.0 mm		< 2.2 mm	
Point image resolution	< 3.8 nm		< 1.6 nm	
Relative aperture	1 : 2.1		1 : 2.3	
	$\lambda = 200 \text{ nm}$	$\lambda = 800 \text{ nm}$	$\lambda = 700 \text{ nm}$	$\lambda = 1050 \text{ nm}$
Focal distance $l_b$	111.4 mm		104.1 mm	
Diffraction angle $\beta$	-8.3°	2.8°	12.2°	18.9°
Tilt angle $k$ of the detector array	-1.9°		-18.1°	

Carl Zeiss  
Spectroscopy GmbH  
07740 Jena  
Germany

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E-mail: [info.spectroscopy@zeiss.com](mailto:info.spectroscopy@zeiss.com)  
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# Concave Grating Polychromator Mounting

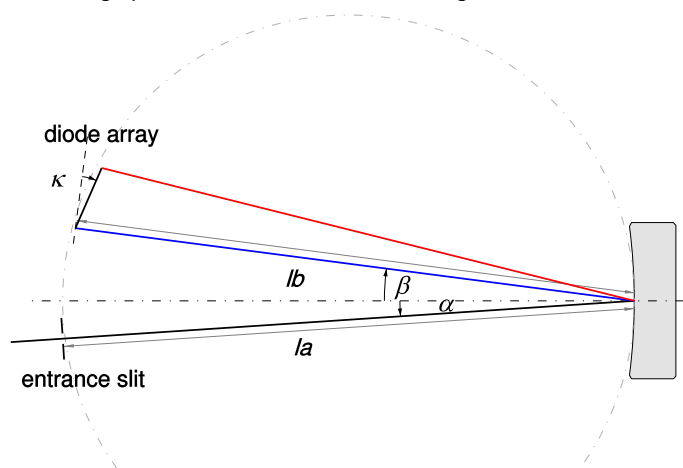


Order number 264510-2952-724

## Grating specification

Groove density	320 ± 1 l/mm
Groove profile	Blazed
Diffraction grating area	≥ Ø 24 mm
Reflective coating	Aluminum (unprotected)
Grating master type	Holographically recorded
Grating type	Epoxy replica (copy)
Storage and transport temperature	-40 °C ... +60 °C (non-condensing environment)
Relative humidity	≤ 93 % (non-condensing environment)

## Mounting specification (Schematic drawing)



By historic convention clockwise incident and diffraction angles are positive.

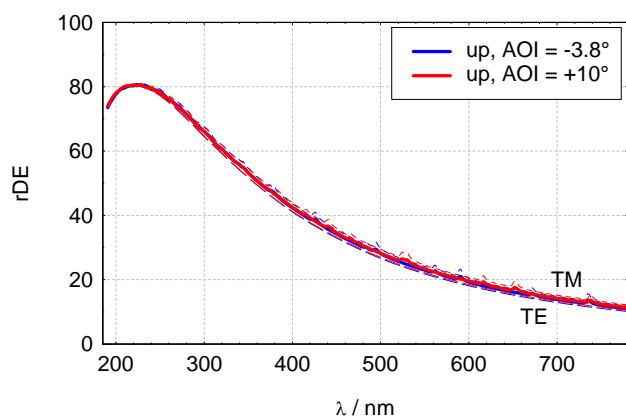
## Optical grating characteristics

Diffraction efficiency (unpolarized @ cAD = 32°)

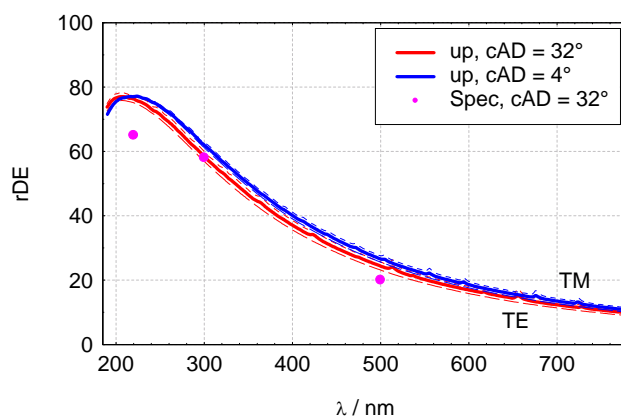
220 nm	≥ 65 %
300 nm	≥ 58 %
500 nm	≥ 20 %

## Typical relative diffraction efficiency (rDE) in first diffraction order

fixed angle of incidence (AOI, polychromator) mounting



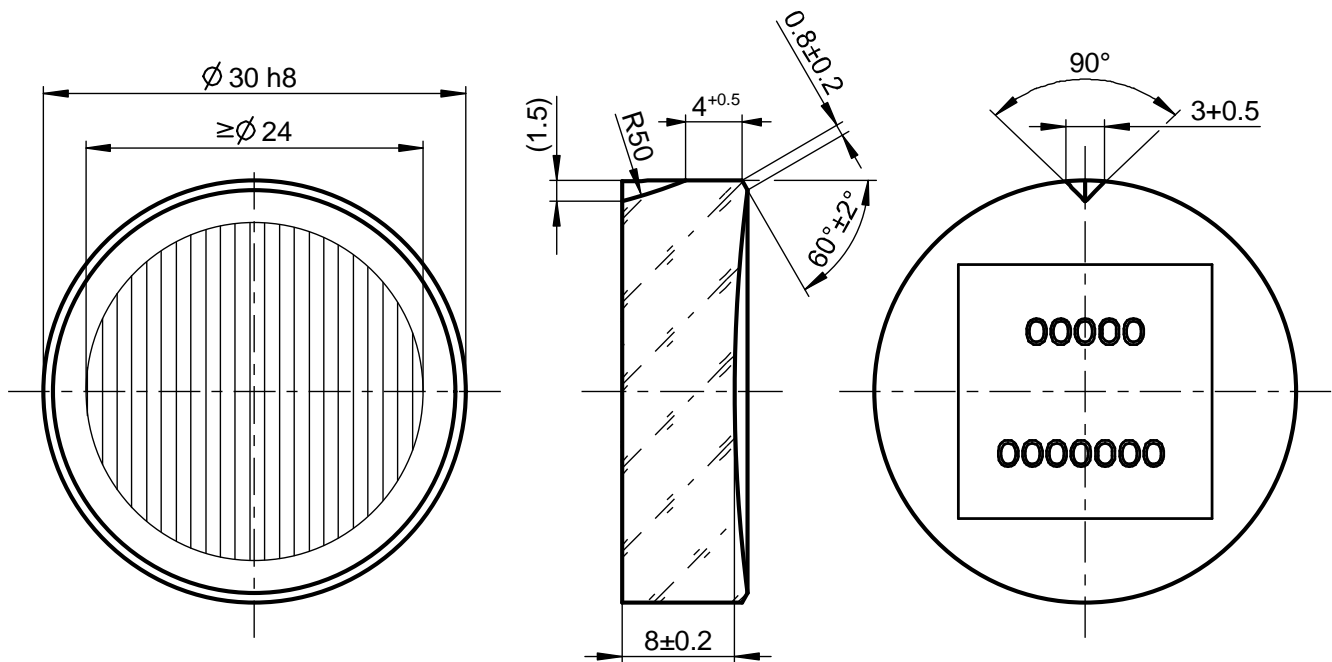
constant angle of deviation (cAD, monochromator) mounting



Typical efficiency curves based on rigorous electromagnetic modeling using measured AFM profiles. rDE refers to the ratio between diffracted power from the grating and reflected power from a mirror coated with the same material.

## Blank specification

Material	N-BK7 (optical glass)
Radius of curvature	109.772 mm
Protective bevel (left surface)	0.5 mm



Application range	200 – 550 nm		200 – 800 nm	
Object distance $l_A$	110 mm		97.6 mm	
Incidence angle $\alpha$	-3.8°		10°	
Spectrum length	12.5 mm		23.4 mm	
Reciprocal linear dispersion	28.0 nm/mm		25.6 nm/mm	
Astigmatism (point image extension)	< 0.9 mm		< 0.8 mm	
Point image resolution	< 1.1 nm		< 1.7 nm	
Relative aperture	1 : 4.6		1 : 4.1	
	$\lambda = 200 \text{ nm}$	$\lambda = 550 \text{ nm}$	$\lambda = 200 \text{ nm}$	$\lambda = 800 \text{ nm}$
Focal distance $l_B$	108.23 mm		122.4 mm	
Diffraction angle $\beta$	7.4°	14.0°	-6.3°	4.7°
Tilt angle $k$ of the detector array	-16.1°		-7.9°	

Carl Zeiss  
Spectroscopy GmbH  
07740 Jena  
Germany

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