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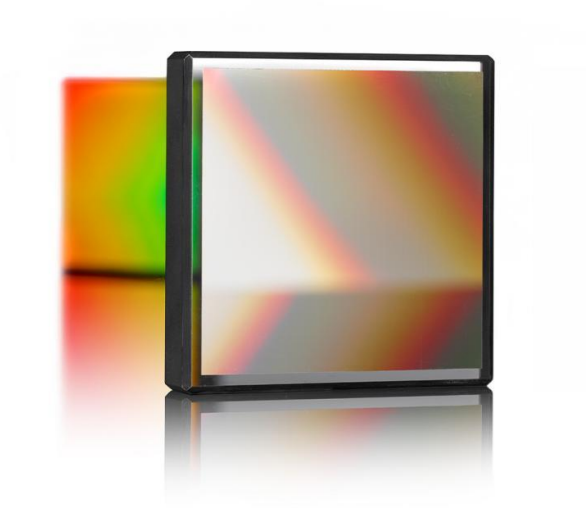
эл.почта: zsf@nt-rt.ru || сайт: https://zeiss.nt-rt.ru/



DIFFRACTION GRATINGS

Plane gratings

Enhancing performance

ZEISS plane gratings fulfill the highest demands in spectrometers in terms of minimum stray light and maximum efficiency, combined with low wavefront aberrations for the best possible optical performance. The blaze profile can be applied during the holography ("True Blaze Technology").

- **Available at short notice**
- **Low stray light and low aberration**
- **Optimized groove profile**
- **Numerous standard configurations available**
- **Custom design**

Plug and play performance Gratings that push the limits of your spectrometer

ZEISS plane gratings are easy to install and ready to use. With low stray light and high efficiency, ZEISS plane gratings are available in various substrate sizes for easy integration into your spectrometer. They can be bare Al (aluminium) or Al+MgF2 (aluminium + magnesium fluoride) coated and have low wavefront aberrations. We can also produce and develop custom gratings tailored to your exact specifications.

Applicable across the board

Plane gratings are optical diffraction gratings on plane substrates. They have the broadest range of applications of all diffraction gratings and can be used in:

✓ monochromators
✓ polychromators
✓ laser technology
✓ beam splitting and combining
✓ aerospace engineering
✓ reflection standards
✓ wavelength de- and multiplexing

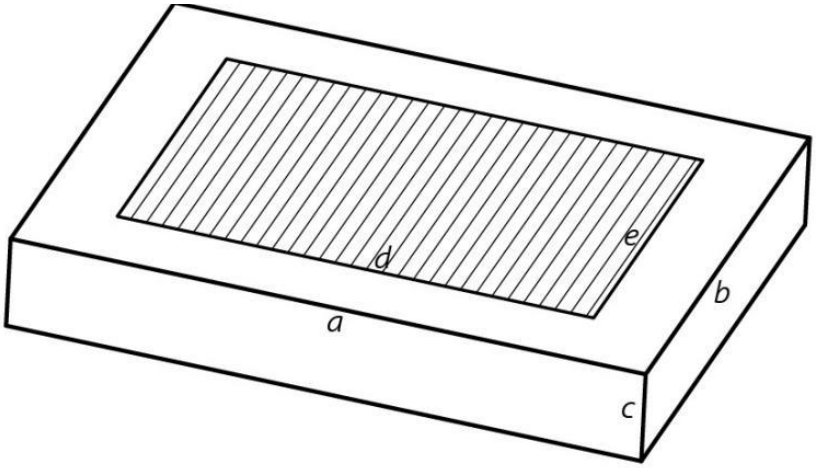
Plane gratings from ZEISS are optimized for spectral ranges between 100 nm and 50 µm. The gratings are mechanically ruled or holographically recorded depending on what method provides the better result. The possible grating profiles are:

- ✓ echelette or blaze
- ✓ sinusoidal
- ✓ laminar

Plane gratings catalogue

- **Holographic**
- **Ruled (blazed)**
-

Grove density [l/mm]	**Nominal wavelength [nm]** b* = blazed, s* = sinusoidal	**Max. clear aperture [mm²]**	**Catalogue number**
3600	230 (b*)	90 x 80	263232xx90224
2604	230 (b*)	70 x 70	263232xx90524
2400	230 (b*)	65 x 60	263232xx90824
2400	UV-VIS (s*)	70 x 70	263232xx50824
2100	230 (b*)	65 x 60	263232xx91024
2100	VIS-NIR (b*)	65 x 60	263232xx51024
1800	230 (b*)	68 x 68	263232xx91324
1800	VIS-NIR (s*)	75 x 70	263232xx51324
1500	VIS-NIR (s*)	65 x 60	263232xx51624
1440	VIS-NIR (b*)	65 x 65	263232xx91624
1400	230 (b*)	75 x 70	263232xx91724
1400	VIS-NIR (s*)	75 x 75	263232xx51824
1302	230 (b*)	65 x 65	263232xx92324
1200	230 (b*)	80 x 80	263232xx92824
1200	VIS-NIR (s*)	75 x 75	263232xx52824
1000	VIS-NIR (s*)	50 x 55	263232xx53024
750	NIR (s*)	70 x 55	263232xx52224
300	230 (b*)	65 x 65	263232xx94924



Definition of catalogue numbers

Please note

The catalog number of each grating is created from various parameters. Please see the explanation below and make sure to define your preferred grating size in the request form.

Key

Example: 263232**xx**902**yy**

"**xx**" defines substrate format (see table below)

"**yy**" defines type of grating / coating:

"**23**" – transmission grating (available upon request)

"**24**" – aluminum coating

"**25**" – gold coating (available upon request)

Available standard substrate sizes

Other sizes incl. round substrates on request

Size Code	a x b x c [mm³]	d x e [mm²]
90	**15 x 10 x 6**	13 x 8
58	**19 x 19 x 6**	17 x 17
62	**40 x 40 x 10**	35 x 35
83	**60 x 60 x 10**	52 x 52
70	**70 x 70 x 12**	65 x 60
76	**75 x 65 x 6**	65 x 63

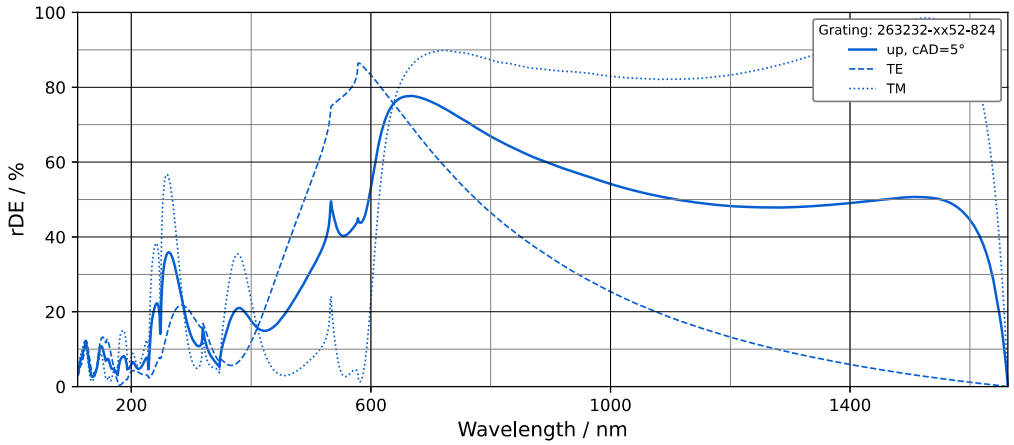
Seeing beyond

Plane Grating

Order number 263232xx52824

Grating specification	
Groove density	1200 l/mm
Groove profile	Sinusoidal
Blaze wavelength	VIS-NIR
Max. clear aperture	75x75 mm²
Reflective coating	Aluminium (unprotected)
Grating master type	Holographic
Grating type	Replica (copy)
Storage and transport temperature	-40° C … +60° C (*)
Operating temperature	≤ +60° C (*)

(*) non-condensing environment



Typical relative diffraction efficiency (rDE) in first diffraction order

Typical efficiency curves are 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. rDE values are based on optical constants of bulk aluminum.

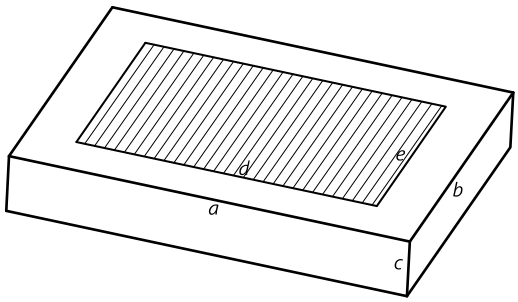
Efficiency curves are only representative and actual values my vary slightly. For wavelength below 190 nm, significant deviations can be expected due to native oxide layer. Specific analysis and/or efficiency-optimized coatings for this wavelength range are available/can be discussed upon request.

Blank specification	
Material	N-BK7 (optical glass)
Protective bevel (all sharp edges)	≤ 0.5 mm
Size Code	263232xx52824 (xx defines size code)
Substrate width	*a*
Substrate length	*b*
Substrate thickness	*c*
Clear aperture	*d x e*

Available Substrate sizes

Size Code	***a x b x c*** *(mm³)*	***d x e*** *(mm²)*
90	15 x 10 x 6	13 x 8
58	19 x 19 x 6	17 x 17
62	40 x 40 x 10	35 x 35
83	60 x 60 x 10	52 x 52
70	70 x 70 x 12	65 x 60
76	75 x 65 x 6	65 x 63

*Other sizes available upon request
*Round substrates also feasible



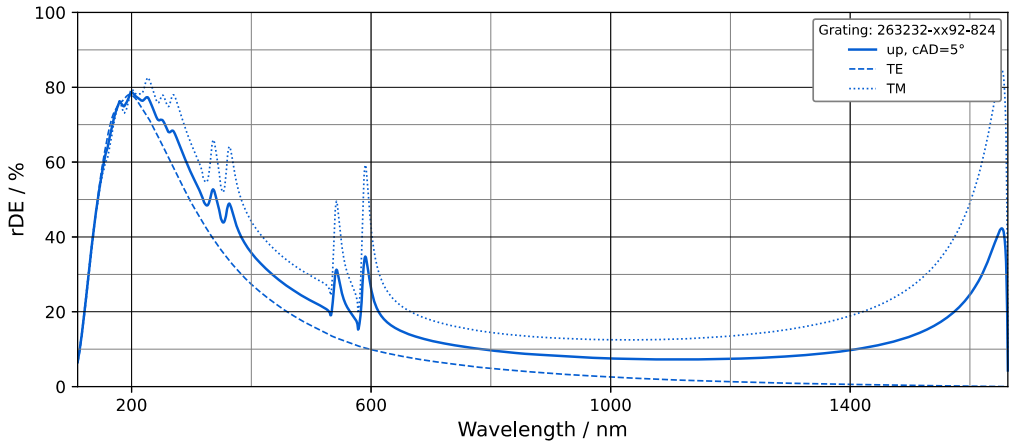
Seeing beyond

Plane Grating

Order number 263232xx92824

Grating specification	
Groove density	1200 l/mm
Groove profile	Blazed
Blaze wavelength	230 nm
Max. clear aperture	80x80 mm²
Reflective coating	Aluminium (unprotected)
Grating master type	Holographic
Grating type	Replica (copy)
Storage and transport temperature	-40° C … +60° C (*)
Operating temperature	≤ +60° C (*)

(*) non-condensing environment



Typical relative diffraction efficiency (rDE) in first diffraction order

Typical efficiency curves are 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. rDE values are based on optical constants of bulk aluminum.

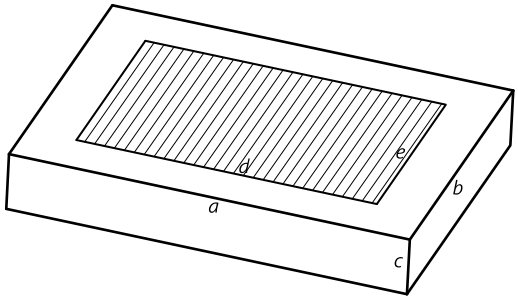
Efficiency curves are only representative and actual values my vary slightly. For wavelength below 190 nm, significant deviations can be expected due to native oxide layer. Specific analysis and/or efficiency-optimized coatings for this wavelength range are available/can be discussed upon request.

Blank specification	
Material	N-BK7 (optical glass)
Protective bevel (all sharp edges)	≤ 0.5 mm
Size Code	263232xx92824 (xx defines size code)
Substrate width	*a*
Substrate length	*b*
Substrate thickness	*c*
Clear aperture	*d x e*

Available Substrate sizes

Size Code	***a x b x c*** *(mm³)*	***d x e*** *(mm²)*
90	15 x 10 x 6	13 x 8
58	19 x 19 x 6	17 x 17
62	40 x 40 x 10	35 x 35
83	60 x 60 x 10	52 x 52
70	70 x 70 x 12	65 x 60
76	75 x 65 x 6	65 x 63

*Other sizes available upon request
*Round substrates also feasible



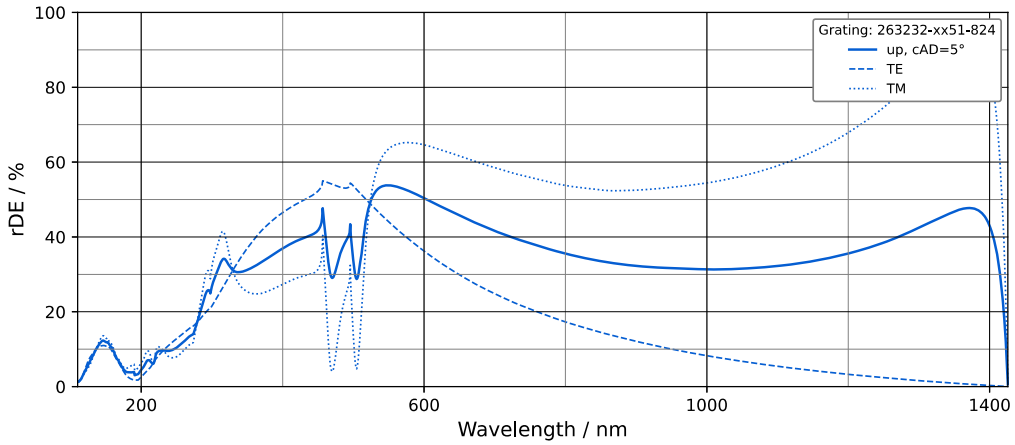
Seeing beyond

Plane Grating

Order number 263232xx51824

Grating specification	
Groove density	1400 l/mm
Groove profile	Sinusoidal
Blaze wavelength	VIS-NIR
Max. clear aperture	75x75 mm²
Reflective coating	Aluminium (unprotected)
Grating master type	Holographic
Grating type	Replica (copy)
Storage and transport temperature	-40° C … +60° C (*)
Operating temperature	≤ +60° C (*)

(*) non-condensing environment



Typical relative diffraction efficiency (rDE) in first diffraction order

Typical efficiency curves are 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. rDE values are based on optical constants of bulk aluminum.

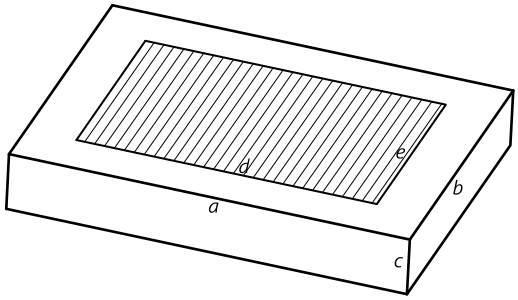
Efficiency curves are only representative and actual values my vary slightly. For wavelength below 190 nm, significant deviations can be expected due to native oxide layer. Specific analysis and/or efficiency-optimized coatings for this wavelength range are available/can be discussed upon request.

Blank specification	
Material	N-BK7 (optical glass)
Protective bevel (all sharp edges)	≤ 0.5 mm
Size Code	263232xx51824 (xx defines size code)
Substrate width	*a*
Substrate length	*b*
Substrate thickness	*c*
Clear aperture	*d x e*

Available Substrate sizes

Size Code	***a x b x c*** *(mm³)*	***d x e*** *(mm²)*
90	15 x 10 x 6	13 x 8
58	19 x 19 x 6	17 x 17
62	40 x 40 x 10	35 x 35
83	60 x 60 x 10	52 x 52
70	70 x 70 x 12	65 x 60
76	75 x 65 x 6	65 x 63

*Other sizes available upon request
*Round substrates also feasible



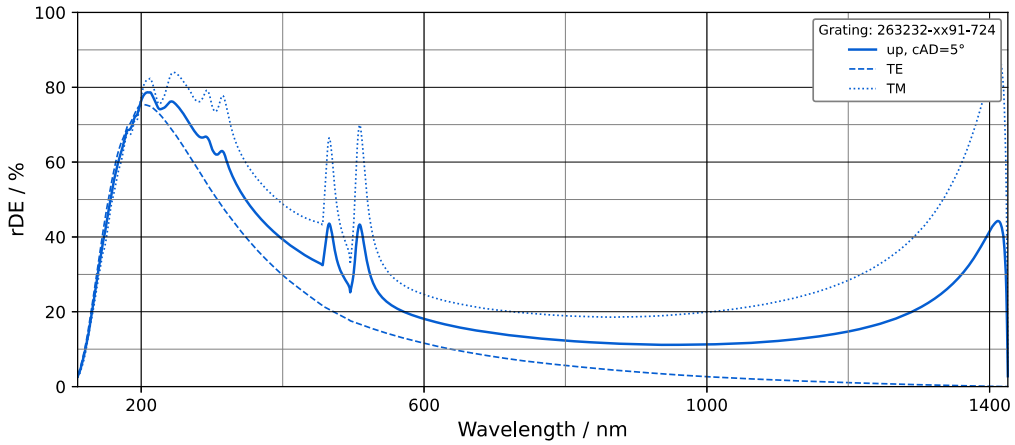
Seeing beyond

Plane Grating

Order number 263232xx91724

Grating specification	
Groove density	1400 l/mm
Groove profile	Blazed
Blaze wavelength	230 nm
Max. clear aperture	75x70 mm²
Reflective coating	Aluminium (unprotected)
Grating master type	Holographic
Grating type	Replica (copy)
Storage and transport temperature	-40° C … +60° C (*)
Operating temperature	≤ +60° C (*)

(*) non-condensing environment



Typical relative diffraction efficiency (rDE) in first diffraction order

Typical efficiency curves are 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. rDE values are based on optical constants of bulk aluminum.

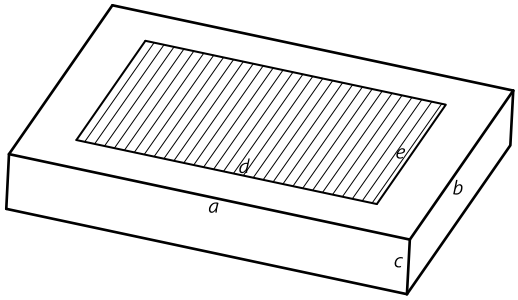
Efficiency curves are only representative and actual values my vary slightly. For wavelength below 190 nm, significant deviations can be expected due to native oxide layer. Specific analysis and/or efficiency-optimized coatings for this wavelength range are available/can be discussed upon request.

Blank specification	
Material	N-BK7 (optical glass)
Protective bevel (all sharp edges)	≤ 0.5 mm
Size Code	263232xx91724 (xx defines size code)
Substrate width	*a*
Substrate length	*b*
Substrate thickness	*c*
Clear aperture	*d x e*

Available Substrate sizes

Size Code	***a x b x c*** *(mm³)*	***d x e*** *(mm²)*
90	15 x 10 x 6	13 x 8
58	19 x 19 x 6	17 x 17
62	40 x 40 x 10	35 x 35
83	60 x 60 x 10	52 x 52
70	70 x 70 x 12	65 x 60
76	75 x 65 x 6	65 x 63

*Other sizes available upon request
*Round substrates also feasible



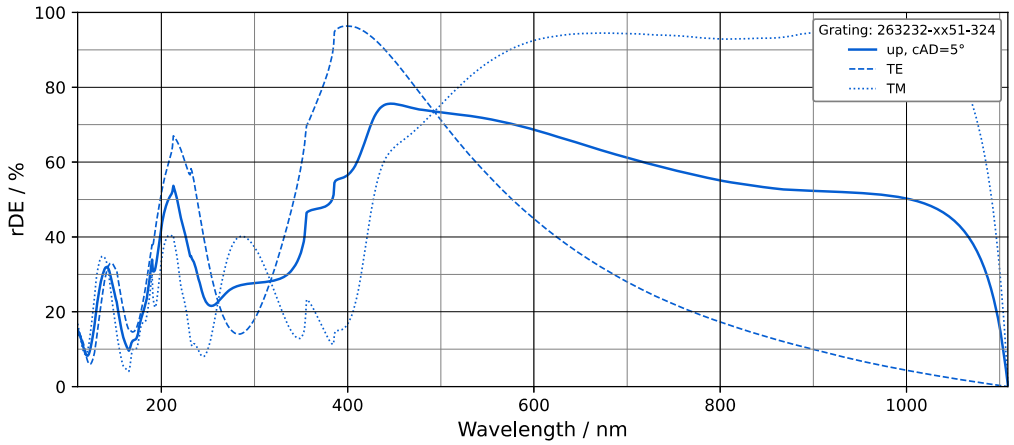
Seeing beyond

Plane Grating

Order number 263232xx51324

Grating specification	
Groove density	1800 l/mm
Groove profile	Sinusoidal
Blaze wavelength	VIS-NIR
Max. clear aperture	75x70 mm²
Reflective coating	Aluminium (unprotected)
Grating master type	Holographic
Grating type	Replica (copy)
Storage and transport temperature	-40° C … +60° C (*)
Operating temperature	≤ +60° C (*)

(*) non-condensing environment



Typical relative diffraction efficiency (rDE) in first diffraction order

Typical efficiency curves are 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. rDE values are based on optical constants of bulk aluminum.

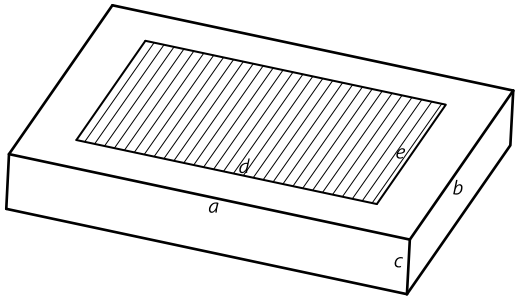
Efficiency curves are only representative and actual values my vary slightly. For wavelength below 190 nm, significant deviations can be expected due to native oxide layer. Specific analysis and/or efficiency-optimized coatings for this wavelength range are available/can be discussed upon request.

Blank specification	
Material	N-BK7 (optical glass)
Protective bevel (all sharp edges)	≤ 0.5 mm
Size Code	263232xx51324 (xx defines size code)
Substrate width	*a*
Substrate length	*b*
Substrate thickness	*c*
Clear aperture	*d x e*

Available Substrate sizes

Size Code	***a x b x c*** *(mm³)*	***d x e*** *(mm²)*
90	15 x 10 x 6	13 x 8
58	19 x 19 x 6	17 x 17
62	40 x 40 x 10	35 x 35
83	60 x 60 x 10	52 x 52
70	70 x 70 x 12	65 x 60
76	75 x 65 x 6	65 x 63

*Other sizes available upon request
*Round substrates also feasible



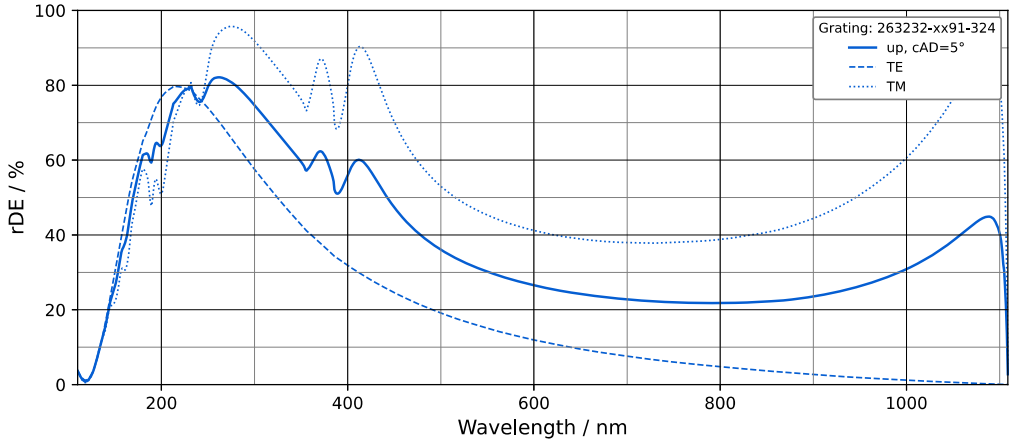
Seeing beyond

Plane Grating

Order number 263232xx91324

Grating specification	
Groove density	1800 l/mm
Groove profile	Blazed
Blaze wavelength	230 nm
Max. clear aperture	68x68 mm²
Reflective coating	Aluminium (unprotected)
Grating master type	Holographic
Grating type	Replica (copy)
Storage and transport temperature	-40° C … +60° C (*)
Operating temperature	≤ +60° C (*)

(*) non-condensing environment



Typical relative diffraction efficiency (rDE) in first diffraction order

Typical efficiency curves are 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. rDE values are based on optical constants of bulk aluminum.

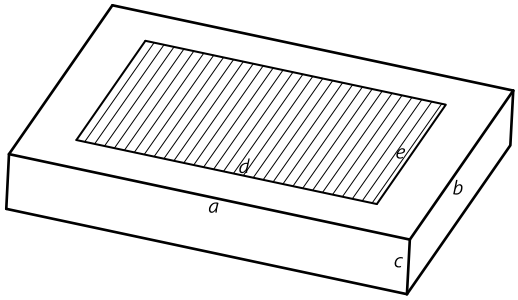
Efficiency curves are only representative and actual values my vary slightly. For wavelength below 190 nm, significant deviations can be expected due to native oxide layer. Specific analysis and/or efficiency-optimized coatings for this wavelength range are available/can be discussed upon request.

Blank specification	
Material	N-BK7 (optical glass)
Protective bevel (all sharp edges)	≤ 0.5 mm
Size Code	263232xx91324 (xx defines size code)
Substrate width	*a*
Substrate length	*b*
Substrate thickness	*c*
Clear aperture	*d x e*

Available Substrate sizes

Size Code	***a x b x c*** *(mm³)*	***d x e*** *(mm²)*
90	15 x 10 x 6	13 x 8
58	19 x 19 x 6	17 x 17
62	40 x 40 x 10	35 x 35
83	60 x 60 x 10	52 x 52
70	70 x 70 x 12	65 x 60
76	75 x 65 x 6	65 x 63

*Other sizes available upon request
*Round substrates also feasible



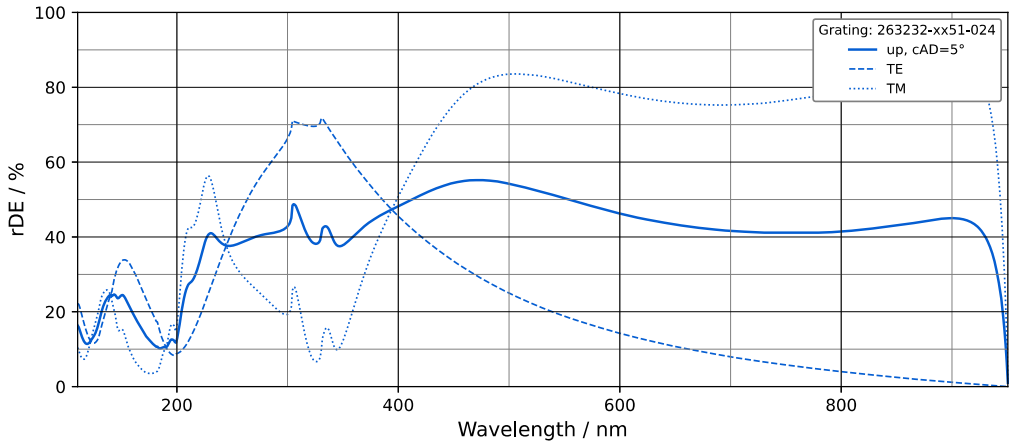
Seeing beyond

Plane Grating

Order number 263232xx51024

Grating specification	
Groove density	2100 l/mm
Groove profile	Sinusoidal
Blaze wavelength	VIS-NIR
Max. clear aperture	65x60 mm²
Reflective coating	Aluminium (unprotected)
Grating master type	Holographic
Grating type	Replica (copy)
Storage and transport temperature	-40° C … +60° C (*)
Operating temperature	≤ +60° C (*)

(*) non-condensing environment



Typical relative diffraction efficiency (rDE) in first diffraction order

Typical efficiency curves are 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. rDE values are based on optical constants of bulk aluminum.

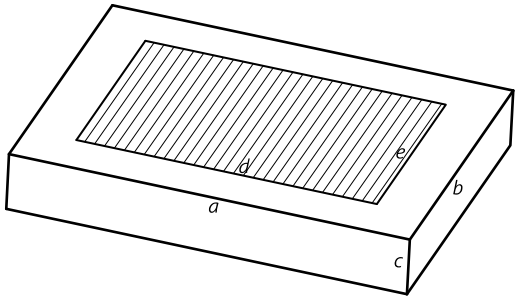
Efficiency curves are only representative and actual values my vary slightly. For wavelength below 190 nm, significant deviations can be expected due to native oxide layer. Specific analysis and/or efficiency-optimized coatings for this wavelength range are available/can be discussed upon request.

Blank specification	
Material	N-BK7 (optical glass)
Protective bevel (all sharp edges)	≤ 0.5 mm
Size Code	263232xx51024 (xx defines size code)
Substrate width	*a*
Substrate length	*b*
Substrate thickness	*c*
Clear aperture	*d x e*

Available Substrate sizes

Size Code	***a x b x c*** *(mm³)*	***d x e*** *(mm²)*
90	15 x 10 x 6	13 x 8
58	19 x 19 x 6	17 x 17
62	40 x 40 x 10	35 x 35
83	60 x 60 x 10	52 x 52
70	70 x 70 x 12	65 x 60
76	75 x 65 x 6	65 x 63

*Other sizes available upon request
*Round substrates also feasible



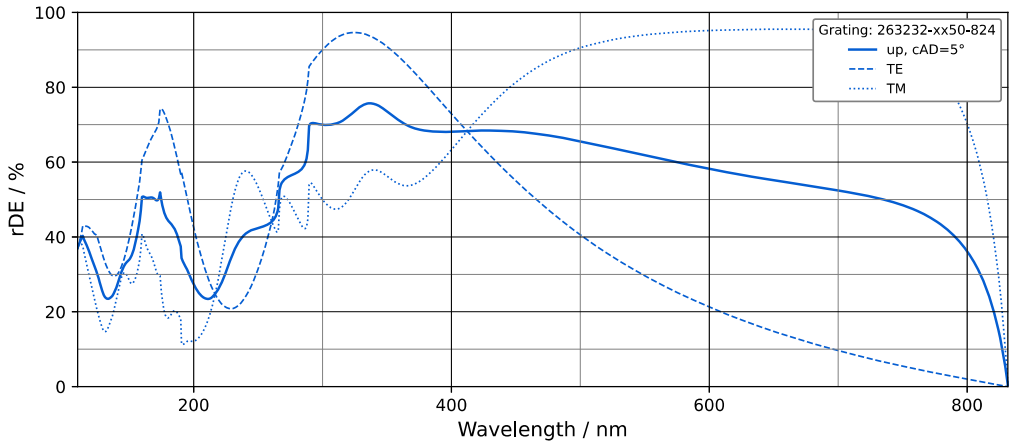
Seeing beyond

Plane Grating

Order number 263232xx50824

Grating specification	
Groove density	2400 l/mm
Groove profile	Sinusoidal
Blaze wavelength	UV-VIS
Max. clear aperture	70x70 mm²
Reflective coating	Aluminium (unprotected)
Grating master type	Holographic
Grating type	Replica (copy)
Storage and transport temperature	-40° C … +60° C (*)
Operating temperature	≤ +60° C (*)

(*) non-condensing environment



Typical relative diffraction efficiency (rDE) in first diffraction order

Typical efficiency curves are 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. rDE values are based on optical constants of bulk aluminum.

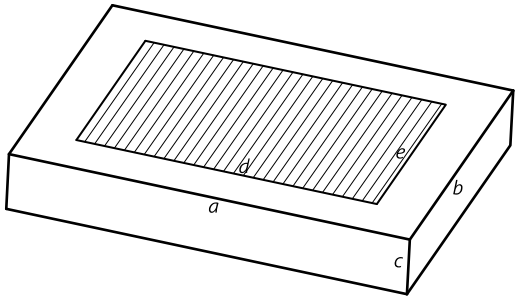
Efficiency curves are only representative and actual values my vary slightly. For wavelength below 190 nm, significant deviations can be expected due to native oxide layer. Specific analysis and/or efficiency-optimized coatings for this wavelength range are available/can be discussed upon request.

Blank specification	
Material	N-BK7 (optical glass)
Protective bevel (all sharp edges)	≤ 0.5 mm
Size Code	263232xx50824 (xx defines size code)
Substrate width	*a*
Substrate length	*b*
Substrate thickness	*c*
Clear aperture	*d x e*

Available Substrate sizes

Size Code	***a x b x c*** *(mm³)*	***d x e*** *(mm²)*
90	15 x 10 x 6	13 x 8
58	19 x 19 x 6	17 x 17
62	40 x 40 x 10	35 x 35
83	60 x 60 x 10	52 x 52
70	70 x 70 x 12	65 x 60
76	75 x 65 x 6	65 x 63

*Other sizes available upon request
*Round substrates also feasible



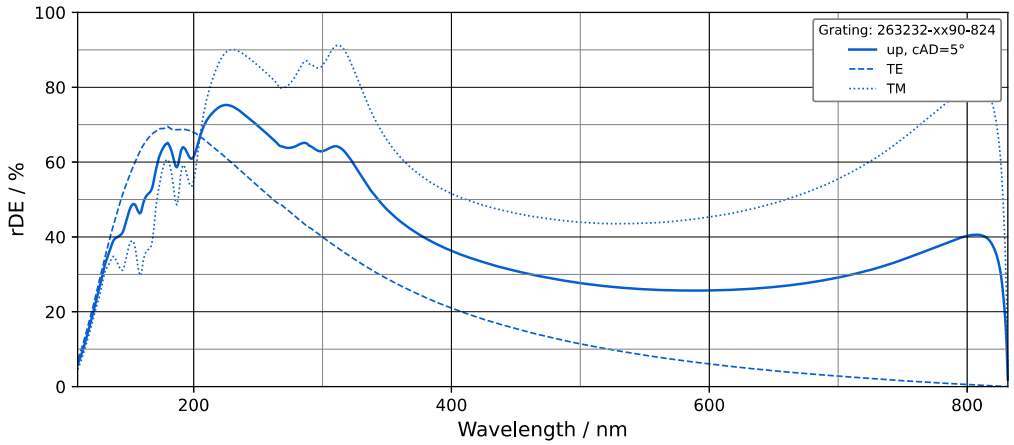
Seeing beyond

Plane Grating

Order number 263232xx90824

Grating specification	
Groove density	2400 l/mm
Groove profile	Blazed
Blaze wavelength	230 nm
Max. clear aperture	65x60 mm²
Reflective coating	Aluminium (unprotected)
Grating master type	Holographic
Grating type	Replica (copy)
Storage and transport temperature	-40° C … +60° C (*)
Operating temperature	≤ +60° C (*)

(*) non-condensing environment



Typical relative diffraction efficiency (rDE) in first diffraction order

Typical efficiency curves are 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. rDE values are based on optical constants of bulk aluminum.

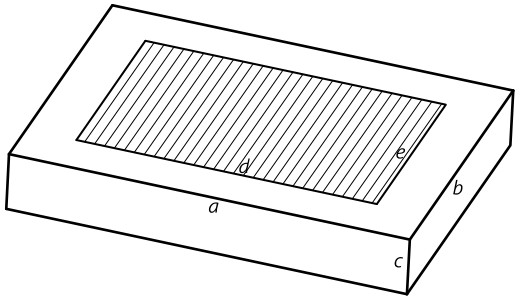
Efficiency curves are only representative and actual values my vary slightly. For wavelength below 190 nm, significant deviations can be expected due to native oxide layer. Specific analysis and/or efficiency-optimized coatings for this wavelength range are available/can be discussed upon request.

Blank specification	
Material	N-BK7 (optical glass)
Protective bevel (all sharp edges)	≤ 0.5 mm
Size Code	263232xx90824 (xx defines size code)
Substrate width	*a*
Substrate length	*b*
Substrate thickness	*c*
Clear aperture	*d x e*

Available Substrate sizes

Size Code	***a x b x c*** *(mm³)*	***d x e*** *(mm²)*
90	15 x 10 x 6	13 x 8
58	19 x 19 x 6	17 x 17
62	40 x 40 x 10	35 x 35
83	60 x 60 x 10	52 x 52
70	70 x 70 x 12	65 x 60

*Other sizes available upon request
*Round substrates also feasible



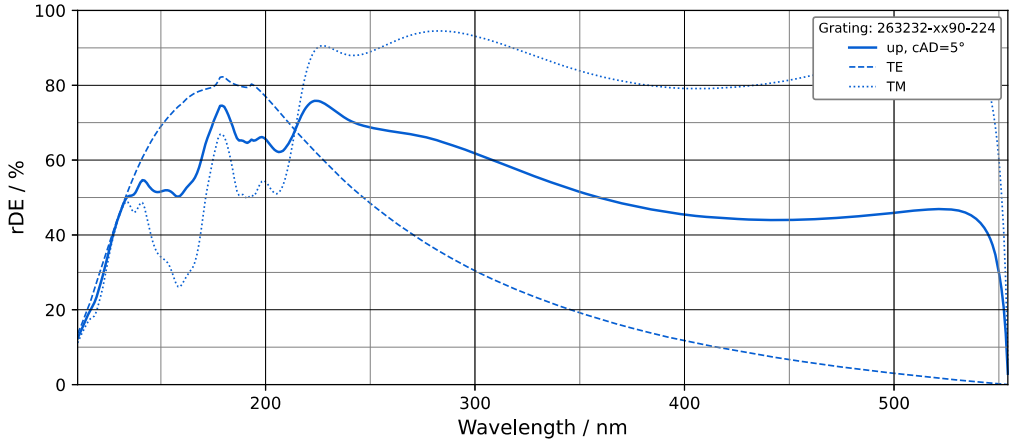
Seeing beyond

Plane Grating

Order number 263232xx90224

Grating specification	
Groove density	3600 l/mm
Groove profile	Blazed
Blaze wavelength	230 nm
Max. clear aperture	90x80 mm²
Reflective coating	Aluminium (unprotected)
Grating master type	Holographic
Grating type	Replica (copy)
Storage and transport temperature	-40° C … +60° C (*)
Operating temperature	≤ +60° C (*)

(*) non-condensing environment



Typical relative diffraction efficiency (rDE) in first diffraction order

Typical efficiency curves are 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. rDE values are based on optical constants of bulk aluminum.

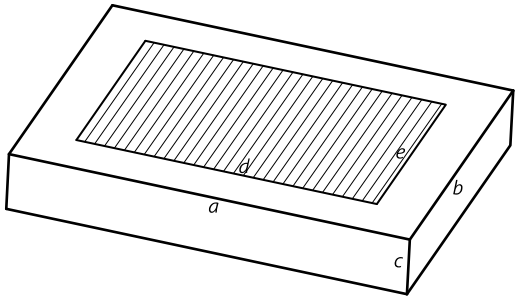
Efficiency curves are only representative and actual values my vary slightly. For wavelength below 190 nm, significant deviations can be expected due to native oxide layer. Specific analysis and/or efficiency-optimized coatings for this wavelength range are available/can be discussed upon request.

Blank specification	
Material	N-BK7 (optical glass)
Protective bevel (all sharp edges)	≤ 0.5 mm
Size Code	263232xx90224 (xx defines size code)
Substrate width	*a*
Substrate length	*b*
Substrate thickness	*c*
Clear aperture	*d x e*

Available Substrate sizes

Size Code	***a x b x c*** *(mm³)*	***d x e*** *(mm²)*
90	15 x 10 x 6	13 x 8
58	19 x 19 x 6	17 x 17
62	40 x 40 x 10	35 x 35
83	60 x 60 x 10	52 x 52
70	70 x 70 x 12	65 x 60
76	75 x 65 x 6	65 x 63

*Other sizes available upon request
*Round substrates also feasible



DIFFRACTION GRATINGS

Rowland circle gratings

Highlighting your spectrometer

Rowland circle gratings for Rowland type spectrometers provide the highest optical quality with excellent resolution, extremely low stray light, good efficiency and accurate groove frequency.

- **Holographically made**
- **Equidistant line spacing**
- **Low stray light**
- **High VUV efficiency**
- **Serial production ready**
- **Available at short notice**

Minimal aberration, maximum application

These gratings are used in mountings based on the Rowland circle, which has a diameter equal to the radius of curvature of the grating. Useful for wide spectral ranges, ZEISS Rowland gratings achieve high resolution with low wavefront aberration and can improve a spectrometer's signal-to-noise-ratio due to low stray light. Optimized for UV applications, they are easy to use and just work when you need them.

Dispersive elements in Rowland circle spectrometers

Rowland gratings are concave gratings designed for the illumination of a Rowland circle. Thus concave diffraction gratings possess both dispersing and imaging properties.
The basic form of imaging gratings is the Rowland circular grating. ZEISS concave gratings are always holographically manufactured and the radii can be selected over a wide range. This means that aperture ratios of up to 1:1 can be achieved. Rowland circle gratings combine imaging properties with UV and VUV spectral range applications to enable the lowest resolution and best signal-to-noise-ratio. ZEISS supports you with customized gratings tailored to your application.

Rowland circle gratings catalogue

Groove density [l/mm]	Dimensions [mm²]	Nominal blaze wavelength [nm]	Catalogue number
3600	Ø 63.5 x 12	170	792050-0000-000
2160	Ø 63.5 x 12	180	792052-0000-000
1440	Ø 63.5 x 12	600	792054-0000-000
3600	Ø 63.5 x 11.8	180	792034-0000-000
3600	Ø 63.5 x 11.8	250	792035-0000-000
3600	Ø 63.5 x 11.8	355	792036-0000-000
2400	Ø 63.5 x 11.8	180	792032-0000-000
2400	Ø 63.5 x 11.8	250	792033-0000-000
1800	Ø 63.5 x 11.8	400	792031-0000-000
1500	Ø 63.5 x 11.8	300	792029-0000-000
1200	Ø 63.5 x 11.8	800	792030-0000-000
3600	Ø 63.5 x 11.8	225	792040-0000-000
2700	Ø 40 x 12.2	220	792039-9901-000
1800	Ø 63.5 x 11.8	600	792045-0000-000
1400	Ø 40 x 12.2	650	792057-0000-000
3600	Ø 80 x 15	180	792048-0000-000
2400	Ø 50 x 9.3	180	792044-0000-000
2400	Ø 35 x 12.1	180	000000-1990-229
1800	Ø 50 x 9.3	505	792055-0000-000
3600	Ø 40 x 8	220	792104-0000-000
1200	64 x 64 x 8	225	792006-0000-000
3600	Ø 32 x 7.05	250	792061-0000-000

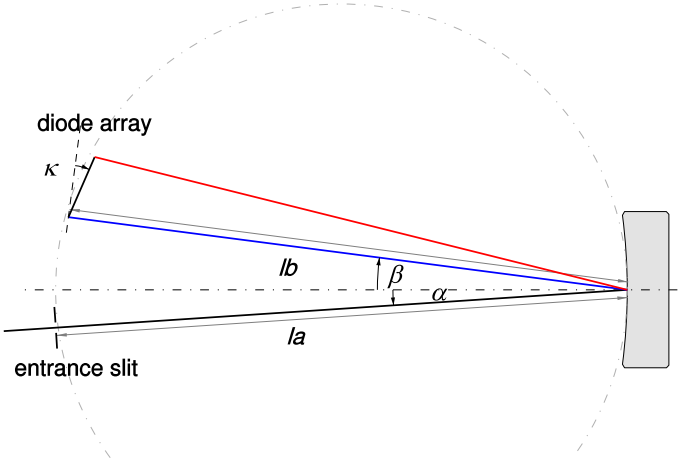
Concave Grating
Polychromator Mounting

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.

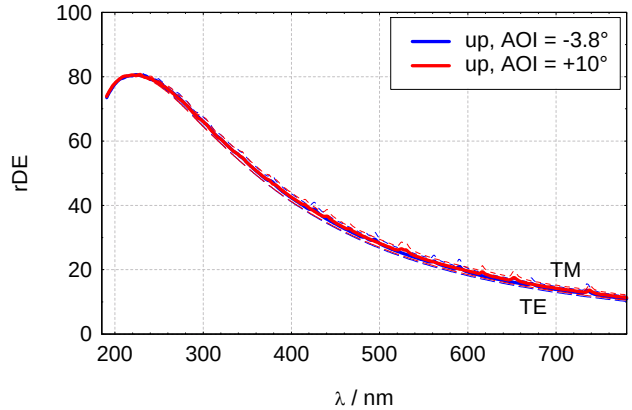
Optical grating characteristics

Diffraction efficiency (unpolarized @ cAD = 32°)

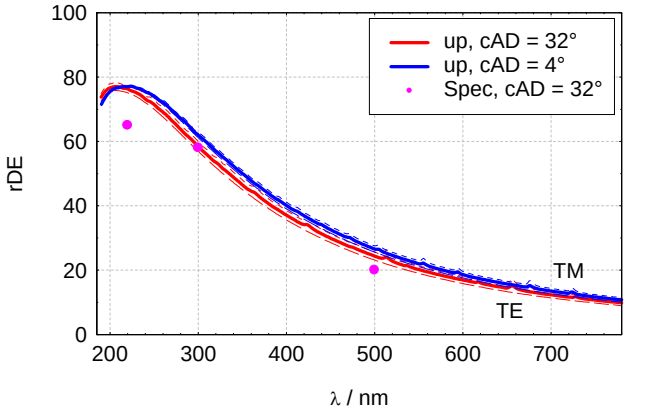
220 nm	≥ 65 %
300 nm	≥ 58 %
500 nm	≥ 20 %

Typical relative diffraction efficiency (rDE) in first diffraction order

fixed angle of incidence (AOI, polychromator) mounting



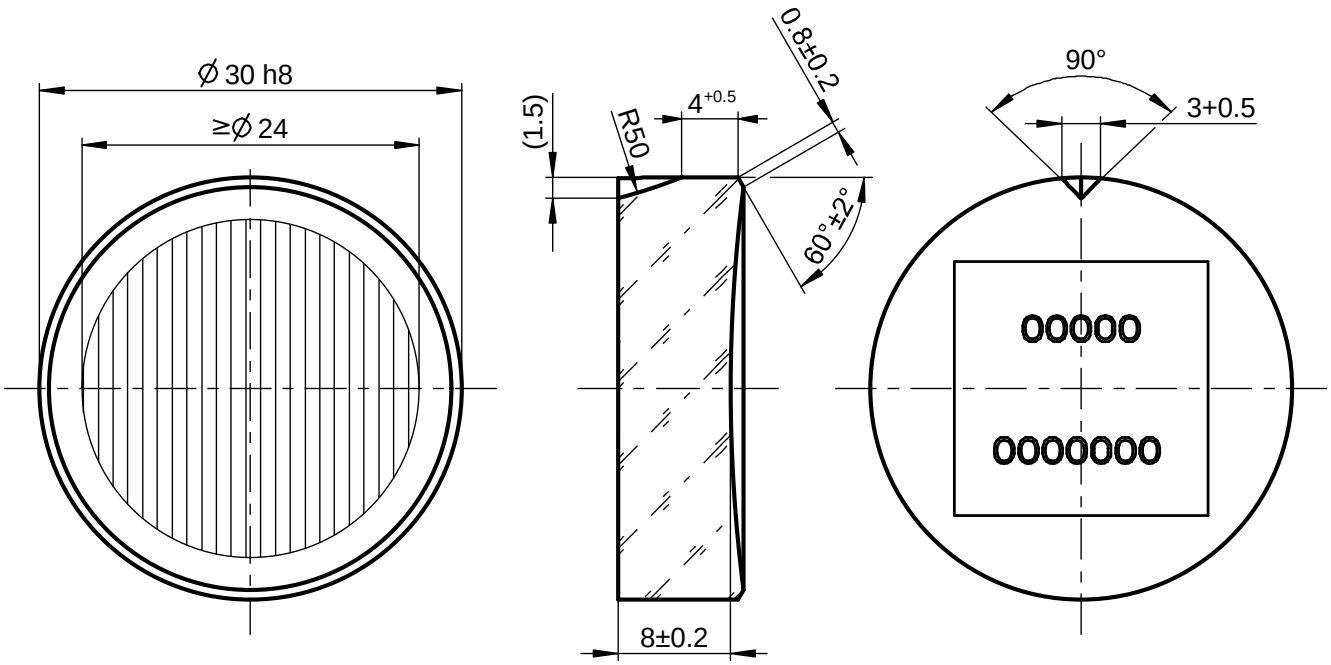
constant angle of deviation (cAD, monochromator) mounting



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 α	-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	
	λ = 200 nm	λ = 550 nm	λ = 200 nm	λ = 800 nm
Focal distance l_B	108.23 mm		122.4 mm	
Diffraction angle β	7.4°	14.0°	-6.3°	4.7°
Tilt angle k of the detector array	-16.1°		-7.9°	

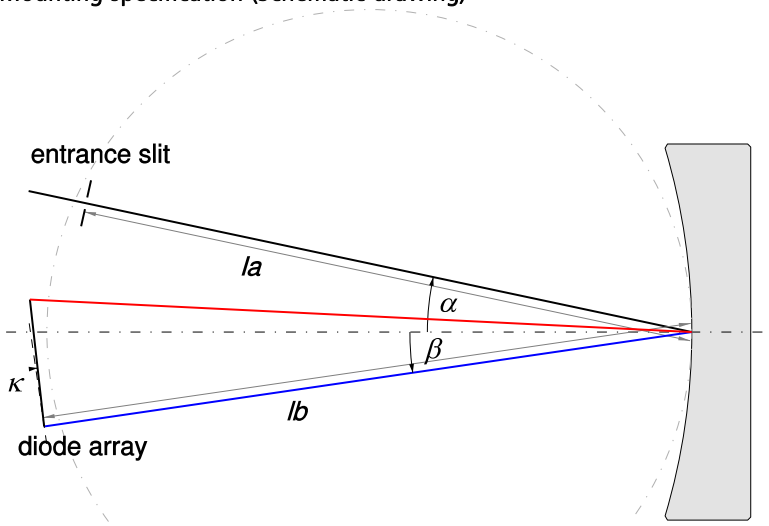
Concave Grating
Polychromator Mounting

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.

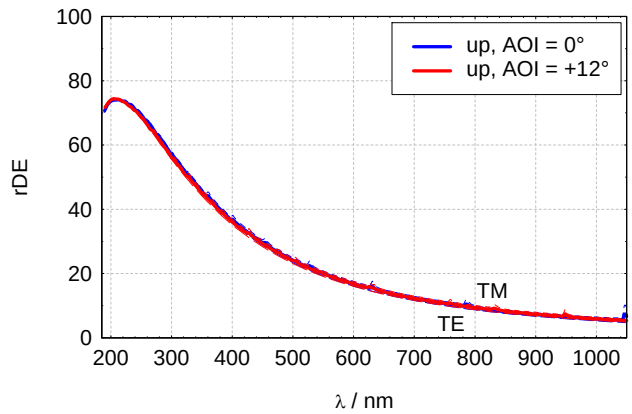
Optical grating characteristics

Diffraction efficiency (unpolarized @ cAD = 32°)

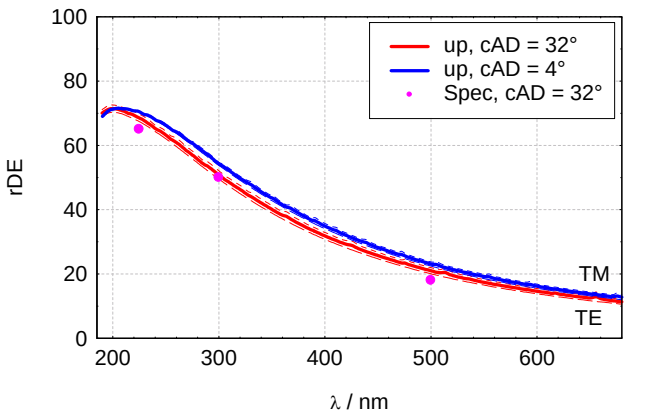
225 nm	≥ 65 %
300 nm	≥ 50 %
500 nm	≥ 18 %

Typical relative diffraction efficiency (rDE) in first diffraction order

fixed angle of incidence (AOI, polychromator) mounting



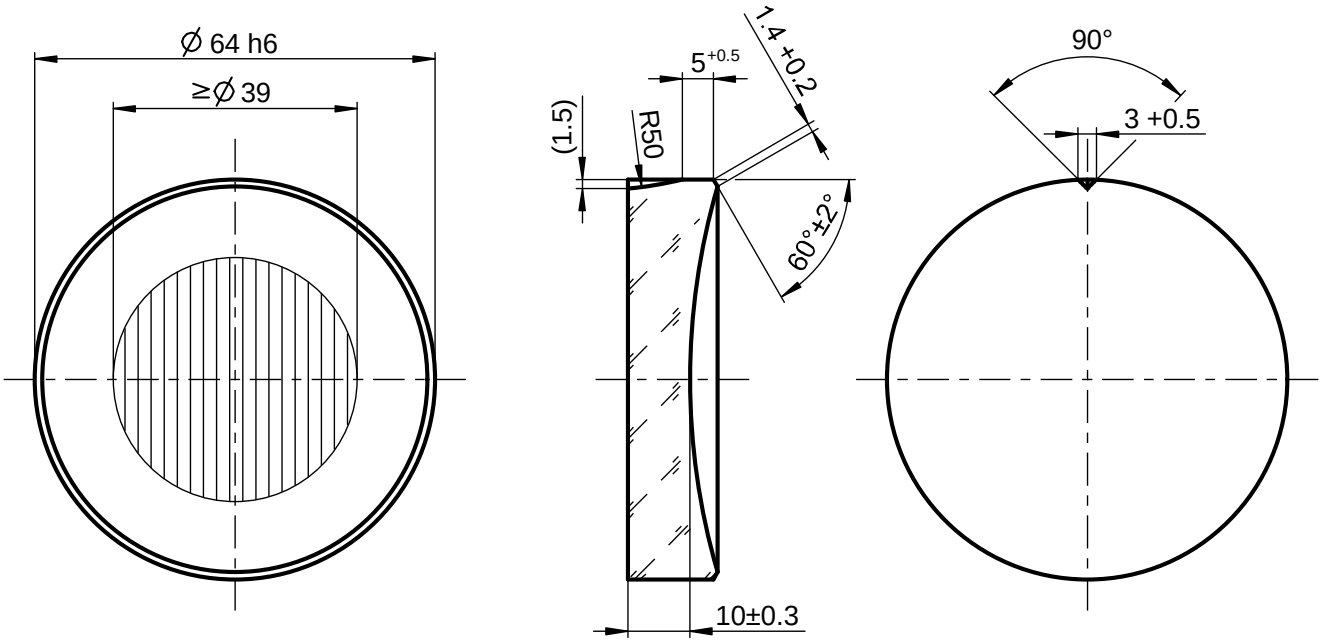
constant angle of deviation (cAD, monochromator) mounting



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 α	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	
	λ = 200 nm	λ = 800 nm	λ = 700 nm	λ = 1050 nm
Focal distance l_B	111.4 mm		104.1 mm	
Diffraction angle β	-8.3°	2.8°	12.2°	18.9°
Tilt angle k of the detector array	-1.9°		-18.1°	

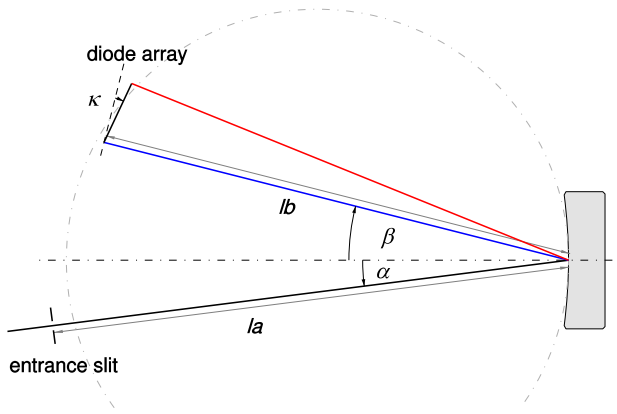
Concave Grating
Polychromator & Monochromator Mounting

Order number 264510-2951-324

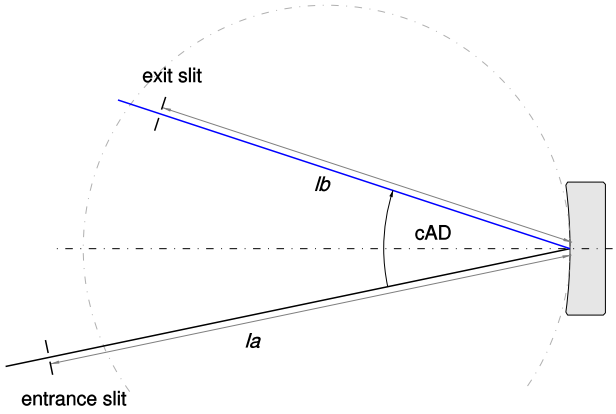
Grating specification

Groove density	600 ± 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)



Polychromator mounting



Monochromator mounting

By historic convention clockwise incident and diffraction angles are positive.

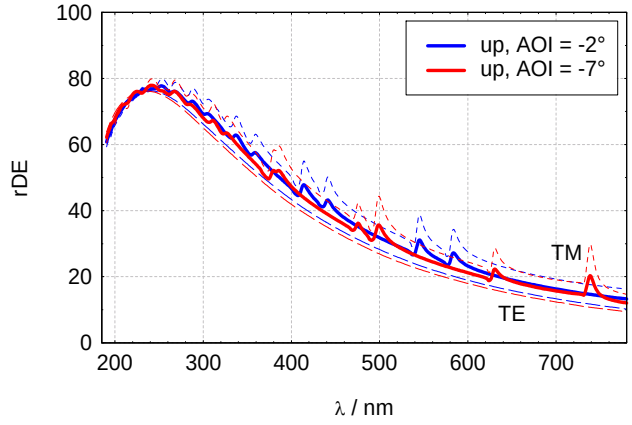
Optical grating characteristics

Diffraction efficiency (unpolarized @ cAD = 32°)

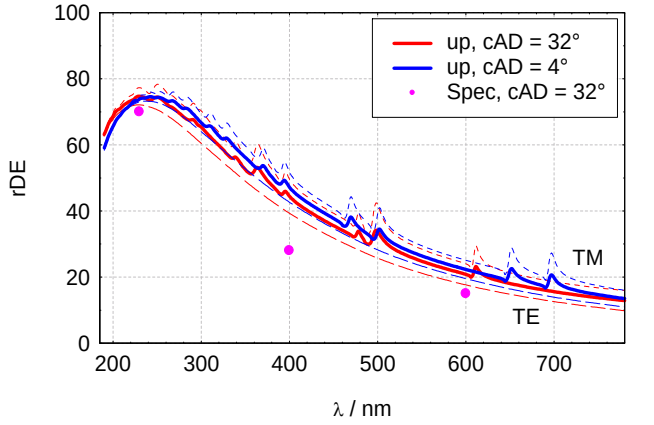
230 nm	≥ 70 %
400 nm	≥ 28 %
600 nm	≥ 15 %

Typical relative diffraction efficiency (rDE) in first diffraction order

fixed angle of incidence (AOI, polychromator) mounting



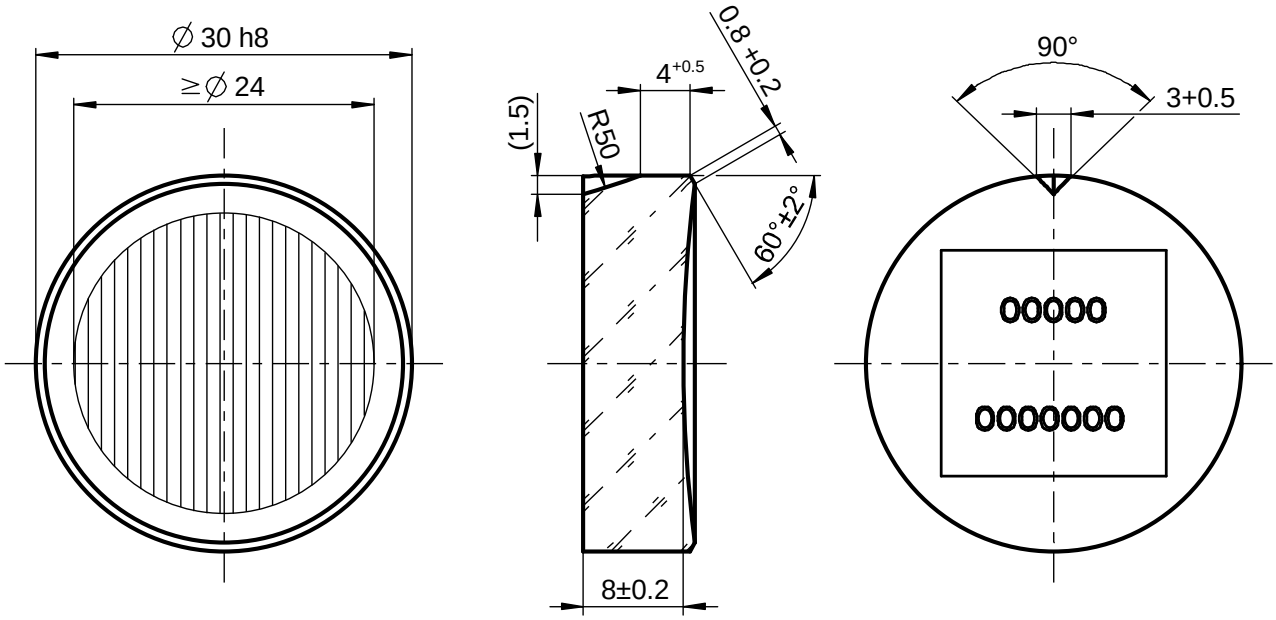
constant angle of deviation (cAD, monochromator) mounting



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



	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 α	-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		—
	λ = 200 nm	**λ = 415 nm**	**λ = 200 nm**	**λ = 800 nm**	**λ = 200 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 β	14.24°	22.03°	8.9°	30.99°	—
Tilt angle k of the detector array	-10.95°		-16.53°		—

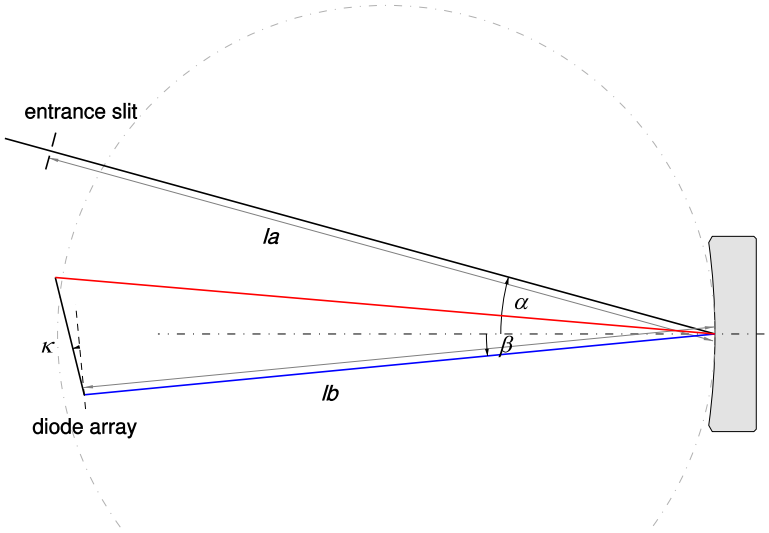
Concave Grating
Polychromator Mounting

Order number 000000-2336-884

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)



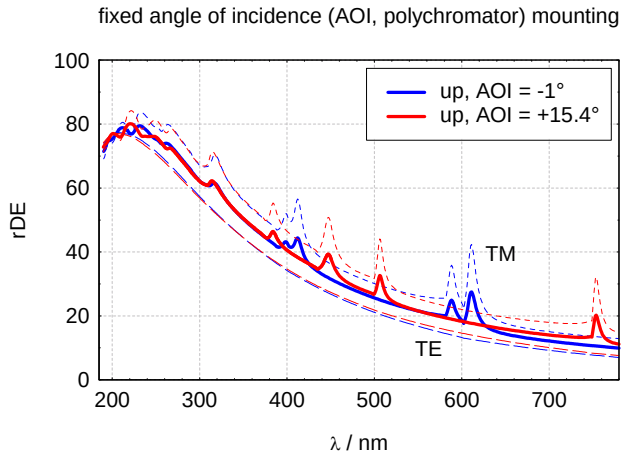
By historic convention clockwise incident and diffraction angles are positive.

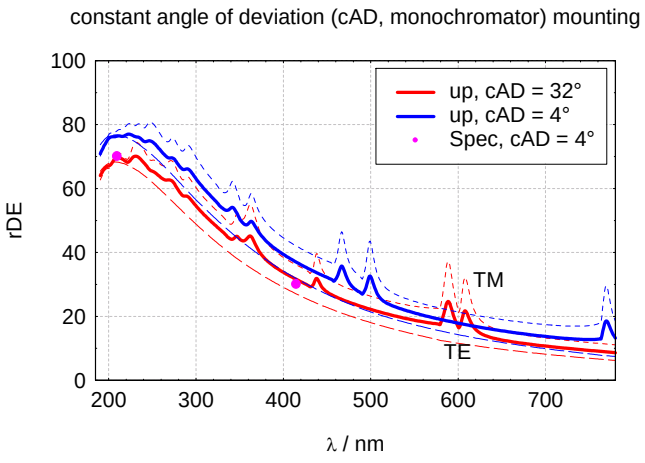
Optical grating characteristics

Diffraction efficiency (unpolarized @ cAD = 4°)

210 nm	≥ 70 %
415 nm	≥ 30 %

Typical relative diffraction efficiency (rDE) in first diffraction order

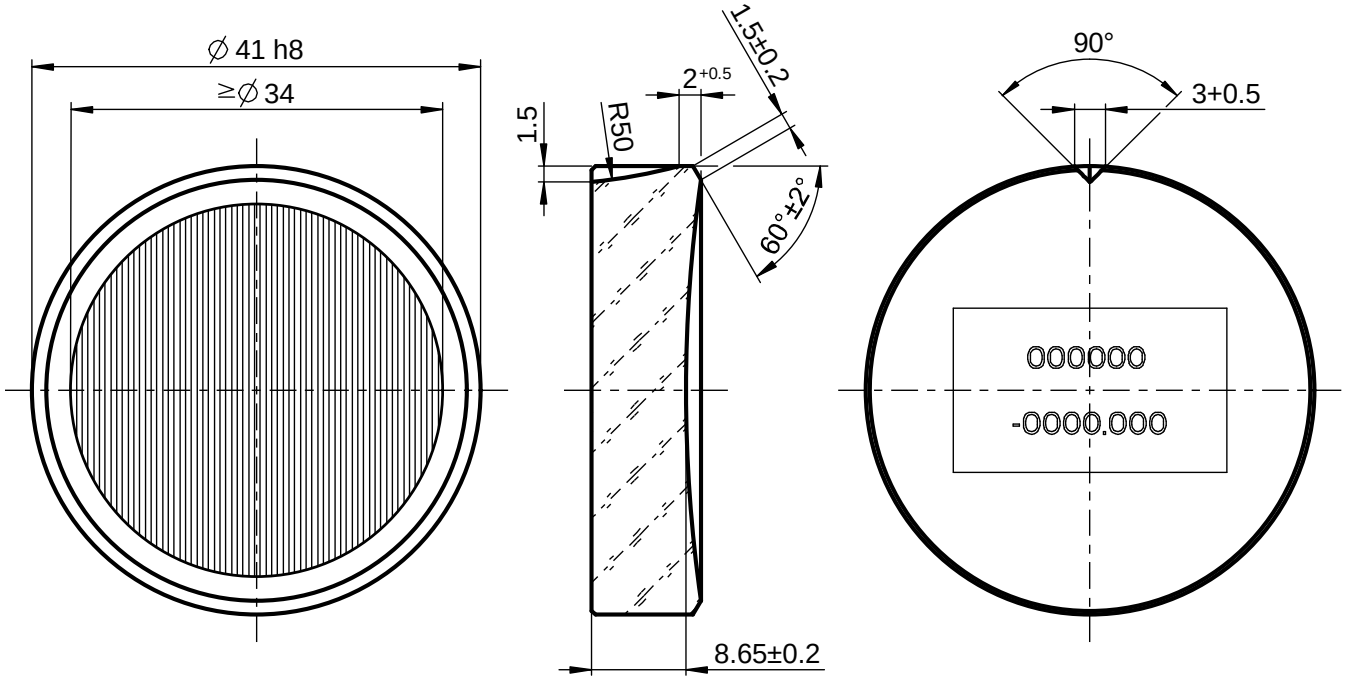




Typical efficiency curves based on rigorous electromagnetic modeling using measured AFM profiles. rDE refers to the ratio between diffracted power from the grating and reflected power from a mirror coated with the same material.

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 α	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	
	λ = 200 nm	**λ = 415 nm**	**λ = 200 nm**	**λ = 800 nm**
Focal distance l_B	133.1 mm	—	193.1 mm	—
Diffraction angle β	-5.5°	4.9°	10.7°	43.9°
Tilt angle k **of the detector array**	8.4°	—	-0.4°	—

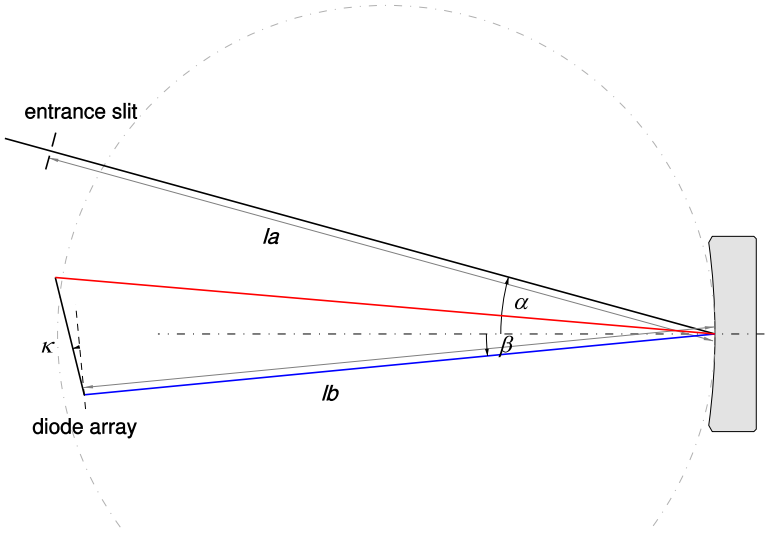
Concave Grating
Polychromator Mounting

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)



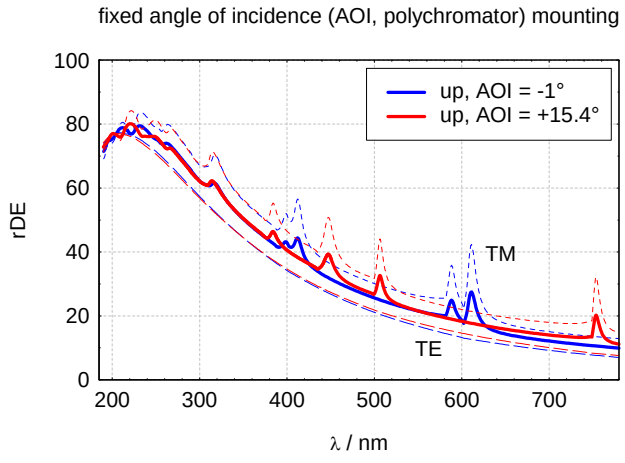
By historic convention clockwise incident and diffraction angles are positive.

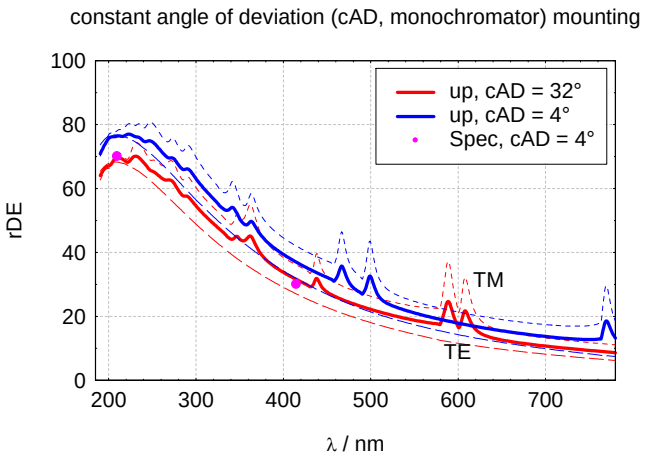
Optical grating characteristics

Diffraction efficiency (unpolarized @ cAD = 4°)

210 nm	≥ 70 %
415 nm	≥ 30 %

Typical relative diffraction efficiency (rDE) in first diffraction order

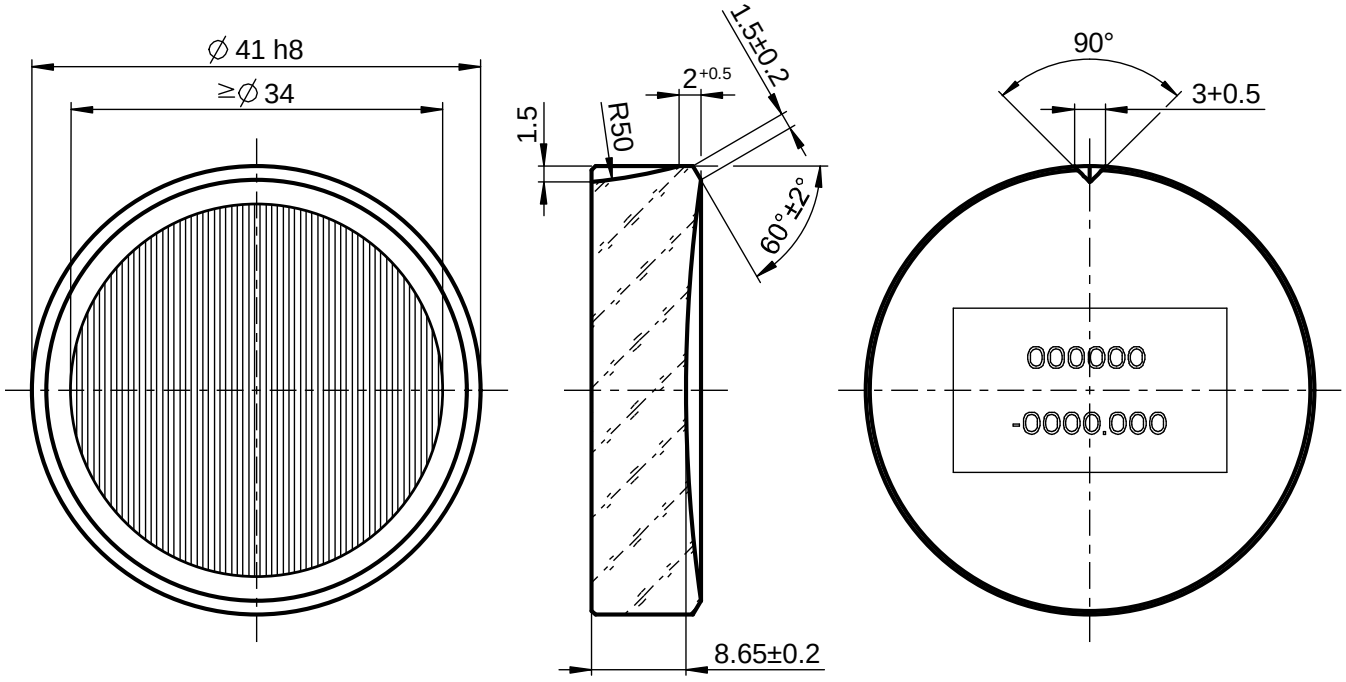




Typical efficiency curves based on rigorous electromagnetic modeling using measured AFM profiles. rDE refers to the ratio between diffracted power from the grating and reflected power from a mirror coated with the same material.

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 α	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	
	λ = 200 nm	**λ = 415 nm**	**λ = 200 nm**	**λ = 800 nm**
Focal distance l_B	133.1 mm	—	193.1 mm	—
Diffraction angle β	-5.5°	4.9°	10.7°	43.9°
Tilt angle k **of the detector array**	8.4°	—	-0.4°	—

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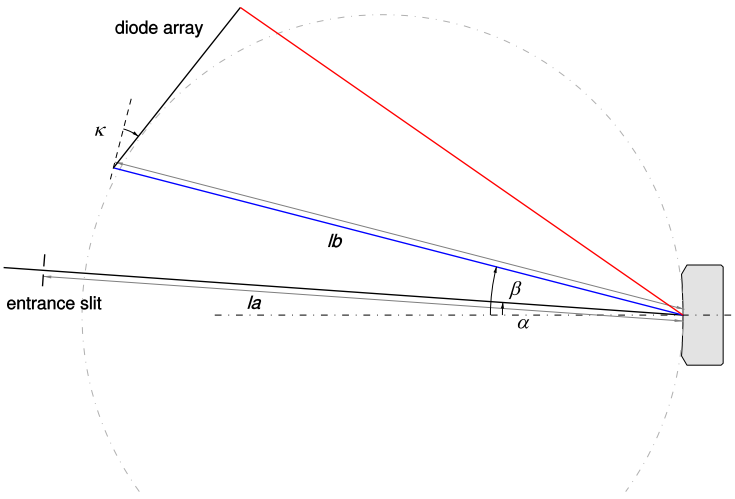
Concave Grating
Polychromator Mounting

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.

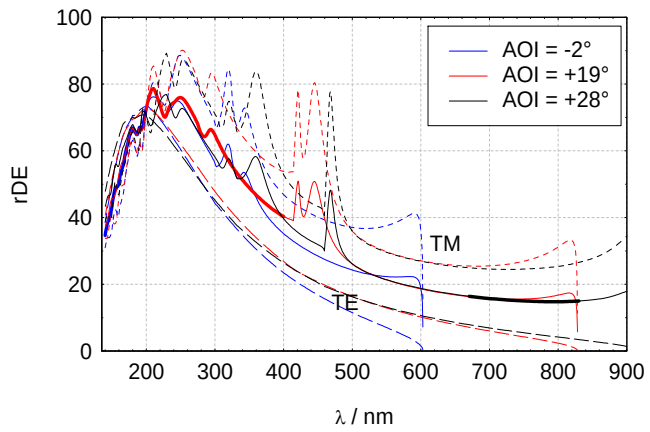
Optical grating characteristics

Diffraction efficiency (unpolarized @ cAD = 32°)

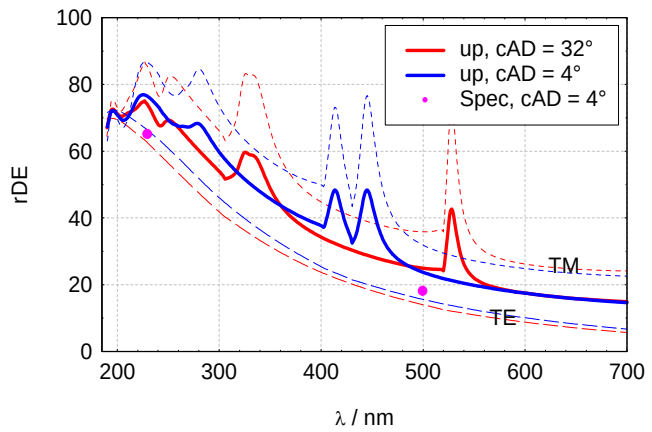
230 nm	≥ 65 %
500 nm	≥ 18 %

Typical relative diffraction efficiency (rDE) in first diffraction order

fixed angle of incidence (AOI, polychromator) mounting



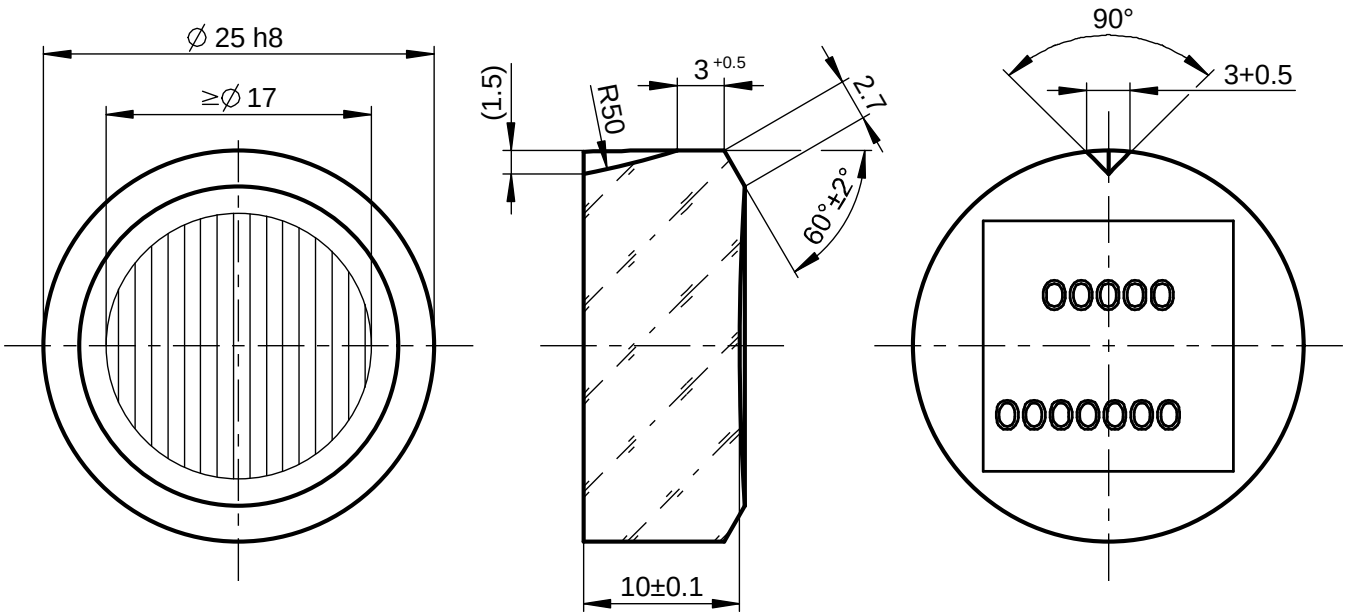
constant angle of deviation (cAD, monochromator) mounting



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) 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 σ	-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	
	λ = 140 nm	**λ = 200 nm**	**λ = 200 nm**	**λ = 400 nm**	**λ = 670 nm**	**λ = 830 nm**
Focal distance l_B	156.6 mm	—	146.6 mm	—	164.8 mm	—
Diffraction angle β	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°	—

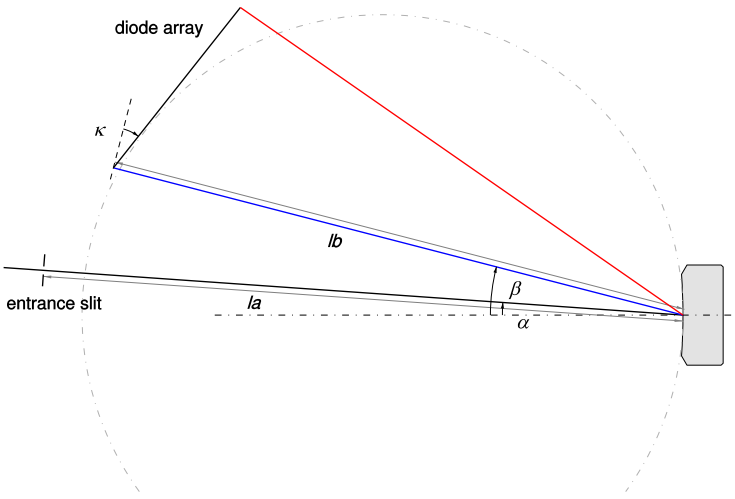
Concave Grating
Polychromator Mounting

Order number 000000-1227-541

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.

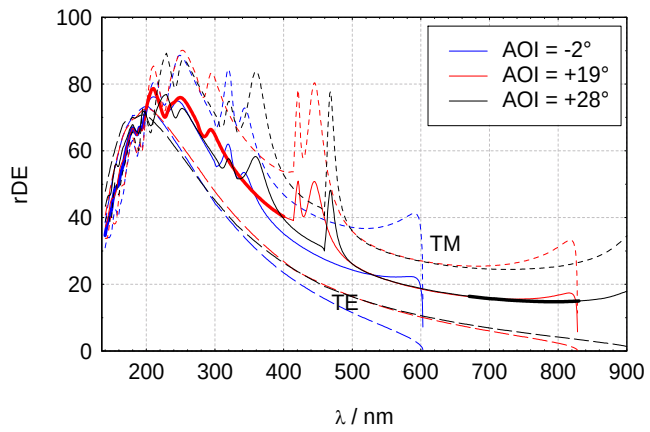
Optical grating characteristics

Diffraction efficiency (unpolarized @ cAD = 32°)

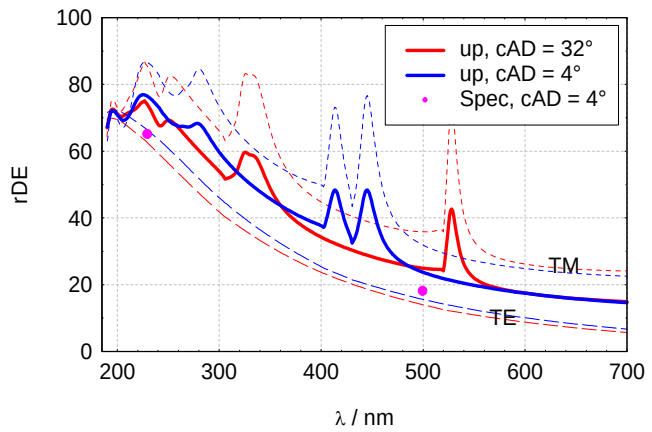
230 nm	≥ 65 %
500 nm	≥ 18 %

Typical relative diffraction efficiency (rDE) in first diffraction order

fixed angle of incidence (AOI, polychromator) mounting



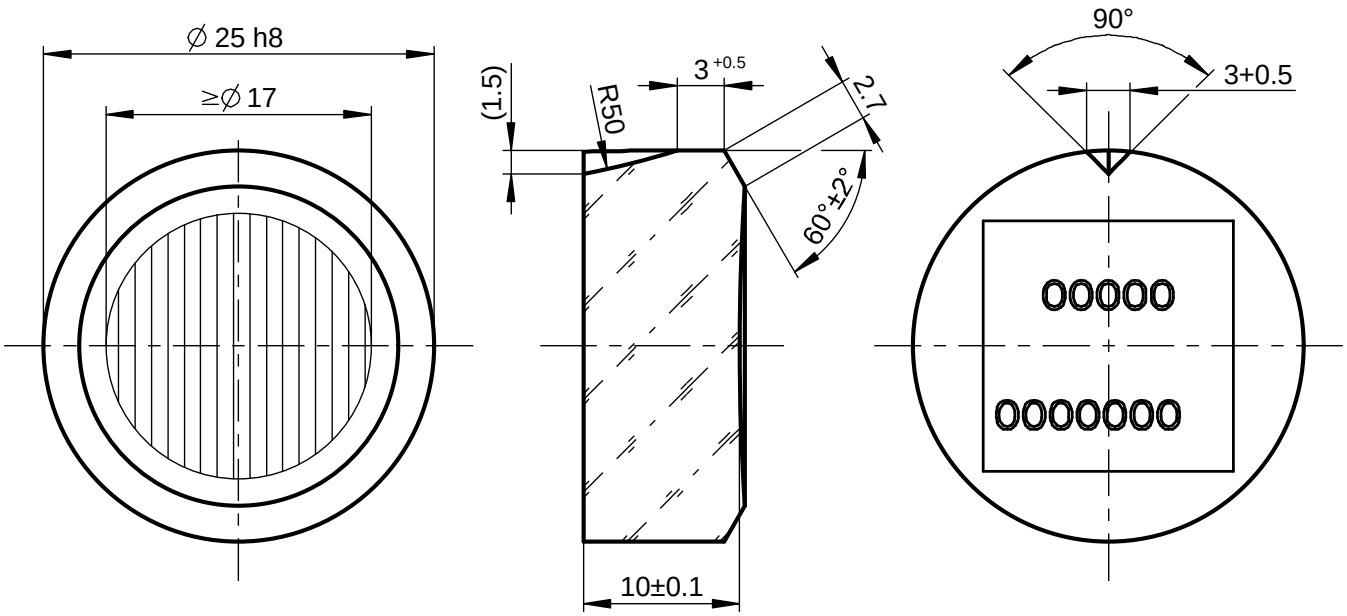
constant angle of deviation (cAD, monochromator) mounting



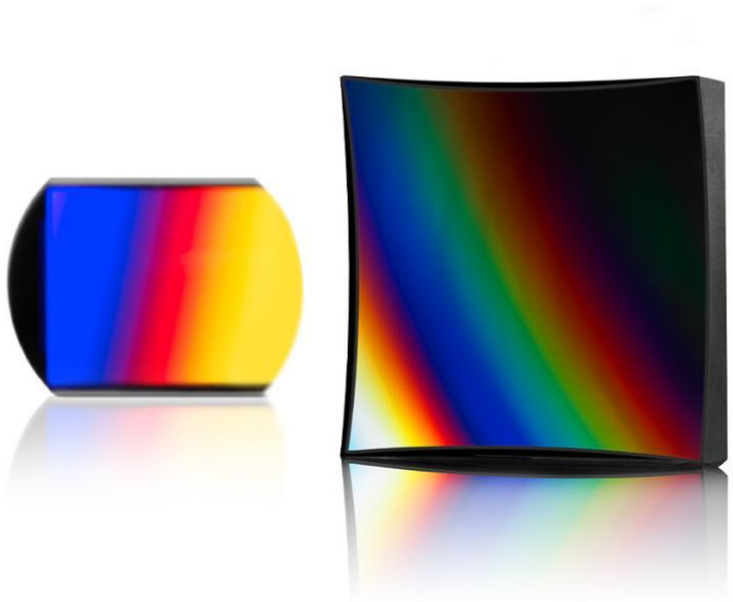
Typical efficiency curves based on rigorous electromagnetic modeling using measured AFM profiles. rDE refers to the ratio between diffracted power from the grating and reflected power from a mirror coated with the same material.

Blank specification

Material	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 α	-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	
	λ = 140 nm	**λ = 200 nm**	**λ = 200 nm**	**λ = 400 nm**	**λ = 670 nm**	**λ = 830 nm**
Focal distance l_B	156.6 mm	—	146.6 mm	—	164.8 mm	—
Diffraction angle β	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°	—

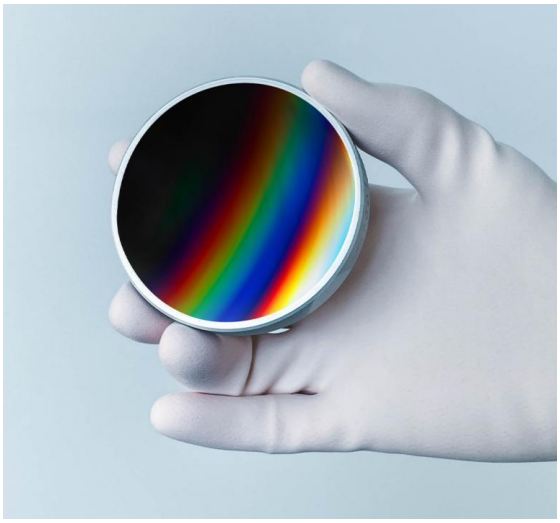


CONCAVE GRATINGS

Mono- & Polychromator gratings One element – two benefits

Mono- & polychromator gratings combine dispersive and imaging properties in a single element. This reduces stray light, which when combined with image correction, optimizes spectrometer performance and the signal-to-noise ratio (SNL). The blaze profile will be applied during the holography ("True Blaze Technology") and especially for curved substrates the blaze profile is aligned to the surface shape.

- **Available at short notice**
- **Holographically made**
- **Low straylight improving SNL ratio of your spectrometer**
- **Optimizes spectrometers**
- **Custom design**



See the benefits in the optical properties

With excellent aberration correction, ZEISS Mono- & Polychromator gratings provide enhanced optical performance. Errors such as astigmatism, spherical aberration and coma are minimized in a wide spectral

range while the focal surface is optimized. Holographically manufactured, a wide range of standard configurations are available and they can also be tailored to your exact specifications. ZEISS blaze technology enables the blaze profile best suited to the substrate shape during holography.

Improving the image

Image correction during holography can optimize imaging on the detector and minimize errors such as astigmatism, spherical aberration or coma for a wide spectral range in your spectrometer. The spectrum split by the grating can then be projected onto a flat receiver such as a one or two-dimensional CCD sensor in high resolution.

This makes it possible to create compact spectrometers with a minimum of components, which provide high resolution and low stray light at the same time.

Depending on the type of optimization, a distinction is generally made between monochromator and polychromator gratings. Monochromator gratings are optimized for a setup with a fixed entrance and exit slit and a grating that can be rotated around a stationary axis. The focus of a monochromator grating does not shift out of the plane of the exit slit during rotation, which, together with reduced aberration, results in greatly improved resolution.

Polychromator gratings are optimized for setups with a fixed position of entrance slit, grating and planar detection device like CCD, PDA and CMOS.

Mono- & Polychromator gratings catalogue

Groove density [l/mm]	Nominal blaze wavelength [nm]	Corrected wavelength range [nm]	Dimensions [mm²] Grating area [mm²]	Radius of curvature [mm]	Mono- (M) / Polychromator (P)	Catalogue number
1900 (blaze)	400	250-650	Ø 64 x 12 Ø 56	207.1	M	264510-2258-824
1864 (sinus)	830	790-880	Ø 64 x 10 Ø 48	168.7	P	264510-2260-624
1600 (blaze)	210	140-830	Ø 25 x 10 Ø 17	149.7	M / P	000000-1227-541
1600 (blaze)	230	200-400	Ø 25 x 10 Ø 17	149.7	P	264510-2951-924
1500 (sinus)	450	330-850	Ø 64 x 12 Ø 56	206.4	M	264510-2257-824
1400 (blaze)	230	200-750	Ø 50 x 10 Ø 46	149.7	M	000000-1390-410
1400 (blaze)	230	220-530	Ø 25 x 10 Ø 18	149.7	P	000000-1312-649
1400 (blaze)	230	190-315	Ø 50 x 10 Ø 46	136.4	M / P	000000-1305-962
1300 (blaze)	230 / 250	200-890	Ø 52 x 10 Ø 25	175.3	M	792102-0001-010
1300 (sinus)	850	340-800	Ø 30 x 8 Ø 24	109.8	M / P	000000-1224-543
1221 (blaze)	230 / 225	185-900	Ø 34 x 7 Ø 27	116.3	M	792012-0000-000
1221 (blaze)	230 / 250	200-250	Ø 50 x 8 Ø 37	163.1	M / P	792005-0000-000
1200 (blaze)	230	180-800	Ø 30 x 8 Ø 24	109.8	M / P	264510-2951-224
1100 (blaze)	230 / 250	190-410	Ø 50 x 10 Ø 20	193.6	P	264510-2953-124
1053 (blaze)	230 / 250	200-1100	Ø 56 x 10 Ø 36 x 30	260.4	M	000000-1321-172
1000 (blaze)	230	200-900	Ø 52 x 10 Ø 36	94.4	M	792101-0001-010
1000 (blaze)	230	190-1100	Ø 50 x 10 Ø 40	193.6	M	264510-2951-724
1000 (blaze)	230	190-850	Ø 64 x 8 Ø 50	192.7	M	264510-2950-824
1000 (blaze)	230	190-400	Ø 50 x 10 Ø 39	193.6	P	264510-2952-424
950 (blaze)	230 / 250	200-415	Ø 32 x 7 Ø 26 / 25	150.7	M / P	792060-0000-000

845 (blaze)	230 / 200	170-410	Ø 41 x 10 Ø 35	138.1	P	264510-2952-924
844 (blaze)	220	200-800	Ø 41 x 9 Ø 34	138.1	M / P	000000-1329-190
844 (blaze)	220	200-800	Ø 41 x 9 Ø 34	138.1	M / P	000000-2336-884
651 (blaze)	230	200-800	Ø 64 x 10 Ø 56	214.8	M / P	264510-2951-124
600 (blaze)	230	180-800	Ø 30 x 8 Ø 24	109.8	M / P	264510-2951-324
527 (blaze)	300	**200-1100**	Ø 56 x 10 Ø 30 x 34	141.3	M	792024-0000-000
355 (sinus)	1800	1400-2400	Ø 64 x 8.1 Ø 50	119.1	P	264510-2260-924
324 (sinus)	380 / 290	190-510	Ø 67 x 10 Ø 57	160.8	P	792017-0000-000
320 (blaze)	230	200-900	Ø 64 x 12 Ø 39	109.8	P	264510-2952-624
320 (blaze)	230	200-800	Ø 30 x 8 Ø 26	109.8	P	264510-2952-724
258 (blaze)	230 / 250	190-600	Ø 34 x 7 Ø 27	116.3	P	792011-0000-000
250 (blaze)	230 / 250	375-750	Ø 34 x 7 Ø 28	116.3	P	792004-0000-000
200 (blaze)	230	200-415	Ø 64 x 10 Ø 50	180.3	P	264510-2950-324
163 (sinus)	560	470-1100	Ø 67 x 10 Ø 57	160.8	P	792015-0000-000
157 (blaze)	230	200-900	Ø 50 x 10 Ø 35	163.1	P	000000-1077-583
148.8 (blaze)	230	200-1100	Ø 64 x 10 Ø 30	181.5	P	000000-1996-915
100 (blaze)	230	190-820	Ø 64 x 10 Ø 50	181.5	P	264510-2952-224

Seeing beyond

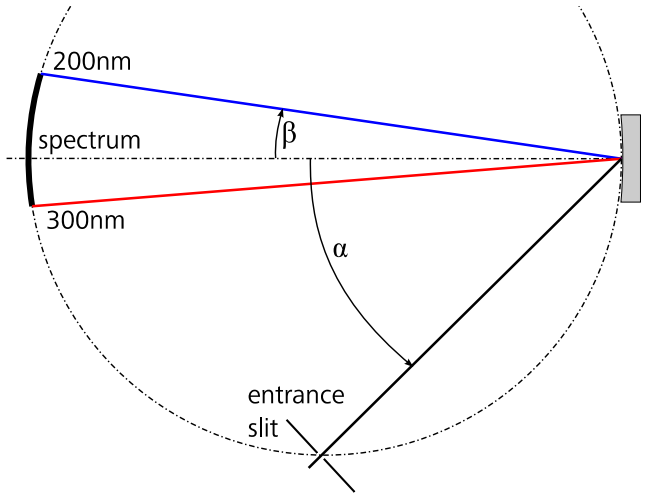
Concave Grating

Rowland Circle Mounting
Order number 792033-0000-000

Grating specification	
Groove density	2400 +/- 4 l/mm
Groove profile	Sinusoidal
Diffraction grating area	≥ Ø 58 mm
Substrate size	Ø 63,5x11,8 mm²
Reflective coating	Aluminium (unprotected)
Grating master type	Holographically recorded
Grating type	Epoxy replica (copy)
Storage and transport temperature	-40 °C … +70 °C (non-condensing environment) (*)
Operating temperature	≤ +60° C (*)

(*) non-condensing environment

Mounting specification (schematic drawing)



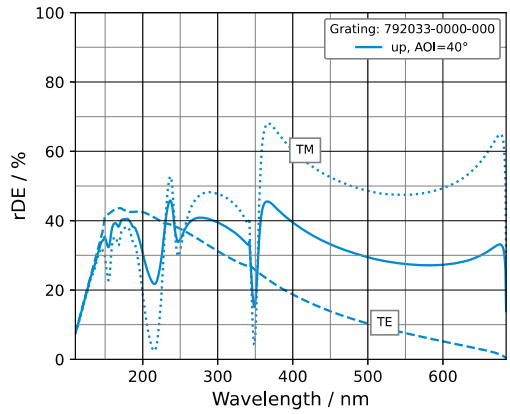
By historic convention clockwise incident and diffraction angles are positive

Optical grating characteristics

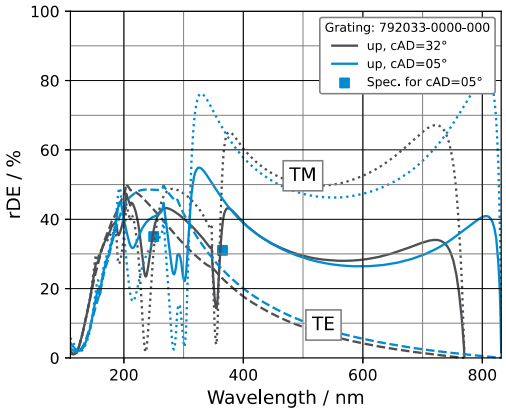
Diffraction efficiency (unpolarized @ cAD = 5°)

250 nm	≥ 35 %
365 nm	≥ 31 %

Typical relative diffraction efficiency (rDE) in first diffraction order



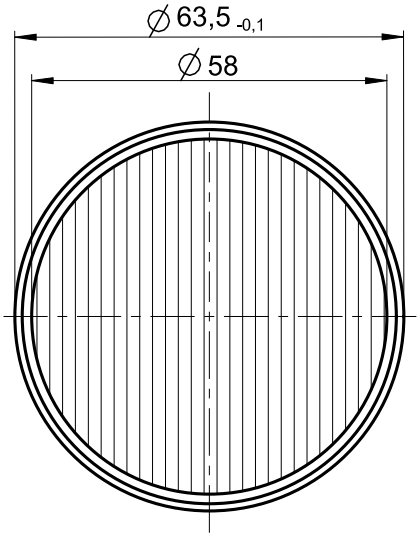
fixed angle of incidence α (AOI) polychromator mounting

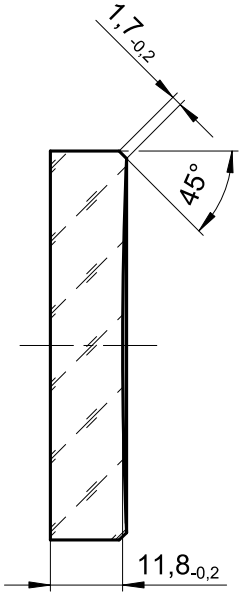


Constant angle of deviation α + β = const. (cAD) monochromator mounting

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	Zerodur
Radius of curvature	749.9 mm
Protective bevel (left surface)	>0.5 mm





Seeing beyond

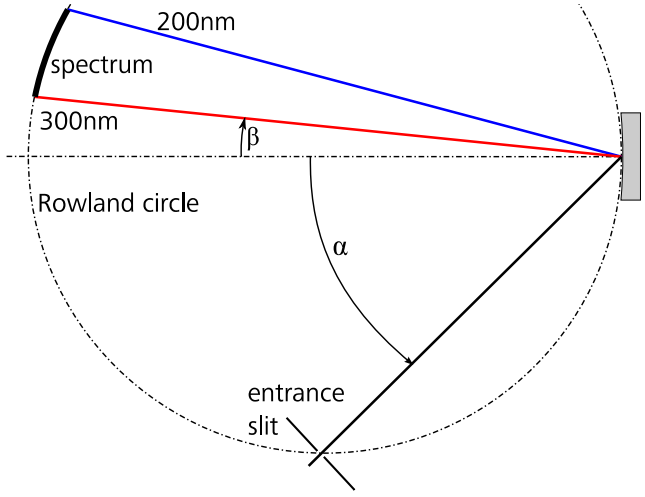
Concave Grating

Rowland Circle Mounting
Order number 792055-0000-000

Grating specification	
Groove density	1800 +/- 0.5 l/mm
Groove profile	Sinusoidal
Diffraction grating area	≥ Ø 44 mm
Substrate size	Ø 50x9.3 mm²
Reflective coating	Aluminium (unprotected)
Grating master type	Holographically recorded
Grating type	Epoxy replica (copy)
Storage and transport temperature	-40 °C … +70 °C (non-condensing environment) (*)
Operating temperature	≤ +60° C (*)

(*) non-condensing environment

Mounting specification (schematic drawing)



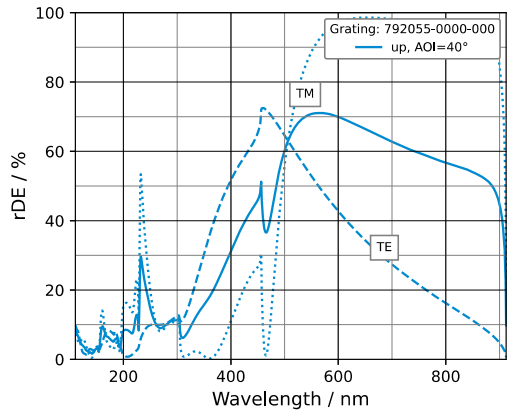
By historic convention clockwise incident and diffraction angles are positive

Optical grating characteristics

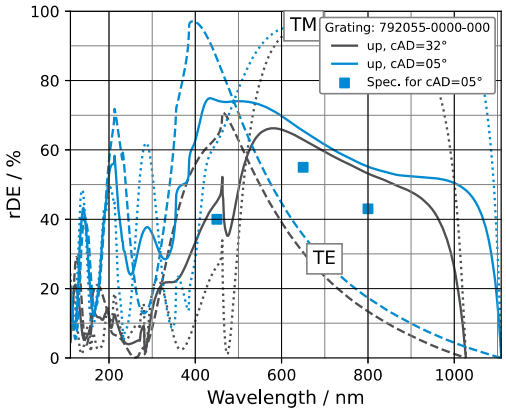
Diffraction efficiency (unpolarized @ cAD = 32°)

450 nm	≥ 40 %
650 nm	≥ 55 %
800 nm	≥ 43 %

Typical relative diffraction efficiency (rDE) in first diffraction order



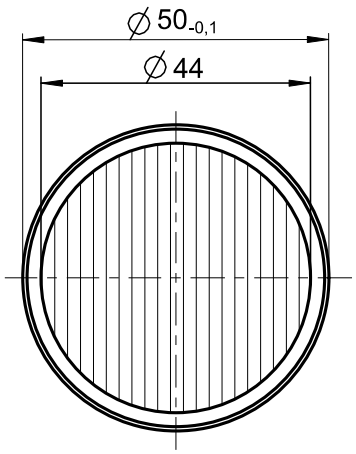
fixed angle of incidence α (AOI) polychromator mounting

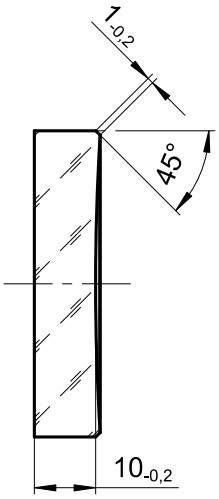


Constant angle of deviation α + β = const. (cAD) monochromator mounting

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	ZKN7
Radius of curvature	398.8 mm
Protective bevel (left surface)	>0.5 mm





Seeing beyond

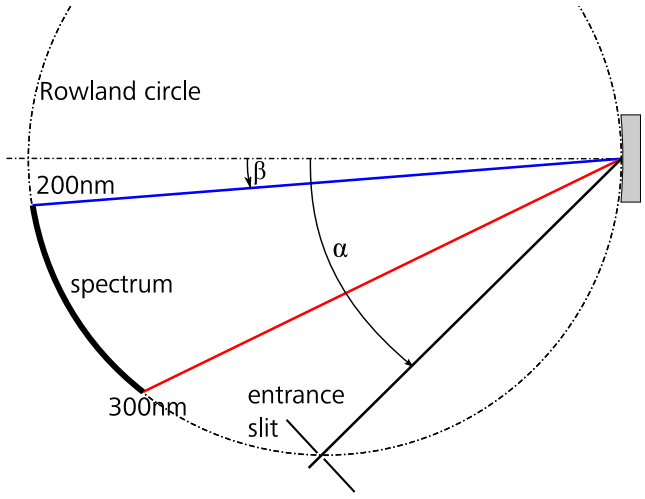
Concave Grating

Rowland Circle Mounting
Order number 792048-0000-000

Grating specification	
Groove density	3600 +/- 5 l/mm
Groove profile	Sinusoidal
Diffraction grating area	≥ Ø 70 mm
Substrate size	Ø 80x15 mm²
Reflective coating	Aluminium (unprotected)
Grating master type	Holographically recorded
Grating type	Epoxy replica (copy)
Storage and transport temperature	-40 °C … +70 °C (non-condensing environment) (*)
Operating temperature	≤ +60° C (*)

(*) non-condensing environment

Mounting specification (schematic drawing)



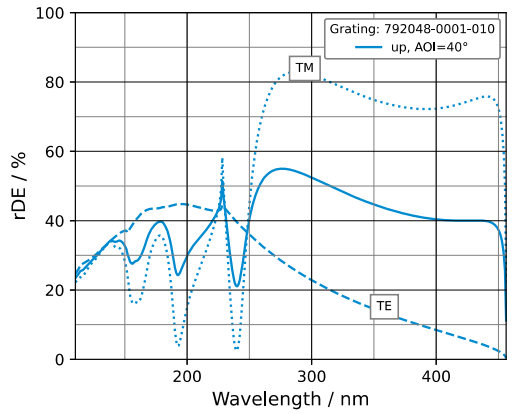
By historic convention clockwise incident and diffraction angles are positive

Optical grating characteristics

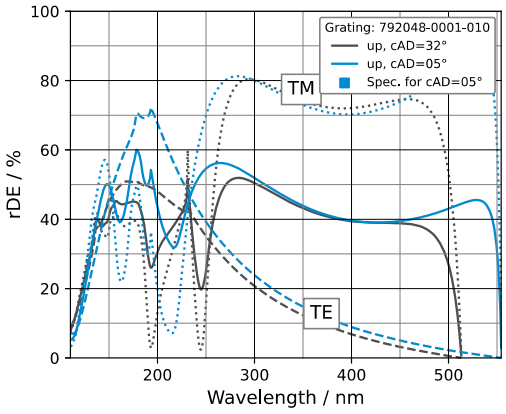
Diffraction efficiency (unpolarized @ fehlt)

fehlt

Typical relative diffraction efficiency (rDE) in first diffraction order



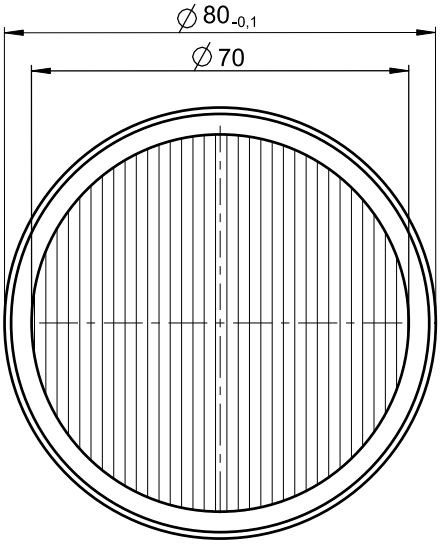
fixed angle of incidence α (AOI) polychromator mounting

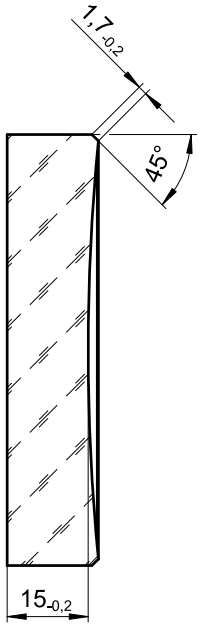


Constant angle of deviation α + β = const. (cAD) monochromator mounting

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	Zerodur
Radius of curvature	398.8 mm
Protective bevel (left surface)	>0.5 mm





Seeing beyond

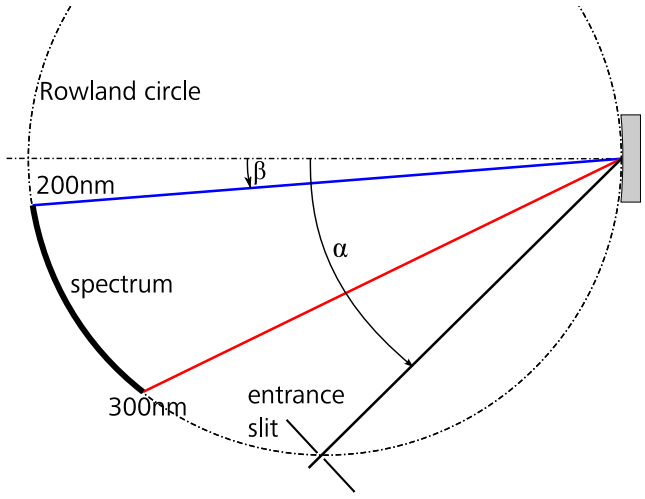
Concave Grating

Rowland Circle Mounting
Order number 792040-0000-000

Grating specification	
Groove density	3600 +/- 5 l/mm
Groove profile	Sinusoidal
Diffraction grating area	≥ Ø 70 mm
Substrate size	Ø 80x15 mm²
Reflective coating	Aluminium (unprotected)
Grating master type	Holographically recorded
Grating type	Epoxy replica (copy)
Storage and transport temperature	-40 °C … +70 °C (non-condensing environment) (*)
Operating temperature	≤ +60° C (*)

(*) non-condensing environment

Mounting specification (schematic drawing)



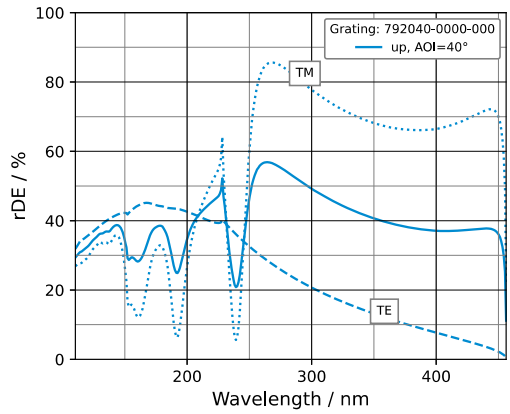
By historic convention clockwise incident and diffraction angles are positive

Optical grating characteristics

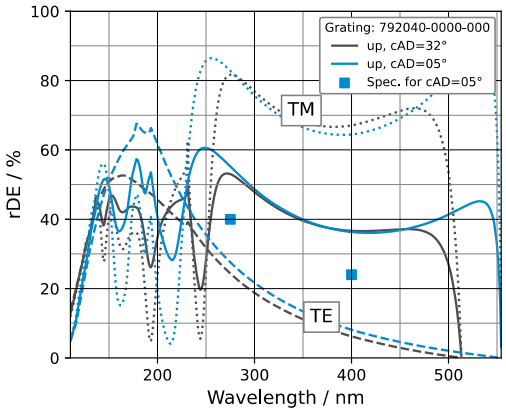
Diffraction efficiency (unpolarized @ cAD = 5°)

275 nm	≥ 40 %
400 nm	≥ 24 %

Typical relative diffraction efficiency (rDE) in first diffraction order



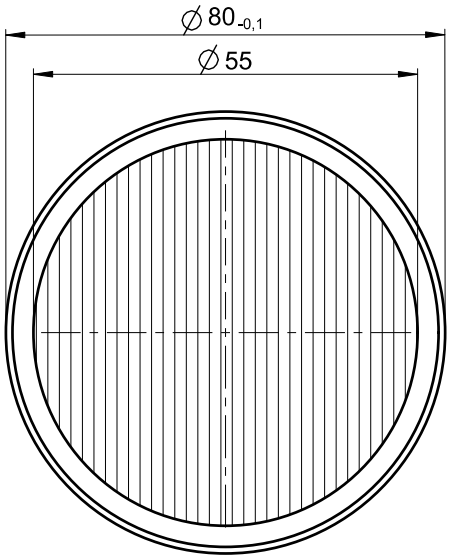
fixed angle of incidence α (AOI) polychromator mounting

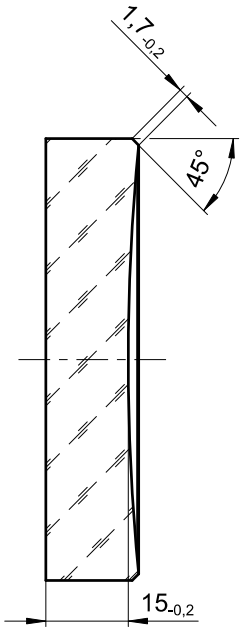


Constant angle of deviation α + β = const. (cAD) monochromator mounting

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	Zerodur
Radius of curvature	501.2 mm
Protective bevel (left surface)	>0.5 mm





Seeing beyond

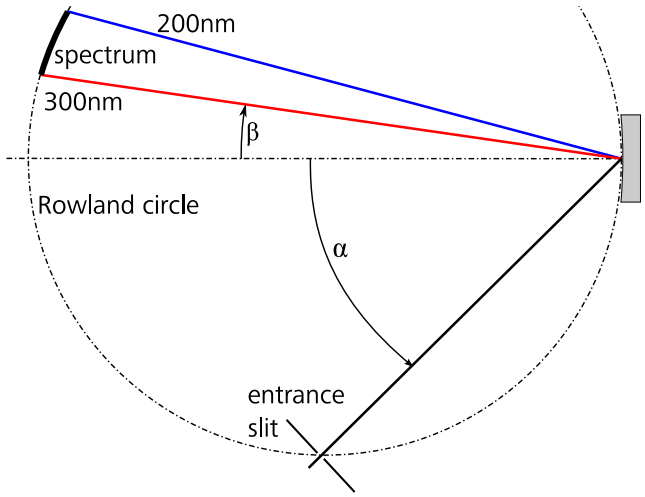
Concave Grating

Rowland Circle Mounting
Order number 792030-0000-000

Grating specification	
Groove density	1200 +/- 1 l/mm
Groove profile	Sinusoidal
Diffraction grating area	≥ Ø 58 mm
Substrate size	Ø 63,5x11,8 mm²
Reflective coating	Aluminium (unprotected)
Grating master type	Holographically recorded
Grating type	Epoxy replica (copy)
Storage and transport temperature	-40 °C … +70 °C (non-condensing environment) (*)
Operating temperature	≤ +60° C (*)

(*) non-condensing environment

Mounting specification (schematic drawing)



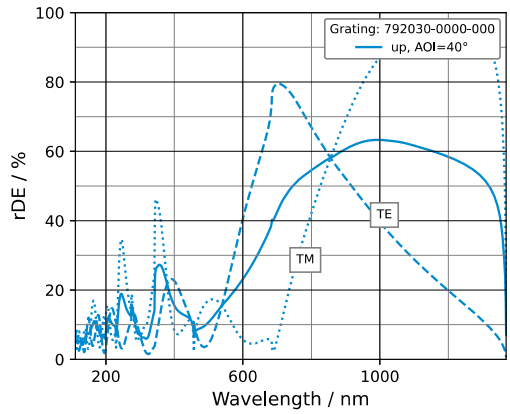
By historic convention clockwise incident and diffraction angles are positive

Optical grating characteristics

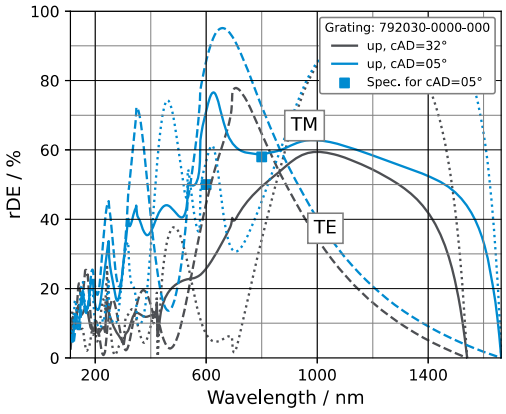
Diffraction efficiency (unpolarized @ cAD = 5°)

600 nm	≥ 50 %
800 nm	≥ 58 %

Typical relative diffraction efficiency (rDE) in first diffraction order



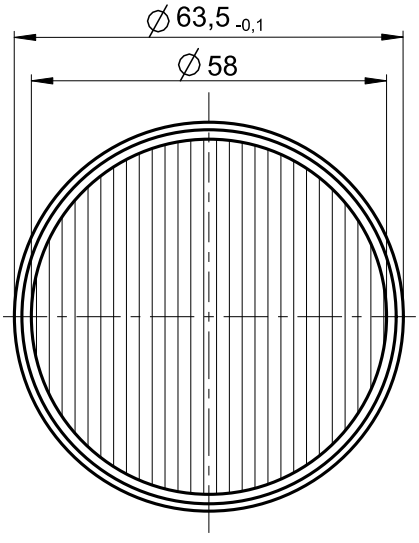
fixed angle of incidence α (AOI) polychromator mounting

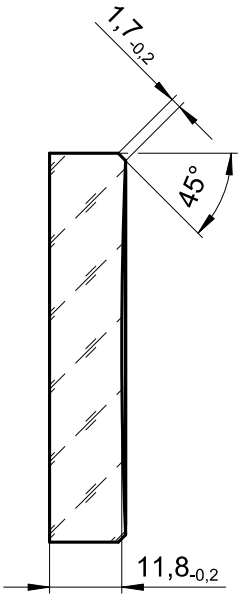


Constant angle of deviation α + β = const. (cAD) monochromator mounting

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	Zerodur
Radius of curvature	749.9 mm
Protective bevel (left surface)	>0.5 mm





Seeing beyond

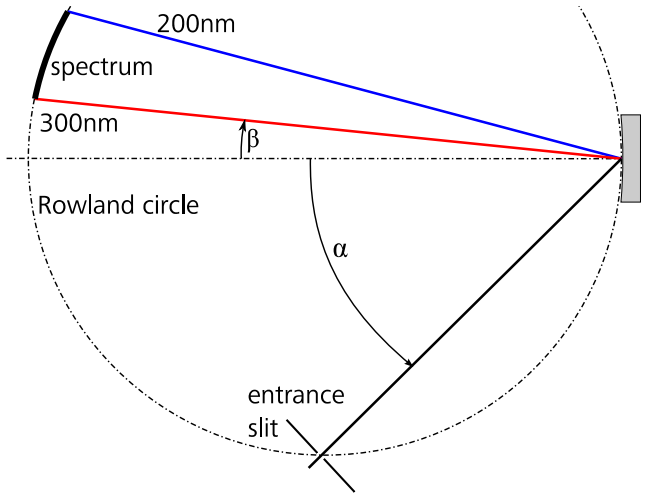
Concave Grating

Rowland Circle Mounting
Order number 792031-0000-000

Grating specification	
Groove density	1800 +/- 2 l/mm
Groove profile	Sinusoidal
Diffraction grating area	≥ Ø 58 mm
Substrate size	Ø 63,5x11,8 mm²
Reflective coating	Aluminium (unprotected)
Grating master type	Holographically recorded
Grating type	Epoxy replica (copy)
Storage and transport temperature	-40 °C … +70 °C (non-condensing environment) (*)
Operating temperature	≤ +60° C (*)

(*) non-condensing environment

Mounting specification (schematic drawing)



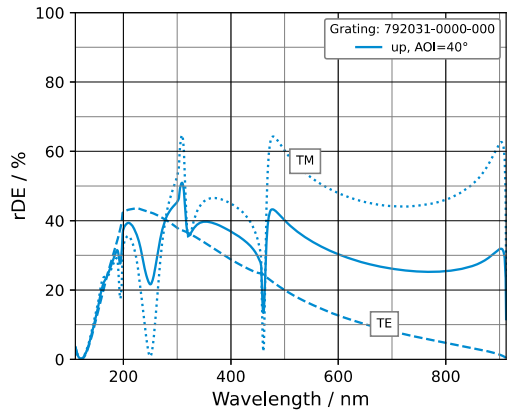
By historic convention clockwise incident and diffraction angles are positive

Optical grating characteristics

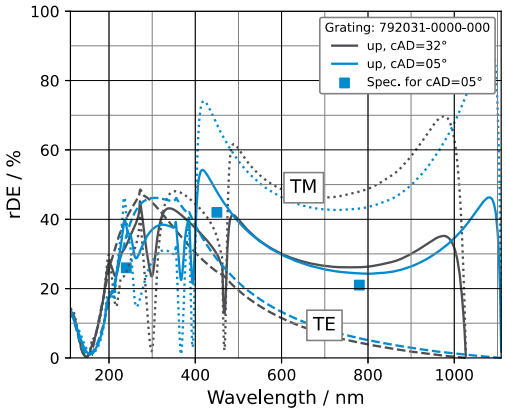
Diffraction efficiency (unpolarized @ cAD = 5°)

240 nm	≥ 26 %
450 nm	≥ 42 %
780 nm	≥ 21 %

Typical relative diffraction efficiency (rDE) in first diffraction order



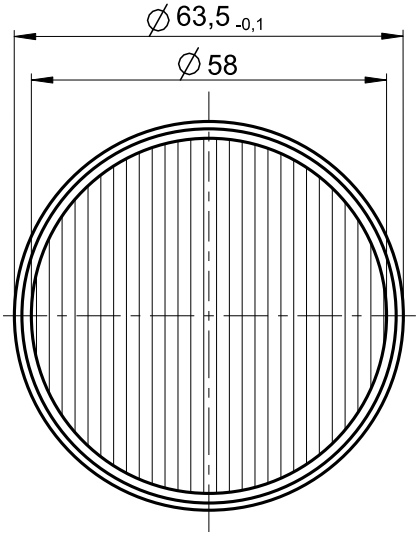
fixed angle of incidence α (AOI) polychromator mounting

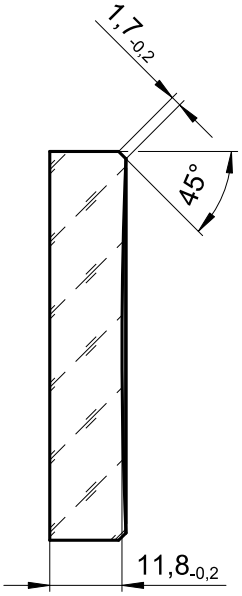


Constant angle of deviation α + β = const. (cAD) monochromator mounting

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	Zerodur
Radius of curvature	749.9 mm
Protective bevel (left surface)	>0.5 mm





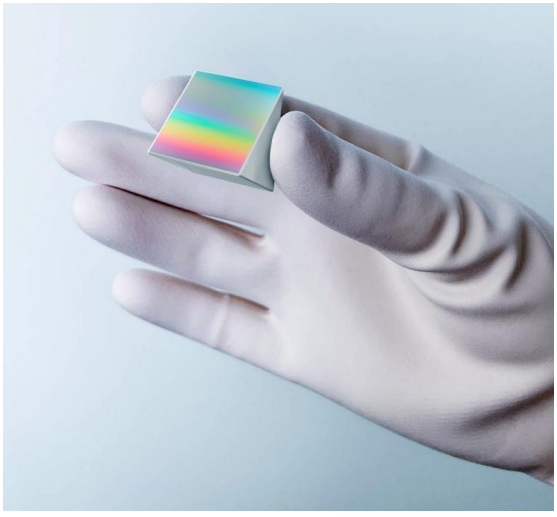
DIFFRACTION GRATINGS

Grisms

Combining plane grating diffraction with prism refraction

A grism is the combination of a prism and a grating. The grisms we offer combine the dispersion properties of gratings with those of a prism. ZEISS can design and produce custom grisms according to your exact specifications.

- **Fully customizable**
- **High performance**
- **Low stray light**
- **Wide range of optical materials from UV to IR**



Combine gratings and prisms exactly the way you want

Plane gratings can be combined with customer-specific prisms (in terms of material and dimensions) to provide the best possible support for your application needs. ZEISS grisms are also very easy to use with little adjustment required. Optically, they offer low wavefront aberration, good stray light performance and can be AR coated as well and custom made to your exact specifications.

Grating prisms (Grisms)

Combining a grating and prism allows for the variation of the grating constant and prism angle to set a non-deflected wavelength, center wavelength or straight-view wavelength, in terms of incoming light.
Used for applications at wavelengths between about 190 nm and 2 µm, the transmission grating is usually located on the hypotenuse surface of the prism. Depending on the optical prism material, such a grating is replicated on the prism.
Custom made Grisms can be applied on the standard available plane gratings. Please see plane gratings catalogue for more information.

Plane gratings catalogue

- **Holographic**
- **Ruled (blazed)**
-

Grove density [l/mm]	**Nominal wavelength [nm]** b* = blazed, s* = sinusoidal	**Max. clear aperture [mm²]**	**Catalogue number**
3600	230 (b*)	90 x 80	263232xx90224
2604	230 (b*)	70 x 70	263232xx90524
2400	230 (b*)	65 x 60	263232xx90824
2400	UV-VIS (s*)	70 x 70	263232xx50824
2100	230 (b*)	65 x 60	263232xx91024
2100	VIS-NIR (b*)	65 x 60	263232xx51024
1800	230 (b*)	68 x 68	263232xx91324
1800	VIS-NIR (s*)	75 x 70	263232xx51324
1500	VIS-NIR (s*)	65 x 60	263232xx51624
1440	VIS-NIR (b*)	65 x 65	263232xx91624
1400	230 (b*)	75 x 70	263232xx91724
1400	VIS-NIR (s*)	75 x 75	263232xx51824
1302	230 (b*)	65 x 65	263232xx92324
1200	230 (b*)	80 x 80	263232xx92824
1200	VIS-NIR (s*)	75 x 75	263232xx52824
1000	VIS-NIR (s*)	50 x 55	263232xx53024
750	NIR (s*)	70 x 55	263232xx52224
300	230 (b*)	65 x 65	263232xx94924

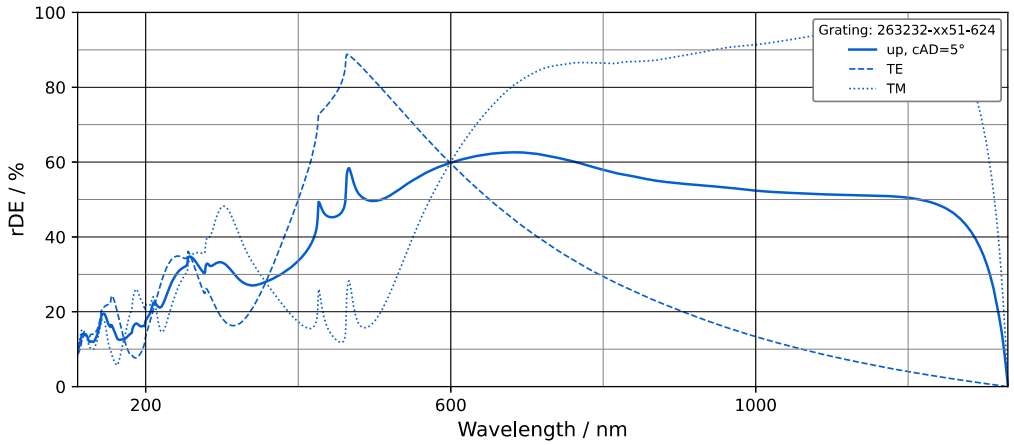
Seeing beyond

Plane Grating

Order number 263232xx51624

Grating specification	
Groove density	1500 l/mm
Groove profile	Sinusoidal
Blaze wavelength	VIS-NIR
Max. clear aperture	65x60 mm²
Reflective coating	Aluminium (unprotected)
Grating master type	Holographic
Grating type	Replica (copy)
Storage and transport temperature	-40° C … +60° C (*)
Operating temperature	≤ +60° C (*)

(*) non-condensing environment



Typical relative diffraction efficiency (rDE) in first diffraction order

Typical efficiency curves are 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. rDE values are based on optical constants of bulk aluminum.

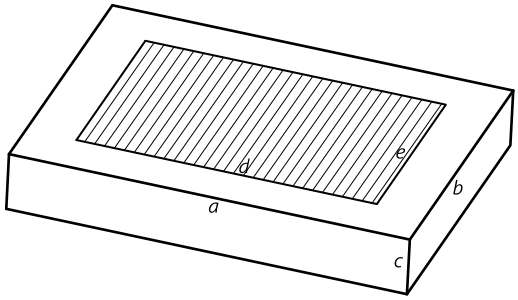
Efficiency curves are only representative and actual values my vary slightly. For wavelength below 190 nm, significant deviations can be expected due to native oxide layer. Specific analysis and/or efficiency-optimized coatings for this wavelength range are available/can be discussed upon request.

Blank specification	
Material	N-BK7 (optical glass)
Protective bevel (all sharp edges)	≤ 0.5 mm
Size Code	263232xx51624 (xx defines size code)
Substrate width	*a*
Substrate length	*b*
Substrate thickness	*c*
Clear aperture	*d x e*

Available Substrate sizes

Size Code	***a x b x c*** *(mm³)*	***d x e*** *(mm²)*
90	15 x 10 x 6	13 x 8
58	19 x 19 x 6	17 x 17
62	40 x 40 x 10	35 x 35
83	60 x 60 x 10	52 x 52
70	70 x 70 x 12	65 x 60
76	75 x 65 x 6	65 x 63

*Other sizes available upon request
*Round substrates also feasible



CONVEX GRATINGS

Offner gratings

For imaging spectrometers

Offner gratings are used in applications with spatially resolved spectral information, especially hyperspectral imaging. Holographic fabrication reduces stray light and increases image quality. In the holographic process at ZEISS, the blaze profile is applied during holography best suited to the shape of the optical substrate. ZEISS has the in-house expertise to design and make customized Offner gratings.

- **Minimizes cross-talk**
- **Good signal-to-noise ratio**
- **Lowest stray light**
- **High efficiency**

See the whole spectrum

ZEISS Offner gratings feature customized aberration correction for enhanced optical performance and reduce the number of optical components in a spectrometer. Image quality can be optimized for wide wavelength bands and there are many standard configurations available. Our Offner gratings can also be tailored to your specifications and are easy to use, with low adjustment thanks to specific customized features.

Make the invisible visible

Hyperspectral imaging or multispectral imaging can show you what you normally cannot see. This is achieved by using spatial and wavelength resolved detection in different electromagnetic ranges (spectra).

Imaging spectroscopy has evolved into a technique for powerful multispectral imaging. Multispectral imaging or hyperspectral imagers are mostly based on Offner imaging spectrometers with low f-numbers. The design of a hyperspectral sensor uses three convex surfaces, including an aberration corrected convex grating and two convex mirrors together with a slit and an imaging sensor. This configuration is dedicated to applications with low resolution and high throughput requirements, enhancing the imaging quality of a spectrometer. All of the hyperspectral information is covered by a single shot sensor picture. ZEISS Offner gratings are used in space applications to achieve the highest performance in environmental analysis.

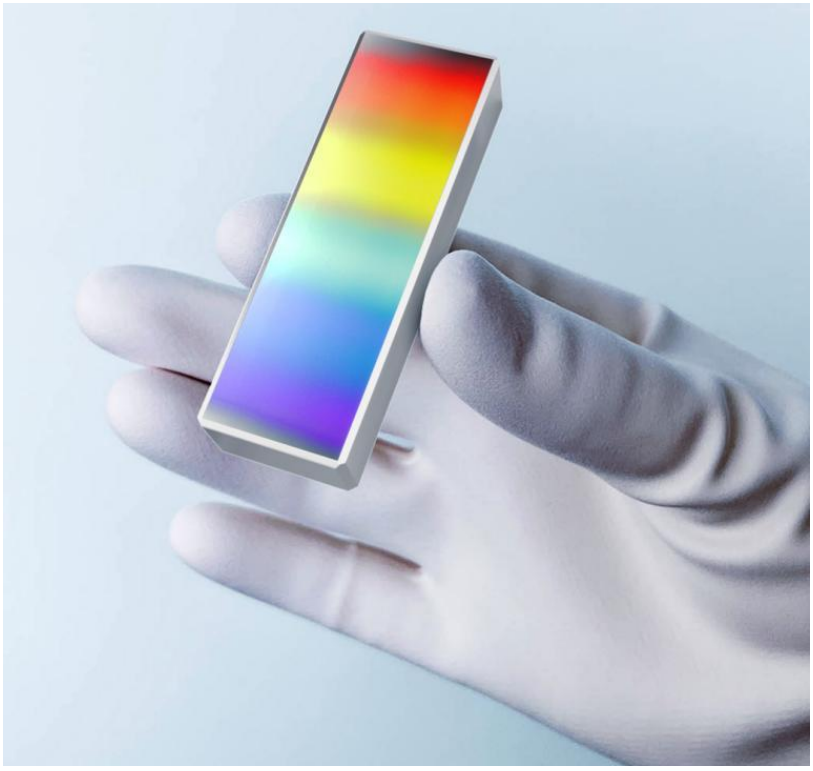
OPTICAL GRATINGS

Laser gratings

Pulse compression and wavelength selection

We offer homogeneous pulse compression gratings with a high laser-induced damage threshold (LIDT) and variable groove densities and standard laser gratings for wavelength selection in modern laser systems. Laser gratings are also used in the laser systems for wavelength selection intra- and extra-cavity for the mode selection of single or even multi-mode lasers.

- **High diffraction efficiency**
- **Transmission and reflection**
- **Low stray light**
- **Choice of substrates**



Wavelength selection, high pulse widths, repetition rates and efficient diffraction

ZEISS pulse compression and laser gratings use monolithic fused silica, with high LIDT, low wavefront aberration and are available in standard or customized form. They are easy to install and provide high performance and efficiency. We also offer replicated and coated gratings (Al, Au) for wavelength tuning in low/mid-range power lasers, which can be also used in telecommunications for WDM and DWDM applications.

The right gratings for your requirements

High-efficiency pulse compression gratings can be manufactured up to a size of 240 x 240 mm with homogeneous grid patterns. Typical line counts for pulse compression applications are between 1000 and 2500 grooves per mm. In addition to flat substrates, you can choose concave, convex and free-form substrates.

Laser gratings from ZEISS are available for spectral ranges between 400 nm and 2 µm.

The function-determining parameters are:

- ✓ line density
- ✓ furrow profile
- ✓ the resulting diffraction efficiency
- ✓ wavefront accuracy
- ✓ resolving power
- ✓ imaging properties
- ✓ substrate material
- ✓ the resulting radiation resistance
- ✓ several coatings like Al, Au and numerous AR coatings

По вопросам продаж и поддержки обращайтесь:

Алматы (727)345-47-04
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
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Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
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Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
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