

Aluminum Mirrors | TFA/TFAN/TFAQ/TFAQN/TFAE/OPBA/OPSQA

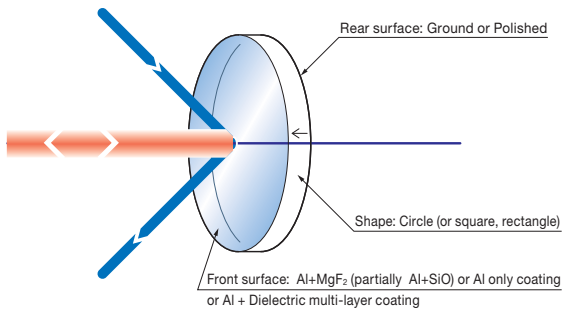
RoHS

This is a vapor-deposited aluminium flat mirror with the substrate polished with high accuracy, designed for high reflectivity at any incident angle.

- With four types to choose from; (TFAN/TFAQN) which is coated with aluminium only, (TFA/TFAQ) which is coated with a protective coating against accidental hard scratches, (TFAE) which is coated aluminium and a protective coating to increase the reflectance of ultraviolet and lastly, (OPBA/OPSQA) which provides Aluminum with protective coat on the optical parallel substrate.
- For ultraviolet, visible and near-infrared light applications.
- For low thermal expansion mirrors, we have (TFAQ/TFAQN) which is made of Synthetic fused silica that provides high rigidity and high precision surface quality.



Schematic



Specifications

Material	BK7 Synthetic fused silica Hard glass (Pyrex® etc.)
Coating	TFAN/TFAQN: Al (without protection coating) TFA/TFAQ/OPBA/OPSQA: Al+MgF ₂ (surface flatness λ/20 is Al+SiO) TFAE: Al + Dielectric multi-layer coating
Parallelism	TFA/TFAN/TFAQ/TFAQN/TFAE: <3' OPBA/OPSQA: <2"
Incident angle	TFA/TFAQ/TFAE: 45° OPBA/OPSQA: 0°
Laser Damage Threshold	0.25J/cm ² (pulse width 10ns, repetition frequency 20Hz)
Surface Quality (Scratch-Dig)	40-20
Clear aperture	90% of actual aperture or circle or ellipse that contacts 90% square of dimension

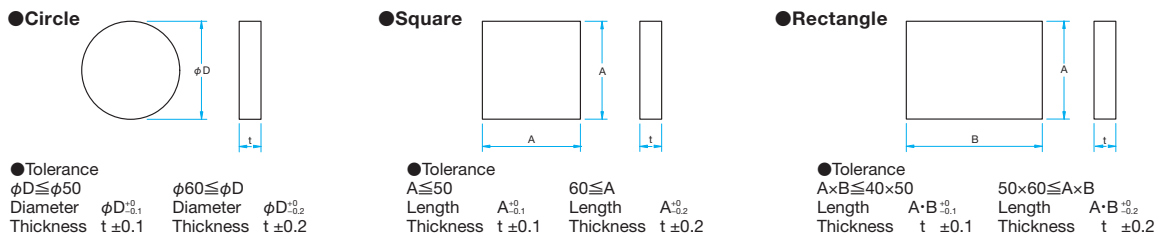
Guide

- ▶ If you need a higher reflectance aluminium mirror, please kindly contact us.
- ▶ Should you require a surface accuracy analysis/data, please kindly contact our sales group.
- ▶ For non-standard sizes other than those listed in the product table, please kindly contact us.
- ▶ Pyrex® is a registered trademark of Corning Inc.

Attention

- ▶ For aluminium mirrors without a protective film, (TFAN/TFAQN) handle carefully as they can be easily scratched oxidation builds up in the surface. Do not rub the surface with paper or cloth as this will harm the surface. For long term storage, use a de-oxidizer to prevent the oxidation.
- ▶ When a laser light is transmitted with multiple mirrors installed there will be a large amount of light loss due to the absorption of the aluminium coating. Please consider using dielectric multi-layer mirrors (TFM) for improved performance.
- ▶ The reflectance specification are represented by the average of the reflectance of P polarized light and S polarized light. Reflectance may vary depending on the polarization state of the incident beam.

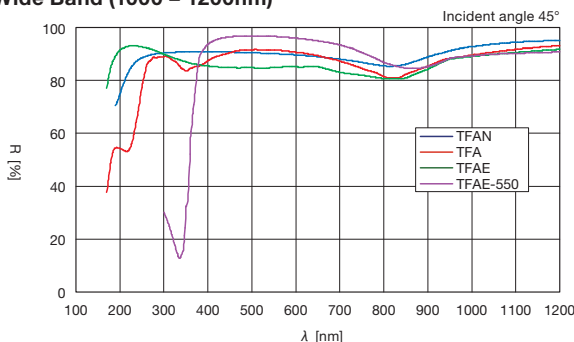
Outline Drawing



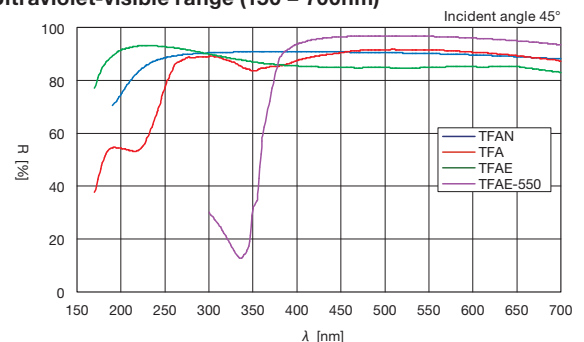
Typical Reflectance Data

R: Reflectance

Wide Band (1000 – 1200nm)



Ultraviolet-visible range (150 – 700nm)





Circle		Diameter ϕ D [mm]	Thickness t [mm]	Material	Surface Flatness	Rear Surface
Al+MgF ₂ (partially Al+SiO)	Al only					
Part Number	Part Number					
TFA-10C03-4	—	ϕ 10	3	BK7	$\lambda/4$	Ground
TFA-10C03-10	TFAN-10C03-10	ϕ 10	3	BK7	$\lambda/10$	Ground
TFA-10C05-10	TFAN-10C05-10	ϕ 10	5	BK7	$\lambda/10$	Ground
TFA-10C05-20	TFAN-10C05-20	ϕ 10	5	BK7	$\lambda/20$	Ground
TFAQ-10C06-20	TFAQN-10C06-20	ϕ 10	6	Synthetic Fused Silica	$\lambda/20$	Ground
TFA-12.7C05-4	—	ϕ 12.7	5	BK7	$\lambda/4$	Ground
TFA-12.7C05-10	—	ϕ 12.7	5	BK7	$\lambda/10$	Ground
TFAQ-12.7C06-20	—	ϕ 12.7	6	Synthetic Fused Silica	$\lambda/20$	Ground
TFA-15C03-10	TFAN-15C03-10	ϕ 15	3	BK7	$\lambda/10$	Ground
TFA-15C05-10	TFAN-15C05-10	ϕ 15	5	BK7	$\lambda/10$	Ground
TFA-15C05-20	TFAN-15C05-20	ϕ 15	5	BK7	$\lambda/20$	Ground
TFAQ-15C06-20	TFAQN-15C06-20	ϕ 15	6	Synthetic Fused Silica	$\lambda/20$	Ground
TFA-20C03-10	TFAN-20C03-10	ϕ 20	3	BK7	$\lambda/10$	Ground
TFA-20C05-4	TFAN-20C05-4	ϕ 20	5	BK7	$\lambda/4$	Ground
TFA-20C05-10	TFAN-20C05-10	ϕ 20	5	BK7	$\lambda/10$	Ground
TFA-20C05-20	TFAN-20C05-20	ϕ 20	5	BK7	$\lambda/20$	Ground
TFAQ-20C06-20	TFAQN-20C06-20	ϕ 20	6	Synthetic Fused Silica	$\lambda/20$	Ground
TFA-25C05-1	TFAN-25C05-1	ϕ 25	5	BK7	λ	Polished
TFA-25C05-4	TFAN-25C05-4	ϕ 25	5	BK7	$\lambda/4$	Polished
TFA-25C05-10	TFAN-25C05-10	ϕ 25	5	BK7	$\lambda/10$	Polished
TFA-25C05-20	TFAN-25C05-20	ϕ 25	5	BK7	$\lambda/20$	Polished
TFAQ-25C06-20	TFAQN-25C06-20	ϕ 25	6	Synthetic Fused Silica	$\lambda/20$	Polished
TFA-25.4C05-4	—	ϕ 25.4	5	BK7	$\lambda/4$	Polished
TFA-25.4C05-10	TFAN-25.4C05-10	ϕ 25.4	5	BK7	$\lambda/10$	Polished
TFAQ-25.4C06-20	—	ϕ 25.4	6	Synthetic Fused Silica	$\lambda/20$	Polished
TFA-30C05-1	TFAN-30C05-1	ϕ 30	5	BK7	λ	Polished
TFA-30C05-4	TFAN-30C05-4	ϕ 30	5	BK7	$\lambda/4$	Polished
TFA-30C05-10	TFAN-30C05-10	ϕ 30	5	BK7	$\lambda/10$	Polished
TFA-30C05-20	TFAN-30C05-20	ϕ 30	5	BK7	$\lambda/20$	Polished
TFAQ-30C06-20	TFAQN-30C06-20	ϕ 30	6	Synthetic Fused Silica	$\lambda/20$	Polished
TFA-40C06-1	TFAN-40C06-1	ϕ 40	6	BK7	λ	Polished
TFA-40C06-4	TFAN-40C06-4	ϕ 40	6	BK7	$\lambda/4$	Polished
TFA-40C06-10	TFAN-40C06-10	ϕ 40	6	BK7	$\lambda/10$	Polished
TFA-40C06-20	TFAN-40C06-20	ϕ 40	6	BK7	$\lambda/20$	Polished
TFAQ-40C08-20	TFAQN-40C08-20	ϕ 40	8	Synthetic Fused Silica	$\lambda/20$	Polished
TFA-50C08-1	TFAN-50C08-1	ϕ 50	8	BK7	λ	Polished
TFA-50C08-4	TFAN-50C08-4	ϕ 50	8	BK7	$\lambda/4$	Polished
TFA-50C08-10	TFAN-50C08-10	ϕ 50	8	BK7	$\lambda/10$	Polished
TFA-50C08-20	TFAN-50C08-20	ϕ 50	8	BK7	$\lambda/20$	Polished
TFAQ-50C10-20	TFAQN-50C10-20	ϕ 50	10	Synthetic Fused Silica	$\lambda/20$	Polished
TFA-50.8C08-10	—	ϕ 50.8	8	BK7	$\lambda/10$	Polished
TFA-60C10-1	TFAN-60C10-1	ϕ 60	10	Hard glass	λ	Polished
TFA-60C10-4	TFAN-60C10-4	ϕ 60	10	Hard glass	$\lambda/4$	Polished
TFA-60C10-10	TFAN-60C10-10	ϕ 60	10	Hard glass	$\lambda/10$	Polished
TFA-60C10-20	TFAN-60C10-20	ϕ 60	10	Hard glass	$\lambda/20$	Polished
TFA-80C12-1	TFAN-80C12-1	ϕ 80	12	Hard glass	λ	Polished
TFA-80C12-4	TFAN-80C12-4	ϕ 80	12	Hard glass	$\lambda/4$	Polished
TFA-80C12-10	TFAN-80C12-10	ϕ 80	12	Hard glass	$\lambda/10$	Polished
TFA-80C12-20	TFAN-80C12-20	ϕ 80	12	Hard glass	$\lambda/20$	Polished
TFA-100C15-1	TFAN-100C15-1	ϕ 100	15	Hard glass	λ	Polished
TFA-100C15-4	TFAN-100C15-4	ϕ 100	15	Hard glass	$\lambda/4$	Polished
TFA-100C15-10	TFAN-100C15-10	ϕ 100	15	Hard glass	$\lambda/10$	Polished
TFA-130C18-1	TFAN-130C18-1	ϕ 130	18	Hard glass	λ	Polished
TFA-130C18-4	TFAN-130C18-4	ϕ 130	18	Hard glass	$\lambda/4$	Polished
TFA-130C18-10	TFAN-130C18-10	ϕ 130	18	Hard glass	$\lambda/10$	Polished
TFA-150C20-1	TFAN-150C20-1	ϕ 150	20	Hard glass	λ	Polished
TFA-150C20-4	TFAN-150C20-4	ϕ 150	20	Hard glass	$\lambda/4$	Polished
TFA-150C20-10	TFAN-150C20-10	ϕ 150	20	Hard glass	$\lambda/10$	Polished

Compatible Optic Mounts

MHG-MP12.7-NL / MHG-HS25-NL, -HS30-NL / MHG-MP50-NL, -MP50.8-NL / MAD-30-10 + MHL-30S / BSHL-15-2 / MHF-20
 MHAN-40S, -60S / MHA-80S, -100AS, -130AS, -150S

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Aluminum Mirrors

TFA/TFAN/TFAQ/TFANQ/TFAE/OPBA/OPSQA



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Femtosecond Laser

Frameless

Accuracy Guarantee

High Power

Ultra Broadband

Dielectric Coating

Aluminum Coating

Gold Coating

UV Enhanced Aluminum Flat Mirrors							
Part Number	Wavelength Range [nm]	Reflectance [%]	Diameter ϕ D [mm]	Thickness t [mm]	Material	Surface Flatness	Rear Surface
TFAE-12.7C05-10	170 – 400	> average 85	ϕ 12.7	5	BK7	$\lambda/10$	Ground
TFAE-25.4C05-10	170 – 400	> average 85	ϕ 25.4	5	BK7	$\lambda/10$	Polished
TFAE-30C05-10	170 – 400	> average 85	ϕ 30	5	BK7	$\lambda/10$	Polished
TFAE-50C08-10	170 – 400	> average 85	ϕ 50	8	BK7	$\lambda/10$	Polished
TFAE-12.7C05-10-550	400 – 700	> average 94	ϕ 12.7	5	BK7	$\lambda/10$	Ground
TFAE-25.4C05-10-550	400 – 700	> average 94	ϕ 25.4	5	BK7	$\lambda/10$	Polished
TFAE-30C05-10-550	400 – 700	> average 94	ϕ 30	5	BK7	$\lambda/10$	Polished

Square						
Al+MgF ₂ (partially Al+SiO) Part Number	Al only Part Number	Length A [mm]	Thickness t [mm]	Material	Surface Flatness	Rear Surface
TFA-10S03-10	TFAN-10S03-10	\square 10	3	BK7	$\lambda/10$	Ground
TFA-10S05-10	TFAN-10S05-10	\square 10	5	BK7	$\lambda/10$	Ground
TFA-10S05-20	TFAN-10S05-20	\square 10	5	BK7	$\lambda/20$	Ground
TFAQ-10S06-20	TFAQN-10S06-20	\square 10	6	Synthetic fused silica	$\lambda/20$	Ground
TFA-12.7S03-4	—	\square 12.7	3	BK7	$\lambda/4$	Ground
TFA-12.7S03-10	—	\square 12.7	3	BK7	$\lambda/10$	Ground
TFA-15S03-4	TFAN-15S03-4	\square 15	3	BK7	$\lambda/4$	Ground
TFA-15S03-10	TFAN-15S03-10	\square 15	3	BK7	$\lambda/10$	Ground
TFA-15S05-4	TFAN-15S05-4	\square 15	5	BK7	$\lambda/4$	Ground
TFA-15S05-10	TFAN-15S05-10	\square 15	5	BK7	$\lambda/10$	Ground
TFA-15S05-20	TFAN-15S05-20	\square 15	5	BK7	$\lambda/20$	Ground
TFAQ-15S06-20	TFAQN-15S06-20	\square 15	6	Synthetic fused silica	$\lambda/20$	Ground
TFA-20S03-4	TFAN-20S03-4	\square 20	3	BK7	$\lambda/4$	Ground
TFA-20S03-10	TFAN-20S03-10	\square 20	3	BK7	$\lambda/10$	Ground
TFA-20S05-4	TFAN-20S05-4	\square 20	5	BK7	$\lambda/4$	Ground
TFA-20S05-10	TFAN-20S05-10	\square 20	5	BK7	$\lambda/10$	Ground
TFA-20S05-20	TFAN-20S05-20	\square 20	5	BK7	$\lambda/20$	Ground
TFAQ-20S06-20	TFAQN-20S06-20	\square 20	6	Synthetic fused silica	$\lambda/20$	Ground
TFA-25S05-1	TFAN-25S05-1	\square 25	5	BK7	λ	Ground
TFA-25S05-4	TFAN-25S05-4	\square 25	5	BK7	$\lambda/4$	Ground
TFA-25S05-10	TFAN-25S05-10	\square 25	5	BK7	$\lambda/10$	Ground
TFA-25S05-20	TFAN-25S05-20	\square 25	5	BK7	$\lambda/20$	Ground
TFAQ-25S06-20	TFAQN-25S06-20	\square 25	6	Synthetic fused silica	$\lambda/20$	Ground
TFA-30S05-1	TFAN-30S05-1	\square 30	5	BK7	λ	Ground
TFA-30S05-4	TFAN-30S05-4	\square 30	5	BK7	$\lambda/4$	Ground
TFA-30S05-10	TFAN-30S05-10	\square 30	5	BK7	$\lambda/10$	Ground
TFA-30S05-20	TFAN-30S05-20	\square 30	5	BK7	$\lambda/20$	Ground
TFAQ-30S06-20	TFAQN-30S06-20	\square 30	6	Synthetic fused silica	$\lambda/20$	Ground
TFA-40S06-1	TFAN-40S06-1	\square 40	6	Hard glass	λ	Polished
TFA-40S06-4	TFAN-40S06-4	\square 40	6	Hard glass	$\lambda/4$	Polished
TFA-40S06-10	TFAN-40S06-10	\square 40	6	Hard glass	$\lambda/10$	Polished
TFA-40S06-20	TFAN-40S06-20	\square 40	6	Hard glass	$\lambda/20$	Polished
TFA-50S08-1	TFAN-50S08-1	\square 50	8	Hard glass	λ	Polished
TFA-50S08-4	TFAN-50S08-4	\square 50	8	Hard glass	$\lambda/4$	Polished
TFA-50S08-10	TFAN-50S08-10	\square 50	8	Hard glass	$\lambda/10$	Polished
TFA-50S08-20	TFAN-50S08-20	\square 50	8	Hard glass	$\lambda/20$	Polished
TFA-60S10-1	TFAN-60S10-1	\square 60	10	Hard glass	λ	Polished
TFA-60S10-4	TFAN-60S10-4	\square 60	10	Hard glass	$\lambda/4$	Polished
TFA-60S10-10	TFAN-60S10-10	\square 60	10	Hard glass	$\lambda/10$	Polished
TFA-60S10-20	TFAN-60S10-20	\square 60	10	Hard glass	$\lambda/20$	Polished
TFA-80S12-1	TFAN-80S12-1	\square 80	12	Hard glass	λ	Polished
TFA-80S12-4	TFAN-80S12-4	\square 80	12	Hard glass	$\lambda/4$	Polished
TFA-80S12-10	TFAN-80S12-10	\square 80	12	Hard glass	$\lambda/10$	Polished
TFA-80S12-20	TFAN-80S12-20	\square 80	12	Hard glass	$\lambda/20$	Polished
TFA-100S15-1	TFAN-100S15-1	\square 100	15	Hard glass	λ	Polished
TFA-100S15-4	TFAN-100S15-4	\square 100	15	Hard glass	$\lambda/4$	Polished
TFA-100S15-10	TFAN-100S15-10	\square 100	15	Hard glass	$\lambda/10$	Polished
TFA-130S18-1	TFAN-130S18-1	\square 130	18	Hard glass	λ	Polished
TFA-130S18-4	TFAN-130S18-4	\square 130	18	Hard glass	$\lambda/4$	Polished
TFA-130S18-10	TFAN-130S18-10	\square 130	18	Hard glass	$\lambda/10$	Polished
TFA-150S20-1	TFAN-150S20-1	\square 150	20	Hard glass	λ	Polished
TFA-150S20-4	TFAN-150S20-4	\square 150	20	Hard glass	$\lambda/4$	Polished
TFA-150S20-10	TFAN-150S20-10	\square 150	20	Hard glass	$\lambda/10$	Polished

Compatible Optic Mounts

CHA-25, -60, -130 / LHA-150



Rectangle						
Al-MgF ₂ (partially Al-SiO) Part Number	Al only Part Number	Length AxB [mm]	Thickness t [mm]	Material	Surface Flatness	Rear Surface
TFA-1015R03-4	TFAN-1015R03-4	10x15	3	BK7	λ/4	Ground
TFA-1015R03-10	TFAN-1015R03-10	10x15	3	BK7	λ/10	Ground
TFA-1015R05-4	TFAN-1015R05-4	10x15	5	BK7	λ/4	Ground
TFA-1015R05-10	TFAN-1015R05-10	10x15	5	BK7	λ/10	Ground
TFA-1015R05-20	TFAN-1015R05-20	10x15	5	BK7	λ/20	Ground
TFAQ-1015R06-20	TFAQN-1015R06-20	10x15	6	Synthetic fused silica	λ/20	Ground
TFA-1525R03-4	TFAN-1525R03-4	15x25	3	BK7	λ/4	Ground
TFA-1525R03-10	TFAN-1525R03-10	15x25	3	BK7	λ/10	Ground
TFA-1525R05-4	TFAN-1525R05-4	15x25	5	BK7	λ/4	Ground
TFA-1525R05-10	TFAN-1525R05-10	15x25	5	BK7	λ/10	Ground
TFA-1525R05-20	TFAN-1525R05-20	15x25	5	BK7	λ/20	Ground
TFAQ-1525R06-20	TFAQN-1525R06-20	15x25	6	Synthetic fused silica	λ/20	Ground
TFA-2030R05-1	TFAN-2030R05-1	20x30	5	BK7	λ	Ground
TFA-2030R05-4	TFAN-2030R05-4	20x30	5	BK7	λ/4	Ground
TFA-2030R05-10	TFAN-2030R05-10	20x30	5	BK7	λ/10	Ground
TFA-2030R05-20	TFAN-2030R05-20	20x30	5	BK7	λ/20	Ground
TFAQ-2030R06-20	TFAQN-2030R06-20	20x30	6	Synthetic fused silica	λ/20	Ground
TFA-2535R05-1	TFAN-2535R05-1	25x35	5	BK7	λ	Ground
TFA-2535R05-4	TFAN-2535R05-4	25x35	5	BK7	λ/4	Ground
TFA-2535R05-10	TFAN-2535R05-10	25x35	5	BK7	λ/10	Ground
TFA-2535R05-20	TFAN-2535R05-20	25x35	5	BK7	λ/20	Ground
TFAQ-2535R06-20	TFAQN-2535R06-20	25x35	6	Synthetic fused silica	λ/20	Ground
TFA-3040R06-1	TFAN-3040R06-1	30x40	6	Hard glass	λ	Polished
TFA-3040R06-4	TFAN-3040R06-4	30x40	6	Hard glass	λ/4	Polished
TFA-3040R06-10	TFAN-3040R06-10	30x40	6	Hard glass	λ/10	Polished
TFA-3040R06-20	TFAN-3040R06-20	30x40	6	Hard glass	λ/20	Polished
TFAQ-3040R08-20	TFAQN-3040R08-20	30x40	8	Hard glass	λ/20	Polished
TFA-4050R08-1	TFAN-4050R08-1	40x50	8	Hard glass	λ	Polished
TFA-4050R08-4	TFAN-4050R08-4	40x50	8	Hard glass	λ/4	Polished
TFA-4050R08-10	TFAN-4050R08-10	40x50	8	Hard glass	λ/10	Polished
TFA-4050R08-20	TFAN-4050R08-20	40x50	8	Hard glass	λ/20	Polished
TFA-5060R10-1	TFAN-5060R10-1	50x60	10	Hard glass	λ	Polished
TFA-5060R10-4	TFAN-5060R10-4	50x60	10	Hard glass	λ/4	Polished
TFA-5060R10-10	TFAN-5060R10-10	50x60	10	Hard glass	λ/10	Polished
TFA-5060R10-20	TFAN-5060R10-20	50x60	10	Hard glass	λ/20	Polished
TFA-6080R12-1	TFAN-6080R12-1	60x80	12	Hard glass	λ	Polished
TFA-6080R12-4	TFAN-6080R12-4	60x80	12	Hard glass	λ/4	Polished
TFA-6080R12-10	TFAN-6080R12-10	60x80	12	Hard glass	λ/10	Polished
TFA-6080R12-20	TFAN-6080R12-20	60x80	12	Hard glass	λ/20	Polished
TFA-80100R15-1	TFAN-80100R15-1	80x100	15	Hard glass	λ	Polished
TFA-80100R15-4	TFAN-80100R15-4	80x100	15	Hard glass	λ/4	Polished
TFA-80100R15-10	TFAN-80100R15-10	80x100	15	Hard glass	λ/10	Polished

High Parallelism						
Part Number	Diameter φD [mm]	Thickness t [mm]	Material	Surface Flatness	Rear Surface	
OPBA-10C05-10	φ10	5	BK7	λ/10	Polished	
OPBA-15C05-10	φ15	5	BK7	λ/10	Polished	
OPBA-20C05-10	φ20	5	BK7	λ/10	Polished	
OPBA-25C05-10	φ25	5	BK7	λ/10	Polished	
OPBA-30C05-10	φ30	5	BK7	λ/10	Polished	
OPBA-40C06-10	φ40	6	BK7	λ/10	Polished	
OPBA-50C08-10	φ50	8	BK7	λ/10	Polished	
OPBA-60C10-10	φ60	10	BK7	λ/10	Polished	
OPSQA-10C05-10	φ10	5	Synthetic fused silica	λ/10	Polished	
OPSQA-15C05-10	φ15	5	Synthetic fused silica	λ/10	Polished	
OPSQA-20C05-10	φ20	5	Synthetic fused silica	λ/10	Polished	
OPSQA-25C05-10	φ25	5	Synthetic fused silica	λ/10	Polished	
OPSQA-30C05-10	φ30	5	Synthetic fused silica	λ/10	Polished	

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Femtosecond Laser

Frameless

Accuracy Guarantee

High Power

Ultra Broadband

Dielectric Coating

Aluminum Coating

Gold Coating