



Nikon-made synthetic silica glass (SiO<sub>2</sub>)

# NIFS series

## For various use with appropriate optical properties

NIKON's synthetic silica glass (NIFS series) is extremely high quality optical glass for use in optical lens of a state-of-art semiconductor production equipments. Especially, NIFS series have suitable optical properties; for use in optical components for vacuum ultraviolet lasers, mirrors, and prisms, etc.

Also, our excellent technology enables to control the physical or optical properties. So we can satisfy your requests.

We can offer NIFS with high precision processing base on the semiconductor production equipments (stepper) lens manufacturing technology, and various quality assurance.

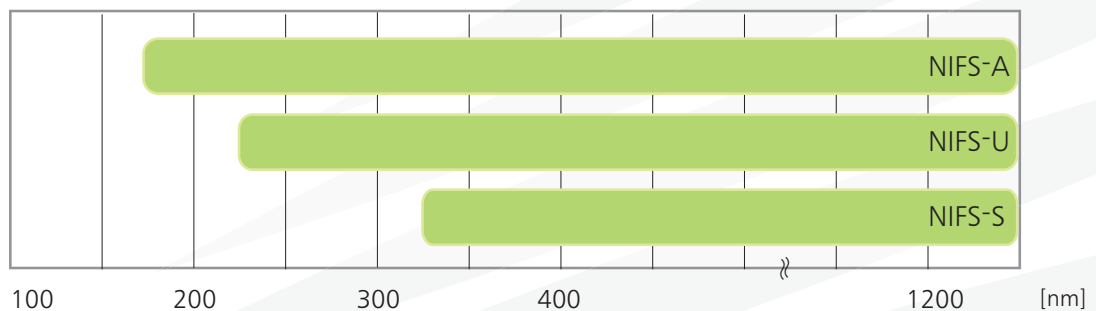
### List of grade of a synthetic silica glass

NIFS-A ...A high quality silica dealing with ArF eximer laser wavelength (193nm).

NIFS-U ...Superior in homogeneity and have high transmittance extending from ultra violet region to visible region wavelength.

NIFS-S ...For general optical devices requiring high transmittance.

Wavelength in use



Grade	Internal transmittance [%/cm]	Laser durability	Birefringence [nm/cm]	Recommended wavelength
NIFS-AL	≥99.9 (at 193nm)	A	≤10	ArF excimer laser (193nm)
NIFS-AB	≥99.9 (at 193nm)	B	≤2	KrF excimer laser (248nm)
NIFS-UL	≥99.9 (at 248nm)	C	≤10	KrF excimer laser (248nm)
NIFS-UB	≥99.9 (at 248nm)	D	≤2	KrF excimer laser (248nm)
NIFS-S	≥99.9 (at 365nm)	-	≤10	UV region, Visible region

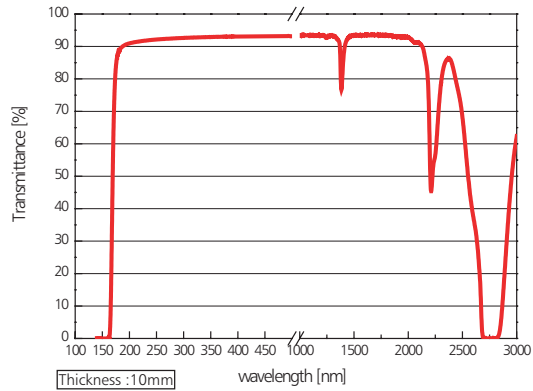
※“L” ending in grade indicates that the laser durability at the wavelength of use is improved, and “B” glass that enhances birefringence in the wavelength.

※With regard to dimensions rather than  $\phi 30 \sim \phi 350$ ,  $t5 \sim t100$ [mm], details of various properties will be decided separately.

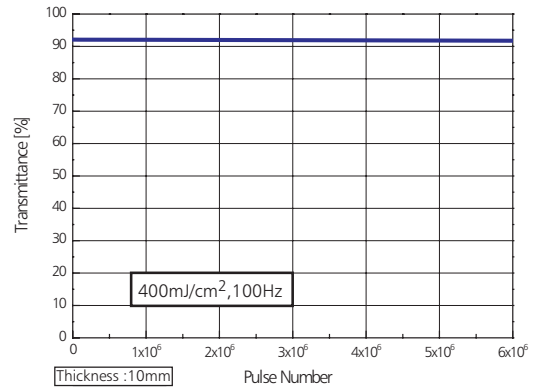
※ Laser durability; “A” - “D” mentioned in laser durability are classified groups according to the relative evaluation. “A” is the highest grade.

## Optical properties

- Light transmittance properties  
(measuring example of NIFS-A)



- Laser durability  
(measuring example of NIFS-UL)



## Impurity concentration

	Element name										[ppb]	
	Li	Na	Mg	K	Ca	Al	Ti	Cr	Fe	Cu		
NIFS-A series Measuring example	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	

## Various measuring technologies

Various properties surely assured by our high accuracy measuring technologies applied in the field of stepper lens measuring.

- Example... Light transmittance (mapping measurement possible), Laser durability, refractive index homogeneity, birefringence (strain) (mapping measurement possible)



**NIKON CORPORATION**  
 Glass Division  
 10-1 Asamizodai 1-chome, Sagami-hara-city,  
 Kanagawa 228-0828 Japan  
 Tel +81-042-740-6376 Fax +81-042-740-6336

