Antireflection Nano-Texture Surface Optics

A nanostructure pattern is created on the surface of high purity fused silica plano-convex lenses to produce an antireflection effect. Because this manufacturing process uses no thin films materials, the lens has a very high damage threshold limit.

Nano-TextureTechnology

Sub-wavelength anti-reflection (AR) nano-textures etched directly into the surface of laser grade fused silica windows and lenses exhibit reflection losses down to 0.1% over wide bandwidths from UV-NIR.

Broadband Anti-Reflection Performance L Type

AR nano-textures inherently perform over unprecedented bandwidths allowing coverage of multiple laser wavelengths in a single optic. Newport offers the long wavelength type, specified as “L” type AR textures R<0.1% 500-800 nm, R<0.3% 900-1100 nm.

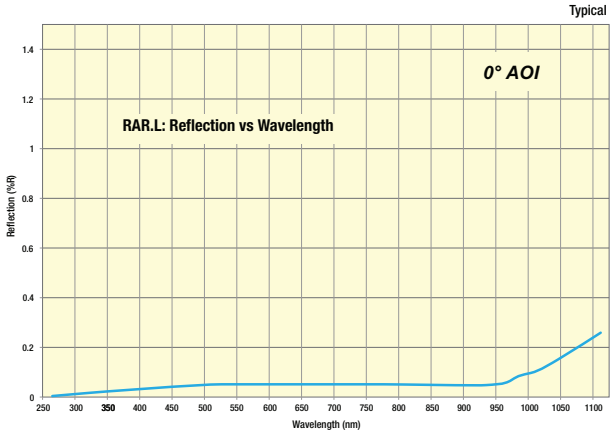
Broadband Anti-Reflection Performance S Type

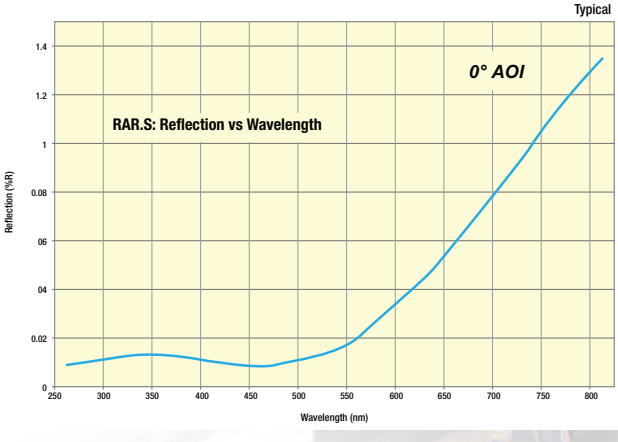
Newport offers the short wavelength type, specified as “S” type AR textures R<0.1% 250-360 nm, R<0.3% 400-550 nm.

Increased Laser Damage Thresholds

Because there are no dissimilar materials used or deposited, the AR nano-textures have no added absorption or surface heating. This results in improved beam parameters and longer lifetimes for your laser optics. Extensive laser damage tests have shown significantly increased pulsed and CW laser damage thresholds compared to thin-film ARs with damage thresholds equivalent to bulk material.

- High laser damage resistance for pulsed or CW applications
- Chemically and mechanically robust & contamination resistant
- Reflection loss down to 0.1%
- No surface absorption – reduced thermal lensing
- Improved beam parameters and long term stability





Newport®

ANTIREFLECTION NANO-TEXTURE SURFACE OPTICS

CW and Pulsed Damage Thresholds

The nano-texture surface treatment yields extremelly high damage threshold results. Typical for pulsed laser applications, the threshold will be higher by 2-5x compared to the standard thin films AR V-coat method. Actual testing results show that the nano-textured optics damaged at 35.6 J/cm^2 at 1064 nm, 10 ns pulses, with 0.5 mm diameter beam. Untreated high purity fused silica was also tested and damaged at 42.1 J/cm^2 under the same parameters.

For applications in the CW regine, testing has been done under long duration CW damage testing at intensities above 15.5 MW/cm^2 with no damage.

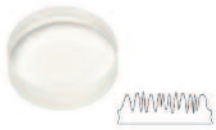
Nano-Texture Optics Cleaning Instructions

Conventional cleaning methods used for standard thin film coatings, such as the drop and drag technique or physical wiping, should not be used on nano-textured optics.

Using these standard cleaning methods will result in further contamination to the surface because solvent residues and debris will be forced deeper into the valleys of the nanostructures. These optics are best cleaned by solvent rinsing first with methanol or isopropyl alcohol or by immersion in an ammonia solution or simple soap and water bath. Aggressive cleaning can be implemented by immersion in acid solutions such as a mix of sulfuric acid and hydrogen peroxide. These cleaning techniques should be used with caution or ideally, not at all. Any cleaning should be completed by rinsing with isopropyl alcohol followed by air drying under cover or nitrogen blow-drying. Polymer Optic Cleaning is not recommended.

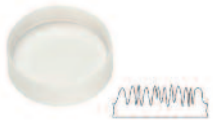
Antireflection Nano-Texture Surface Fused Silica Optical Windows

Model: 05Q20RAR.L NEW	Parallel Window, NanoTextured UV Fused Silica, 12.7 mm, λ /10, 500-1100 nm
Model: 05Q20RAR.S NEW	Parallel Window, NanoTextured UV Fused Silica, 12.7 mm, λ /10, 250-550 nm
Model: 10Q20RAR.L NEW	Parallel Window, NanoTextured UV Fused Silica, 25.4 mm, λ /10, 500-1100 nm
Model: 10Q20RAR.S NEW	Parallel Window, NanoTextured UV Fused Silica, 25.4 mm, λ /10, 250-550 nm



Antireflection Nanostructure Surface Fused Silica Plano-Convex Lenses

Model: SPX503RAR.L NEW	Plano-Convex lens, NanoTextured Fused Silica, 12.7 mm, 10 mm EFL, 500-1100 nm
Model: SPX503RAR.S NEW	Plano-Convex lens, NanoTextured Fused Silica, 12.7 mm, 10 mm EFL, 250-550 nm
Model: SPX529RAR.L NEW	Plano-Convex lens, NanoTextured Fused Silica, 12.7 mm, 50 mm EFL, 500-1100 nm
Model: SPX529RAR.S NEW	Plano-Convex lens, NanoTextured Fused Silica, 12.7 mm, 50 mm EFL, 250-550 nm



Antireflection Nano-Texture Surface Fused Silica Plano-Concave Lenses

Model: SPC501RAR.L NEW	Plano-Concave Lens, Nano-Textured Fused Silica, 12.7 mm, –100 mm EFL, 500-1100 nm
Model: SPC501RAR.S NEW	Plano-Concave Lens, Nano-Textured Fused Silica, 12.7 mm, –100 mm EFL, 250-550 nm
Model: SPC502RAR.L NEW	Plano-Concave Lens, Nano-Textured Fused Silica, 12.7 mm, –40 mm EFL, 500-1100 nm
Model: SPC502RAR.S NEW	Plano-Concave Lens, Nano-Textured Fused Silica, 12.7 mm, –40 mm EFL, 250-550 nm
Model: SPC507RAR.L NEW	Plano-Concave Lens, Nano-Textured Fused Silica, 12.7 mm, –75 mm EFL, 500-1100 nm
Model: SPC507RAR.S NEW	Plano-Concave Lens, Nano-Textured Fused Silica, 12.7 mm, –75 mm EFL, 250-550 nm

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