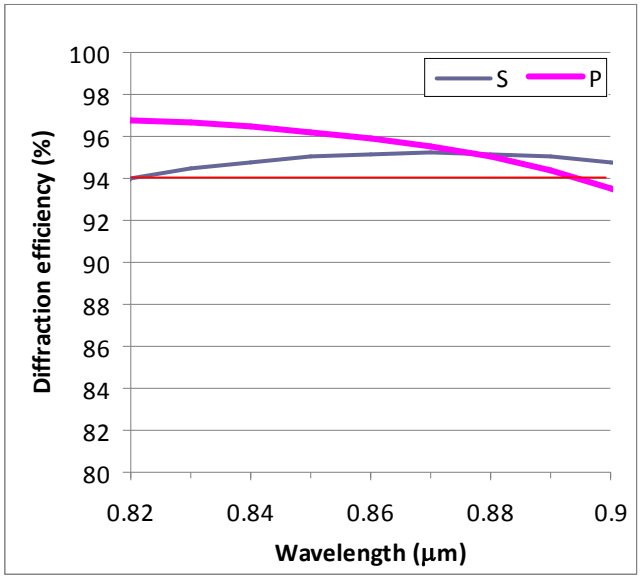
Specification for High Efficiency Pulse Compression Transmission Grating, T-1200-850 series

Crafting light for the Information Age



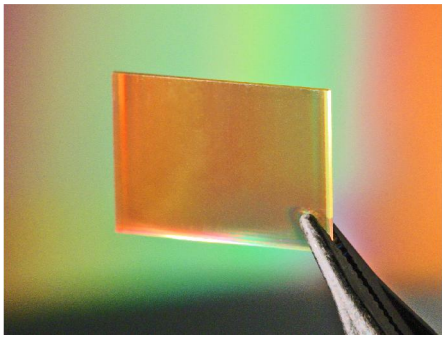
LightSmyth Technologies' transmission gratings are fabricated on fused silica substrates and robust dielectric films by state-of-the-art projection photolithography and reactive ion etch. These high fidelity semiconductor fabrication methods enable precise realization of sophisticated proprietary grating designs that provide diffraction efficiency close to 100% and line spacing control to 1 part per million.
No other grating technology is capable of achieving this degree of performance combined with the cost effectiveness and reproducibility afforded by semiconductor volume fabrication technology.

Left: Typical absolute diffraction efficiency of 1208 grooves/mm Transmission Grating.

Features:

- Ultra-High Diffraction Efficiency.
- Low Polarization Sensitivity.
- Excellent Feature Fidelity and Groove Uniformity.
- Only fused Silica and robust dielectrics are used, no polymers.
- High optical power handling.
- Extreme environmental stability. Telcordia qualified.
- Each grating is a master: low light scatter, no ghosting.
- Very competitive pricing.
- Strict quality control. LightSmyth is ISO 9001:2008 certified.

Applications



- Pulse Compression
- High power Beam splitters/combiners
- Spectroscopy
- Remote Sensing

See the next page for technical specification

LightSmyth Technologies 875 Wilson Street, Unit C, Eugene, 97478 OR USA Tel + 1-541-431-0026 www.LightSmyth.com

Kokyo 株式会社 光響

Email : info@symphotony.com
Web : https://www.symphotony.com/

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Optical		
Description	**Value**	**Units**
Line Density	1208.459	Lines/mm
Line Density Uniformity	± 0.001	Lines/mm
Angle of Incidence (AOI) [1]	30.7 ± 1	°
Wavelength Range	850 ± 20	nm
Optimal polarization [2]	Any	
Diffraction Efficiency [3]	>94	%

[1] Optical grating performance will remain substantially similar over a 5 ° variation in angle of incidence.
[2] p-polarization: electric field vector is perpendicular to the grating lines; s-polarization is orthogonal to p.
[3] Worst case in the operational wavelength range for optimal polarization.

Mechanical	
Dimension tolerances	±0.2 for grating size and width
Substrate Thickness	0.675 ± 0.050 mm
Material	Fused silica, dielectric layers
Scratch/Dig [4]	60/40 standard, 40/20 and 20/10 custom

[4] as per MIL-PRF-1380B in the clear aperture; no requirements outside of the clear aperture.

Substrate dimension options				
Part number	Substrate width, mm [5]	Substrate height, mm [5]	Clear aperture width, mm [6]	Clear aperture height, mm [6]
T-1500-875-2516-94	24.8	15.8	23.8	14.8
T-1200-850-13020-94	130	20	125	19
Custom dimensions	Any rectangle fitting within 130 mm diameter circle (e.g. 130 x 20 mm)			

[5] Width is perpendicular to grating grooves, height is along the grating grooves.
[6] Clear aperture is centered on the substrate

Typical Optical Layout

The transmission grating is designed to operate in Littrow configuration, where the angle of incidence and diffraction are the same for the central operational wavelength. Light is dispersed in the plane perpendicular to the grooves.