

Optical Solar Reflectors

Designed and manufactured for thermal control

Qioptiq

- Design and manufacture of radiation-stable Optical Solar Reflectors (OSR's)
- Over 35 years of Space Heritage
- Space Qualified
- Choice of glass types (CMX, CMO)
- Worlds leading supplier
- Bespoke solutions

Typical Optical Solar Reflector Specifications with 0.10mm thick CMX and CMO glass types

| | Specification | Maximum Alpha | Emittance | Front Surface Sheet Resistance | Front to Back Conductivity |
|---------------------------------|---------------|---------------|-----------|--------------------------------|----------------------------|
| Standard OSR (CMX) | PS 343 | 0.100 | 0.86 | N/A | N/A |
| Conductive Coated OSR (CMX) | PS 344 | 0.100 | 0.83 | <5 K Ohms/Square | <200k Ohms |
| UVS Coated OSR (CMX)* | PS 347 | 0.060 | 0.83 | N/A | N/A |
| UVS/CC/OSR (CMX) | PS 349 | 0.060 | 0.83 | <5 K Ohms/Square | <200k Ohms |
| Conductive Coated OSR CMO Glass | PS 613 | 0.085 | 0.83 | <5 K Ohms/Square | <200k Ohms |
| Plain OSR (CMO) | PS 614 | 0.085 | 0.87 | N/A | N/A |

Alpha - Solar absorptance measurements calculated between 250 and 2500nm

Emittance - Normal emittance calculated between 5 and 50 microns

*UV Reflective coating designed to operate from 0 – 66° angle of incidence

Mechanical Properties

| | |
|------------------------------|--------------------------------------------------------------------------------------------------------|
| Thickness: | 0.050mm to 0.50mm / 0.002" to 0.02" Special thicknesses on request |
| Tolerancing: | LxW ±0.05mm / 0.002" |
| Surface Finish: | As drawn to: MIL-PRF-13830B, 80/50 scratch dig |
| Parallelism: | 0.05mm per 20mm |
| Perpendicularity: | 90° ± 0° 30' |
| Coating: | Uncoated area, masked by coating tooling, shall not exceed 1% of the total coverglass area |
| Edge Quality: | Chemically etched for strength enhancement |
| Humidity Resistance: | 98% ± 2% relative humidity for 72 hours @ 50°C ± 20°C |
| Adhesion: | Using cellulose tape to MIL-M-13508 |
| Abrasion: | 20 strokes with 6mm pencil type eraser to MIL-E-12397 loaded to 10N |
| Radiation Resistance: | UV exposure, electron, low energy proton, high energy proton - please refer to relevant specifications |
| Thermal Cycling: | Details on request |

Physical Properties

| | CMX | CMO |
|---------------------------------------|-----------------------------------|-----------------------------------|
| Density: | 2.60 ± 0.02g cm ³ | 2.54 ± 0.02g cm ³ |
| Thermal Expansion Coefficient: | | |
| Average over range -100°C to 100°C | 6.0 ± 0.75 x 10 ⁻⁶ /°C | 5.5 ± 0.75 x 10 ⁻⁶ /°C |
| Average over range -100°C to 200°C | 6.5 ± 0.75 x 10 ⁻⁶ /°C | 6.0 ± 0.75 x 10 ⁻⁶ /°C |
| Average over range +30°C to 200°C | 7.0 ± 0.75 x 10 ⁻⁶ /°C | 6.5 ± 0.75 x 10 ⁻⁶ /°C |
| Youngs Modulus: | 75.0 ± 2 GNm ⁻² | 70 ± 2 GNm ⁻² |
| Poissons Ratio: | 0.21 ± 0.05 | 0.22 ± 0.05 |
| Bulk Resistivity: | | |
| At 20°C | 11.5 ± 1 log ohm meter | 16.0 ± 1 log ohm meter |
| At 60°C | 10.0 ± 1 log ohm meter | 14.0 ± 1 log ohm meter |
| Refractive Index: | 1.524 – 1.530 | 1.510 – 1.516 |

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