



Salt Fog Durable Anti-Reflection coating on Silicon, optimised for maximum transmission from 3.5 μm to 5.0 μm .

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Date: 29/11/2011

Introduction

The following results apply to 25mm x 1mm thick Plano/wedged monocrystalline Silicon substrates coated with Artemis Optical Limited's, 3.5 μm – 5 μm Proteus HDAR coating. The second surface is wedged to ensure accurate single surface reflection measurements.

Coating Description

The coatings were designed to produce maximum transmission with low reflection in the 3.5 μm to 5 μm region, whilst providing an extended level of durability within a 90 day salt fog environment.

Spectral performance

Transmission measurements were conducted on 25mm x 1mm thick Silicon plano/plano substrates coated on both faces with Artemis' Proteus HDAR coating. Reflection measurements apply to single surfaces of coated Silicon wedges.

All measurements were conducted on a Perkin Elmer 983G spectrophotometer.

The substrates were coated to meet the following target requirements.

Transmission		Reflection	
Average Transmission from 3.5 μm to 5 μm	>98%	Average Reflection from 3.5 μm to 5 μm	\leq 0.3%

Cosmetic Standard

Artemis' Proteus HDAR coatings are qualified to a scratch / dig specification of 80/50 as a minimum requirement.

Environmental Performance

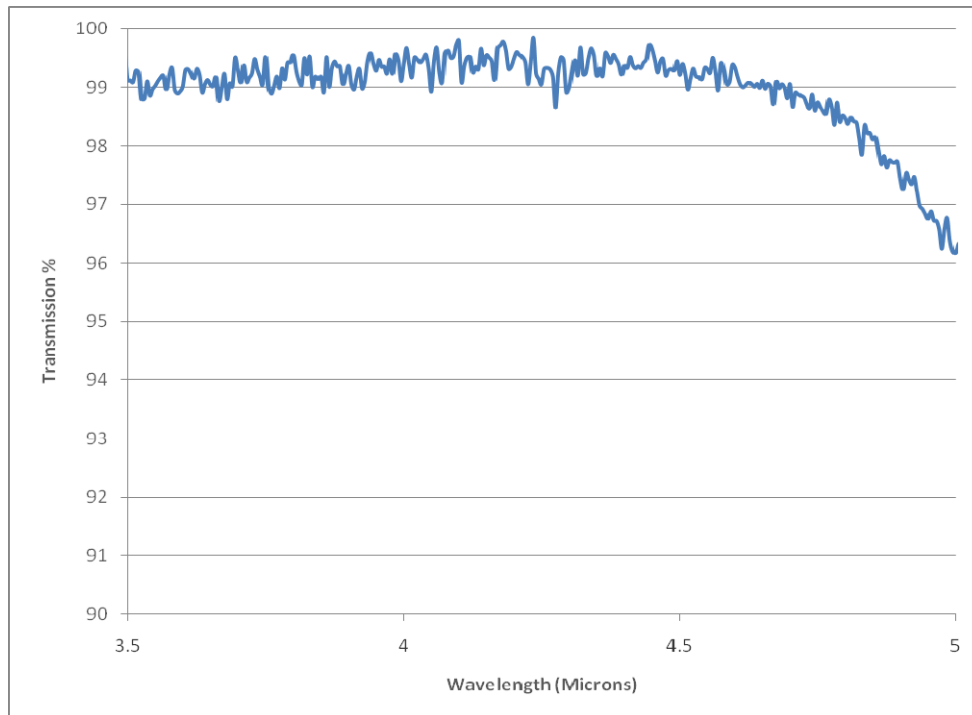
The coating is qualified to the following environmental tests.

Side	Test	Specification	Paragraph
1 & 2	Adhesion	MIL-C-48497	4.5.3.1
1 & 2	Humidity	MIL-C-48497	4.5.3.2
1 & 2	Severe Abrasion	MIL-C-48497	4.5.5.1
1 & 2	Temperature Cycle	MIL-M-13508C	4.4.4
1 & 2	Salt Fog	MIL-STD-810F	509.4 *

* This test has been successfully completed for 90 days durability trials.

Spectral Performance Proteus HDAR

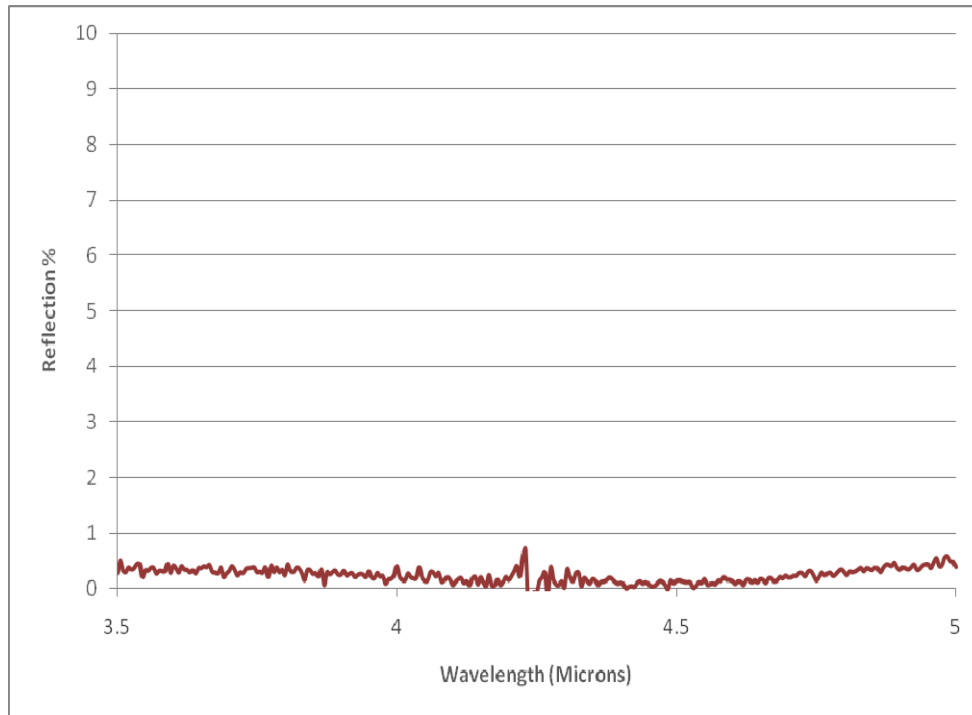
Transmission for 2 sides coated



Transmission	Target	Actual
Average transmission from 3.5 µm to 5.0 µm	>98%	98.98%

Spectral Performance Proteus HDAR

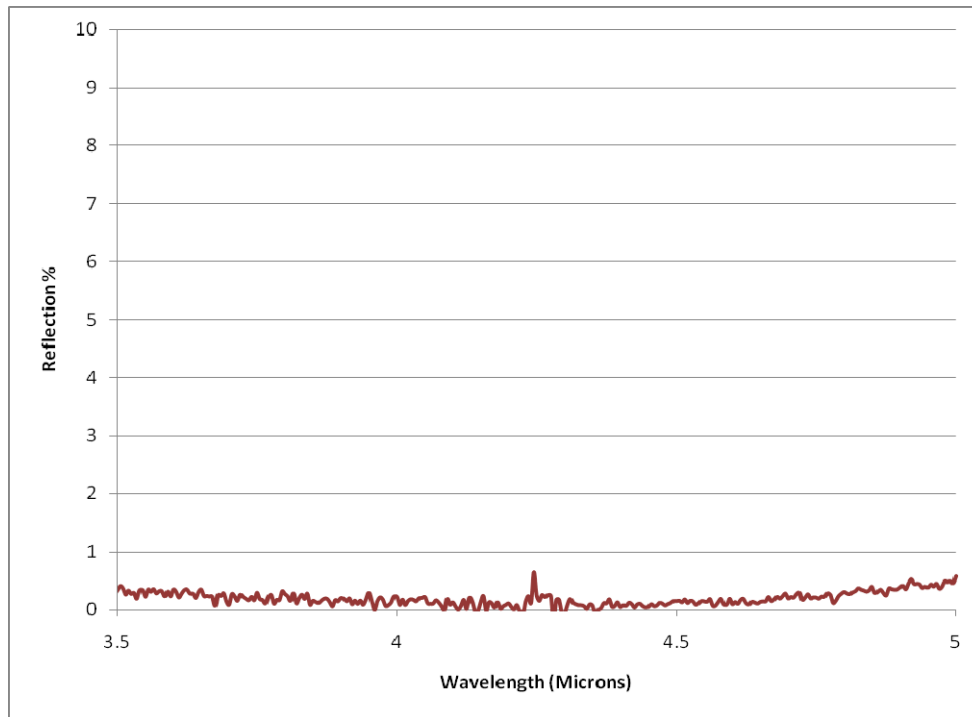
Reflection for side 1, single surface measurements



Reflection	Target	Actual
Average reflection from 3.5 μm to 5.0 μm	<0.3%	0.237%

Spectral Performance Proteus HDAR

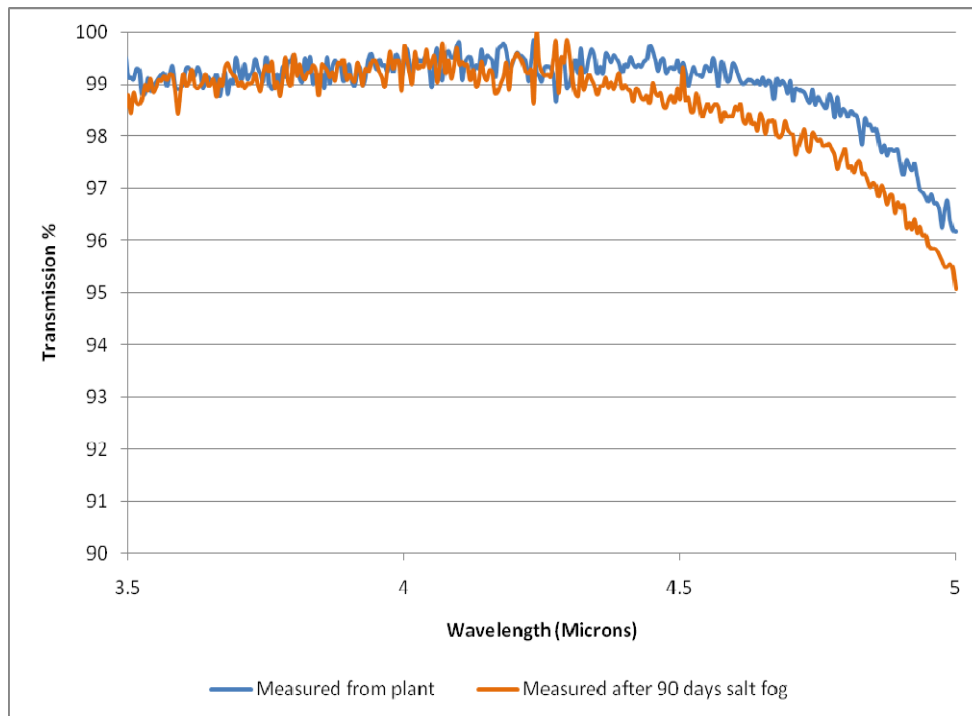
Reflection for side 2, single surface measurements



Reflection	Target	Actual
Average reflection from 3.5 μ m to 5.0 μ m	<0.3%	0.198%

Appendix 1

The graph below shows the transmission of a 25mm x 1mm thick Silicon plano / plano substrate coated on 2 faces with the Proteus coating and measured pre (blue), and post (orange) 90 days salt fog exposure.



The spectral performance shows insignificant deterioration measurements after salt fog exposure of 90 days.

Average transmission deterioration from 3.5 μm to 5.0 μm	0.377%
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The cosmetic quality of the parts has not been compromised by the 90 days salt fog exposure with samples meeting the required environmental criteria.