Hybrid Diamond-like Carbon Films (DLC) / High Efficient Anti-Reflection (HEAR)

ISP Part Number: HYDLC-AR-Ge-8-12

DESCRIPTION: Hybrid DLC coating is a variation of the conventional DLC coatings. The successful combination of hard carbon with our proprietary dielectric coating design will result in lower reflectivity. The Hybrid DLC coating is a broadband W-type anti-reflection coating on substrates materials such as Si or Ge. It can be deposited to the exterior surface of windows or lens as required for marine and other harsh environments without compromising on the transmission.

SUBSTRATE MATERIAL: Ge

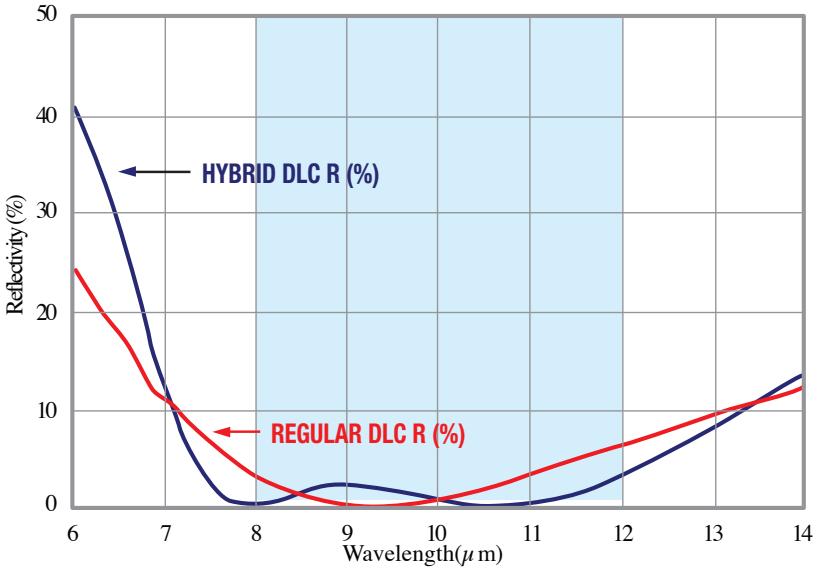
POLARIZATION: Averaged polarization (S+P) / 2

SPECTRAL RANGE: 8-12μm **(MWIR)**

AVERAGED REFLECTANCE: $R_{avg} \leq 1.5\%$ per surface

MEASUREMENT: Transmission on 25.4mm dia. x 1mm thick window and reflectance on 6-8 degrees 25.4mm dia. wedged witness sample

COATING MATERIAL: Non-radioactive materials to be used.



1. HYB DLC AR 8-12μM ON EXTERNAL SURFACE

ITEM	CONDITION	REQUIREMENT
1.1 Reflectance	0-15° AOI	$R_{avg} \leq 1.5\%$ per surface
1.2 Humidity	24hrs, 95-100%RH, 120+/-4°F	MIL-F-48616 / MIL-C-48497C
1.3 Temperature	-80°F to 160°F for 2 hrs at each temperature	MIL-F-48616 / MIL-C-48497C
1.4 Solubility and Cleanability	Immersion test in Acetone and Alcohol for 1 hour instead of using Trichloroethylene	MIL-F-48616 / MIL-C-48497C
1.5 Adhesion	Adhesion (Cellophane tape test with quick removal)	MIL-F-48616 / MIL-C-48497C
1.6 Abrasion	Severe abrasion (20 cycles under 2 lb force)	MIL-F-48616 / MIL-C-48497C
1.7 Salt fog	72hrs+	MIL-STD-810C, Para 509.1
1.8 Wind screen wiper test	In a mixture of sand and water. For 5min at 1000 rpm	TS 1888, Para 5.4.3

2. HEAR 8-12μM ON INTERNAL SURFACE

ITEM	CONDITION	REQUIREMENT
2.1 Reflectance	0-15° AOI	$R_{avg} \leq 1.5\%$
2.2 Humidity	24hrs, 95-100%RH, 120+/-4°F	MIL-F-48616 / MIL-C-48497C
2.3 Temperature	-80°F to 160°F for 2 hrs at each temperature	MIL-F-48616 / MIL-C-48497C
2.4 Solubility and Cleanability	Immersion test in Acetone and Alcohol for 1 hour instead of using Trichloroethylene	MIL-F-48616 / MIL-C-48497C
2.5 Adhesion	Adhesion (Cellophane tape test with quick removal)	MIL-F-48616 / MIL-C-48497C
2.6 Abrasion	Moderate abrasion (25 cycles under 1 lb force)	MIL-F-48616 / MIL-C-48497C

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