



# Diamond-like Carbon Films (DLC) / High Efficient Antireflection (HEAR)

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

**DESCRIPTION:** Hydrogenated diamond-like coatings (DLC) are used when the environmental conditions are considered harsh. It provides the toughest coating surface available in optics.

**SUBSTRATE MATERIAL:** Ge

**POLARIZATION:** Averaged polarization (S+P) /2

**SPECTRAL RANGE:** 8-12 $\mu$ m (LWIR)

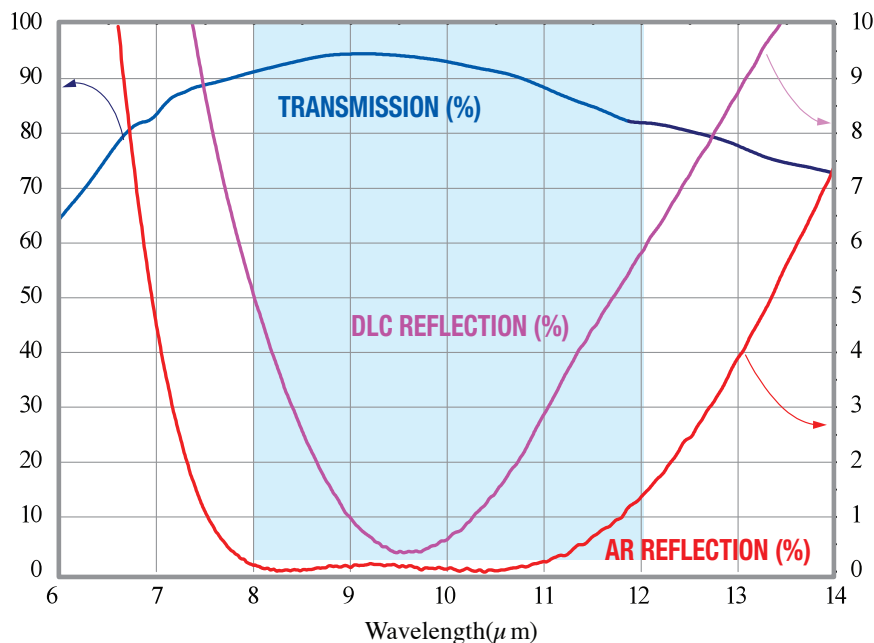
**AVERAGED REFLECTANCE:** Averaged Reflectance in entire spectral range (Ravg)

**MAXIMUM REFLECTANCE OR TRANSMISSION:** Maximum Peak in entire spectral range (Rmax. or Tmax.)

**MINIMUM REFLECTANCE OR TRANSMISSION:** Minimum Peak in entire spectral range (Rmin. or Tmin.)

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

**COATING MATERIAL:** Non-radioactive material to be used.



ITEM	CONDITION	REQUIREMENT
1.1 Reflectance	0-15° AOI	Ravg ≤ 3.0% and Rmax ≤ 8% per surface
1.2 Transmission	0° AOI	Tavg ≥ 90.0% and Tmin ≥ 80% on DLC/HEAR
1.3 Humidity	24hrs, 95-100%RH, 120+/-4°F	MIL-F-48616 / MIL-C-48497C
1.4 Temperature	-80°F to 160°F for 2 hrs at each temperature	MIL-F-48616 / MIL-C-48497C
1.5 Solubility and Cleanability	Immersion test in Acetone and Alcohol for 1 hour instead of using Trichloroethylene	MIL-F-48616 / MIL-C-48497C
1.6 Adhesion	Adhesion (Cellophane tape test with quick removal)	MIL-F-48616 / MIL-C-48497C
1.7 Abrasion	Severe abrasion (20 cycles under 2 lb force)	MIL-F-48616 / MIL-C-48497C
1.8 Salt fog	72hrs+	MIL-C-675
1.9 Wind screen wiper test	In a mixture of sand and water. For 5min at 1000 rpm	TS 1888, Para 5.4.3

ITEM	CONDITION	REQUIREMENT
2.1 Reflectance	0-15° AOI	Ravg ≤ 0.5%
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