



## ISP OPTICS Corporation

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# High Durability (HDAR) / High Efficient Antireflection (HEAR)

## ISP Part Number: HD-AR-Ge-8-12

**Description:** High durability coating (HDAR) is used for exterior surface of optics for wear resistance at normal environment. Its wear resistance is superior to HEAR coating.

**Substrate Material:** Ge

**Polarization:** Averaged polarization (P-pol+S-pol) /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 25.4mmdia. x 1mm thick window and reflectance on 6-8degrees 25.4mm dia. wedged witness sample

**Coating Material:** Non-radioactive material to be used.

**Report:** Certificate of Compliance, spectral measurement (reflectance and transmission) and durability test report

### 1. HDAR 8-12 $\mu$ m on external surface

Item	Condition	Requirements
1.1 Reflectance	0°-12° AOI	Ravg $\leq$ 2.0% per surface
1.2 Transmission	0°-12° AOI	Tavg $\geq$ 95% thru HDAR/HEAR
1.3 Humidity	24hrs, 95-100%RH, 120+/-4°F	MIL-F-48616 / MIL-C-48497 A
1.4 Temperature	-80°F to 160°F for 2 hrs at each temperature	MIL-F-48616 / MIL-C-48497 A
1.5 Solubility and Cleanability	Immersion test in Trichloroethylene and Ethyl alcohol for 10 min	MIL-F-48616 / MIL-C-48497 A
1.6 Adhesion	Adhesion (Cellophane tape test with quick removal)	MIL-F-48616 / MIL-C-48497 A
1.7 Abrasion	Severe abrasion (20 cycles under 2 lb force)	MIL-F-48616 / MIL-C-48497 A
1.8 Salt fog	48hrs+	MIL-STD-810C, Para. 509.1

### 2. HEAR 8-12 $\mu$ m on internal surface

Item	Condition	Requirements
2.1 Reflectance	0°-12° AOI	Ravg $\leq$ 0.5% per surface
2.2 Humidity	24hrs, 95-100%RH, 120+/-4°F	MIL-F-48616 / MIL-C-48497 A
2.3 Temperature	-80°F to 160°F for 2 hrs at each temperature	MIL-F-48616 / MIL-C-48497 A
2.4 Solubility and Cleanability	Immersion test in Trichloroethylene and Ethyl alcohol for 10 min	MIL-F-48616 / MIL-C-48497 A
2.5 Adhesion	Adhesion (Cellophane tape test with quick removal)	MIL-F-48616 / MIL-C-48497 A
2.6 Abrasion	Moderate abrasion (25 cycles under 1 lb force)	MIL-F-48616 / MIL-C-48497 A
2.7 Salt fog	48hrs+	MIL-STD-810C, Para. 509.1



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