

# Product Datasheet



## Ultra Low-Profile Retroreflector™ - ULPR™

The Ultra Low-Profile Retroreflector™ (ULPR™) series is a cutting-edge ultralight compact retroreflector. This series represents the PLX brand by having a rugged stability, offered in a range of accuracy options and configurations.

The Ultra Low-Profile Retroreflector™ (ULPR™) series will fit where other retros won't. The ULPR™ is the ideal retroreflector series with a 36% weight reduction over the other retroreflector series. The round shape of the retroreflector is ideal for direct mounting on to bores, standard optical bench lenses and mirror holders. The newest member of the PLX retroreflector family pushes performance further with its compact and sleek patent pending mounting design. The Ultra Low-Profile Retroreflector™ is also extremely stable across varying temperatures, vibration levels, and shock conditions.



### Specifications

|                  |                                  |
|------------------|----------------------------------|
| Substrate        | Pyrex                            |
| Housing material | Aluminum 6061                    |
| Surface Flatness | $\lambda/10 - \lambda/20$ @633nm |
| Surface Quality  | 80-50 Scratch-Dig                |
| Beam Deviation   | 0.25 – 30.0 Arcsecond            |

### Coating Types

- A – Enhanced Aluminum
- B – IR Enhanced Aluminum
- C – Unprotected Aluminum
- D – UV Enhanced Aluminum
- E – Protected Silver
- G – Protected Gold
- H – Unprotected gold
- I – Protected Aluminum

The ULPR™ series is available in standard sizes of 0.5 in (12.7mm) to 5.0 in (125mm). The units are available in accuracies to 0.25 arc seconds beam deviation and  $\lambda/10$  wave reflected wavefront error. The ULPR™ is provided in a versatile housing, which is compatible with all major mounting systems. The ULPR™ is available with a broad range of standard metallic coatings which meet all applicable MIL-specs. Unprotected metallic coatings are especially suited to interferometric applications. Custom coatings are available upon request.

#### Note:

**Beam Deviation** is the maximum deviation from parallelism, expressed in seconds of arc, of any single return beam from any of the 6 sub-apertures of the retroreflector, when the retroreflector is fully-illuminated.

**Exiting Wavefront** is the resultant maximum peak-to-valley wavefront deformation from a fully-illuminated retroreflector, where  $\lambda = 633\text{nm}$ . (See next page)

Beam deviation and exiting wavefront are interrelated, and it is only necessary to specify one.

Certain high accuracy models may be heavier than indicated here. Check with us for actual weight.

#### Important Notice

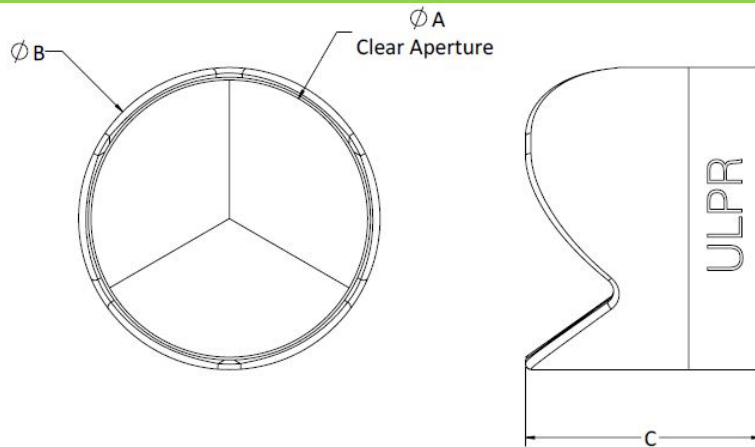
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### Outline Drawings



| Item    | $\phi A$ (in/mm) | $\phi B$ (in/mm) | C (in/mm)  |
|---------|------------------|------------------|------------|
| ULPR-05 | 0.50/12.70       | 0.58/14.61       | 0.50/12.57 |
| ULPR-10 | 1.00/25.40       | 1.09/27.69       | 0.85/21.59 |
| ULPR-15 | 1.48/37.54       | 1.57/39.82       | 1.22/30.99 |
| ULPR-20 | 1.98/50.40       | 2.09/53.09       | 1.58/40.13 |
| ULPR-25 | 2.37/60.14       | 2.48/62.99       | 1.85/46.99 |
| ULPR-50 | 4.53/114.95      | 4.68/118.75      | 3.38/85.85 |

### Coating Types

| SUFFIX | WAVELENGTH RANGE (nm) | AOI 55° PER-SURFACE REFLECTANCE (AVG) |
|--------|-----------------------|---------------------------------------|
| A      | 400 - 700             | 93%                                   |
| B      | 600 - 1,600           | 89%                                   |
| C      | 225 - 10,000          | 90%                                   |
| D      | 225 - 700             | 89%                                   |
| E      | 450 - 10,000          | 96%                                   |
| G      | 650 - 16,000          | 97%                                   |
| H      | 650 - 20,000          | 97%                                   |
| I      | 400 - 750             | 87%                                   |

Detailed coating curves are available in the following pages.

### Custom Configurations

#### Custom configurations for specialized applications

PLX engineers can create a custom product for your application. Potential variations include: smaller and larger apertures; modified mounts to meet your interface; super-critical accuracies; dielectric mirror coatings for high-powered lasers; and units able to withstand military and space environments.

### Specifications

| Item    | Exiting Wavefront (p.v.633nm) | Weight (grams) |
|---------|-------------------------------|----------------|
| ULPR-05 | 0.30 – 0.90                   | 3.26           |
| ULPR-10 | 0.15 – 3.50                   | 17.4           |
| ULPR-15 | 0.10 – 5.25                   | 46.6           |
| ULPR-20 | 0.15 – 7.00                   | 96-105         |
| ULPR-25 | 0.25 – 9.00                   | 159-168        |
| ULPR-50 | 0.45 – 18.0                   | 840-980        |

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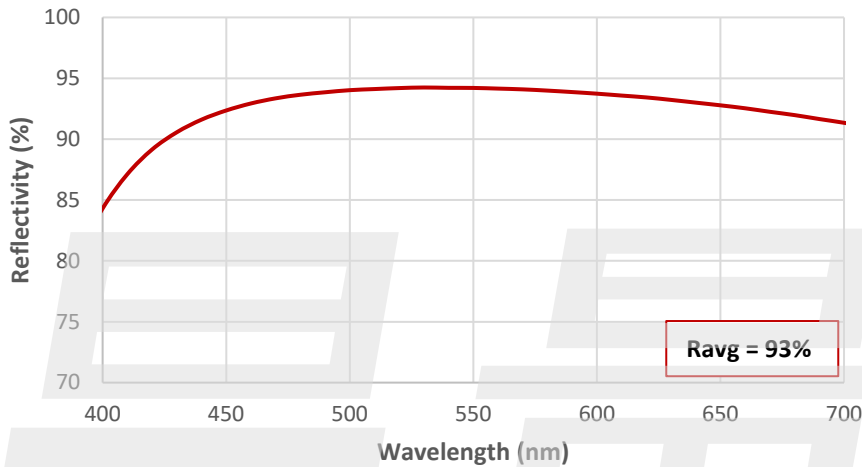
## Ultra Low-Profile Retroreflector™ - ULPR™



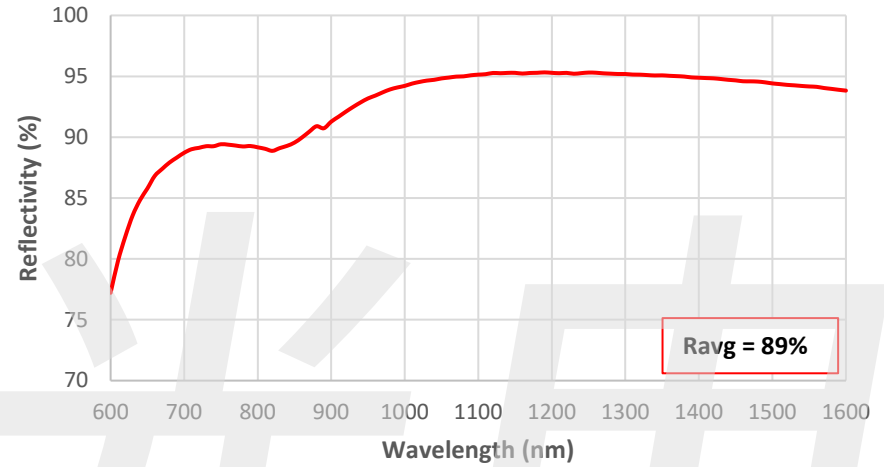
### Coating Curve

AOI 55°

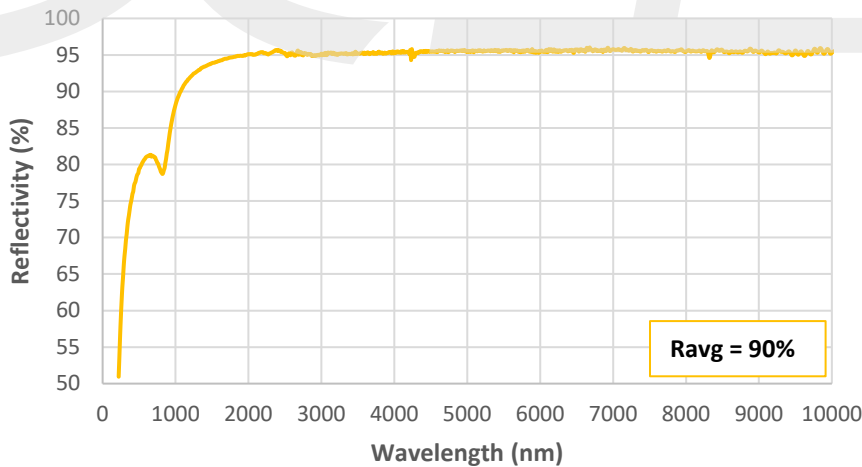
**A - Enhanced Aluminum Coating 400-700 nm**



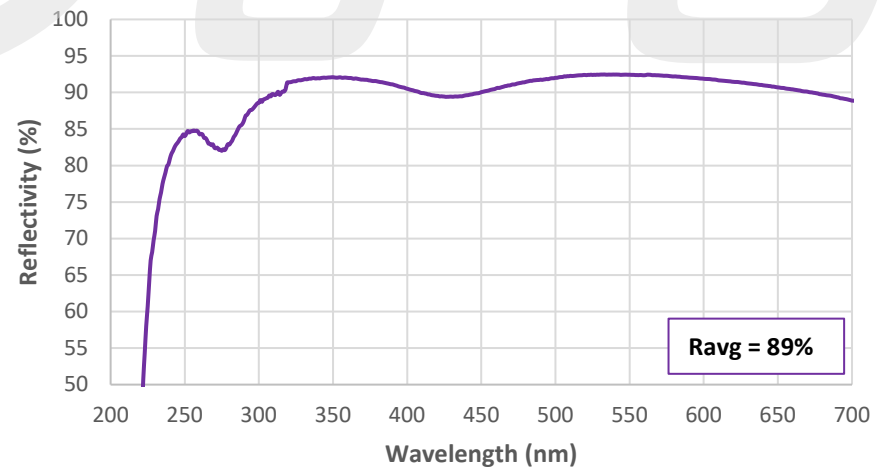
**B - IR Enhanced Aluminum Coating 600-1600 nm**



**C - Unprotected Aluminum Coating 225-10000nm**



**D - UV Enhanced Aluminum Coating 225-700 nm**



**Not e:** Coatings meet Ravg requirement, but coating curves are for reference as  $R(\lambda)$  may vary  $\pm 2\%$

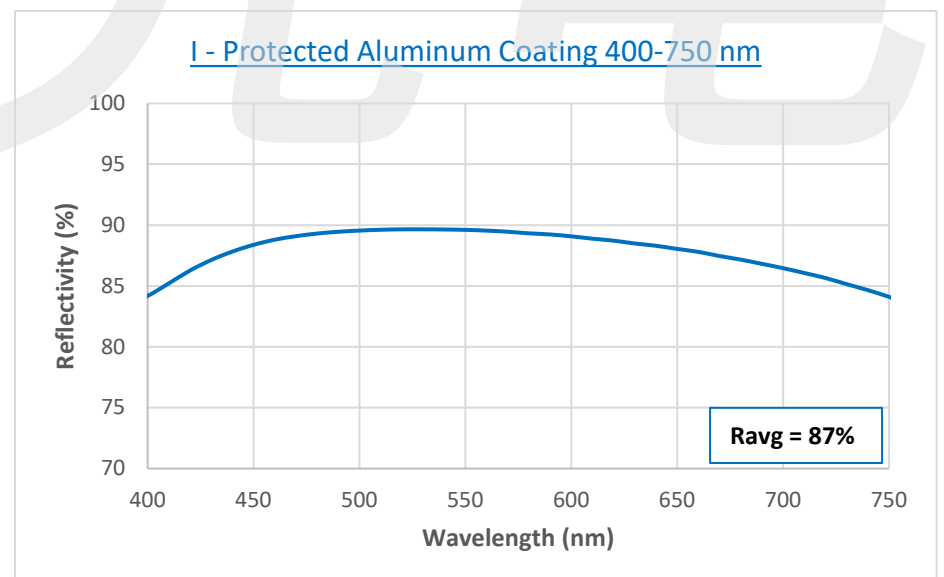
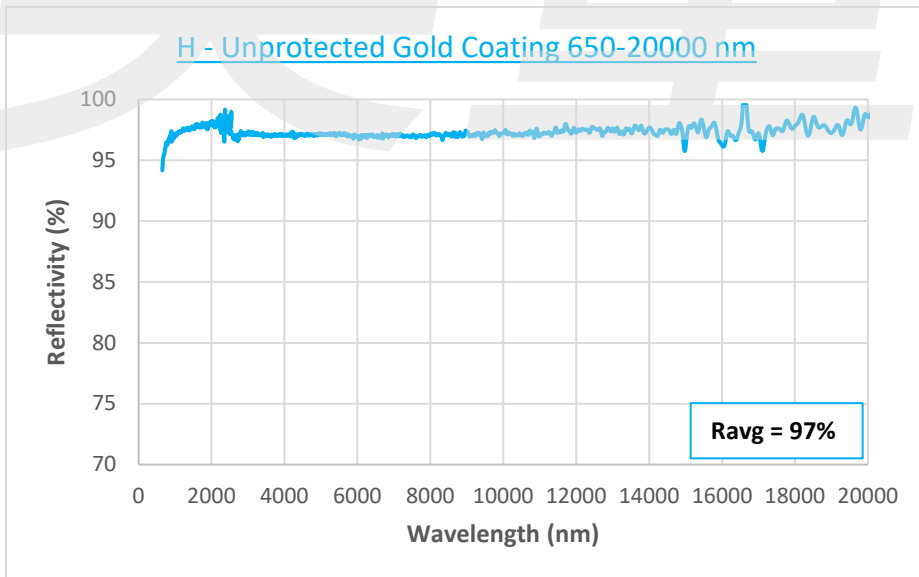
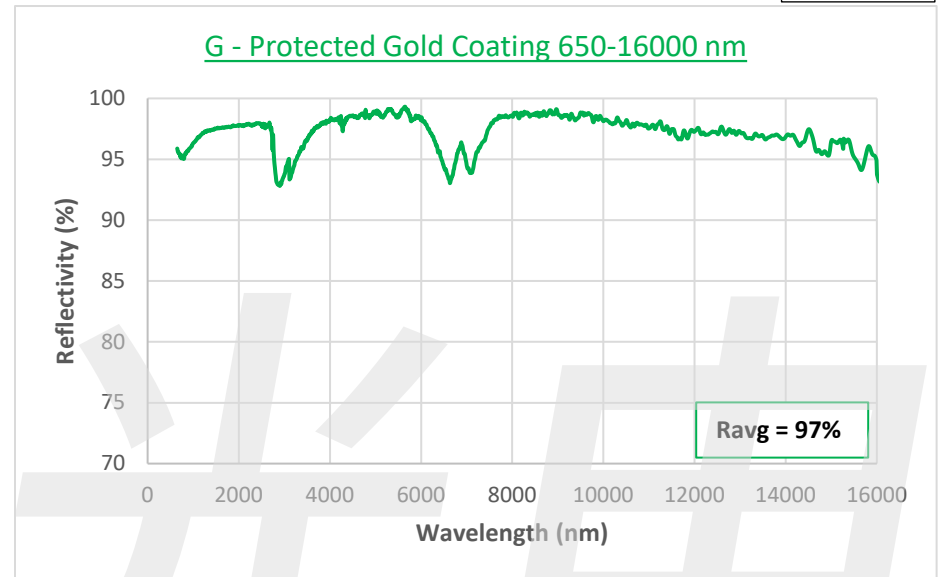
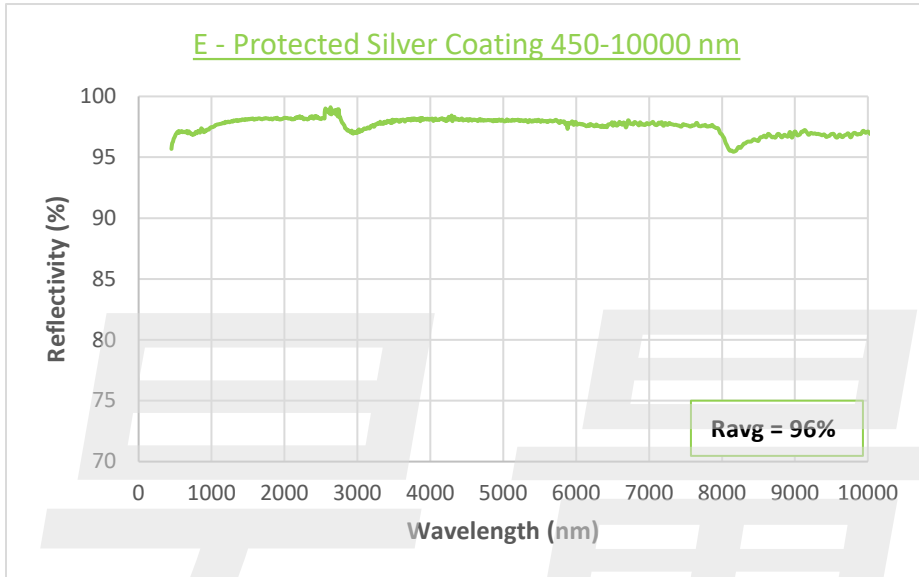
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### Coating Curve

AOI 55°



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