

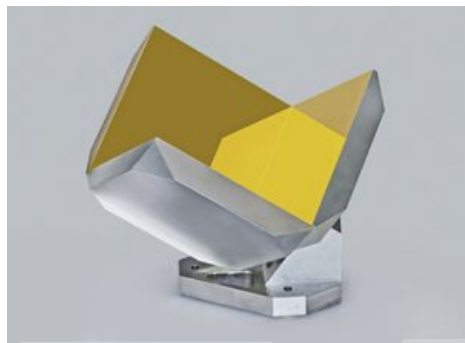
# Product Datasheet

## Ultra Stable Hard-Mounted Retroreflector - USHM™



The improved ultra-stable USHM solidly connects the Retroreflector to the next assembly.

PLX's improved USHM's robust mountings and mirror technology offer properties which enable them to perform exceptionally well in critical applications and harsh conditions. USHM configurations have been utilized in military and space applications and are especially well suited for interferometers where high stability of the OPD and concentricity of the apex to the mounting thread are critical requirements. Lighter weight aluminum mounted versions are also available.



Specifications	
Substrate	Pyrex
Housing material	Invar
Surface Flatness	$\lambda/10 - \lambda/20 @633\text{nm}$
Surface Quality	80-50 Scratch-Dig
Beam Deviation	0.5 – 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

Standard USHM mirror coatings are aluminum, silver and gold, in both bare metal and with protective overcoats. All protected PLX coatings meet MIL-SPEC durability and adhesion requirements. Unprotected metallic coatings work well for interferometric applications. Custom coatings are available. PLX USHMs are vacuum compatible and can be positioned about the permanently connected post in any orientation, providing greater freedom for different mounting configurations.

#### 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)

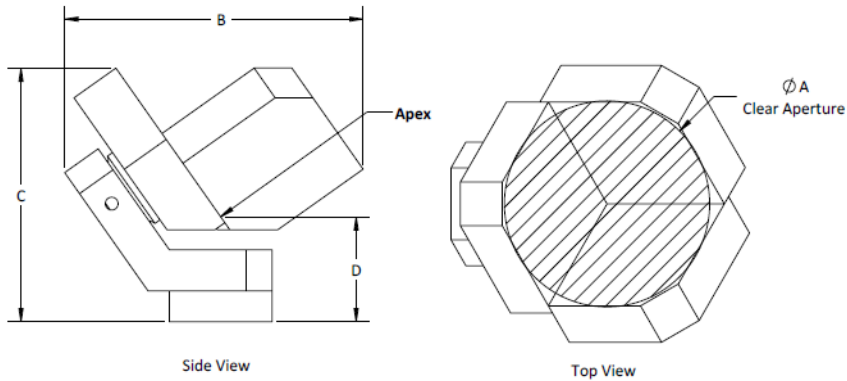
Beam deviation and exiting wavefront are interrelated, and it is only necessary to specify one.

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

#### Important Notice

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### Outline Drawings



### 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%

Item	Accuracy (arc.sec.)	ØA (in/mm)	B (in/mm)	C (in/mm)	D (in/mm)
USHM-10	1.0 – 30.0	1.00/25.40	1.45/36.92	1.23/31.28	0.51/12.95
USHM-15	0.5 – 30.0	1.50/38.10	1.94/49.26	1.69/43.03	0.65/16.48
USHM-20	0.5 – 1.0	2.00/50.80	2.55/64.81	1.98/50.24	0.58/14.61
USHM-20	2.0 – 30.0	2.00/50.80	2.48/62.94	1.98/50.24	0.58/14.61
USHM-25	0.5 – 1.0	2.38/60.33	3.00/76.32	2.32/58.96	0.65/16.43
USHM-25	2.0 – 30.0	2.38/60.33	2.93/74.45	2.27/57.64	0.60/15.11
USHM-50	0.5 – 1.0	4.56/115.89	5.52/140.09	4.43/112.47	0.73/18.62
USHM-50	2.0 – 30.0	4.56/115.89	5.47/138.85	4.36/110.67	0.66/16.81

Detailed coating curves are available in the following pages.

### Custom Configurations

#### Custom configurations for specialized applications

PLX engineers can create a custom HMHR for your application. Potential variations include: smaller and larger apertures; modified hard 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	Beam Deviation (arc.sec.)	Exiting Wavefront (p.v.633nm)	Weight (grams)
USHM-10	1.0-30.0	0.15-3.50	34
USHM-15	0.5-30.0	0.10-5.25	73
USHM-20	0.5-30.0	0.15-7.00	126-136
USHM-25	0.5-30.0	0.25-9.00	206-227
USHM-50	0.5-30.0	0.45-18.00	369-855

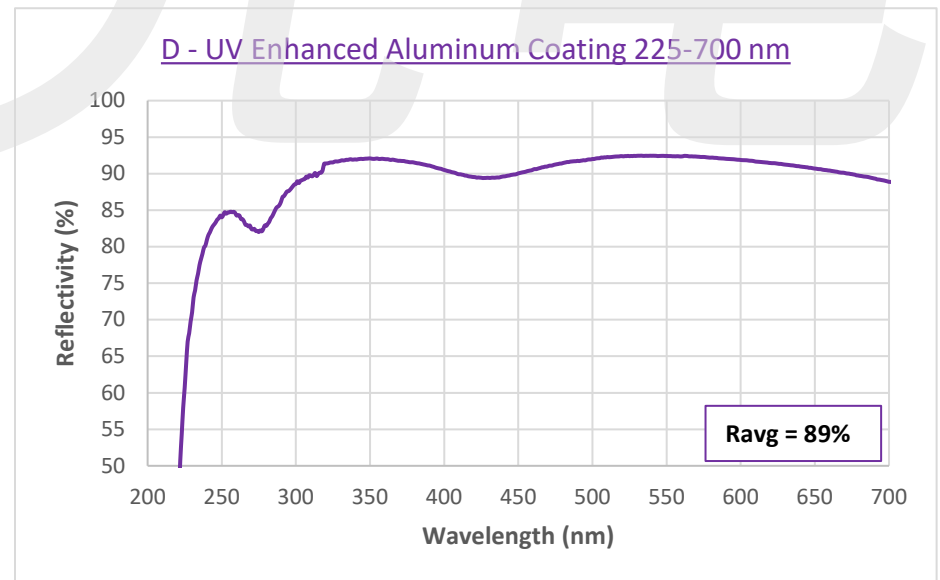
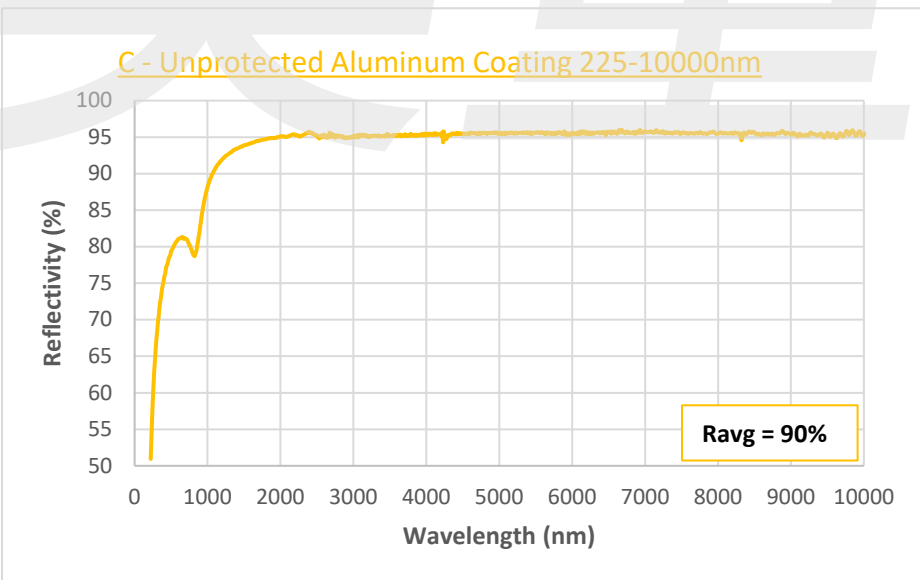
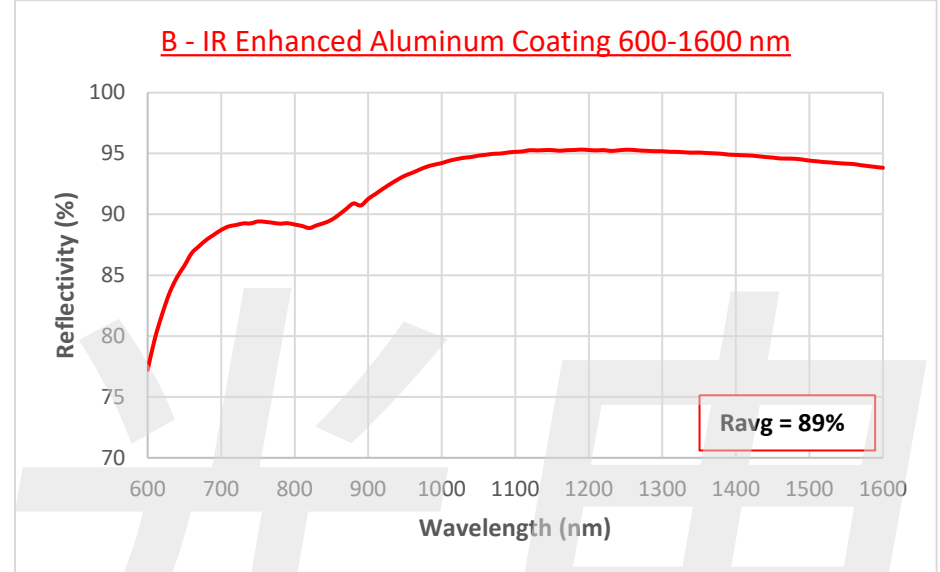
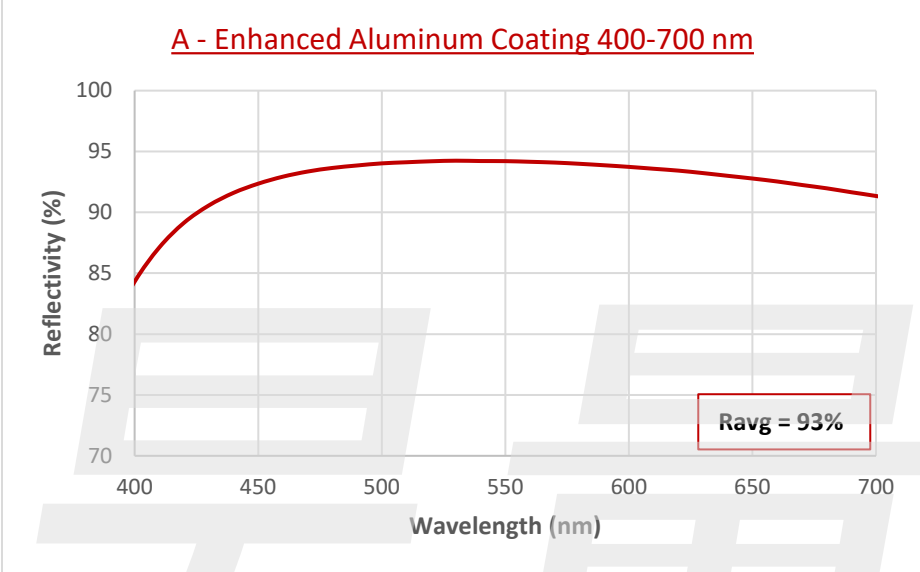
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### Coating Curve

AOI 55°



Note: Coatings meet Ravg requirement, but coating curves are for reference as R(λ) may vary ± 2% per lot.

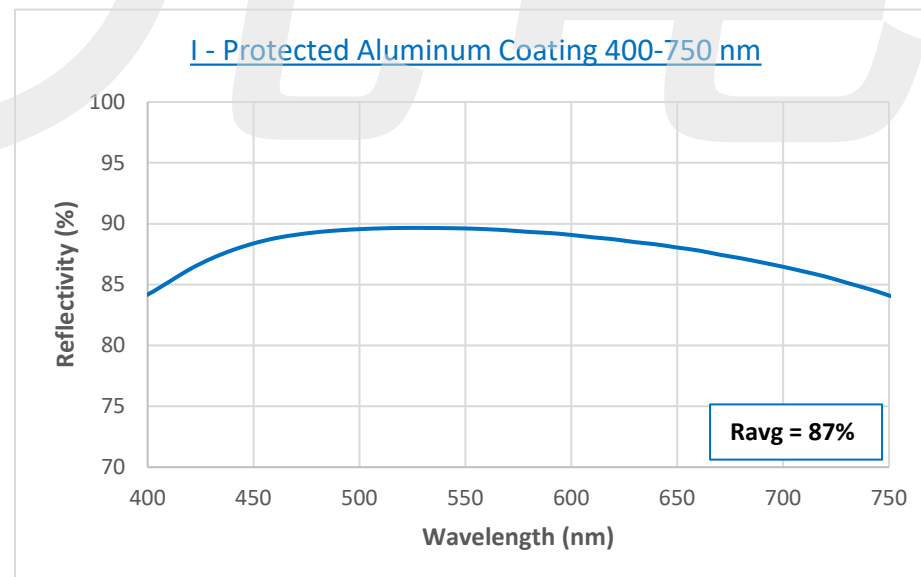
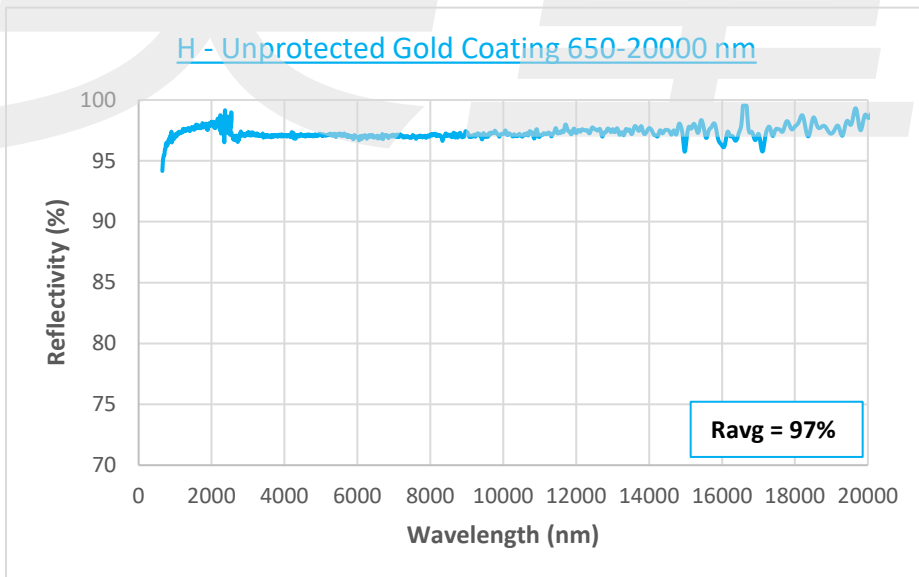
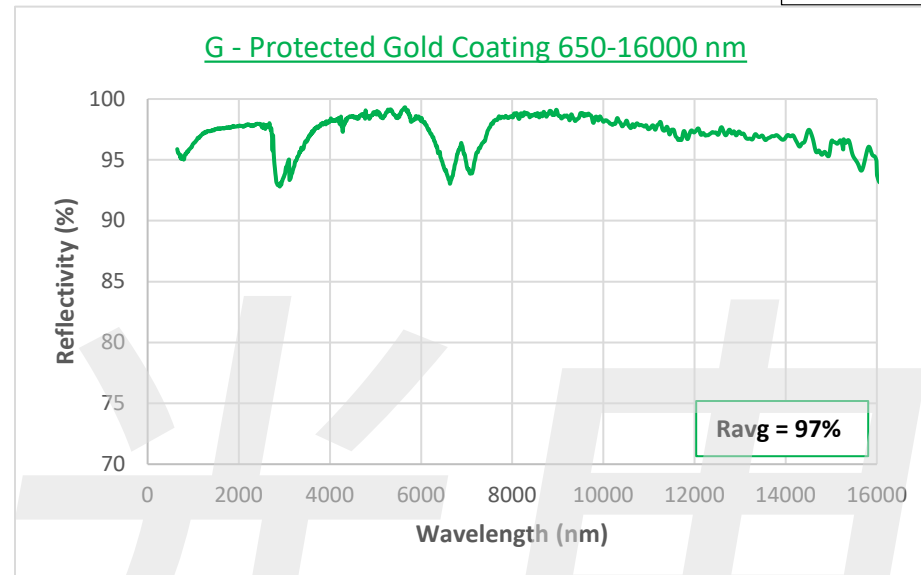
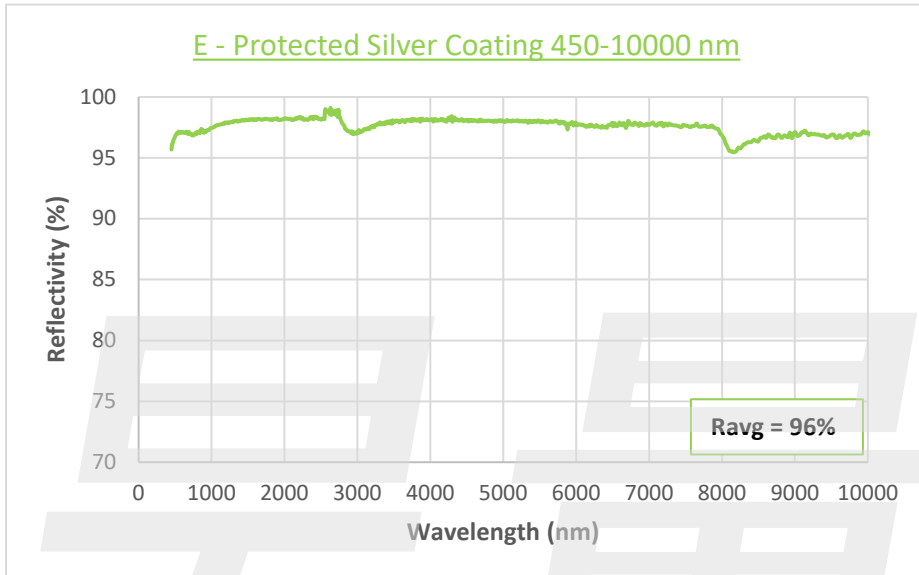
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