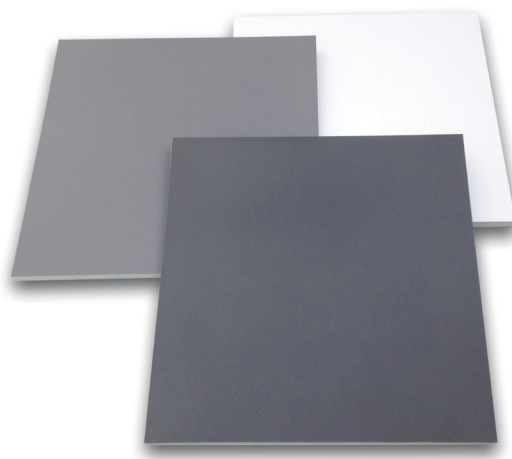


# Commercial Targets

## Permafect® Reference Reflectance Targets



### **In the field, as you fly. Absolute spectral reflectance where it matters most.**

Our Commercial Targets are a comprehensive, portable, UV-VIS-NIR reference reflectance tool that improves the success of ground truth and baseline calibrations for aerial imaging systems.

### **Uniform Spectral Response and Durable**

Aerial imaging systems require low uncertainty reference reflectance targets for broadband sensor characterization. The reflectance targets you use to calibrate your spectral imaging system matter. Grey painted cards, fabrics, and paper leave you at a disadvantage.

There's a better solution, Permafect greyscale targets. Permafect diffuse reflectance coatings maintain their appearance under a wide variety of lighting environments and have uniform spectral response. They are thermally and physically durable, thermally color stable, and UV light stable. Permafect has no gloss, no polarization and no fluorescence.

**Permafect Commercial Targets** are scalable, UV-VIS-NIR reference reflectance targets, on a rugged lightweight backing material. If you need a durable and portable, low uncertainty reference target to ground truth your aerial imaging system, our Commercial Targets are right for you.

Commercial Targets are 18.5 mm thick and consist of an aluminum honeycomb network sandwiched between two sheets of aluminum. The material design provides a mechanically flat, rugged, and lightweight target backing solution available in four standard target sizes; 0.5 m x 0.5 m, 1.0 m x 1.0 m, 1.5 m x 1.5 m, and 1.2 m x 2.4 m, with or without mounting.

### **No Other Options Compare**

- Lightweight
- Durable
- Tailorable
- Uniform
- Easy to Clean

### **Applications**

- Lidar
- Time of Flight
- Ground Truth
- Imager Calibration
- Sensor/Source Compensation

## Results you can trust

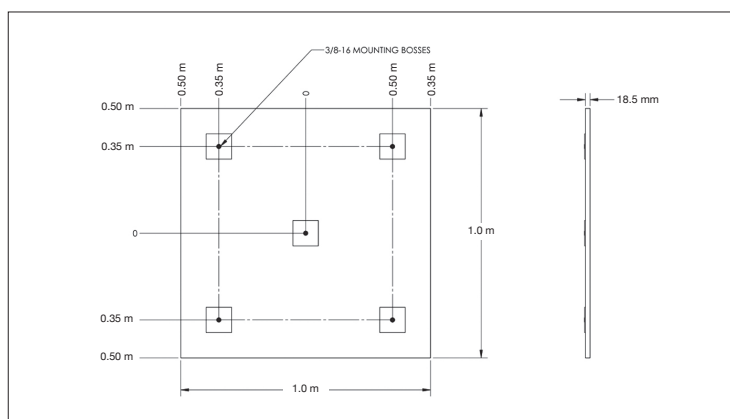
All Permafect targets include reflectance data. Commercial targets are calibrated across the UV-VIS-NIR spectral range so you can accurately baseline your spectral imaging system.

Commercial Targets include a report of the average spectral reflectance from 350 to 2400 nm. The average reflectance is calculated from nine individual measurement points collected in a grid across the target surface. All commercial targets include a 905 nm reflectance uniformity map.

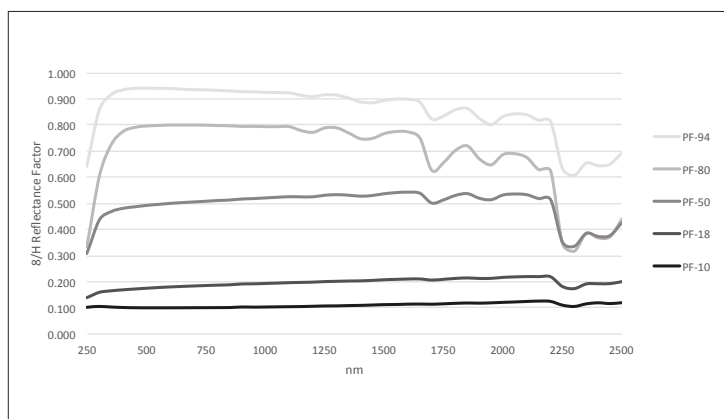
## Performance Specifications for Permafect Targets

Permafect-X (%)	5%	10%	18%	50%	80%	94%
<b>Variance from average at 905 nm</b> for targets 1 m <sup>2</sup> or smaller	±1.25% 3.75% - 6.25%	±1.25% 8.75% - 11.25%	±1.25% 16.75% - 19.25%	±1.75% 48.25% - 51.75%	±1.25% 78.75% - 81.25%	+3.0% / -0% 94.0% - 97.0%
<b>Variance from average at 905 nm</b> for targets greater than 1 m <sup>2</sup>	±1.5% 3.5% - 6.5%	±1.5% 8.5% - 11.5%	±1.5% 16.5% - 19.5%	±2.0% 48.0% - 52.0%	±1.5% 78.5% - 81.5%	+3.0% / -0% 94.0% - 97.0%
<b>Uniformity:</b>						
0.5 m x 0.5 m at 905 nm	±1.0%	±1.0%	±1.0%	±1.5%	±1.0%	±1.0%
1.0 m x 1.0 m at 905 nm	±1.0%	±1.0%	±1.0%	±1.5%	±1.0%	±1.0%
1.5 m x 1.5 m at 905 nm	±1.5%	±1.5%	±1.5%	±2.0%	±1.5%	±1.5%
1.2 m x 1.2 m at 905 nm	±1.5%	±1.5%	±1.5%	±2.0%	±1.5%	±1.5%

## Example of Commercial Target with Mounting



## Typical 8/H Reflectance Factors of Permafect



## Approximate Target Weights

Size	Weight
0.5 m x 0.5 m	2.0 kg
1.0 m x 1.0 m	8.0 kg
1.5 m x 1.5 m	18.0 kg
1.2 m x 2.4 m	23.0 kg

## What's in the box?

- Permafect Commercial Target in one of six reflectance levels
- Signed calibration report with UV-VIS-NIR spectral reflectance calibration and 905 nm reflectance uniformity map.
- USB with PDF report

# Commercial Targets Ordering Information

## Commercial Targets with mounting

MODEL	DESCRIPTION	ORDER NUMBER
PFT-05-05M-CT-TMCM	Permafect 5%, Commercial Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02041-005
PFT-10-05M-CT-TMCM	Permafect 10%, Commercial Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02041-010
PFT-18-05M-CT-TMCM	Permafect 18%, Commercial Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02041-018
PFT-50-05M-CT-TMCM	Permafect 50%, Commercial Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02041-050
PFT-80-05M-CT-TMCM	Permafect 80%, Commercial Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02041-080
PFT-94-05M-CT-TMCM	Permafect 94%, Commercial Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02041-095
PFT-05-10M-CT-TMCM	Permafect 5%, Commercial Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02042-005
PFT-10-10M-CT-TMCM	Permafect 10%, Commercial Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02042-010
PFT-18-10M-CT-TMCM	Permafect 18%, Commercial Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02042-018
PFT-50-10M-CT-TMCM	Permafect 50%, Commercial Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02042-050
PFT-80-10M-CT-TMCM	Permafect 80%, Commercial Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02042-080
PFT-94-10M-CT-TMCM	Permafect 94%, Commercial Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02042-095
PFT-05-15M-CT-TMCM	Permafect 5%, Commercial Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02043-005
PFT-10-15M-CT-TMCM	Permafect 10%, Commercial Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02043-010
PFT-18-15M-CT-TMCM	Permafect 18%, Commercial Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02043-018
PFT-50-15M-CT-TMCM	Permafect 50%, Commercial Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02043-050
PFT-80-15M-CT-TMCM	Permafect 80%, Commercial Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02043-080
PFT-94-15M-CT-TMCM	Permafect 94%, Commercial Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02043-095
PFT-05-12M24M-CT-TMCM	Permafect 5%, Commercial Target, 1.2 m x 2.4 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02044-005
PFT-10-12M24M-CT-TMCM	Permafect 10%, Commercial Target, 1.2 m x 2.4 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02044-010
PFT-18-12M24M-CT-TMCM	Permafect 18%, Commercial Target, 1.2 m x 2.4 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02044-018
PFT-50-12M24M-CT-TMCM	Permafect 50%, Commercial Target, 1.2 m x 2.4 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02044-050
PFT-80-12M24M-CT-TMCM	Permafect 80%, Commercial Target, 1.2 m x 2.4 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02044-080
PFT-94-12M24M-CT-TMCM	Permafect 94%, Commercial Target, 1.2 m x 2.4 m, 18.5 mm thick, Honeycomb Al backing, with mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02044-095

## Commercial Targets Ordering Information

### Commercial Targets without mounting

MODEL	DESCRIPTION	ORDER NUMBER
PFT-05-05M-CT-TCM	Permafect 5%, Commercial Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02031-005
PFT-10-05M-CT-TCM	Permafect 10%, Commercial Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02031-010
PFT-18-05M-CT-TCM	Permafect 18%, Commercial Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02031-018
PFT-50-05M-CT-TCM	Permafect 50%, Commercial Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02031-050
PFT-80-05M-CT-TCM	Permafect 80%, Commercial Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02031-080
PFT-94-05M-CT-TCM	Permafect 94%, Commercial Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02031-095
PFT-05-10M-CT-TCM	Permafect 5%, Commercial Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02032-005
PFT-10-10M-CT-TCM	Permafect 10%, Commercial Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02032-010
PFT-18-10M-CT-TCM	Permafect 18%, Commercial Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02032-018
PFT-50-10M-CT-TCM	Permafect 50%, Commercial Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02032-050
PFT-80-10M-CT-TCM	Permafect 80%, Commercial Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02032-080
PFT-94-10M-CT-TCM	Permafect 94%, Commercial Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02032-095
PFT-05-15M-CT-TCM	Permafect 5%, Commercial Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02033-005
PFT-10-15M-CT-TCM	Permafect 10%, Commercial Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02033-010
PFT-18-15M-CT-TCM	Permafect 18%, Commercial Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02033-018
PFT-50-15M-CT-TCM	Permafect 50%, Commercial Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02033-050
PFT-80-15M-CT-TCM	Permafect 80%, Commercial Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02033-080
PFT-94-15M-CT-TCM	Permafect 94%, Commercial Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02033-095
PFT-05-12M24M-CT-TCM	Permafect 5%, Commercial Target, 1.2 m x 2.4 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02034-005
PFT-10-12M24M-CT-TCM	Permafect 10%, Commercial Target, 1.2 m x 2.4 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02034-010
PFT-18-12M24M-CT-TCM	Permafect 18%, Commercial Target, 1.2 m x 2.4 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02034-018
PFT-50-12M24M-CT-TCM	Permafect 50%, Commercial Target, 1.2 m x 2.4 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02034-050
PFT-80-12M24M-CT-TCM	Permafect 80%, Commercial Target, 1.2 m x 2.4 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02034-080
PFT-94-12M24M-CT-TCM	Permafect 94%, Commercial Target, 1.2 m x 2.4 m, 18.5 mm thick, Honeycomb Al backing, without mounting, 905 nm nine point mapping and calibration from 350 to 2400 nm	AA-02034-095



## Permafect Targets Carry and Stow Case Options

- Cases carry one to three targets
  - Protects surface and corners from being scratched and dinged
    - Hard sided case with reinforced corners
    - Foam lined fitted inserts
    - Can be used to stack targets in constrained spaces
- Grab and go
  - Recessed handles
- Grab and drag larger targets
  - EZ Haul wheels options
- Easy access
  - Hinged cases
- Secure
  - Recessed latched
- No additional packaging needed
  - Can be used for shipments, storage and transport

MODEL	DESCRIPTION	ORDER NUMBER
PFT-05M-Carry Case	Carry case for Permafect 0.5 m x 0.5 m Targets Main unit size: (L x W x H) -> 0.61 m x 0.61 m x 0.20 m No castors or wheels. Weight: 9.5 kg	AA-01523-050
PFT-1M-Carry Case Wheeled	Carry case for Permafect 1 m x 1 m Targets Main unit size: (L x W x H) -> 1.12 m x 1.12 m x 0.20 m With corner wheel installed. Weight: 25 kg	AA-01524-100
PFT-15M-Carry Case Wheeled	Carry case for Permafect 1.5 m x 1.5 m Targets Main unit size: (L x W x H) -> 1.63 m x 1.63 m x 0.20 m With corner wheel installed. Weight: 30 kg	AA-01524-150
PFT-15M-Target Mount and Carriage	Target mount for Permafect 1.5 m x 1.5 m Targets; connection straps and blocks for connecting two carriages together. All hardware and tools provided	AA-01525-150