

# Lidar Targets

## Permafect® Reference Reflectance Targets

### Proven performance in range

Permafect Lidar Targets are a complete reference reflectance solution for accurately testing range sensitivity at lidar wavelengths and accelerating your lidar system production.

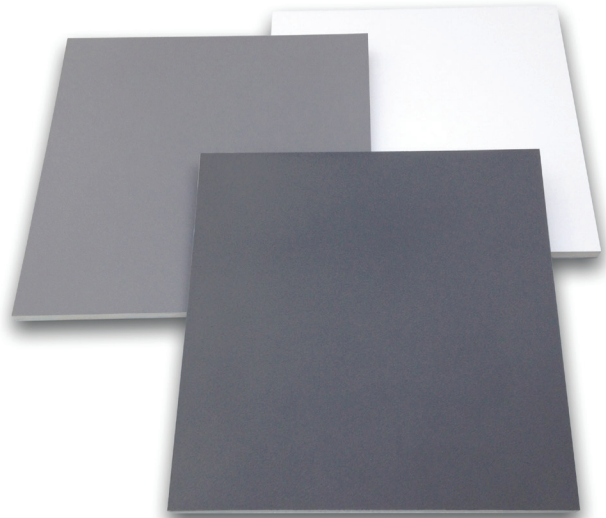
### Uniform spectral response and durable

Lidar sensing systems require greyscale reference reflectance targets to characterize range sensitivity. The reflectance targets you use to test your lidar 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 Lidar Targets are scalable, reference reflectance targets, on rugged lightweight backing material. If you're an automotive OEM or supplier and require a durable absolute reflectance target for characterizing the range sensitivity of your lidar system, our Lidar Targets are right for you.

Lidar Targets are 18.5 - 25.4 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.

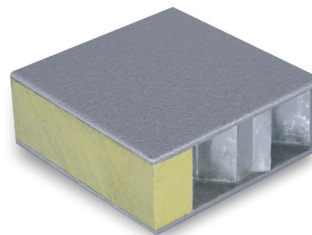


### No other options compare:

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

### Applications:

- Lidar
- Sensitivity and range
- Time of Flight



# Results you can trust

All Permafect targets include reflectance data. Lidar targets are calibrated at the wavelengths that matter most for lidar testing.

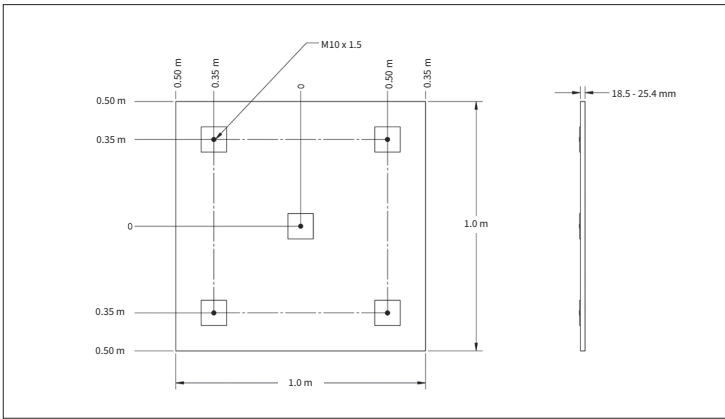
Lidar Targets include a calibration report of the average spectral reflectance at 850 nm, 905 nm and 1550 nm.

The average reflectance values are calculated from nine individual measurements collected in a grid across the target surface.

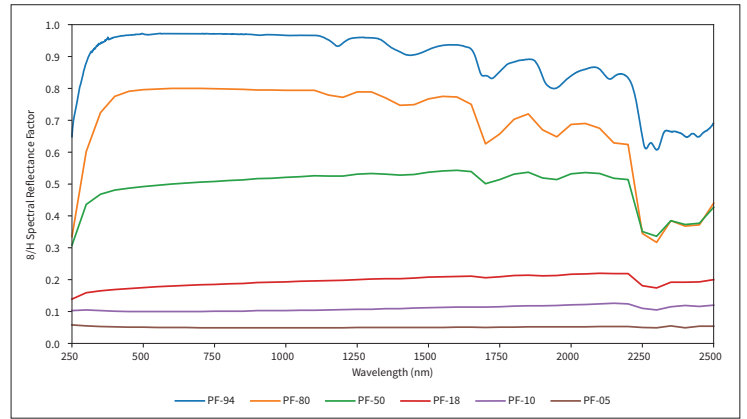
All Lidar Targets include 850 nm, 905 nm and 1550 nm reflectance uniformity maps. Your target will ship with a calibration certificate, uniformity map, and pdf files on USB.

## Performance Specifications

Permafect-X (%)	5%	10%	18%	50%	80%	94%
Tolerance at 905 nm:	±2%	±2%	±2%	±2%	±2%	+3% / -0%
Variance from Nominal:	3% - 7%	8% - 12%	16% - 20%	48% - 52%	78% - 82%	94% - 97%
Uniformity:	±1%	±1%	±1%	±1.5%	±1%	±1%



Example of Lidar Target with Mounting



Typical 8/H Reflectance Factors of Permafect

## Approximate Target Weights and Thickness

Size	Weight	Thickness
0.5 m x 0.5 m	2.0 kg	18.5 mm
1.0 m x 1.0 m	8.0 kg	18.5 mm
1.5 m x 1.5 m	18.0 kg	18.5 mm
1.2 m x 2.4 m	23.0 kg	25.4 mm

## What's in the box?

- Permafect Lidar Target in one of six reflectance levels
- Signed calibration report with 850 nm, 905 nm and 1550 nm reflectance data and 850 nm, 905 nm and 1550 nm uniformity map.
- USB with PDF report

## Model Number Key

PFT-W-WW-XX-YY

PFT: Permafect Target

W: Target Reflectance: 5, 10, 18, 50, 80, or 94%

WW: Size: 05M (0.5 m x 0.5 m), 10M (1.0 m x 1.0 m), 15M (1.5 m x 1.5 m), 12M24M (1.2 m x 2.4 m)

XX: Target Class:

RT: Rigid Target

LT: Lidar Target

CT: Commercial Target

YY: Calibration and Mounting Options:

T: Target

TC: Target with Reflectance Calibration

TCM: Target with Reflectance Calibration and Mapping

TMCM: Target with Mounting Plates, Reflectance Calibration and Mapping



## Ordering Information - Lidar Targets with mounting

Model Number	Description	Order Number
PFT-05-05M-LT-1550-850-TMCM	Permaflect 5%, Lidar Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01954-005
PFT-10-05M-LT-1550-850-TMCM	Permaflect 10%, Lidar Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01954-010
PFT-18-05M-LT-1550-850-TMCM	Permaflect 18%, Lidar Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01954-018
PFT-50-05M-LT-1550-850-TMCM	Permaflect 50%, Lidar Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01954-050
PFT-80-05M-LT-1550-850-TMCM	Permaflect 80%, Lidar Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01954-080
PFT-94-05M-LT-1550-850-TMCM	Permaflect 94%, Lidar Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01954-095
PFT-05-10M-LT-1550-850-TMCM	Permaflect 5%, Lidar Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01955-005
PFT-10-10M-LT-1550-850-TMCM	Permaflect 10%, Lidar Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01955-010
PFT-18-10M-LT-1550-850-TMCM	Permaflect 18%, Lidar Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01955-018
PFT-50-10M-LT-1550-850-TMCM	Permaflect 50%, Lidar Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01955-050
PFT-80-10M-LT-1550-850-TMCM	Permaflect 80%, Lidar Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01955-080
PFT-94-10M-LT-1550-850-TMCM	Permaflect 94%, Lidar Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01955-095
PFT-05-15M-LT-1550-850-TMCM	Permaflect 5%, Lidar Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01956-005
PFT-10-15M-LT-1550-850-TMCM	Permaflect 10%, Lidar Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01956-010
PFT-18-15M-LT-1550-850-TMCM	Permaflect 18%, Lidar Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01956-018
PFT-50-15M-LT-1550-850-TMCM	Permaflect 50%, Lidar Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01956-050
PFT-80-15M-LT-1550-850-TMCM	Permaflect 80%, Lidar Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01956-080
PFT-94-15M-LT-1550-850-TMCM	Permaflect 94%, Lidar Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01956-095
PFT-05-12M24M-LT-1550-850-TMCM	Permaflect 5%, Lidar Target, 1.2 m x 2.4 m, 25.4 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01957-005
PFT-10-12M24M-LT-1550-850-TMCM	Permaflect 10%, Lidar Target, 1.2 m x 2.4 m, 25.4 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01957-010
PFT-18-12M24M-LT-1550-850-TMCM	Permaflect 18%, Lidar Target, 1.2 m x 2.4 m, 25.4 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01957-018
PFT-50-12M24M-LT-1550-850-TMCM	Permaflect 50%, Lidar Target, 1.2 m x 2.4 m, 25.4 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01957-050
PFT-80-12M24M-LT-1550-850-TMCM	Permaflect 80%, Lidar Target, 1.2 m x 2.4 m, 25.4 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01957-080
PFT-94-12M24M-LT-1550-850-TMCM	Permaflect 94%, Lidar Target, 1.2 m x 2.4 m, 25.4 mm thick, Honeycomb Al backing, with mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01957-095

## Ordering Information - Lidar Targets without mounting

Model Number	Description	Order Number
PFT-05-05M-LT-1550-850-TCM	Permafect 5%, Lidar Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01941-005
PFT-10-05M-LT-1550-850-TCM	Permafect 10%, Lidar Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01941-010
PFT-18-05M-LT-1550-850-TCM	Permafect 18%, Lidar Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01941-018
PFT-50-05M-LT-1550-850-TCM	Permafect 50%, Lidar Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01941-050
PFT-80-05M-LT-1550-850-TCM	Permafect 80%, Lidar Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01941-080
PFT-94-05M-LT-1550-850-TCM	Permafect 94%, Lidar Target, 0.5 m x 0.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01941-095
PFT-05-10M-LT-1550-850-TCM	Permafect 5%, Lidar Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01942-005
PFT-10-10M-LT-1550-850-TCM	Permafect 10%, Lidar Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01942-010
PFT-18-10M-LT-1550-850-TCM	Permafect 18%, Lidar Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01942-018
PFT-50-10M-LT-1550-850-TCM	Permafect 50%, Lidar Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01942-050
PFT-80-10M-LT-1550-850-TCM	Permafect 80%, Lidar Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01942-080
PFT-94-10M-LT-1550-850-TCM	Permafect 94%, Lidar Target, 1.0 m x 1.0 m, 18.5 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01942-095
PFT-05-15M-LT-1550-850-TCM	Permafect 5%, Lidar Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01943-005
PFT-10-15M-LT-1550-850-TCM	Permafect 10%, Lidar Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01943-010
PFT-18-15M-LT-1550-850-TCM	Permafect 18%, Lidar Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01943-018
PFT-50-15M-LT-1550-850-TCM	Permafect 50%, Lidar Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01943-050
PFT-80-15M-LT-1550-850-TCM	Permafect 80%, Lidar Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01943-080
PFT-94-15M-LT-1550-850-TCM	Permafect 94%, Lidar Target, 1.5 m x 1.5 m, 18.5 mm thick, Honeycomb Al backing, without mounting, Calibration at 850, 905, and 1550 nm, 9 point mapping	AA-01943-095
PFT-05-12M24M-LT-1550-850-TCM	Permafect 5%, Lidar Target, 1.2 m x 2.4 m, 25.4 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01944-005
PFT-10-12M24M-LT-1550-850-TCM	Permafect 10%, Lidar Target, 1.2 m x 2.4 m, 25.4 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01944-010
PFT-18-12M24M-LT-1550-850-TCM	Permafect 18%, Lidar Target, 1.2 m x 2.4 m, 25.4 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01944-018
PFT-50-12M24M-LT-1550-850-TCM	Permafect 50%, Lidar Target, 1.2 m x 2.4 m, 25.4 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01944-050
PFT-80-12M24M-LT-1550-850-TCM	Permafect 80%, Lidar Target, 1.2 m x 2.4 m, 25.4 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01944-080
PFT-94-12M24M-LT-1550-850-TCM	Permafect 94%, Lidar Target, 1.2 m x 2.4 m, 25.4 mm thick, Honeycomb Al backing, without mounting, nine point mappings and calibrations at 850, 905, and 1550 nm	AA-01944-095



## Permafect Targets Carry and Stow Cases

- 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

## Carry and Stow Case Ordering Information

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