



VARGard™ Series Antireflective Films

Antireflective Films for High Quality Display Enhancements

- Improves LCD and other electronic display contrast and readability.
- Reduces glare (diffuse) and specular reflection by over 85%.
- Protects displays, increases mechanical and chemical durability.
- Available in rolls, 18" x 24" sheets or cut to custom sizes for immediate use, or Dontech will apply to your product in an ESD controlled cleanroom environment.

*Antireflective and
Antiglare/Antireflective
Available*

Experience the VARGard™ Difference

VARGard™ films improve electronic display readability by reducing glare and reflection losses in high ambient light conditions by converting the reflections into transmitted energy. With the addition of VARGard™, reflections can be reduced over 85%. Typical applications include the aftermarket enhancement of flat panel displays (e.g., LCDs) and touchscreens used in high ambient light environments.

Your Clear Optical Solution

VARGard™ is available in a variety of surface finishes from very matte to polished (i.e., no antiglare properties). VARGard™ films come standard with pressure sensitive adhesive (PSA) for optically coupling the film to electronic displays and other surfaces. EZKlean™ hydrophobic and oleophobic coatings are the outer most layer of VARGard™ films. These surface treatment coatings repel fingerprints, oils, and inks, improving the optical appearance during normal use and improving the ease with which the film can be cleaned.

Standard VARGard™ Products

- **92 VARGard™** – polished clear (92 gloss) – best suited for high ambient light indoor/outdoor applications where maximum display resolution is required or where lambertian reflections are an issue.
- **60 VARGard™** – matte (60 gloss finish) – combination of both diffuse (antiglare) and specular antireflective properties. Suitable for high ambient light and outdoor applications where good display resolution is required.
- **Mattegard™** – antiglare-only PET films available in 60 gloss finishes. Mattegard™ comes with PSA and release liners.

MARKETS

Aerospace | Medical | Military | Industrial

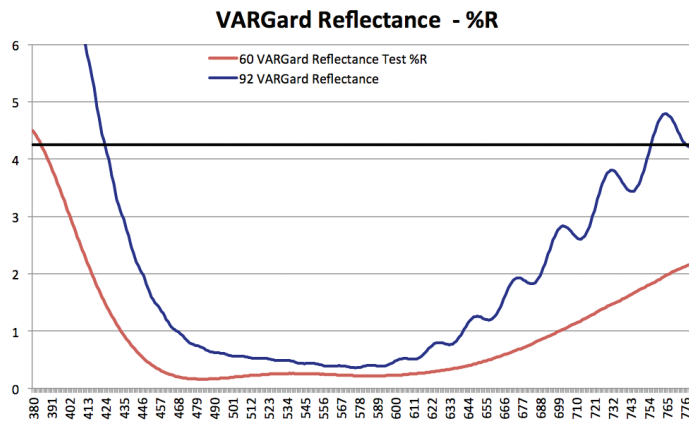
Custom VARGard™ Products

Dontech, Inc. manufactures a variety of custom optical filters and enhancement films.

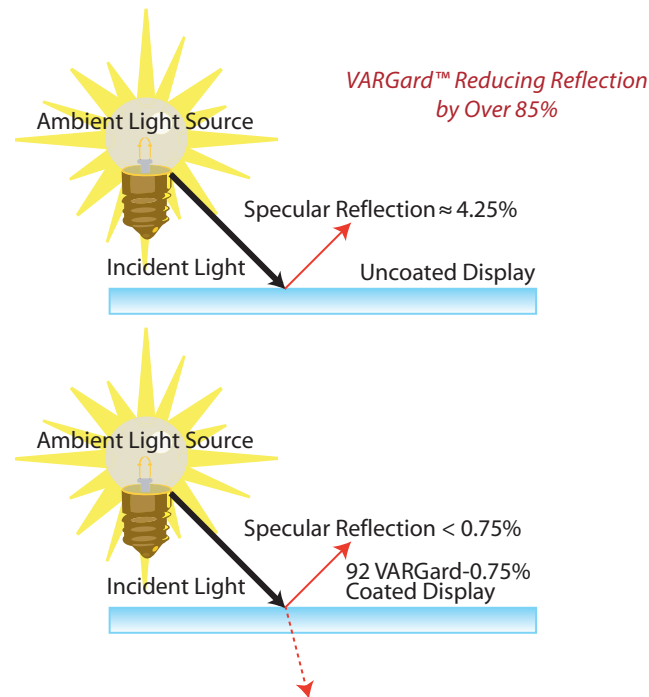
- **Conductive VARGard™** – conductive AR films for antistatic applications.
- **Polarizing VARGard™** – by combining AR coatings with circular or linear polarizers, front surface and internal reflections are greatly reduced, resulting in increased contrast and sunlight readability.
- **Heat Shield™ VARGard™** – An infrared (IR) blocking film layer can be incorporated into the optical stack to further protect displays from thermal loading due to solar radiation.
- **Custom Antireflective films** – Dontech can vacuum deposit custom antireflective coatings with a maximum 0.5% or 0.25% total luminous reflection for higher performance applications such as avionic displays.
- **Custom substrates** – TAC, PMMA, and glass.



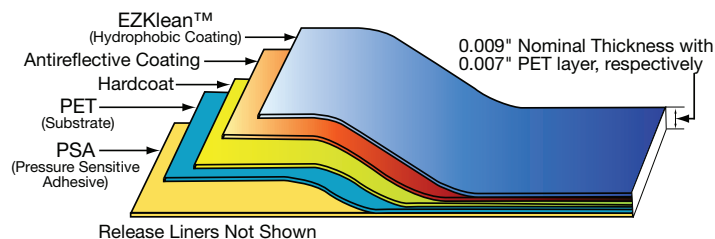
Reflection of VARGard™ Coated vs. Uncoated Display



VARGard™ Optical Reflection Curve Reflection Properties of VARGard™ vs. Uncoated Display



VARGard™ Construction



VARGard™ Product Specifications

Substrate – Polyethylene Terephthalate (PET) – thermoplastic film – 0.007"

Optical Properties:

- Antireflective coating: Multi-layer, broadband AR coating; total luminous reflection of <0.75% max.; average photopic value <0.6% (380 to 780 nm).
- Light transmission: $\geq 94\%$
- Wavelengths transmitted: 380 to 780 nm

P/N	Size	Description
92 VARGard-0.75 with EZKlean	18" x 24" x 0.009"	0.007" thick optical grade PET with a 92 gloss hard coating (no antiglare properties) and a <0.75% maximum photopic reflection antireflection coating. The outer most layer is Dontech's EZKlean brand hydrophobic/oleophobic coating.
60 VARGard-0.75 with EZKlean	18" x 24" x 0.009"	0.007" thick optical grade PET with a 60 gloss hard coating (antiglare properties) and a <0.75% maximum photopic reflection antireflection coating. The outer most layer is Dontech's EZKlean brand hydrophobic/oleophobic coating.

Note: VARGard™ comes standard with protective masking on the front and a release liner on the rear surfaces. Gloss levels per ASTM-D-523.

Hard Coating – improves resistance to abrasion, scratching and chemicals and exceeds either a 2 or a 3H pencil hardness per ASTM-D-3363, Mitsubishi JPIA Lead. Clear/Polished for 92 VARGard™; 60 Gloss Antireflective coating for 60 VARGard™.

EZKlean™ – Fluorocarbon- or silane-based hydrophobic/oleophobic surface coatings. Reduces surface tension and resists fingerprints, oils and most inks.

Testing per ASTM-D-1308, 1 hour spot open test

Distilled Water	Acetone
Soap Solution	Vinegar (3% Acetic Acid)
Lubricating Oil	Unleaded Gasoline (87 Octane)
Coffee	Butyl Acetate
Windex®	Butyl Cellulosolve
Window Cleaner	Acetate
Isopropyl Alcohol (70% by Volume)	Methyl Ethyl Ketone (MEK)
VM & P Naphtha	Toluene

Chemical Resistance of VARGard™ with EZKlean™

Storage – Shelf-life of VARGard™ films is 6 months at $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, Maximum RH 50%. Storage below 23°C will extend the life of the film. Film must be brought back to room temperature before using. Material should never be stored below 10°C .

Thermal Range – -40°C to $+70^{\circ}\text{C}$ for product when properly installed over glass or most hard coatings.

Humidity – After exposure to an atmosphere of $48.90 \pm 2.2^{\circ}\text{C}$ and 95 to 100% relative humidity, the coated surface meets the durability requirement.

Durability – Mil-C-675C: Para. 4.5.10 Eraser Test, Para. 4.5.11 Cheesecloth test

Adhesion – Mil-C-675C: Para. 4.5.12 Cellophane tape test

Dontech, Inc. is an ISO-9001 certified designer of optical filters for contrast enhancement and EMI/RFI shielding for electronic displays and enclosures. For more information visit us at www.dontech.com