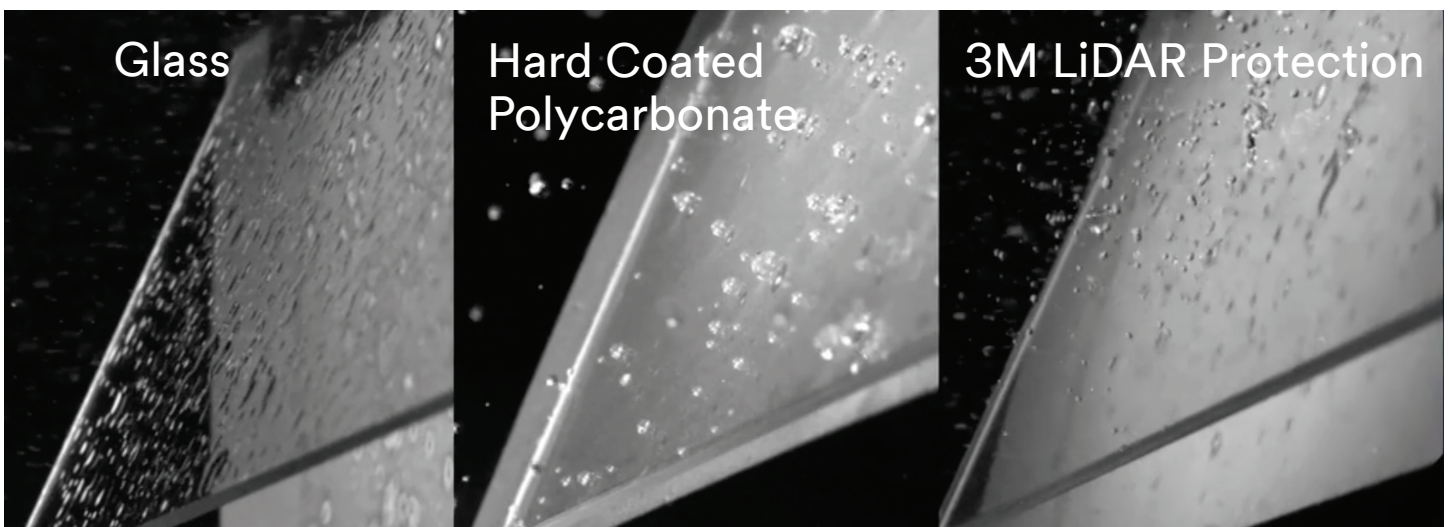


3M™ Sensor Protection Film (SPF)



Product Description

3M™ Sensor Protection Film uses 3M's advanced coating technology to generate replaceable superhydrophobic and oleophobic films that can be applied to the covers of external automobile sensors.

Applications

3M™ Sensor Protection Film is typically used on lidar lens covers to maintain signal fidelity in a variety of inclement weather conditions. Additionally, 3M Sensor Protection Film serves as a sacrificial surface against rock chips that would otherwise require the replacement of the lens cover. Oleophobic properties enable the film to be easily cleaned with mild solvents and standard washing compounds.

3M Sensor Protection Film is intended to be a replaceable and serviceable film that applies and removes easily without leaving behind residue which could impact the operation of the lidar sensor. The film is neutral in color and has high transmission at typical lidar operational wavelengths.

Typical Properties

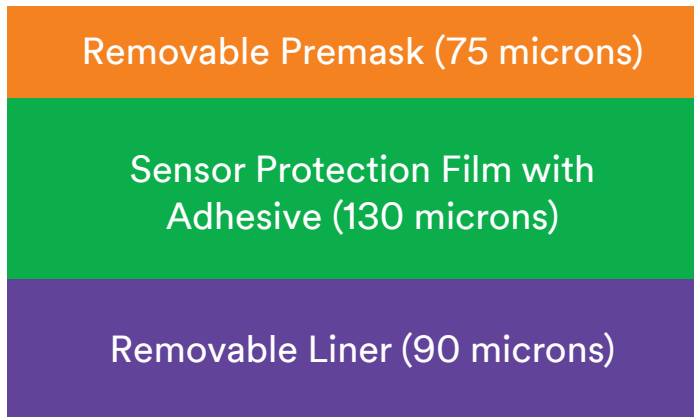
Technical information provided consists of typical developmental product data and should not be used for specification purposes. Unless otherwise noted, all tests are performed at room temperature.

Property	Typical Value
Transmission at 905 nm	> 99% (substrate-referenced)
Haze	< 1%
Transmitted Wavefront Error (905 nm laminated to glass)	< 300 nm (RMS) < 2 microns (Peak to Valley)
Water Contact Angle, Hysteresis	> 150°, 10°
Water Roll Off Angle (14 micro-L drop)	< 10°
Hexadecane Contact Angle, Hysteresis	> 100°, 35°
Nominal Thickness (with Adhesive)	130 microns
Abrasion (Max cycles crock cloth at 0.4 N/cm ²)	> 100 cycles
Temperature and Humidity Resistance	-40°C, 85°C, 65°C/95%RH for 500 hours
Thermal Shock Resistance	-40°C to 85°C for 200 cycles (hour each)

Product Features

- Superhydrophobic surface to prevent water adhesion
- Oleophobic properties to enable cleaning with mild solvents
- Replaceable film with easy to apply and remove adhesive
- High transmission at sensor wavelengths with neutral appearance

Product Construction



Shelf Life and Storage (prior to application)

Material should be stored in its original packaging, laying in a horizontal orientation, away from direct sunlight. Heavy objects should not be piled on top of it to avoid damaging the product. Ambient temperature and humidity should be controlled to 10-30°C at 30-60% relative humidity. Avoid applying pressure to, or resting objects on, the product to prevent marking, denting or deforming. Hold product by the edges to prevent soiling of the view area and wear gloves to prevent fingerprints or nail marks. Do not slide the product.

Availability

This product is in development and not available for commercial sale at this time.

Important Sample Notice

This prototype or product (the “Product”) is developmental and made available to the recipient (“Recipient”) on a non-exclusive basis for the sole purpose of evaluating its use in Recipient’s application. Product may vary product-to-product and lot-to-lot or be changed in the future without notice. 3M does not guarantee future availability. Product is transferred subject to 3M’s Standard Terms and Conditions, except as modified by this Notice. Products may be subject to patent applications and/or other intellectual property rights held by 3M or its designated affiliate (the “IP Rights”) and no license of any IP Rights is granted to Recipient except for the limited purpose described above. In addition to any other confidentiality obligations that Recipient may have to 3M, for three years after the date of last shipment. Recipient shall treat each Products as 3M’s confidential information using such care as Recipient uses in maintaining the confidentiality of its own secret information, but no less than a reasonable degree of care.

Limited Warranty

3M warrants that each Product will conform to our Customer Quality Standard (the “3M Warranty”) for 12 months after 3M’s Product shipment (“Warranty Period”). Any engineering or technical information, recommendations, installation instructions, jumbo delivery standards, certificates of analysis, and other information or materials relating to Products (“Other Product Information”) is provided for the Product buyer’s convenience and is not warranted. 3M will have no obligations under the 3M Warranty with respect to any Product that has been: (a) not stored, handled, or transported in accordance with this Warranty or Other Product Information; or (b) modified or damaged by anyone other than 3M.



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