

# NANOMYTE<sup>®</sup> Hardcoat



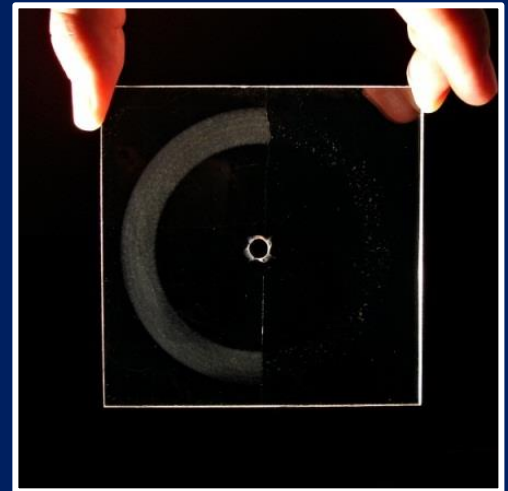
**NANOMYTE® Hardcoat** fulfills the need for abrasion or scratch-resistant coatings on plastic substrates, which are needed in a variety of applications such as ophthalmic & sportswear lenses, automobile, and airplane windows. Transparent plastics, such as polycarbonate and acrylic, as well as molded parts with a high gloss finish, can scratch and scuff easily and lose transparency quickly during routine use and maintenance. After standardized ASTM D1044 abrasion testing, uncoated acrylic and polycarbonate become extremely hazy in appearance, with a measured haze value of 25% - 35% (this is called "delta haze"). Commercially available hard coatings for these materials can typically reduce the delta haze value to 2% - 6%,

however this degree of damage can still be quite visible. NEI's NANOMYTE® Hardcoat SR-100 offers substantial further improvements in resistance to ASTM D1044 abrasion, with delta haze values typically under 1%. The figure below compares the abrasion-tested surface of our hardcoat with that of a leading brand in the market.

In addition to excellent scratch-resistance, NANOMYTE® Hardcoat has very good chemical resistance, remaining unaffected by brief exposure to common household and industrial chemicals which can sometimes seriously degrade bare plastic surfaces. Sensitive polymers, such as polycarbonate, are well protected from solvent attack.



**Coated polycarbonate plates after 1000 cycles of Taber abrasion testing (ASTM D-1044, 500 gram load, CS-10F wheel)**



**PMMA plate with uncoated side (left) and coated side (right) after testing**

## HARDCOAT BENEFITS

NANOMYTE® Hardcoat features a unique, water-based formulation which can be safer to work with and more environmentally friendly than traditional solvent-based coating systems. Our patent-pending coating chemistry enables the use of an unlimited amount of excess water in the coating formulation, so the product may be freely diluted with water to achieve the desired results. This coating solution also offers greater convenience, allowing

for application under ambient conditions without the need for the stringent environmental controls commonly required in commercial hardcoating processes. NANOMYTE Hardcoat also has a long shelf life and good adhesion to a variety of substrates.

**NANOMYTE® Hardcoat SR-100** and **Hardcoat UV-100** are packaged in gallon size bottles, as well as 55 gallon drums for high volume applications.

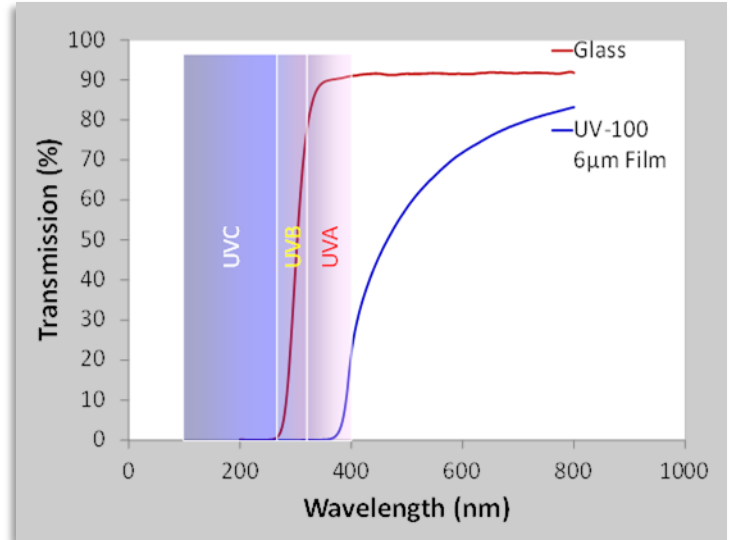
# HARDCOAT

## HARDCOAT PRODUCT LINES

In addition to exceptional hardness and scratch resistance, other functionalities, such as UV protection, anti-fogging, anti-fouling, antireflection and corrosion protection, can be incorporated into the NANOMYTE® Hardcoat formulation. NEI currently offers two grades: **Hardcoat SR-100** and **Hardcoat UV-100**. SR-100 is an all-purpose coating solution that offers excellent scratch, chemical and solvent resistance for plastic substrates. The product is compatible with most standard coating techniques, such as dip, flow, roll and web coating. Depending on the surface chemistry of the substrate, the coating can be deposited either directly onto clean surfaces or after a priming step. The coated surface is then typically thermally cured at around 100° C or less.

Hardcoat UV-100 offers both UV protection and scratch resistance, particularly when used in conjunction with SR-100. UV-100 contains UV absorbers that prevent damaging radiation from reaching the substrate materials, dramatically improving weatherability by preventing degradation of sensitive polymers.

The graph shows a UV-Vis (optical transmission) spectrum of UV-100 on a glass substrate. The transmission of uncoated glass is shown for comparison, where you can see that most of the UVA and much of the UVB spectrum pass through



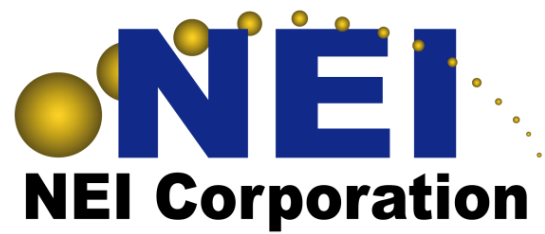
UV-Vis transmission spectra of uncoated polycarbonate and polycarbonate coated with NANOMYTE® Hardcoat UV-100

unimpeded. Only a very thin layer of UV-100 is needed to absorb most of the UV radiation that the glass fails to block, with <1% transmission below 350 nm possible by applying a film thickness of only 6 microns (0.2 mil).

## CUSTOMIZABLE FORMULATIONS

We will work with you to develop suitable application and curing protocols for your specific application. We have the in-house capability to coat prototype components and substrates. Using the NANOMYTE® Hardcoat technology platform, we can engineer additional coating functionalities, such as anti-fogging, anti-fouling, antireflection, and self-healing, to meet your specific needs.

FEATURES	BENEFITS
WATER-BASED FORMULATION	Not sensitive to moisture, environmentally friendly and suitable for use on a variety of substrates
2 YEAR SHELF LIFE (AT ROOM TEMPERATURE)	Decreases the need to frequently replace coating solutions and reduces waste
CLEAR & TRANSPARENT COATING SOLUTION	Highly transparent coating; tinting is possible
STRONG ADHESION	Durable coating with a long lifetime
EASY APPLICATION	Affordable for large volume applications



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