



PRODUCT DATA

Overview

MetaShieldCLEAN™ is an invisible nanocoating that prevents stains and dust from accumulating on plastic surfaces. The formula's easy-to-clean functionality significantly reduces maintenance time and cost by simply wiping away unsightly residue with a dry cloth. MetaShieldCLEAN improves aesthetic appearance as well as maintain surface characteristics without the use of harsh cleaning agents, limiting corrosion over time.

MetaShieldCLEAN is also a durable, protective coating providing increased abrasion resistance. The formula's one-coat spray and UV cure application is easy to apply and quickly dries into a transparent ultra-thin film to deliver a superior cost/performance ratio compared to similar market offerings. MetaShield products are proudly made in the USA using ISO 9001 manufacturing.

Benefits

- Stain, Dust and Microbe Resistant
- Abrasion Resistant
- Transparent/Ultra-Thin
- One-Coat Spray Application
- Durable
- Cost-Effective
- Increased Cleanability

Applications

- Packaging/Bottles/Cases
- Consumer Appliances
- Publically Accessed Structures
- Sensors/IoT
- Furniture
- Countertops
- HVAC/Piping

GENERAL	Substrates	Plastics	
	Optimal film thickness	10-15 µm	
	Coverage per Liter	25-50 m²/L	
	VOC	10%	
	Cure method	UV Radiation	
DURABILITY	Abrasion resistance - Linear (25 passes/CS10F/500g)	ΔHaze: 6.39%	
	Pencil hardness (ASTM D3363-05) on ABS	2B	
	Pencil gouge on ABS	HB	
	Indentation hardness (ISO 14577-1)	379.4 MPa	
	Adhesion (Crosscut Tape Test/ASTM D3359-02)	5B	
	Extended UV exposure	Pass	
	Heat tolerance (80° C for 24 hours)	Pass	
	Thermal cycling (ASTM D6944-15)	Pass	
	Resistance to ethanol	Pass	
	Resistance to isopropanol	Pass	
	Resistance to acetone	Pass	
	Resistance to lacquer thinner	Pass	
OPTICAL	Visible Light Transmission (400-700 nm)	91.40%	
	Haze (ASTM D1003-13)	0.87%	
	Index of Refraction at 590 nm	1.53	
CONTACT ANGLES	Coating	Common Coated ABS	MetaShieldClean on ABS
	Water	80.9	108.8
	Di-iodo methane	67.6	88.0
	n-Dodecane	16.3	54.6
	Dimethylpolysiloxane	8.2	44.0
	Artificial fingerprint	46.3	71.4



APPLICATION

Pre-Application Exposure To Light

- MetaShieldCLEAN is highly sensitive to visible and UV light. Exercise caution to minimize TOTAL cumulative exposure time liquid is at all times including extracting & mixing to prevent reactions from occurring prior to UV curing.
- Initial signs of over exposure include yellowing of the liquid. Under factory and laboratory fluorescent lighting this may occur in as little as 15-20 minutes of TOTAL cumulative exposure time.
- MetaShieldCLEAN must always be kept in its original container with cap/lid on. Spray equipment with ability to block all light from solution is highly recommended.

Surface Preparation

- Surfaces must be completely cleaned with appropriate solvent or cleaner for proper coating. Any surfactants, oils, dirt, smudges, watery residue, will cause delamination due to contamination.
- Use compressed air to remove any loose particles/debris left on surface.

Mixing

- No agitation or stirring is required before extracting from original container labeled M. Moderate mixing is acceptable if residue has accumulated above the solution inside the bottle.
- Allow all air bubbles to dissipate before use if agitation has occurred during transportation, mixing, or extraction.

Application

- Application and drying in dust-free environment is strongly recommended.
- Filter the solution through 0.45µm polypropylene filter before spraying.
- Spray at ambient temperature and humidity. Apply wet coating to achieve thickness between 10-15µm Dry Film Thickness (DFT). Shrinkage is approximately 25-30% with no thinning. Thinning will result in greater shrinkage. Adjustments in viscosity may be required depending on spray equipment.
- Average coverage is 35-40 m²/liter. Effective coverage may range from 26-50 m²/liter, depending on equipment, wastage, and amount of thinner.
- If thinning is desired, you MUST use 99.5% grade isopropyl alcohol CAS 67-63-0 or better. The isopropyl alcohol must be as devoid of water as possible, as moisture will inhibit curing. Start with a suggested ratio of 2 parts MetaShieldCLEAN to 1 part isopropyl alcohol by volume until desired result is achieved.



APPLICATION

- Example setup with a Low Volume Low Pressure (LVLP) air atomizing sprayer at the 2:1 ratio noted below:
Distance from substrate: 6.4 cm Fluid flow: 4.5 ml per minute
Travel speed: 2.4 cm per second Atomization pressure: 10 psi
- If dip coating is desired, please contact Metashield for instructions.

Curing

- The MetaShieldClean photo initiator is designed to cure under UV light at wave length peaks of 312 and 365 nm.

Step 1

Allow coating to rest at room temperature for 3-6 minutes for solvents to evaporate. If solvents are still present while UV curing, the resulting film becomes hazy or opaque and may peel off the surface. If this occurs, increase evaporation time.

Step 2

Expose the coating to appropriate UV light source; use the following verified UV cure parameters as a guide:

- UV cure system: 6 inch mercury bulb (non-doped) and metal arc type ballast
- Energy: UVA $\geq 873 \text{ mJ/cm}^2$, UVB $\geq 902 \text{ mJ/cm}^2$, and UVC $\geq 262 \text{ mJ/cm}^2$
- Belt speed: 6 ft/min (slower could begin to warp plastic substrates at the distance noted below)
- Distance: 4.5 in (closer could begin to warp plastic substrates at the belt speed noted above)

Extended exposure at lower energy settings may be needed to avoid softening or warping plastic surfaces.

Clean Up

- Uncured MetaShieldCLEAN should be cleaned immediately from equipment and surfaces with isopropanol CAS 67-63-0 or acetone CAS 67-64-1.

Storage And Shelf Life

- Exercise care to minimize the TOTAL cumulative exposure time to UV and visible light.
- Pot life varies based on the TOTAL cumulative exposure time outside the original containers. Plan on a maximum of 15-20 minutes if exposed to indoor laboratory and factory lighting and less if exposed to sunlight.
- Approximate shelf life is 6 months stored at 20-25° C in original light blocking containers.



APPLICATION

Helpful Links

Product Data & Application Instructions are periodically updated to reflect new information relating to the product. It is important that the customer obtain the most recent version for the product at: [PRODUCT AND APPLICATION DATA](#)

Contact Customer Support: Tel: 212.938.3699

Email: support@metashield.com

Additional Information

SAFETY AND CAUTIONS

Customer accepts all responsibility for the proper and safe handling, application, ventilation, cleanup, storage, and disposal of MetaShieldCLEAN and associated thinning and cleaning chemicals. Please see the applicable SDS for details on hazards, precautions and safety recommendations.

WARRANTY

Metashield warrants (I) its title to the product, (II) that the quality of the product conforms to Metashield's specifications for such product in effect at the time of manufacture and (III) that the product shall be delivered free of the rightful claim of any third person for infringement of any U.S. patent covering the product. THESE ARE THE ONLY WARRANTIES THAT METASHIELD MAKES AND ALL OTHER EXPRESS OR IMPLIED WARRANTIES, UNDER STATUTE OR ARISING OTHERWISE IN LAW, FROM A COURSE OF DEALING OR USAGE OF TRADE, INCLUDING WITHOUT LIMITATION, ANY OTHER WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OF USE, ARE DISCLAIMED BY METASHIELD. Any claim under this warranty must be made by Buyer to Metashield in writing within five (5) days of Buyer's discovery of the claimed defect, but in no event later than the expiration of the applicable shelf life of the product, or one year from the date of the delivery of the product to the Buyer, whichever is earlier. Buyer's failure to notify Metashield of such non-conformance as required herein shall bar Buyer from recovery under this warranty.

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