

CytoThane MW and WX2100

CytoThane MW is a superhydrophobic coating favored by radome manufacturers for its high water contact angle ($>145^\circ$) and its flexible application methods, including roller, spray, and screen print. While spray application is efficient for factory-based over-coating, roll-on is recommended for in field applications to better control overspray. CytoThane MW is a single-part, air-cured coating for marine and ground-based microwave antennas, radomes, and other telecommunications equipment. Ka-band ground stations utilizing CytoThane MW have reported significant reductions in rain attenuation (rain fade losses) under heavy rain conditions, with expected losses on uncoated systems around 10 dB. Comparative tests between coated and uncoated antennas have shown signal strength margins of 15-20% during heavy rain, where the signal from an uncoated dish drops out at 45%, the coated dish maintains operation at 60-65%.



When assessing hydrophobicity, the water bead contact angle on a horizontal surface is a crucial measure (Figure 1). However, due to the absence of universal standards for categorizing hydrophobic performance, we provide the following definitions as a general guideline:

- Non-hydrophobic: Contact angle below 90° .
- Semi-hydrophobic: Contact angle nearing 90° (approximately 80° to 90°).
- Hydrophobic: Contact angle exceeding 90° but below 130° .
- Super-hydrophobic: Contact angle surpassing 130° , with certain coating products reaching up to 160° .

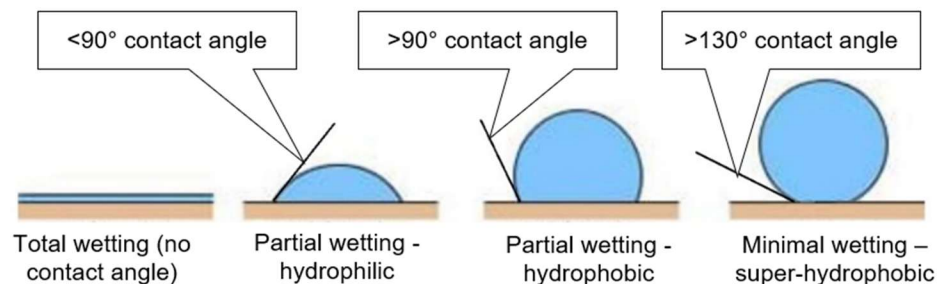


Figure 1 Hydrophobicity performance levels

Key application considerations include:

- Drying time: Initial - 2 hours; substantial cure - 24 hours; full cure - 5 to 10 days
- Water contact angle: Over 140°
- Shelf life of unopened product: 12 months
- Coverage: 50 to 200 square feet per pound (200 to 800 square feet per gallon), depending on percent overlap and degree of dispersion.

WX2100 versus CytoThane MW: WX2100 is the aerosol caned version of CytoThane MW. When a surface is coated with CytoThane, water forms beads and rolls-off the surface preventing water film formation and reduces ice and snow buildup.

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Durability: CytoThane repels rain, ice, and snow for up to 5 years. The CytoThane coated surface may be washed with a hose spray, but handling or rubbing it will reduce performance. To achieve better abrasion resistance a specialty base coat primer and a specialty formulated CytoThane is available.

Coverage: Apply by spraying or rolling. Spray application provides the most consistent results. Coverage will vary by the thickness of coating applied. The coverage of CytoThane per gallon is 200 to 800 square feet depending on the thickness of spray or roll-on application. For roll-on application, roller cover nap thickness of ⅓ or ¼ inch is recommended. Coverage with 11 oz aerosol cans of CytoThane is 10 to 15 square feet.

Directions: The temperature of the surface to be sprayed should be between 45°F and 95°F. At lower temperatures, the coating requires several days to properly dry. Keep container at room temperature prior to use. All surfaces need to be dry, clean, and free from dust, wax, grease, and polishes for good adhesion. Shake vigorously for 30 seconds. Hold the spray-gun vertically 8-10 inches from the surface. Depress the button fully. Move evenly across the surface covering 6-10 inches per second. Apply half overlapping strokes 3-4 inches apart. Shake the reservoir for a few seconds every 15 seconds. Allow 2 hours to dry before exposure to rain. The coating is substantially cured in 24 to 48 hours. The recommended Wet Film Thickness is 4 to 8 mils and a Dry Film Thickness of 2 mils. For best performance never touch the coated surface.



Purchasing: CytoThane is offered for sale online at www.CYTONIX.com and by calling or emailing Cytonix. CytoThane solvents are flammable and is usually shipped via UPS ground to the lower 48 United States, Canada, and Mexico. Overseas shipments require appropriate certified packaging, labelling, and shipping methods.

UV resistance: CytoThane shows great resistance to 280 to 380 nm UV exposure that could be expected during 2 to 5 years at equatorial installations. Surface analysis after prolonged exposure showed no evidence of erosion or water penetration.

Temperature Cycle Testing: CytoThane was uncompromised by rapid temperature cycling and can be expected to perform well in both cold and hot environments.

Salt Fog and Chlorine Exposure: CytoThane is functionally uncompromised by the extremely corrosive chlorine atmosphere and can be expected to perform well in many other corrosive environments. CytoThane showed complete or substantial resistance to high salt and high humidity environments that are expected for marine or coastal installations. No visible corrosion after 1,000 hours of salt fog.

Performance: CytoThane exhibited no significant loss of contact angle after 6 hours of rain. In subsequent tests, CytoThane had 145° contact angles after exposure to extreme rain at 60 inches per hour for one hour. The coating and substrate remain dry under 1 foot of water for one month.

History: CytoThane has been available for commercial applications since 2003. This includes large radomes such as that shown in the picture in Norway, wind farms in Spain, antenna in Alaska, and wind speed sensors (anemometers) worldwide.



Customer Testimonial: "In my opinion this super-hydrophobic coating may be the best countermeasure in the prevention of ice accretion on non-shielded microwave dishes equipped with molded spherical or conical radomes, shielded microwave dishes equipped with non-hydrophobic surfaced rigid planar radomes, parabolic grid dishes, mobile radio fiberglass radomed panel antennas, passive reflectors and many more telecommunication applications." - RSG

Substrates: Recommended for metal, fabrics, plastic, rubber, and tedlar surfaces.

Limitations: Excessive abrasion and touching will reduce performance. Organic solvents will reduce performance.

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Color:	Standard frosty white
Tints:	Gray, tan, blue, red, green
Solids percent:	~10%
Flammability:	Flammable
Storage temperature:	20-30°C
Shelf life:	1 year
Weatherability:	1 - 5 years (varies based on environmental conditions)
Dielectric constant:	3 at 100 MHz
Electrical resistivity:	~2 tera ohms
Taber abrasion:	Super-hydrophobic after 5-10 cycles with CS10 wheel
Water contact angle versus exposure time in a rapid aging environmental chamber:	-- 1 year (7 days in chamber): 145° -- 5 years (25 days in chamber): 144° -- 10 years (48 days in chamber): 138° -- 15 years (72 days in chamber): 119°



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