

Technical Data Sheet VIRIDYN SH-1

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3.0	29-Aug-2025	Date of first issue:	27-Jul-2025

OVERVIEW

Type	Easy-to-apply, one-step, RF-transparent superhydrophobic nano-coating.
Functionality	High water contact angle (> 145°). Harsh-environment protection for marine and ground-based microwave antennas, radomes, and other telecommunications equipment. Mitigates rain-fade and other environment-driven signal attenuation. Prevents snow and ice accumulation.
Limitations	Excessive abrasion and touching will reduce performance. Organic solvents will reduce performance.
Application	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. Drying time: Initial = 2 hours; Substantial Cure = 24 hours; Full Cure = 5 to 10 days. Substrates: Recommended for metal, fabrics, plastic, rubber, and Tedlar® surfaces.
Testing Summary	<p>Rain-Fade: Ka-band ground stations utilizing VIRIDYN SH-1 have reported significant improvements 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%.</p> <p>UV resistance: VIRIDYN SH-1 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.</p> <p>Temperature Cycle Testing: VIRIDYN SH-1 was uncompromised by rapid temperature cycling and can be expected to perform well in both cold and hot environments.</p> <p>Salt Fog and Chlorine Exposure: VIRIDYN SH-1 is functionally uncompromised by the extremely corrosive chlorine atmosphere and can be expected to perform well in many other corrosive environments. VIRIDYN SH-1 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.</p>

HYDROPHOBIC PERFORMANCE DEFINITIONS

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°.

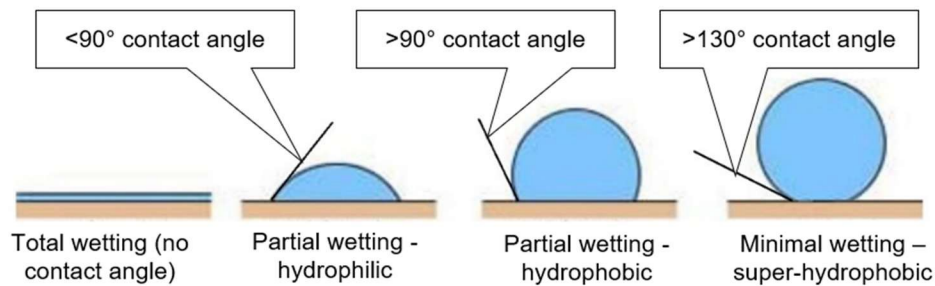


Figure 1 Hydrophobicity performance levels

PROPERTIES OF VIRIDYN SH-1

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	<ul style="list-style-type: none"> - 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°

DURABILITY

VIRIDYN SH-1 repels rain, ice, and snow for up to 5 years. The VIRIDYN SH-1 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 VIRIDYN SH-1 is available.

SUPERHYDROPHOBIC PERFORMANCE

VIRIDYN SH-1 exhibited no significant loss of contact angle after 6 hours of rain. In subsequent tests, VIRIDYN SH-1 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.

COVERAGE

Apply by spraying or rolling. Spray application provides the most consistent results. Coverage depends on the thickness of spray or roll-on application.

200 to 800 square feet per gallon.

50 to 200 square feet per pound.

For roll-on application, roller cover nap thickness of 1/8 or 1/4 inch is recommended.

Coverage with 11 oz aerosol cans of VIRIDYN SH-1 is 10 to 15 square feet.

APPLICATION INSTRUCTIONS

Temperature: 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.

Surface Preparation: All surfaces need to be dry, clean, and free from dust, wax, grease, and polishes for good adhesion.

Spray Application:

1. Shake vigorously for 30 seconds.
2. Hold the spray-gun vertically 8-10 inches from the surface.
3. Depress the button fully.
4. Move evenly across the surface covering 6-10 inches per second.
5. Apply half overlapping strokes 3-4 inches apart.
6. Shake the reservoir for a few seconds every 15 seconds.
7. 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.**

HISTORY

VIRIDYN SH-1 has been available for commercial applications since 2003.

This includes large radomes in Norway, wind farms in Spain (see pictures), 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)

IDENTIFICATION

Product name

VIRIDYN SH-1

MANUFACTURER or SUPPLIER'S DETAILS

Company name of supplier

ViriDyn LLC
www.viridyn.com
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