



# Aculon® Metal Repellency Treatment

## Product Information

**Aculon® Metal Repellency Treatment** nano-scale repellency product is a surface treatment capable of imparting hydrophobicity and oleophobicity to a wide variety of metals in a simple, one-step process. Aculon Metal Repellency Treatment is typically applied by either dipping or wiping, and results in a hydro/oleophobic monolayer film that is resistant to chemical and mechanical degradation.

Solids	Solvent	Color
<5% Proprietary Ingredient	Ethanol, Fluorosolvent	Clear/ Colorless

Physical Properties of Formulation (all values @ 25°C)	
Viscosity*	2 cP
Boiling Point of Solvent	78°C
Flash Point	13.9°C
Environmental	Non toxic, non-ozone depleting, flammable
Shelf Life	2 Years (Unopened container)
Specific Gravity	0.98g/ml

\*Determined by Zahn Cup #1 testing

Physical Properties of Post Treatment Coating	
Visible Light Transmission	100%
Coating Thickness	2-4nm
Solvent and Chemical Resistance	High
Hydrophobicity (Water Contact Angle on Flat Substrate)	116°
Oleophobicity (Oil Contact Angle on Flat Substrate)	80°
Sliding Angle of Water Droplet	20-30°
Coating degradation temperature	225°C

## Features

- Treats most metals, for precious metals see Aculon's optimized Precious Metal Treatment
- Repels water, oil, and other organic materials
- Lowers the coefficient of friction of surfaces (results in a 'slick' feeling)
- Does not change the appearance of the surface
- Easy to apply and safe to use (take flammable liquid precautions)
- Does not leach from surfaces after application and drying
- Does not polymerize upon drying, so over-application is not a problem

## Application Ideas

- Impart repellency to stainless steel, pipes, and other industrial metals and material
- Non-fouling (ink-repellent) surface for printer nozzles
- Nonstick film for inside micro heat exchangers
- Any application where added liquid repellency of metal surfaces is beneficial.

## Application Techniques

### Surface Preparation/ Cleaning:

Ensure the metal surface is visually clean by either using the provided Windex sprayer, degreasing with solvents, rinsing with soap and water, or utilizing your standard cleaning procedure.

For ideal bonding and coating longevity in aggressive environments remove all surface contaminants by creating a water break free surface (contact angle  $<20^\circ$ ). Contact Aculon directly for more aggressive cleaning options.

### Treatment Application:

**Wipe:** Utilize pre-moistened towelette or dispense 1.5 ml Aculon Metal Repellency Treatment onto a fresh piece of folded polyester or cotton cloth and vigorously wipe every surface for 1 minute by rubbing in a circular motion, then wipe excess treatment from the surface using a microfiber cloth.

**Spray:** It is not recommended to spray-apply Aculon Metal Repellency Treatment, as it is 'autophobic', meaning it repels itself as the monolayer begins to form on the surface. This can create a film with multiple, large pinholes as well as excess material drying up in spots on the surface. If you require a spray-based formulation, contact an Aculon representative.

**Dip:** Immerse the substrate in the treatment for one minute, remove carefully so that excess treatment does not dry up and streak/spot on the surface then air dry. If excess treatment does remain on the surface, wiping with a microfiber cloth or a tissue wetted with ethanol will remove any excess. If you cannot or do not want to contact the surface mechanically, then it can be alternatively rinsed away with Aculon fluorosolvent rinse (contact an Aculon representative for samples).

**Dip Coating with Sonication:** Ensure the substrate is clean. Completely submerge the substrate in the solution and sonicate for five minutes. Remove substrate from the solution and allow to air dry in a clean area.

**Drying/ Curing:** If curing is necessary (short dip times are used), the treated substrates are best cured at  $120^\circ\text{C}$  peak metal temperature for approximately 30 seconds. For silicon and titanium oxides, lengthening the cure time to 5 minutes is recommended. Aluminum does not need a cure if the dipping time is lengthened to 5 minutes/room temperature, otherwise a cure is recommended.

### Testing For Hydrophobicity:

Allow droplets of water to fall onto the surface, they should bead up to a contact angle  $>90^\circ$ . If the surface is not hydrophobic clean the surface again and reapply.

### Safety, Handling, Storage, Shelf Life:

Store in a cool ( $\sim 25^\circ\text{C}$ ) and dry area, and keep away from direct sun light. See this product's MSDS for proper handling and fire hazard data. When stored properly, product has a 2 year shelf life.

### For Additional Information:

To request additional product information or sales assistance, contact Aculon's Technical Team, at 858-350-9474. For information on other Aculon products, please visit our website at [www.aculon.com](http://www.aculon.com).

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