

Nano-Clear NCI Coating for Industrial Applications - TDS



High Gloss - Polyurethane Hybrid Clear

Nano-Clear® NCI is the only industrial coating in the global marketplace to enhance and extend the service life of painted assets by 10+ years. Nano-Clear dramatically improves corrosion resistance, scratch, abrasion, chemical & UV resistance. Nano-Clear penetrates deep into the pores of painted surfaces to enhance color, improve gloss, dramatically improve surface hardness and extend UV resistance. Nano-Clear is a one-component humidity cured / highly cross-linked / hybrid polyurethane nanocoating.

Nano-Clear® 1K physical properties are far superior to leading 2K & 3K industrial coatings like Imron®.

APPLICATION USES

Produces a highly durable high-gloss clear coating over freshly painted or in-service painted surfaces including 2K epoxies (2K = *two-component*), 2K polyurethanes, 2K topcoatings, powder coatings, anodized aluminum, concrete, teak wood and fiberglass.

Application Potential: Aboveground Storage Tanks, Exterior Pipelines, Lifeboats, Cargo Ships, Epoxy Floors, Exposed-Aggregate Painted Building Structures, Railway Tank Cars, Chemical Tanks, Heavy Duty Equipment, Agriculture Equipment, Fleet Vehicles...

- One-component formulation - save on labor and preparation time.
- Designed to be applied directly over two-component coatings.
- Extends in-service life of newly painted or highly oxidized painted surfaces.
- Enhances original color, gloss, surface hardness and UV resistance.
- High scratch resistance (4H pencil hardness).
- Extreme chemical resistance (>1500 MEK rubs).
- Extreme weathering resistance (98-100% gloss retention).



PAINT / MATERIAL COMPATIBILITY

- Designed to be applied over "newly" painted 2K epoxies, 2K polyurethanes, powder coatings, concrete, exposed-aggregate, teak wood.
- Designed to be applied over properly prepared "in-service" painted 2K epoxies, 2K polyurethanes, powder coatings and teak wood.

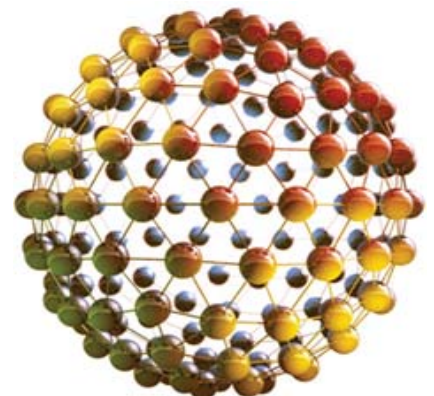
NANO-CLEAR APPLICATION CONDITIONS

Temperature: 40°F (4°C) to 100°F (38°C)
Relative Humidity: 20% to 90%

PHYSICAL PROPERTIES

Polymer Chemistry: Nanostructured Polyurethane Hybrid
Mixing Ratio: No mixing required
Recommended Dry Film Thickness: 2 mil (50 µm)
Recommended Wet Film Thickness: 6 mil
Pencil Hardness - ASTM D3363: 4H (7H w/NCIM Matte Additive)
Pendulum Hardness (Persoz) - ASTM D4366: 220
Abrasion Resistance - ASTM D4060: 8.4 mg loss
Impact Strength - ASTM D2794: > 140
Water Immersion Test - ISO 2812-2: Pass
QUV Resistance - ASTM D4587: 99%
Xenon WOM - ASTM G155: 99%
MEK Resistance - ASTM D4752: >1500
Salt Spray - ASTM B-117: 6000 hrs. no rust, no blisters
DMA - Crosslink Density - (X103 mol/m³): 2.17
VOC (as received): 1.05 lbs. / gal.
Viscosity: 200 cps

NANO-CLEAR 3D POLYMER





APPLICATION INFORMATION

Consult SDS for proper handling, cleanup, disposal, and use of personal protective equipment. Circulate sufficient air to maintain working environment below the PEL and LEL. Apply according to local, state, and federal (OSHA) regulations.

- Ambient temperature: 40°F (4°C) to 100°F (38°C)
- Relative Humidity: 20% to 90%
- Metal temperature: 40°F (4°C) to 100°F (38°C)
- Surface temperature: At least 5°F (-5°C) above the dew point
- Material temperature: 40°F (4°C) to 90°F (32°C)



SURFACE PREPARATION

Newly Painted / Wet-on-Wet Paint Application:

- Apply directly over two-component epoxies, two-component polyurethanes, two-component topcoatings & powder coatings.
- Allow solvents to fully evaporate-out from the underlying paint prior to the application of Nano-Clear NCI (typically 3-6 hours).

Cured Paint or In-Service Painted Surfaces:

- Repair any structural damage (rust or chipping) using a two-component epoxy or polyurethane primer.
- Surface must be sanded with 400 grit orbital sander, then cleaned using **SuperClean**, then water rinse & dry.
- Surface is ready to be spray apply or rolled with Nano-Clear NCI using the application instructions below.



WET-ON-WET SPRAY APPLICATION

- Apply **3 - 4** wet coats @ 2 mils per each wet coat using an HVLP spray gun (1.4 mm spray tip).
- Allow **2 - 5 min.** between wet coats to allow for solvent evaporation.
- Avoid recoating additional coats after 20 min. as flow and leveling will be negatively effected.
- Recommended (Wet Film Thickness WFT): 2 - 3 mil per each wet coat (6 mil wet film build total).
- Recommended (Dry Film Thickness DFT): 2.00 to 2.50 mil depending on surface properties desired.

The number of wet coats required should be determined by the overall gloss level 5 min. after application:

- * High gloss = Good film build
- * Low Gloss = Low film build (*recommend applying another wet coat to increase gloss and improve properties*).



Solvent Flash: Allow 2 to 5 min. between wet coats at 72°F (22°C) to allow for solvent evaporation.

THINNING

- No thinner is required as Nano-Clear has very low viscosity.

EQUIPMENT CLEAN-UP

- Clean equipment immediately after using Acetone or MEK. Never clean spray equipment with water or alcohol.



CURE TIME @ 72°F (22°C), 50% R.H.

Dust free: ~ 20-30 minutes
 Tack free: ~ 30-40 minutes
 Handle: ~ 4 hours
 Dry Hard: 24 hours @ 72°F (22°C)
 Full Cure: 48 hours @ 72°F (22°C)

CURE TIME @ 90°F (32°C), 50% R.H.

Dust free: ~ 10-15 minutes
 Tack free: ~ 20-30 minutes
 Handle: ~ 3 hours
 Dry Hard: 24 hours @ 90°F (32°C)
 Full Cure: 48 hours @ 90°F (32°C)

- * Lower temperatures and lower humidity conditions will slow-down the curing rate.
- * Higher temperatures and higher humidity conditions will speed-up the curing rate.

- * **Nano-Clear NCA Accelerator may be added to NCI @ 1-2% by weight to reduce dust-free and tack-free time.**
- * **Nano-Clear NCIM Matting Additive may be added to NCI @ 10-27% by weight to reduce gloss and improve abrasion.**

SURFACE COVERAGE PER GALLON

333 ft² / gal @ 2.00 mil DFT or 31 m² / 3.8L @ 2.00 mil DFT (3 wet coats @ 2.00 mils each wet coat = 6.00 mil wet total).

WEIGHT PER GALLON:

8.0 lbs (3.63 kg)

PACKAGING

1 gal (3.8L), 5 gal (19L), 55 gal (208L)

SHIPPING WEIGHT

1 gal container - 8 lbs (3.63 kg), 5 gal container - 40 lbs (18.14 kg), 55 gal container - 440 lbs (200 kg)

TRANSPORTATION, STORAGE & SHELF-LIFE

Transportation: Min. 40°F (4°C) and Max. 86°F (30°C) for short periods.

Storage & Shelf-Life: Un-opened Container:

40°F (4°C) Minimum: 12 month

72°F (22°C) Max: 12 month

80°F (27°C) Max: 6 month

90°F (38°C) Max: 2 month

Storage & Shelf-Life: Opened* Container:

80°F (27°C) Max: 2 months

*Opened is defined as cap is opened-and-closed immediately after pouring contents to avoid solvent evaporation / contamination.

SAFETY INSTRUCTIONS

Consult Nano-Clear NCI Safety Data Sheet prior to use.

APPLICATION EQUIPMENT

- Apply using HVLP (Sata, DeVilbiss, Iwata..), Conventional or Airless (Graco..) spray equipment.
- Nano-Clear may also be applied using a wipe-on technique using a **Merit Dynamic 9" Pad (#00227)**.
- High spots may occur using a "wipe-on" technique. Avoid high spots by evening surface while wet.



AIR SPRAY EQUIPMENT



Spray Gun: HVLP or LVLP (SATA, Devilbiss or Iwata)

Fluid Tip: 1.3, 1.4 or 1.5 mm

Fan Pattern: Full fan, when applying 2 wet coats @ 3 mil each wet coat (6 mil wet total)

Fluid Control: 2 1/2 turns out

Spray Pattern: 50% overlap

Pressure at Gun: 29 - 30 PSI

AIRLESS SPRAY EQUIPMENT

Tip Size: Graco 415, 515 or 615 or 815 spray tip

Pump: 30:1 or 40:1

Pump Pressure: 800 psi

BUFFING & POLISHING (if needed)

- **Equipment:** Orbital sander and orbital polishing equipment.
- **Orbital Sand:** Use 800 grit paper, then 1000, then 1500, then 2000, then 2500 grit paper.
- **Compound:** Use heavy cut compound with wool pad @ 1,200 to 1,400 RPM.
- **Polishing:** 3M SRC (scratch resistant clears) polishing paste with wool @ 1,200 to 1,400 RPM.
- **Final High Gloss Polish:** Use light to medium cut polishing paste with wool pad @ 1,200 to 1,400 RPM.

SURFACE MAINTENANCE / CLEANING

- Use low pH soap and water for clean-up.
- Use lint-free microfiber cloths to clean and dry surfaces.
- Use paint thinner to remove graffiti.

IMPORTANT COMMENTS

1. Use dedicated spray lines and equipment for the best results. Clean equipment immediately after use using paint thinner or acetone. Avoid contact with skin and hair as Nano-Clear will adhere like super-glue.
2. Avoid recoating after 20 minutes as flow and leveling will be effected.

Nano-Clear Application Recommendations:

Nano-Clear is a unique one-component clear coating with remarkable physical properties. The application of Nano-Clear is very important to achieve these desired outlined physical properties. The substrate type (material composition) and surface preparation is critically important prior to considering the application of Nano-Clear Coatings. The application parameters of Nano-Clear are just as, or even more important, than achieving the desired physical properties.

Important: *Nano-Clear + Poor Adhesion = Failure. Nano-Clear + Excellent Adhesion = 10+ Year Performance.*

Application Environment:

Nano-Clear was developed to cure or crosslink in the presence of humidity. As a general rule, higher humidity results in a faster cure cycle. Lower humidity results in a slower cure cycle. Higher humidity may reduce flow and leveling of Nano-Clear. One way to improve flow and leveling is to reduce the wet-on-wet recoat time to 2 to 5 minutes (vs. 5-10). Conversely, lower humidity positively affects the flow and leveling of Nano-Clear.

It is important to spray Nano-Clear in a dust-free environment so as to avoid surface contamination. Appropriate ventilation, approved respirator, protective clothing and rubber gloves are required to apply Nano-Clear.

Package Stability:

Nano-Clear is sensitive to moisture contamination. It is very important to quickly close the gallon, pail or drum container immediately after opening. Do not leave the container cap open for extended periods, which will allow solvents to evaporate and crosslinking to begin. ***Moisture contamination or storage at high temps will cause gelation within the container.***

It is "not" recommended to repackage Nano-Clear in smaller containers without first consulting Nanovere for application instructions including package material type (*un-lined aluminum bottle or Baritainer® only*) and nitrogen gas blanketing.

Substrate Consideration:

Nano-Clear is designed to adhere directly to cleaned highly-oxidized or newly-painted steel surfaces including epoxy, polyester, polyurethane, latex and powder coatings. Nano-Clear will also adhere directly to sanded fiberglass, sanded gelcoat, un-coated stone pavers and epoxy coated cement.

Nano-Clear will "not" adhere directly to bare aluminum, steel, rust, stainless steel or chrome unless surface treated or primed. Nano-Clear has been shown to adhere directly to these substrates with a phosphoric acid surface treatment. Testing will be required to ensure proper adhesion with any surface treatment.

Surface Preparation:

Nano-Clear is designed to be a permanent coating with proper surface preparation. Cured painted surfaces require sanding with 400 grit orbital sander, solvent clean, then apply 3 - 4 wet coats of NCI. Nano-Clear NCI will "not" adhere to a surface with oil, grease, silicone, wax or fluorination present. It is important to remove surface contaminants using an effective degreaser like "SuperClean" (sodium hydroxide based cleaner) + Water + Dry. Solvents like acetone, MEK and paint thinner are also effective at removing surface contaminants.

It is important to achieve an extremely high gloss surface, which indicates proper dry-film-build thickness. Lower gloss levels indicate lower dry-film-build thickness. Lower dry-film-build thickness reduces long-term durability.

Fresh / New Paint: Nano-Clear will adhere directly to fresh primer, basecoat or topcoats systems using a wet-on-wet application process. It is important to first allow all of the solvents to escape these systems prior to the application of Nano-Clear Coatings. Nano-Clear can be applied to primer, basecoat or topcoat systems using three to four wet coats with 2 to 5 minutes between Nano-Clear wet coats to allow for solvent evaporation.