



## Nano-Clear NCI 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 "newly" painted or "oxidized" painted surfaces 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 highly oxidized paint surfaces including 2K epoxies (2K = *two-component*), 2K polyurethanes, 2K topcoatings, powder coatings, anodized aluminum and sanded fiberglass.

**Application Potential:** Oil & Gas Tankers, Oil & Gas Pipelines, Exterior Pipelines, Lifeboats, Cargo Ships, Epoxy Floors, Bridges, Painted Building Structures, Railway Tank Cars, Chemical Tanks, Heavy Duty Equipment, Anodized Aluminum, Transformers...

- 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.
- Restores original color, gloss, surface hardness and extreme 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, sanded fiberglass and anodized aluminum.
- Designed to be applied over "oxidized" painted 2K epoxies, 2K polyurethanes, powder coatings, sanded fiberglass and anodized aluminum.

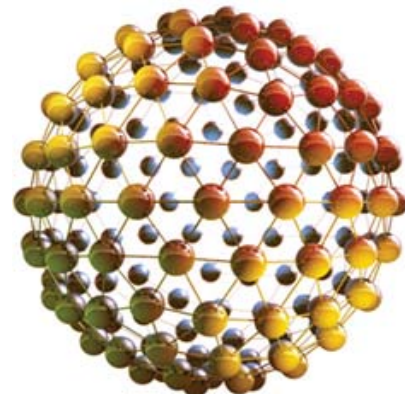
#### APPLICATION CONDITIONS

Temperature: 40°F (4°C) to 90°F (32°C)  
Relative Humidity: 20% to 90%

#### PHYSICAL PROPERTIES

Polymer Chemistry: Nanostructured Polyurethane Hybrid  
Mixing Ratio: No mixing required  
Recommended Dry Film Thickness: 2.00 mil (50 µm)  
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: 5000 hrs. no rust, no blisters  
DMA - Crosslink Density - (X103 mol/m<sup>3</sup>): 2.17  
VOC (less exempts): 1.25 lbs. / gal. or 156 g / L Viscosity: 20 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 90°F (32°C)
- Relative Humidity: 20% to 90%
- Metal temperature: 40°F (4°C) to 90°F (32°C)
- Metal 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 Oxidized Painted Surfaces:

- Repair any structural damage (rust or chipping) using a two-component epoxy primer.
- Surface must be thoroughly cleaned using **SuperClean Degreaser**; water rinse & dry.
- **Cured or Oxidized paint must be sanded using 400 grit orbital sander, then solvent clean using acetone.**
- Surface is ready to be spray applied with Nano-Clear NCI using the application instructions below.



## RECOMMENDED FILM BUILD

- Number of spray coats: Apply **3 - 4** wet coats with 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.
- Recommended (Dry Film Thickness DFT): 1.5 – 2.50 mil depending on surface properties desired.

### Nano-Clear NCI Over Newly Painted: Wet-on-Wet technique

- Apply **3 - 4** wet coats @ 2 - 3 mils per each wet coat to "**Fill & Fortify**" the paint layer for long-term surface protection.

- **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*).

### Nano-Clear NCI Over Cured or Oxidized Paint:

- Apply **3 - 4** wet coats @ 2 - 3 mils per each wet coat to "**Fill & Fortify**" the oxidized paint layer for long-term surface protection.

- **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.

## SURFACE COVERAGE PER GALLON

333 ft<sup>2</sup> / gal @ 2.00 mil DFT or 31 m<sup>2</sup> / 3.8L @ 2.00 mil DFT (3 wet coats @ 2.00 mils each wet coat).

## 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, Conventional or Airless spray equipment.
- Nano-Clear may be applied using a "wipe-on" technique using **9 in. Shur-Line Deck Painter Pad** (HomeDepot).
- Streaking or 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

**Fluid Control:** 2 1/2 turns out

**Spray Pattern:** 50% overlap

**Pressure at Gun:** 29 - 30 PSI

## AIRLESS SPRAY EQUIPMENT

**Tip Size:** Graco 417, 517 or 617 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. Nano-Clear 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.

**Oxidized Paint Surfaces:** See above surface preparation / cleaning process. Applying three to four wet coats of Nano-Clear NCI are recommended depending on the gloss levels achieved after application. The first two wet coats of NCI will enhance the color of the underlying paint. The next two wet coats of NCI will fortify the paint and provide long-term surface protection. **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.**

**Glossy Surfaces:** Nano-Clear will adhere to highly glossy painted surfaces when first treated with an orbital sander using 400 grit paper, then solvent clean to remove surface contaminants. Three to four wet coats of Nano-Clear NCI are recommended depending on the gloss levels achieved after application. The first two wet coats of NCI will enhance the color of the underlying paint. The next two wet coats will fortify the paint and provide long-term surface protection.

**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.

