
Polyurea Spray-On Bedliner Coating – Technical Material Specification

1.0 Material Overview & Common Uses

Polyurea is a fast-curing, high-performance elastomeric coating formed by the reaction of an isocyanate component with a resin blend. Unlike polyurethane, polyurea does not require a catalyst and cures almost instantly upon application, making it ideal for vertical and overhead surfaces without sagging or running.

Common industrial applications include spray-on truck bedliners, heavy equipment linings, secondary containment liners, pipeline coatings, and waterproofing membranes for roofs and decks. Its exceptional abrasion resistance, chemical resistance, and flexibility make it a preferred choice for high-wear environments.

2.0 Core Technical Properties & Sizing

- Tensile Strength: 2,500 – 4,500 psi (ASTM D412)
- Elongation at Break: 300% – 600% (ASTM D412)
- Tear Resistance: 400 – 600 pli (ASTM D624)
- Hardness: Shore A 85 – 95 (ASTM D2240)
- Abrasion Resistance: < 100 mg loss (ASTM D4060, CS-17 wheel, 1000 cycles)
- Impact Resistance: > 160 in-lbs (ASTM D2794)
- Service Temperature Range: -40°C to 120°C continuous
- Density: 1.05 – 1.15 g/cm³ (mixed)
- Standard Dry Film Thickness: 60 – 125 mils (1.5 – 3.2 mm) per coat
- Gel Time: 3 – 10 seconds at 70°F (21°C)
- Tack-Free Time: < 60 seconds
- Full Cure Time: 24 hours at 70°F (21°C) before heavy service

3.0 Processing, Machinability & Application

Polyurea is applied using a heated, high-pressure plural-component spray system (e.g., Graco Reactor or Gusmer H-series). The two components (A-side: isocyanate, B-side: resin blend) are heated separately to 140°F – 180°F (60°C – 82°C) and mixed at the spray gun impingement chamber. Proper mixing is critical; an imbalance of more than 5% by volume will result in incomplete cure or tackiness.

Surface preparation is mandatory: the substrate must be clean, dry, and free of oil, grease, rust, and loose scale. For steel, abrasive blasting to SSPC-SP10 (near-white metal) with a 2–4 mil anchor profile is required. For plastics (e.g., truck bed liners), scuff sanding with 80-grit and solvent wiping is necessary to promote adhesion.

- Spray pressure: 2,000 – 3,000 psi at the gun
- Hose temperature: maintain 140°F – 180°F (60°C – 82°C) throughout
- Gun tip size: 0.023 – 0.031 inch (0.58 – 0.79 mm) depending on desired texture
- Fan pattern: 12 – 24 inches wide, overlap 50% for uniform thickness

- Ambient conditions: substrate temperature must be at least 5°F above dew point; relative humidity below 75%
- Do not apply if ambient temperature is below 40°F (4°C) or above 120°F (49°C)
- Recoat window: within 2 hours or after 24 hours; between 2–24 hours requires scuff sanding

4.0 Common Defects & Quality Control

- Reject if coating exhibits fisheyes, craters, or pinholes larger than 1/16 inch (1.6 mm) in diameter
- Reject if there is any delamination or blistering after 24-hour cure
- Reject if dry film thickness varies more than $\pm 20\%$ from specified target
- Reject if coating remains tacky or soft after 4 hours at 70°F (21°C)
- Reject if orange peel texture is inconsistent or runs/sags are visible on vertical surfaces
- Reject if adhesion fails a crosshatch tape test (ASTM D3359, rating < 4B)
- Reject if any foreign contamination (dust, dirt, oil) is embedded in the coating
- Acceptable color variation: $\Delta E < 2.0$ per ASTM D2244

5.0 Storage, Handling & WHMIS Guidelines

Polyurea components are classified as hazardous materials under WHMIS 2015. The isocyanate component (A-side) is a sensitizer and respiratory hazard; the resin blend (B-side) may contain amines and other irritants. Both components must be stored in accordance with manufacturer SDS requirements.

- Store A-side (isocyanate) at 60°F – 90°F (15°C – 32°C) in a dry, well-ventilated area away from moisture and direct sunlight
- Store B-side (resin) at 60°F – 90°F (15°C – 32°C); do not allow to freeze
- Shelf life: 6 months from date of manufacture in unopened, sealed containers
- Follow FIFO (First In, First Out) inventory rotation; discard any material beyond shelf life
- Mandatory PPE: full-face respirator with organic vapor cartridge (NIOSH approved), chemical-resistant gloves (nitrile or butyl), coveralls, and safety glasses with side shields
- Do not eat, drink, or smoke in areas where polyurea is handled or applied
- In case of skin contact, wash immediately with soap and water; remove contaminated clothing
- In case of eye contact, flush with water for at least 15 minutes and seek medical attention
- Spill containment: absorb with inert material (vermiculite, sand) and dispose as hazardous waste per local regulations
- Keep containers tightly sealed when not in use; moisture contamination will cause premature curing and pressure buildup

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