NU COAT PLUS ™

ASPHALT POLYMER TREATMENT

PART 1 – GENERAL

1.1 SUMMARY

Nu Coat Plus™ is a spray-applied Asphalt Polymer Treatment (APT) designed to seal and preserve asphalt pavements by resisting oxidation, moisture intrusion, raveling, UV exposure, and de-icing salt effects common in the Intermountain region.

System Composition

- CSS-1h asphalt emulsion (meets applicable ASTM/AASHTO)
- Polymer modification for improved cohesion, flexibility, and crack resistance
- Fine aggregate, mineral fillers & carbon black for film build, UV stability, and durable micro-texture
- Proprietary performance additives to meet Nu Coat Plus™ performance protocols.
- Water, adjusted to target application viscosity

Typical Applications

- Roadways & Low-speed streets
- Shoulders and auxiliary lanes
- Parking lots and access drives
- Rumble strips and ancillary pavement surfaces.

Performance Intent

- Reduce raveling and moisture ingress.
- Improve surface cohesion.
- Enhance UV stability and color uniformity for an extended protection interval.
- Comply with relevant ASTM requirements.
- Nu Coat Plus™ Proprietary Protocols for regional climate and traffic conditions

Limitations

This treatment is not intended to provide structural improvement. Structural failures must be repaired prior to application.
Nu Coat Plus™ is asphalt-emulsion-based and designed to avoid the elevated PAH levels associated with coal-tar sealers.

1.2 REFERENCES

Applicable standards include:

AASHTO Standards

- ASHTO M17 – Standard Specification for Mineral Filler for Asphalt Mixtures
- AASHTO R5 – Standard Practice for Selection and Use of Emulsified Asphalts.
- AASHTO T11 – Standard Method of Test for Materials Finer Than 75-µm
- AASHTO T27 – Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregates
- AASHTO T44 – Standard Method of Test for Solubility of Bituminous Materials
- AASHTO T49 – Standard Method of Test for Penetration of Bituminous Materials
- AASHTO T51 – Standard Method of Test for Ductility of Asphalt Materials
- AASHTO T59 – Standard Method of Test for Emulsified Asphalts
- AASHTO T84 – Standard Method of Test for Specific Gravity and Absorption of Fine Aggregate.
- AASHTO T90 – Standard Method of Test for Determining the Plastic Limit and Plasticity Index of Soils,
- AASHTO T100 – Standard Method of Test for Specific Gravity of Soils
- AASHTO T267 – Standard Method of Test for Determination of Organic Content in Soils
- AASHTO T308 – Standard Method of Test for Asphalt Binder Content of Asphalt Mixtures by the Ignition Method

ASTM Standards

- ASTM C33 – Standard Specification for Concrete Aggregates
- ASTM D36 – Standard Test Method for Softening Point of Bitumen
- ASTM D244 – Standard Test Methods and Practices for Emulsified Asphalts
- ASTM D522 – Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings
- ASTM D870 – Standard Practice for Testing Water Resistance of Coatings Using Water Immersion
- ASTM C1252 – Standard Test Methods for Uncompacted Void Content of Fine Aggregate
- ASTM D2939 – Standard Test Methods for Emulsified Bitumen Used as Protective Coatings
- ASTM D3910 – Standard Practices for Design, Testing, and Construction of Slurry Seal

- ASTM D 6934 – Standard Test Method for Residue by Evaporation of Emulsified Asphalt
- ASTM E1911 – Standard Test Method for Measuring Surface Frictional Properties Using the Dynamic Friction Tester
- ASTM E303-93 – Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester

ISSA Standard

- ISSA TB 100 – Test Method for Wet Track Abrasion of Slurry Surfacing System

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1.3 SUBMITTALS

1. Mix Design Package

Submit a complete engineered mix design including:

- Target aggregate gradation.
- Asphalt binder content.
- Polymer solids content ≥ 10% by weight of asphalt binder.
- Required performance test data (cohesion, abrasion resistance, friction, residue properties, durability).

2. Material Certifications

Provide manufacturer-issued documentation:

- Certificate of compliance for all supplied materials.
- Verification of approved emulsion source (when agency-mandated).

3. Experience Qualifications

Submit proof of Contractor capability:

- Minimum five (5) comparable successfully completed projects.
- Project references with contact information.

4. Equipment & Calibration

Provide an equipment inventory including:

- Mixing, proportioning, and application equipment proposed for the work.
- Current calibration records for all metering, spray, and mixing systems.

1.4 QUALITY ASSURANCE

- Use materials from approved sources.
- Manufacturer's certificate of compliance showing all materials meet the requirements of Part 2.
- Verification that the asphalt/polymer emulsion supplier adheres to UDOT Quality Management Plan Section 508 Asphalt Emulsion and is listed as an approved supplier on the Department Central Materials website.
- Do not change emulsion or aggregate source without revising mix design.
- Proportioning tolerance shall not exceed ±0.5% per material.
- Non-complying products shall be rejected.

1.5 WARRANTY

The Contractor and Supplier shall jointly provide a minimum two (2) year written warranty, contingent upon the existing pavement being determined to be in suitable condition as mutually evaluated by the Contractor and Supplier.

The warranty shall cover defects including:

- Delamination
- Peeling
- Premature wear

Warranty excludes damage from:

- Snowplows
- Studded tires
- Mechanical damage
- Acts beyond contractor control

PART 2 – PRODUCTS

2.1 ASPHALT EMULSION

Emulsion shall conform to CSS-1h specification in accordance with Utah Department of Transportation specification, Section 02745, and AASHTO M208.

TEST	Temp	Method	SPECIFICATION
Saybolt Furol Viscosity, s	25^0C	T59	20-100
Storage Stability, 24 hr		T59	Max 1.0
Particle Charge	---	T59	Positive
Sieve test, %	---	T59	Max 0.10
Cement Mixing, %		T59	Max 2.0
Distillation			
Residue, %	---	T59	**Min. 57**
Tests on Residue from Distillation			
Penetration, 100g, 5s, dmm	25^0C	T49	40-90
Ductility, (5cm/min.), cm	25^0C	T51	Min. 40
Solubility in trichloroethylene, %	---	T44	Min 97.5

Emulsion shall:

- Be homogeneous.
- Show no separation during storage.
- Meet guidelines shown on the table below.

2.2 AGGREGATE & MINERAL FILLER

2.2.1 MINERAL FILLER

Use Mineral Filler—e.g., rock dust, clay/slate fines, hydrated lime, or hydraulic cement—conforming to AASHTO M 17 / ASTM D242 (dry, free-flowing, essentially free of agglomerations and organic fines)

Mineral fines—shall meet the acceptance criteria in Table 1 (properties) and Table 2 (gradation).

Table 1 — Physical Properties (Mineral Filler)

Item / Property	Requirement	Referenced Standard / Test
Condition	Dry, free-flowing; essentially free from agglomerations	AASHTO M 17
Organic impurities	Essentially free of organic impurities	AASHTO M 17
Plasticity Index (PI)	PI ≤ 4 *(not applicable to hydraulic lime/cement)*	AASHTO T 90

Table 2 — Gradation (Mineral Filler)

Sieve Size	% Passing	Referenced Standard / Test
#16 (1.18 mm)	100	AASHTO M 17 / AASHTO T 37
#30 (600 µm)	97–100	AASHTO M 17 / AASHTO T 37
#50 (300 µm)	95–100	AASHTO M 17 / AASHTO T 37
#200 (75 µm)	70–100	AASHTO M 17 / AASHTO T 37

AGGREGATE

Aggregates used in the Nu Coat Plus™ system shall contribute to consistent film-build, micro texture, durability, and long-term wear resistance. All aggregates shall meet the following requirements:

General Requirements

Aggregate Requirements

Aggregates for the Nu Coat Plus™ system shall be high-quality, clean, durable, angular, and non-friable mineral materials that support uniform film-build, micro texture, and long-term wear resistance.

Aggregate shall be:

• **Clean:** free of coatings, clay balls, vegetation, and other deleterious or organic matter.
• **Stable**: non-soluble in water and non-flammable.
• **Strong:** angular, durable, and non-friable to support micro texture and abrasion resistance.
• **Gradation-controlled:** verify by AASHTO T 27 (sieve analysis) and AASHTO T 11 (washed fines).
• **Shape/texture** (as needed): assess by ASTM C1252 (uncompacted void content indicator of angularity).
• **Compatible & consistent:** no contaminants harmful to binder adhesion; manage stockpile moisture for uniform mixing.

Physical Property Requirements

Property	Requirement
Water Absorption	≤ 10%
Particle Angularity	Conform to ASTM C1252 (Uncompacted Void Content of Fine Aggregate)
Moisture Content	Report
Cleanliness / Deleterious Material	Must be free of organic impurities and deleterious matter (ASTM C33 guidance)
Solubility	Non-soluble in water
Flammability	Non-flammable

Gradation Table

Sieve Size	% Passing	Referenced Standard/Test
#8	100	AASHTO T27
#16	75–100	AASHTO T27
#30	70–100	AASHTO T27
#60	40–90	AASHTO T27
#100	35–80	AASHTO T27
#200	20–70	AASHTO T27

Minimum fine aggregate content shall be 30% by weight of the wet mix.

2.3 MIX DESIGN PERFORMANCE

The completed mix shall meet the following:

Table 1— Nu Coat Plus™ Polymer-Modified Asphalt Sealer: Mix Properties, Test Methods, and Acceptance Criteria

Property / Test	Standard / Method	Requirement / Acceptance Criteria
Weight per Gallon (lb/gal)	ASTM D6937	≥ 10
Solids Content by Evaporation at 130 °C	ASTM D6934	≥ 48%
Uniformity of Emulsified Bitumen Coating (a)	ASTM D2939 - 5	Pass

Wet Film Continuity (a)	ASTM D2939 - 22	Pass
Test on Residue		
Mineral Aggregate & Fines Content of Mix Cured at 130 °C	AASHTO T308	≥ 50%
Asphalt Content by Ignition Method of Mix Cured at 130 °C	AASHTO T308	≥ 30%
Drying Time (h) (a)	ASTM D2939 - 13	2 to 6
Wet-Track Abrasion Test (1 h soak), g/ft²	ASTM D3910 - 6.4	≤ 15
Wet-Track Abrasion Loss (72 h soak), g/m²	ISSA TB 100	≤ 80
Dynamic Friction Test Number at 20 km/h (b,c)	ASTM E1911	≥ 90% of base value
British Pendulum Test Number(b,c)	ASTM E303 - 93	≥ 90% of base value
Mandrel Bend Test	ASTM D522	No Cracking
Adhesion Strength—Concrete Block (CMU) Substrate (psi) (e)	ASTM D4541	≥ 200
Resistance to Impact (a)	ASTM D2939 - 26	No Chipping, Cracking, or Delamination
Resistance to Heat (a)	ASTM D2939 - 14	No Blistering, Sagging, or Slipping
Resistance to Water (a)	ASTM D2939 - 15	No Softening, Delamination, or Re-emulsification
Flexibility Test (a)	ASTM D2939 - 16	No Cracking or Delamination
Resistance to Motor Oil (a,d)	ASTM D2939 - 25 (modified—motor oil substitution)	No visible discoloration at 24 h and 7 d

Note:

- **(a)** Alternative film prep: 50 mils (1.27 mm) via calibrated applicator on 6 × 3 in. (150 × 75 mm) steel panel, or per ASTM D2939.
- **(b)** Only one friction test required—use either ASTM E1911 or ASTM E303.
- **(c)** Base value from an engineer-approved control mix or equivalent reference, tested under equivalent conditions per ASTM E1911/E303.
- **(d)** ASTM D2939 kerosene resistance modified by substituting motor oil (e.g., SAE 10W-30, API SP) and evaluating at 24 h and 7 d; acceptance: no visible discoloration; report any softening, swelling, blistering, or tack.

- **(e)** Adhesion testing per ASTM D4541 on interior sealed CMU; report sealer/coating used, substrate description/prep, dolly size, and failure mode.

2.4 WATER

Water shall be potable and free from salt or contaminants.

2.5 ADDITIVES

- Plant incorporation only: Additives shall be introduced at the manufacturer's facility under controlled batching/QA.
- Polymer content: Provide ≥ 10% polymer solids by weight of asphalt binder (residue basis); document on manufacturer's Certificate of Analysis (CoA).
- No field modification: Contractor shall not modify mix in field.
- No added water post-manufacture: After Nu Coat Plus™ is produced and loaded for transport, no dilution or re-tempering is permitted.
- Handling & storage: Follow supplier instructions; prevent contamination from tanks/hoses; avoid freezing/overheating.
- Documentation: Each load shall be accompanied by a CoA

2.6 EQUIPMENT

Mixing Equipment

- Central plant with automated, weight-based proportioning of emulsion, fines/sand, water, and approved additives,
- Regular calibration required.

Application Equipment

- **Approved Applicator**: Continuous flow mixing paver or approved spray system. Capable of applying at least 15,000 square yards of material per day.
- **Homogenization**: Full sweep agitation.
- **Uniform Application:** Calibrated spray bar capable of uniform application.
- **Operator Control:** An operator control station capable of adjusting material spread rates in accordance with project calibration procedures.
- **Tank Conditioning:** Storage tanks must maintain homogenous mixture.
- **Spray Bar Requirement:** A spray bar capable of applying the Nu Coat Plus™ mixture and positioned in accordance with established calibration requirements.

Storage Tanks

- Provide storage tanks with sufficient capacity to accommodate the full transport load when delivering Nu Coat Plus™ mixture from the central mixing plant to the job site storage facility.
- Ensure all onsite storage tanks are equipped with internal full-sweep agitation systems capable of maintaining a uniform, homogeneous mixture.

PART 3 – EXECUTION

3.1 WEATHER LIMITATIONS

Do not apply unless:

- Pavement and air temperature in the shade is ≥ 55°F and rising.
- No forecast for rain within 24 hours
- Temperature not projected below 45°F within 48 hours (daytime or nighttime)

Do not apply during:

- Rain
- Snow
- High winds
- Freezing conditions

3.2 SURFACE PREPARATION

- Repair first: Correct structural failures; patch/level distressed areas; complete and cure crack/patch repairs per product guidance.
- Cure time (new asphalt): Allow new pavement to cure per supplier requirements before sealing
- Clean & decontaminate: Remove all dirt, dust, sand, and debris; degrease and prime oil/chemical spots with a compatible primer.
- Verify dryness: After washing, ensure the pavement—including all cracks and joints—is clean and visibly dry, with no standing water or damp pockets.
- Protect adjacent assets: Mask/cover curbs, gutters, sidewalks, utilities, manholes/valve boxes, guideposts, street fixtures, service entries, landscaping, and nearby structures to prevent overspray/staining.

3.3 APPLICATION

- Apply two coats.
- Allow first coat to set and dry before second coat.
- Apply at least 40 percent of the required total application with each coat.
- Minimum total application rate:
  0.30 gal/yd²
- Typical coverage:
  25–30 sq ft per gallon (two coats combined)

Application requirements:

- Maintain constant delivery rate regardless of the speed of the delivery machine.
- Full coverage “curb to curb” for both coats.
- No runoff of Nu Coat Plus™ in any areas.
- Straight joints and clean edges.
- Longitudinal overlap ≤ 3 inches.
- Keep traffic off surface until cured (minimum 24 hours).
- Apply Nu Coat Plus™ with hand spray bars and squeegees in areas where the distributor spray bar cannot reach.
- Avoid unsightly appearance in hand work areas.

3.4 TRAFFIC CONTROL

- Provide traffic control per project specifications.
- Keep traffic off surface until Nu Coat Plus™ material is completely dried and does not track.
- Use reflective devices/lighting for low-light work.

3.5 POST APPLICATION

- Remove overspray.
- Clean adjacent structures.
- Remove non-compliant material.
- Ensure surface is free of streaks, holes, or bare spots.
- Allow adequate time for curing after completing Nu Coat Plus™ application before applying permanent markings.
