

## Detailed Application Specification



# STAR-SEAL

## Asphalt Pavement Sealer System

### 1.0 Objectives:

This specification covers the application of STAR-SEAL, sealcoating system for existing, sound asphalt pavements.

- 1.1 To extend the service life of asphalt pavements by sealing out:
  - the sun's ultraviolet rays, which result in oxidative decomposition,
  - deteriorating effects of deicing salts, oils, gasoline, and grease,
  - water and subsequent damage to the sub-base caused by water penetration.
- 1.2 To beautify and enhance the appearance.
- 1.3 To reduce the maintenance costs and extend the service life.
- 1.4 To fill minor surface imperfections and yield an even looking surface.
- 1.5 To provide a limited degree of skid resistance.

### 2.0 Materials:

#### 2.1 Coal Tar Pitch Emulsion.

- 2.1.1 Coal Tar Pitch Emulsion must meet or exceed **ASTM 5727-00** (formerly Federal specification RP-355e), when tested in accordance with **D 2939-98**.
- 2.1.2 The Coal Tar Pitch Emulsion shall also be in compliance with **ASTM D 3320-90**.
- 2.1.3 The material shall be prepared from straight run high temperature coke-oven tar meeting the requirement of **ASTM D 490-92**
- 2.1.3 The material shall be homogeneous and show no separation or coagulation components that can not be re dispersed with moderate stirring.
- 2.1.4 The material shall be suitable for application and complete coverage, by brush or by approved mechanical methods, to the bituminous surface at a spreading rate of 0.18 - 0.20 Gal. (based on the amount of STAR SEAL Concentrated) per square yard in a two-(2) coat application system.

**STAR-SEAL** meets and or exceeds the requirements, as detailed above.

- 2.2 **Sand / Aggregate Specifications:** Sand shall be clean hard and irregular silica sand, free of clay, dust, salt, and organic matter. It must meet the following gradation.

| U.S. Sieve Size              | Percentage Retained |         |
|------------------------------|---------------------|---------|
|                              | Minimum             | Maximum |
| No. 20 or coarser (0.850 mm) | 0                   | 0       |
| No. 30 (0.600 mm)            | 0                   | 5       |
| No. 40 (0.425 mm)            | 7                   | 25      |
| No. 50 (0.300 mm)            | 15                  | 50      |
| No. 70 (0.212 mm)            | 20                  | 40      |

|                    |            |   |    |
|--------------------|------------|---|----|
| No. 100            | (0.150 mm) | 3 | 30 |
| No. 140            | (0.106 mm) | 0 | 10 |
| No. 200            | (0.075 mm) | 0 | 7  |
| Finer than No. 200 |            | 0 | 3  |

**2.3 Water** shall be clean and potable, free of harmful soluble salts, within a temperature range of 50-80 deg. F.

**2.4 Additive - STAR MACRO-FLEX**, (meeting FAA P-627, 628 Engineering Brief No. 46A) is recommended. The additive is based on Acrylonitrile/butadiene latex rubber and shall be used per mix design and specification requirements.

**2.5 Crack Fillers:** Must be certified by the supplier for compatibility with the sealcoating material. Cold pour crack fillers, **STAR STA-FLEX** and the premium grade **STA-FLEX SUPREME**, are recommended by S.T.A.R. Hot pour rubberized crack fillers may also be used.

**2.6 Primers :**

**2.6.1 Oil Spot Primers:** Must be certified by the Sealcoat manufacturer for compatibility with the sealcoating material. **STAR S.O.S. Primer/Sealer** is recommended.

**2.6.2 Pavement Primer:** Must be certified by the Sealcoat manufacturer for compatibility with the sealcoating material.

**2.6.3. Specialty Coatings/Primers** may be recommended by the manufacturer for problematic areas, e.g. rust streaks in the pavement, excessive surface contamination with oil, grease, fat etc. **STAR ONE STEP**, pre-diluted with water (in 1:2 volume ratio; product: water) is recommended. It is also recommended for fresh laid asphalt patches and polished aggregates.

### 3.0 Surface Preparation

3.1 For new installations, the pavement surface must be cured at least 30 days in hot weather. Check by spreading some water. If the water does not bead and stays in a continuous film, the pavement is suitable for sealcoating.

3.2 Clean the surface thoroughly to remove all foreign debris (dirt, gravel, silt, etc.) using air blowers or by flushing with water. Embedded dirt and silt shall be removed with steel bristle hand brooms.

3.3 Mud areas shall be thoroughly scraped and pressure washed with clean water.

3.4 Treat all grease and oil spots by scraping off the excess oil and dirt with a wire bristle broom and coat with **STAR OIL SPOT PRIMER SEALER (S.O.S.)** in accordance with directions. **STAR ONE STEP** is recommended for areas contaminated extensively with oil, grease fuel etc.

3.5 Make all necessary repairs, patch soft spots, fill all cracks and holes in the pavement. All patched areas must be cured before applying **STAR-SEAL**.

3.6 Treat old or badly oxidized asphalt pavement with a primer coat of diluted **STAR-SEAL**, one (1) part by volume thoroughly mixed with Three (3) parts of clean water. Apply the primer at 0.04 to 0.06 Gal./ Sq. yard (based on undiluted sealer).

Allow the primer coat to dry thoroughly, about 2-4 hours under normal drying conditions, prior to sealcoating with **STAR-SEAL**.

### 4.0 Materials and Recommendations:

#### 4.1 Materials Calculations:

STAR SEAL- For a standard two (2) coat sealcoating system, calculate at the rate of 0.18-0.20 gallons of undiluted sealer per square yard of the asphalt surface to be sealcoated.

Ist coat requires- 0.10-0.12 gal./square yard,

IInd. coat requires- 0.08-0.10 gal./square yard.

Other Ingredients (water, sand/aggregates, Star Macro-flex)-see section 4.2.

## 4.2 Recommended Systems:

| Usage area  | Coats   | STAR SEAL<br>Gal. | WATER<br>Gal. | SAND<br>Lb. | MACRO-<br>FLEX<br>Gal. | COVERAGE<br>RATE (mixture)<br>Gal/ Sq.yd. |
|---|---------|-------------------|---------------|-------------|------------------------|---|
| <u>Low Traffic</u>  | Ist.    | 100               | 30-40         | 200-300     | 0-3                    | 0.15-0.20                                 |
| Home Driveways, Parking stalls<br>Walkways, cart and bicycle paths,<br>etc.                         | II nd.  | 100               | 25-40         | 0- 300      | 0-3                    | 0.10-0.15                                 |
| <u>Moderate Traffic</u>   | Ist.    | 100               | 30-50         | 300-500     | 0-4                    | 0.15-0.20                                 |
| Driveways, Parking lots, airfield<br>and Highway shoulders, gas station<br>aprons, etc.             | II nd.  | 100               | 30-50         | 0-500       | 0-4                    | 0.10-0.15                                 |
| <u>Heavy Traffic</u>  | Ist.    | 100               | 30-60         | 400-600     | 0-5                    | 0.15-0.20                                 |
| Industrial & commercial Parking lots,<br>Airfield Taxiways, Service stations,<br>Steep grades, etc. | II nd.  | 100               | 30-60         | 400-600     | 0-5                    | 0.15-0.20                                 |
|   | III rd. | 100               | 30-40         | 0-500       | 0-4                    | 0.10-0.15                                 |

**4.3.1 Prime coat-** For old, oxidized pavements, a primer coat is recommended. The suggested materials are noted below;

- a. STAR SEAL, diluted with clean potable water in 1:3 volume ratio (sealer: water) applied at 0.04 to 0.06 Gal.(undiluted sealer)/ Square yard.
- b. STAR ONE STEP, diluted with clean potable water in 1:2 volume ratio (STAR ONE STEP: Water), applied at 0.05-0.08 gal. (mixed)/ Square Yard.

## 4.4 Sand Slurry Preparation

- Add the required amount of water to the sealer in the mixing tank and mix thoroughly.
- Keep the mixer running at a moderate rate.
- Add the sand in a steady stream of about one 100 lb. bag per minute. When adding sand, be sure of firm footing and never place hands and arms in the agitating mixer.
- After adding all the sand, close the lid of the mixing tank and raise the speed of the mixer to “high” setting.
- Mix for 10 minutes to allow the contents of the tank to mix thoroughly and break any sand clumps.
- Reduce the agitator speed to moderate setting and keep running. If the mixer is shut off during transport to the job site, it must be restarted and the contents mixed for at least 10 minutes before the application begins. Keep it running during the entire application period.

## 5.0 Application of Material:

- 5.1 The material shall be applied according to the specifications detailed in Section 4. These systems provide a protective coating that is free of voids, pinholes, and holidays.
- 5.1 The first coat, **STAR-SEAL** sand slurry, shall be uniformly applied over the entire surface. If the surface temperature is more than 90 deg. F, pre-dampen with a light mist. Avoid puddles. There should be no free standing water.
- 5.2 Allow the first coat to dry sufficiently to take light traffic without scuffing. It will take about 4-6 hours under ideal drying conditions.
- 5.3 If the specification calls for a second coat, apply it perpendicular to the previous coat, if practical.
- 5.4 The completed application shall be allowed to cure at least for 24 hours and then tested for traffic-ability prior to opening for regular use.
- 5.6 The amount of material needed will vary according to the porosity and texture of the pavement. The mix designs (i.e. **STAR SEAL** and other ingredients) expressed in section 4 are for guidelines only.

## 6.0 Method of Application

### 6.1 Squeegee/ Brush (Hand Application) method:

- 6.1.1. The agitator in the sealer tank should be kept on to keep the material in suspension at all times. The machine should be equipped with a fog bar to be used for pre-dampening if the pavement temperature exceeds 90 deg. F.
- 6.1.2. Coat the edges first. Pour a continuous ribbon of the **STAR-SEAL** along the pavement edge 6-12 inches from curbing.
- 6.1.3 Draw the **STAR-SEAL** mix away from the pavement edge by pulling a squeegee or brush perpendicular through the ribbon of material at a slight angle. Walk parallel to the pavement edge. Repeat the process in reverse direction pulling the excess material toward the center of the pavement. For best results use a squeegee followed by a brush. Pour more **STAR-SEAL** mix to maintain a working ribbon of material and continue across the pavement until it is completely covered.

### 6.2 Machine Application:

- 6.2.1. When applying by machine, seal the edges of the pavement by hand. The machine should then be used to apply **STAR-SEAL** mix to the remaining area. A self-propelled machine that squeegees and brushes the sealer into the pores of the pavement is recommended.
- 6.2.2. Spray application should deposit the material per specified coverage rates.

**7.0 Striping:** If striping is required, use STAR-BRITE Latex Traffic Paint (TT-P-1952b) or STAR BRITE PLUS, fast drying-100% Acrylic Traffic Paint . Allow the seal coat to dry at least 24 hours before striping. Refer to the Technical Data Sheet for details.

## 8.0 Precautions:

- 8.1 **STAR-SEAL** must be protected from freezing. Do not store at temperatures below 32 deg F.
- 8.2 Do not apply **STAR-SEAL** during rainy or foggy weather. Ground and air temperature must be 50 deg.F and rising prior to and after application
- 8.3 Drying is retarded by excessive moisture in the air or ground. Examples: rain, fog, prolonged humidity and seasonal extremes (early Spring - late Fall). Under such conditions, the use of **STAR MACRO-FLEX** is recommended to obtain optimum and uniform drying. Follow the recommended coverage rates. IF **STAR -SEAL** is applied too heavy, the surface will dry first and restrict the water evaporation from the rest of the film, slowing down full curing process.
- 8.4 **STAR-SEAL** is based on coal tar pitch. Prolonged and/or repeated contact may cause skin irritation. A protective cream should be used. Avoid breathing vapors. Wear protective clothing. See the Material Safety Data Sheet for **STAR-SEAL** for details.
- 8.5 **STAR-SEAL** is based on coal tar pitch. Prolonged and/or repeated contact may cause skin irritation. A protective cream should be used. Avoid breathing vapors. Wear protective clothing. See the Material Safety Data Sheet for **STAR-SEAL** for details. 8.7 Refer to “Personal Safety and Environment when using Refined Coal Tar Emulsion “ (PCTC 02, March, 1992. publication) for additional safety details.
- 8.6 Keep out of reach of children.

### Disclaimer:

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