



**Table 2. BITUMINOUS MATERIAL PROPERTY REQUIREMENTS**

<u>Test Property</u>	<u>Test Method</u>	<u>Requirements</u>
Specific Gravity @ 25/25° (77/77°F)	ASTM D 70	1.04 min.
Viscosity Engler 50 cc @ 50°C (122° F)	ASTM D 1665	4.5 max.
Water, % by Volume	ASTM D 95	2.0 max.
Distillation, % by weight to 170°C (338°F) 270°C (518°F) 300°C (572°F)	ASTM D 20	20 max. 25 – 45 30 - 55
Softening Point of residue from 300°C (572°F) distillation test	ASTM D 36	40 – 55°C (104-131°F)

**629-2.2 VERIFICATION OF BITUMINOUS MATERIALS.** The Bituminous Materials specifications contained in Section 2.1 shall be verified by submitting a sample of the product to the Engineer who shall send the sample to an independent laboratory to confirm the property requirements in ASTM D 490, minimum quantities contained in Section 629-2.1 and Table 1 and 2

### **CONSTRUCTION METHODS**

**629-3.1 WEATHER LIMITATION.** The rejuvenator/sealer shall be applied only when the existing surface is dry and the pavement surface temperature is 50° F (10° C) or higher.

**629-3.2 EQUIPMENT.** The Contractor shall furnish all equipment, tools, and machines necessary for the performance of the work. The product shall be delivered in dedicated tankers and/or containers with filters. The distributor shall be designed and equipped as follows:

- a. Adequate hearing capability for rapid heating of the rejuvenator sealer to the proper application temperature if required.
- b. A positive displacement pump capable of pumping low viscosity material and providing a pre-selected constant pressure of 20-60 psi (140 to 410 kPa) to deliver the specified rates of application.
- c. A full circulation spray bar equipped with proper nozzles which will provide the specified rates of application.
- d. A hooded spray bar and applicator which maintains constant nozzle height.
- e. A positive shut-off for the spray bar.
- f. A hand spray, with the hose, equipped with a positive shut-off at the spray gun.
- g. A thermometer installed in the distributor tank to measure the temperature to the rejuvenator/sealer at the time of application.
- h. A tachometer calibrated to a minimum of tenths of miles (kilometers) per hour. Ordinary speedometers will not be accepted as tachometers, and any Distributor on which the tachometer is not operating properly shall not be used.

- i. A chart listing the capacity of the tank in gallons (liters) shall be carried in each unit. This chart shall show gallonage (liters) for each 1 inch (2.5mm) of depth. A chart will show speed/pressure application rates.
- j. The distributor shall be equipped with filters, both during loading and unloading of the product.

**629-3.3 CLEANING EXISTING SURFACE.** Prior to placing rejuvenator/sealer, the surface of the pavement shall be clean and free from all debris, dust, dirt, or other loose, foreign matter.

**629-3.4 TEST SECTION.** Prior to full production the Contractor shall place a series of a minimum one-square yard test sections at the rate of 0.05, 0.06 and 0.075 gallons etc., per square yard, as needed. The area to be tested will be designated by the Engineer and will be located on the existing pavement. On runways, test sections shall be placed every 1000 feet (300 m) along the length of the runway.

**629-3.5 APPLICATION RATE.** The Engineer shall examine the test sections no sooner than 24 hours after placement and perform the viscosity test, at the discretion of the engineer, as described in paragraph 629-4.1. The field fuel resistance test described in paragraph 629-4.2 shall be performed, if required. The Engineer shall advise the Contractor of the application rate for the remainder of the project based on the results of the test section examination and test results. The application rate selected shall be that which produces the specified reduction in viscosity, if required, provides the specified fuel resistance (if required), and in which all rejuvenator/sealer penetrates into the surface within 24 hours. The (Engineer/Sponsor) may specify a decrease in the viscosity in the top ½ inch of the treated pavement.

**629-3.6 APPLICATION TEMPERATURE.** The product shall be applied at a product temperature of 70° F or above. The asphalt pavement temperature shall be at least 50° F and rising.

## **MATERIAL ACCEPTANCE**

**629-4.1 ACCEPTANCE SAMPLING AND TESTING.** All acceptance sampling and testing necessary to determine conformance with the requirements specified in this section will be performed at the discretion of the Engineer at no cost to the contractor.

**629-4.2 VISCOSITY.** The binder extracted (ASTM D 2172) from samples of the upper 3/8 inch (9mm) of the surface of the treated pavement shall show a decrease in viscosity from the untreated pavement as measured by ASTM D 2171. A percent decrease in viscosity will be computed as follows:

$$\% \text{ decrease in viscosity} = \frac{(\text{viscosity of untreated sample}) - (\text{viscosity of treated sample})}{(\text{viscosity of untreated sample})} \times 100$$

On projects involving pavement areas where protection from fuel spillage is required, a fuel resistance test shall be conducted. The following paragraph shall be included in the specification.

### **629-4.3 FIELD FUEL RESISTANCE TEST.**

- a. **Procedure:** ASTM D 1308 – Chemical Resistance of Organic Coatings.
- b. **Failure Criteria:** Softening shall be considered a failure.

**629-4.4 SKID RESISTANCE.** The manufacturer shall provide to the engineer independent test results demonstration that the product does not lower skid resistance below FAA acceptable levels.

**629-4.5 TEST FREQUENCY.** One viscosity (and one field fuel test) shall be performed for each 150,000 square feet (14,000 square meters) or fractional part of treated pavement. The location of the viscosity test (and field fuel test) shall be randomly selected by the Engineer. The tests shall be performed as soon as possible after the manufacturer's recommended cure time.

## QUALITY CONTROL PROGRAM

**629-5.1 CONTRACTORS CERTIFICATION.** Samples of the bituminous material that the contractor proposed to use, together with a statement as to their source, must be submitted and approved before applying the material.

The Contractor shall furnish the Manufacturer's certification that each consignment of coal-tar rejuvenator/sealer shipped to the project meets the requirements of paragraph 629-2.1. Further, the manufacturer must certify that the contractor is approved for the installation of the rejuvenator/sealer.

**629-5.2 INSPECTION.** The Contractor shall have a knowledgeable representative on the job site at the beginning of operations. The manufacturer's representative shall have knowledge of the materials, procedures, and equipment described in this specification and shall oversee the mixing of the component materials and application of the rejuvenator/sealer. The manufacturer's representative shall have a minimum of two years experience in the use of coal-tar rejuvenator/sealer. Documentation of this experience shall be furnished to the Engineer prior to the start of operations. The cost of the manufacturer's representative shall be included in the bid price.

**629-5.3 FREIGHT AND WEIGH BILLS.** The Contractor shall furnish the Engineer with receipted bills when railroad shipments are made, and certified weigh bills when materials are received in any other manner, for the coal-tar rejuvenator/sealer used in the construction covered by the contract. The Contractor's representative shall not remove material from the tank car or storage tank until the initial outage and temperature measurement have been verified.

**629-5.4 WARRANTY.** The Contract shall warrant that the treated pavement shall retain a lower/lowered viscosity for a period of two (2) years from date of treatment. The proposed rejuvenating product shall furnish proof of the successful two (2) year reduction period for the viscosity requirement. The Engineer/Sponsor will designate an area of no less than ten square yards of pavement as the control section for all testing. The contractor shall further warrant that from the date the Coal-tar Rejuvenator Sealer is applied and for a period of three years thereafter, the material will not flake, peel, chip or spall, or the Manufacturer's authorized representative will reapply the Coal-tar Rejuvenator Sealer as necessary. Finally, the Contractor will warrant the treated surface to be fuel resistant and remain fuel resistant for a period of three years after the date of application.

The warranty shall be effective only if spills are cleaned up as per local regulations.

## METHOD OF MEASUREMENT

**629-6.1** The coal-tar rejuvenator/sealer shall be measured as the number of square yards/square meters installed at the approved application rate and accepted as complete by the proper Authority.