



BULLETIN #2
September 1988

EQUIVISCIOUS TEMPERATURE (EVT)

(Supersedes Bulletins #2 and #2A dated December 15, 1977)

In 1977 NRCA issued Bulletin #2 announcing that the Association had adopted the equiviscous temperature (EVT) concept. This followed the determination that the flow characteristic (viscosity) of roofing bitumens at the point of application to the substrate is an important factor in the construction of built-up roof membranes. The equiviscous temperature (EVT) was then defined as the temperature at which the viscosity of roofing asphalt is 125 centistokes.¹ Subsequently, Technical Bulletin #2A was issued to redefine the equiviscous temperature (EVT) range of roofing asphalt as the temperature at which a viscosity of 125 centistokes is attained, $\pm 25F$.

The results of two recent research programs^{2,3} suggest:

- an appropriate equiviscous temperature (EVT) for coal tar products;
- a need for modification of the equiviscous temperature (EVT) for roofing asphalt.

NRCA recommends the following modifications in defining Equiviscous Temperatures (EVT) for roofing bitumens:

Equiviscous temperature (EVT): The recommended temperature for the application of roofing bitumens at the mop bucket or felt layer immediately prior to application to the substrate.

Asphalt products: The recommended equiviscous temperature (EVT) range for roofing asphalt (ASTM D-312, Type I, II, III, and IV) is the temperature at which a viscosity of 75 centipoise is attained, $\pm 25F$.

Coal tar products: The recommended equiviscous temperature (EVT) range for coal tar products (ASTM D-450, Type I and III) is the temperature at which a viscosity of 25 centipoise is attained, $\pm 25F$.

NRCA strongly recommends that the following information be printed on each carton, package and bill of lading for both asphalt and coal tar products:

Product type: The type of product by ASTM designation, e.g., ASTM D-312, Type III, ASTM D-450, Types I and III.

Flash point: The flash point as determined by ASTM Standard D-92, Flash and Fire Point by Cleveland Open Cup.

Equiviscous temperature (EVT) of asphalt: The temperature at which the *asphalt* attains a viscosity of 75 centipoise as determined by ASTM Method D-4402, Viscosity Determinations of Unfilled Asphalt Using the Brookfield Thermosel Apparatus.

Equiviscous temperature (EVT) of coal tar. The temperature at which the coal tar product attains a viscosity of 25 centipoise when determined by ASTM Method D-4402, Viscosity Determinations of Unfilled Asphalt Using the Brookfield Thermosel Apparatus.

Supplementary Suggestions

Excessive and prolonged heating of asphaltic and coal tar products may have a deleterious effect on the quality of the product. Further, excessive heating may present a serious flash or fire hazard to property and personnel. In light of these parameters, NRCA makes the following recommendations:

DO maintain kettle and tanker temperature less than 25F below the **actual** flash point of the material used.

NEVER heat materials to or above the **actual** Flash Point.

DO NOT maintain materials at high temperatures for prolonged periods of time.

DO NOT allow materials to stand in luggers for long periods.

DO insulate hot transport lines.

DO circulate materials.

One consequence of a change in EVT from 125 centistokes to 75 centipoise, $\pm 25F$, is the potential need to increase the temperature at which the bitumen is heated in the kettle or tanker. NRCA encourages manufacturers to furnish bitumens with a sufficiently high flash point such that contractors can heat the material to temperatures sufficient to apply material in the EVT range, particularly in cold weather applications, without maintaining the material above 25F below the actual flash point.

Notes:

1. Centistoke is a unit of a liquid's kinematic viscosity. It is obtained by dividing a liquid's dynamic viscosity expressed in centipoise by its density.
2. NRCA-Koppers Co. research report on *Temperature and Viscosity Effects on the Application of Coal Tar Products During the Construction of Built-Up Roofing Systems*, December 1986.
3. NRCA-Trumbull research report on *Temperature and Viscosity Effects on the Application of Asphalt During the Construction of Built-Up Roofing Systems*, September 1988.