

MASTICS FOR PAVEMENT PRESERVATION REPAIRS

by Pa. Association of Asphalt Material Applicators

Mastics are a new road maintenance product recently approved by PennDOT for use in providing more permanent repair to problem areas. Due to the varying properties of the mastics listed for use on PennDOT projects, road crews must make sure they follow the manufacturer's installation instructions on timing, handling, and use of the material.

The following are general instructions for most mastic products.

What are Mastics?

The term "mastic" refers to polymer-modified asphalt binder mixed with prepackaged engineered aggregates used in pavement preservation repairs. These binders provide improved bonding and adhesion to existing pavements, elasticity, and elongation for flexibility. The aggregates provide structural strength and a load-bearing capacity to the repair.

Mastics can be used to repair the following:

- Cracks greater than 1 inch wide
- Pavement seam failures
- Longitudinal shoulder joint failures
- Potholes
- Utility cuts
- Depressions, ruts, and low areas
- Large joints around raised manholes and catch basins
- Uneven pavement levels
- Raveled and delaminated pavements
- Leveling bridge approaches



Preparing the Surface

Mastics are generally applied with surface temperatures as low as 40°F and ambient air temperature of 40°F. The manufacturer may extend the temperature range (low and high limits), but doing so will require additional labor, preparation work, and equipment, such as hot air lances, heated chutes, and torches.

Before mastics are applied, the repair area should be:

- 1) thoroughly cleaned of all loose material, vegetation, dust, and debris,
- 2) dry, and
- 3) readied to receive the mastic so that it will also adhere to the sides and not just to the base.

Tools such as wire brushes, leaf blowers, compressed air, and hot air lances are recommended and may even be required to appropriately prepare the pavement repair area.

Once the area is cleaned and dried, check with your material supplier to determine if a primer is recommended. If one is not, then the repair area is ready to receive the mastic material.

Melting the Mastic

The heating of the mastic is achieved in a mastic melter, a unit that can range from 10 to 350 gallons. Most melters use indirect heat, either by an oil-jacketed or air-jacketed system, to prevent damage to the modified binders. They also incorporate agitation to properly blend the mix and keep the aggregates in suspension.

While mastic melters operate similarly to crack-sealing melters, one obvious difference is the horizontal mixing agitator shaft and the fact that they do not pump the material. Due to the aggregates in the mix, pumping the mastic is not possible.

Getting material out of the melter is accomplished by gravity or with a built-in screw auger, allowing the mix to be drawn down a chute or directly out from the discharge opening.

The mastic material comes packaged in boxes, bags, or container units, similar to conventional crack sealants. Non-meltable materials, such as cardboard boxes, must be removed before the mastic/aggregate blocks are deposited into the melter. As the mastic melts, the binder and aggregates combine to form the proper blend. Be sure to heat the blend to the manufacturer's recommended application temperature before it is applied.

Applying the Material

Application of the material can be achieved in several ways. Gravity flow from the mastic melter into the void is the easiest. With the use of metal 5-gallon pails or a small shuttle buggy, the material may be placed more precisely on the repair. A common method of application is to drop the material from the rear of the melter into a hand toolbox screed. For larger repairs, drag boxes affixed to the rear of the melter under the discharge opening allow the material to be spread consistently over a continuous longitudinal crack.

Once the mastic is placed in the repair area, smooth the surface and edges using a hot steel-plate hand tool that has been kept heated in a side heating compartment of the mastic melter. This tool reduces the rough and uneven surface of the repair and rolls the edges smooth to minimize any uneven surfaces.

Each manufacturer must provide sufficient bags of clean and dry fine



aggregate topping stone to be applied to the surface of the mastic. This fine stone improves the surface friction properties of the repair without additional costs to the roadway owner.

The mastic repair area should be cooled down to the manufacturer's recommended temperature range before it is reopened to traffic. Traffic control will be necessary to accommodate the placement of the material and the cooling time of the repair. The amount of time it takes to cool the mastic enough for traffic to be allowed back on the road will depend on pavement surface temperature, mastic application temperature, and depth and width of the repair.

Depending on the depth of the crack and the cross-slope of the pavement, multiple applications of the mastic may be necessary to fill the crack gradually.

Protecting Employees

As with crack sealing or any operation that requires elevated temperatures, road crew members and operators must wear the proper personal protective equipment (PPE), including but not limited to long-sleeve shirts and pants, proper footwear, hard hats, eye protection, gloves, and safety vests.

One final note: Be sure to contact the product manufacturer to ensure thorough understanding of the kinds of repairs the product is intended for, as well as what the requirements are for handling, heating, applying, and finishing it on pavement repairs.