

## SEAL COAT

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The use of a seal coat for pavement preservation of roadways is a widely used process that adds additional years to the life of roads.

Municipalities need to monitor their road system and follow the recommended right-time, right-treatment approach, and develop a plan that works for their community. Preserving good roads is the best way to extend the life of the road. Proper planning of a complete road maintenance program should consider how a seal coat can stretch municipal tax dollars by delaying paving or roadway reconstruction. Seal coats preserve existing pavement by preventing the infiltration of water through the road surface and damaging the road base. A seal coat can extend the life of a road up to seven to 10 years if properly applied and maintained.

What is a seal coat? It is a layer of asphalt emulsion (a mixture of asphalt, water, and an emulsifying product) that is applied to the prepared road surface. This seals smaller cracks and waterproofs the surface. Then an application of clean aggregate is placed almost immediately on the emulsion to protect it and allow traffic to drive on the surface without damage to the emulsion and the vehicle. It is then rolled with rubber-tired rollers.

As with any road paving, full depth reclamation, or seal coat project, drainage facility inspection and/or replacement should occur early on. Shoulder cutting, base repair and patching, and crack sealing on large cracks (over 1/4 inch) filled with an approved sealer should also be done.

To prepare the surface for a seal coat, care should be taken to assure that the roadway is clean and free of any substances that will prevent the emulsion from bonding to the pavement. Power brooms, vacuum trucks, blowers and high-pressure water are some of the equipment and methods utilized to clean the roadway.

The emulsion is applied at a calculated rate suitable for the current condition of the roadway. Each year, contractors are required to submit a design using this information to PennDOT for approval and then must follow the approved design when doing the actual work.

Aggregates in Pennsylvania naturally have either a positive or negative charge and the emulsion must be made to allow the bonding of the material instead of natural magnetic repulsion, which will not allow the aggregate to stick but be rejected. Emulsions can be made to have the proper positive or negative charge to accomplish a satisfactory result.

While the use of seal coat has been around for many years, recently some additions and revisions have occurred to the process which have enhanced the use in residential areas which at one time were avoided due to complaints from the citizens.

First the aggregate used is required to be washed to be clean. The fines in the aggregate must be less than 1.0%, passing the No. 200 sieve. Additionally, if using a pre-coated aggregated (pretreated with an approved asphalt through a plant) the fines in the aggregate must be less than 2.0%, passing the No. 200 sieve.

A fog seal may be included in a seal coat job. It is a special formulation of emulsion placed over



**A view of a completed seal coat project along a municipal road in the commonwealth. Photo: PAAMA**



Pennsylvania  
**Department of Transportation**  
Local Technical Assistance Program  
[www.pa.gov/pennidot](http://www.pa.gov/pennidot)

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the seal coat to help lock down the aggregate and gives a desirable finish that mimics a paved surface. This application has gained wide acceptance although it does increase the cost of the project.

The above specifications can be found in PennDOT Publication 408, Specifications, and contractors must follow these specifications when doing work where PennDOT-supplied liquid fuels monies are involved. All materials used in the seal coat process must be PennDOT approved.

Additionally, PennDOT Publication 447, Approved Products for Lower Volume Local Roads, has a very similar specification to the one in PennDOT Publication 408. The main difference is that Pub 447 allows for a use of a smaller aggregate (a 1/4-inch-sized referred to as a # 9M) as a second layer or as a single application on roads with an ADT of not more than 350 cars per day.

Pub 447 also has specifications for a fiber reinforced seal coat and a seal coat over paving fabric. Both processes are designed for locations with excessive cracking issues. A bituminous fiber reinforced stress-absorbing membrane interlayer is an innovative, crack-inhibiting and sealing membrane. A combination of polymer-modified asphalt emulsion, chopped strands of fiber



**An emulsion distributor truck at work followed by a calibrated chip spreader and dump truck with #8 aggregate. Photo: PAAMA**

should be considered when planning and bidding on these projects. Sometimes municipal crews will do the traffic control, or it can be included in the bid package directing the contractor to provide the service.

A successful project of any kind is accomplished by planning, preparation, and adherence to the specifications and project inspection.



**A calibrated chip spreader at work along a residential street distributing #8 aggregate. Note that manhole covers are protected so that emulsion and aggregate do not adhere to the cover. Photo: PAAMA**



**Emulsion is being applied as it is followed closely by a chip spreader as suggested in the specifications. Photo: PennDOT**

## Resources

Asphalt Seal Coat: PennDOT Pub 408, Section 470

[https://www.pa.gov/content/dam/copapwp-pagov/en/pennDOT/documents/public/pubsforms/publications/pub\\_408/pub%20408.pdf](https://www.pa.gov/content/dam/copapwp-pagov/en/pennDOT/documents/public/pubsforms/publications/pub_408/pub%20408.pdf)

Pretreated Aggregate: PennDOT Pub 408, Section 471

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Bituminous Seal Coat: PennDOT Pub 447, Section MS-0340-0005

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