

Choosing a Coal Tar-Free Sealcoat: Guidance for property owners and managers

Sealcoats are brushed or sprayed on asphalt pavement to improve appearance and seal out moisture and oxygen, which can degrade the underlying asphalt. Typically lasting two to four years, sealcoats can extend the life of the pavement, while maintaining a uniform black appearance on paved surfaces. Most sealcoats are asphalt emulsions (i.e. a mixture of liquids that would otherwise separate without an additive). The following are examples typical commercial sealcoats:

- **Fog seal emulsions**—30% binder, 50% or more water, and polymers and additives to enhance product performance. These emulsions include:
 - Asphalt (petroleum-based) emulsion
 - Coal tar pitch emulsion
 - Gilsonite® emulsion
 - Acrylic emulsion
- **Slurry seal**—an asphalt emulsion with aggregates, mineral fillers, and additives which bonds to existing pavement and cures to form a new wearing surface
- **Chip seal**—a layer of asphalt emulsion with about 60% asphalt and 40% water combined with a layer of fine aggregate on top of the existing pavement layer

Sealcoat emulsions that contain water are easier and safer to spread. When the water evaporates, the thorough mixing allows the remaining binder oils and solids to cure in a uniform layer, which seals out moisture and oxygen which break down the underlying asphalt.

Asphalt Maintenance Basics

- Regularly evaluate your pavement’s condition and act before significant deterioration occurs
- Discuss issues with several sealcoat contractors or pavement engineering consultants with experience using safer non-coal tar alternatives
- Work only with sealcoat providers who show you complete product data sheets so you can identify and avoid coal tar.
- Follow best application practices:
 1. Thoroughly repair and prepare the surface
 2. Follow the manufacturer’s recommendations for mixing, application rate, and number of coats needed for your conditions
 3. Apply sealcoat only when weather and temperature conditions are right
- Know what the final result should look like. When fully cured, the sealcoat should have uniform coverage and appearance, with all aggregate and spaces covered and no gaps or pinholes.

(Many people use “sealant” and “sealcoat” to mean the same thing, but the industry uses “sealant” materials to fill cracks ¼- to 1-inch-wide.)

Some newer types of sealcoats contain no water, instead using agricultural, plant-based oil and various types of hydrocarbon solvents, and often include some polymers. These polymers are designed to replace lost or oxidized oils and restore the flexing and binding properties of asphalt pavement.

Deciding to Sealcoat

The first step to protecting your asphalt pavement is monitoring it year to year. Watch for signs of loss of asphalt binder between the aggregate (small stones) and loose aggregate. Also look for fine cracks and take action before they widen. If you have new pavement, treatments can start any time after the first year.

While a contractor may suggest sealcoating every two to three years, sealing too frequently can cause build-up, flaking, or peeling. After five or more years most of the old application will have worn off in high traffic areas. What remains will stay in place underneath a new coat. If you're worried about whether a new coating will stick, pre-test a small area.

Talk with paving engineers or contractors about your pavement's history of damage (fuel or oil spills or drips, extreme heat and rutting, severe freeze or thaw conditions, overhanging vegetation, etc.) and what you need to protect against. Consider also whether your primary concern is visual appearance or pavement preservation. If a sealcoat is determined to be the best option, then work with a professional to choose the safest most effective sealcoat possible.



Severely Damaged Pavement

While a sealcoat is a less-expensive short-term treatment option, it may not be the most protective or cost effective if your pavement is older or badly deteriorated. Chip-seal or total replacement with asphalt or other materials may be a better option.

Choosing a Sealcoat Product

The most common non-coal tar sealcoat is petroleum asphalt-emulsion (CAS number 8052-42-4). Good asphalt sealcoat emulsions are affordable, provide a black appearance for one to two, and can provide ongoing protection for two to four years if properly applied. They can be used in locations that ban coal tar. Asphalt sealcoat data sheets show ranges such as 10 to 30% (a higher content is preferred). Sealcoats with polymer content of 2.5% to 5% may dry faster, be more flexible, and help retain aggregate (chip or gravel) if you are applying a chip-seal. Following are more details about a variety of sealcoat products:

- For **asphalt-based sealcoat emulsions**, the water content will be included on the data sheet, and the manufacturer may also provide guidance on limits to the final dilution to aid in spraying

or spreading. When cured, the sealcoat should have uniform coverage and appearance, with all aggregate and spaces between covered without gaps or pinholes.

- For **asphalt fog seal-sealcoat** products, look for the binder component (asphalt) of 25 to 30%. Many data sheets will give wide ranges such as 10 to 30% (ask for the higher asphalt content).
- The **asphalt emulsion for chip-seals** (over a layer of gravel) should be around 65% residual asphalt.
- For larger commercial parking lots, **chip-seals** with gravel are slightly more expensive than sealcoats without stone, but can last twice as long as an asphalt sealcoat alone.
- **Gilsonite® sealcoats** typically have some petroleum asphalt content, and are another low-polyaromatic hydrocarbon (PAH) option. However, they may also include naphtha, mineral spirits, or other solvents which may be a locally regulated for air quality. It is often recommended this type of coat only be applied on unsealed or asphalt-sealed pavement; not onto coal tar or acrylic-sealed surfaces.
- **Acrylic-based, agricultural oil-based sealcoats, and cement-based micro-layers** are not as readily available as asphalt-based sealcoats, and there is less long-term experience or research showing how they protect and preserve pavement, especially for retail acrylics applied by homeowners. Even though somewhat higher in initial cost than asphalt-based sealcoats, professionally-formulated and -applied non-asphalt sealcoats may be appropriate for some applications.
- **Polymers** like styrene/butadiene, isoprene, or neoprene increase flexibility to stand up to extremes of heat and cold, and they help the sealcoat set faster, which is important when rain, cold, or darkness are impending or in commercial parking lots where traffic needs to get back on the pavement as quickly as possible.
- **Clay, mineral, quartz** or similar materials add strength and are typically around 20% by weight.
- **Carbon black, slate** and other mineral additives darken the coating.
- **Sand** is often added by a contractor at three- to six pounds-per-gallon of sealcoat to fill a rough surface, or to provide traction to newer or smoother pavement. Be aware that as the sealcoat binder starts to wear away, the sand released will cause greater abrasion under tires and accelerate the wear rate of the coating.

Choosing a Safer Alternative

It is the buyer's responsibility to look at data sheets and talk to providers about key ingredients for pavement protection and manufacturer's recommendations for optimal application.

You should request a safety data sheet with clear ingredient identification and percentages. If a safety data sheet is not available, ask for more information or choose a product or supplier who offers one.

Do not specify sealcoat products if their safety data sheets, container labels, or technical bulletins show the Chemical Abstracts Service (CAS) numbers:

- 65996-93-2
- 65996-89-6
- 8007-45-2

Or the words: coal tar, refined coal tar, refined tar, refined coal tar pitch, coal tar pitch volatiles, RT-12, tar, or similar terms.

Best Sealcoat Application Practices

While there are many products that work well, good surface preparation and proper weather conditions during application and drying are essential to achieving a lasting coating.

- Clean cracks under one-inch-wide thoroughly and fill them with a durable and flexible rubberized sealant that will adhere tightly to the asphalt. Cracks larger than one-inch-wide should be filled with new asphalt pavement.
- Remove and clean loose material including past sealcoat layers, fuel and oil leaks, and spill spots
- Follow the manufacturer's mixing, water dilution, and application recommendations closely
- Application of asphalt sealcoat should take place only if the air temperature is at least 55°F and rising (typically May through September)
- Asphalt and other sealcoats should not be applied at night or when rain is expected in less than three hours, in foggy conditions, or when the pavement surface has standing water. Turn off or cover all sprinkler irrigation systems.
- Make sure the applicator follows the manufacturer's mixing, water dilution, and application recommendations closely. Let them know you expect full and unbroken coverage when the coating is fully cured (as much as 90 days after application) or you will expect them to return, prepare the surface properly, and apply more sealcoat at no extra cost.
- If more than one coat is required, be sure you or the contractor follows the manufacturer's recommendations for time and surface condition requirements before applying a second coat. If drying conditions are good and the surface area is big enough, contractors can cover the entire surface with the first coat and have it be dry enough that they can immediately start applying a second coat. This may not be possible in other conditions. If a return trip is required, it may increase a contractor's quote. Make sure this is clear before accepting a bid.



Application costs

Be aware that the condition of your pavement will dictate how much sealcoat is required. Make sure all estimates are based on the same assessment of condition, and the intended application rates and number of coats. Do not accept a lower price estimate based on under-applying the product.

A 1,000-square-foot area with a smooth surface will cost about 25 cents per square foot (\$2.25 per square yard) or \$250; a rough surface adds up to 10 cents more per-square-foot, or \$100 in total.

Larger jobs will have a lower per-square-yard price since the basic cost of mobilizing a crew, equipment, and materials is spread over a larger area. Quotes for large parking lots are in the \$1.00 to \$1.50 per square yard range for sealcoat; \$1.50 to \$2.25 for chip-seal.

A comparison of 2012 retail prices shows asphalt-based sealcoats averaging about \$3.60 per gallon; acrylic-based at an average of \$8.00 per gallon, and; Gilsonite®-based at an average of \$8.40 per gallon. Contractors may quote prices per square yard. To convert your pavement area in square feet to square yards, divide by 9. For example, 1,000 square feet divided by 9 equals 111 square yards. To convert square foot price to square yard price, multiply by 9. If the price is 25 cents per square foot it will cost \$2.25 per-square-yard.

Costs for owners with larger surfaces

Here's a comparison of large-surface costs for good condition pavement (remember that costs per square yard will be higher for smaller surfaces or poor condition pavement). An Asphalt fog seal/sealcoat jobs can be in the \$1.00 to \$1.50 per square yard range; Chip-seal (asphalt emulsion with fine aggregate embedded into it), in the \$1.50 to \$2.25 per square yard range; Gilsonite® and acrylic sealcoat, in the \$3.00 to \$7.00 per square yard range (smaller jobs will cost more, towards the high end of the range); Agricultural oil seals, in the \$1.70 to \$2.00 per square yard range.

Working with a sealcoat contractor

Sealcoat applicators have a wide variety of sealcoat products to choose from, depending on customer requirements. Applicators that apply coal tar-based sealcoats should also be capable of apply asphalt emulsion, Gilsonite or latex based sealcoats if requested. When specifying or contracting for asphalt sealcoating, specify that the coating product be free from coal tar; refined coal tar; refined tar; refined coal tar pitch; coal tar pitch volatiles; and/or RT-12.

Be aware that the sealcoat will shrink in thickness more than 50% by the time it's fully cured, which could be up to three months depending on conditions. Let your contractor know you will make your final assessment of their work then.

Ask about the contractor's guarantee and get it in writing. This will protect you should final curing not show the complete coverage, if weather conditions prevented proper curing or if some other early failure should occur. Reputable contractors who are experienced in applying alternatives to coal tar will stand behind their application for at least a year.

For more information on alternatives to coal tar-based asphalt sealcoats, see: [Moving to safer alternatives to coal tar sealcoats](#)

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