



Asphalt Maintenance FACT SHEET

The Challenge of Asphalt Cracking

Pavement design and maintenance engineers have long contended with cracking in asphalt pavements. Fatigue cracking and rutting are often the primary mode of deterioration in asphalt surfaces.

Crack treatment – sealing or filling – prevents moisture from penetrating the base and subgrade, thereby preventing the weakening of the roadway structure.

Over 15 years, an unmaintained surface costs \$39.07 per square yard. Regular maintenance of sealcoating every three years reduces that cost to \$23.84 per square yard.

– www.asphaltinstitute.org

First Impressions Matter: A well-maintained property has higher value and greater appeal for patrons

First impressions matter. We've always known that. Your customers and tenants make a first impression on your property. People think: "If they maintain their parking lot, they probably maintain the building units too!"

A well-maintained property leads to higher occupancy rates, less turnover and overall greater satisfaction.

Why seal cracks in asphalt pavement?

Crack sealing is a cost effective method of pavement maintenance, adding years to the surface's life.

Crack sealing stops moisture from penetrating the sub-based and causing deterioration of the pavement.

Over time, neglecting those cracks exacerbates the problem. The cracks will grow deeper and cause other types of pavement failures.

The good news is cracks happen, so it doesn't necessarily reflect on the quality of your property. The bad news is neglecting to fix those cracks leads to further cracking and potholing, which leaves a poor impression and reduces overall serviceability.





Is it too late to take care of cracks?

That depends on the state of decay. If your pavement surface has an extreme state of decay, crack filling and/or sealing will do little to delay the need for more extensive corrective actions.

Measuring Crack Density

Crack density measures how closely spaced are the transverse cracks on given length of roadway. The table below measures crack density.*

Linear Crack Length per 100 meter Pavement Section	Density
Less than 10 meters	Low
10 meters to 135 meters	Moderate
More than 135 meters	High

Crack Sealing Versus Crack Filling

Crack sealing and crack filling are not the same thing. In fact, they're two distinct treatments. Treating cracks effectively requires understanding the difference.



Crack Sealing

Crack sealing should be performed on pavement in relatively good condition: a sound base with more than 10 feet between the cracks. It's an intensive operation that prevents water from entering the pavement structure. The treatment involves routing the crack to specific configuration and placing high-quality sealant inside.



Crack Filling

Crack filling is a less intensive operation. It fills closely spaced (less than 10 feet apart) random cracks that are connected to each other. Placing a filler into the crack, without affecting the crack's geometry, crack filling reduces water infiltration while reinforcing the adjacent pavement.

Determining the Appropriate Crack Maintenance Application

Crack Density	Average Level of Edge Deterioration (percent of crack length)		
	Slight (0 to 25)	Moderate (26 to 50)	Extreme (51 to 100)
Low	Monitor or Crack Treatment	Crack Treatment	Crack Treatment or Crack Repair
Moderate	Crack Treatment	Crack Treatment	Crack Repair
High	Surface Treatment	Surface Treatment	Rehabilitation

* Developed by the Michigan Department of Transportation

Crack Treatment Activity

Crack Characteristics	Crack Sealing	Crack Filling
Width (mm)	5 to 25	5 to 25
Edge Deterioration (e.g., spalls, secondary)	Minimal to None (Greater than 25% of crack length)	Moderate to None (Greater than 50% of crack length)
Annual horizontal movement (mm)	Less than 2.5 mm	More than 2.5 mm
Types of Cracks	Transverse thermal cracks Transverse reflective cracks Diagonal or meandering cracks	Longitudinal reflective cracks Longitudinal cold-joint cracks Longitudinal edge cracks Distantly spaced blocked crack



The Lifespan of Asphalt Parking Lots

Asphalt pavements are a combination of rock, sand and glue. Together they form a liquid asphalt that binds everything together. They have an effective life of 7-12 years before they will need expensive repairs. The two main causes of wear are:

1. *UV radiation breaking down the asphalt glue*
2. *Poor resistance to salts, chemicals and petroleum products such as oil and gas*

These two factors are unavoidable. However, preventative maintenance is fundamental to mitigating the impact of these wear-and-tear issues.

Let's have a look at the causes and solutions.



UV RADIATION

UV radiation breaks down the asphalt glue, weakening so it no longer holds the rocks and sand, gradually loosening the surface. As this occurs, you will notice some changes.

1. *The first and most obvious change is the colour. The surface will gradually move from black to brown and then finally to grey.*
2. *Next the parking lot begins looking rough and sand piles seem to appear in the low areas of the parking lot. That's your parking lot's deterioration.*
3. *In the later stages of degradation, the bigger rocks fall out, raveling takes place. The parking lot becomes rough with dirt and grass filling the space where rocks were.*

The UV radiation also oxidizes the asphalt and causes the surface to lose some flexibility. Flexibility is important: the asphalt can take great loads and bounce back to its original condition. However, as that flexibility wears away, the flexibility becomes brittle and it cracks and breaks.



PETROLEUM PRODUCTS

Petroleum products such as oil spots and gas spills cause significant damage. Gasoline and oils will dissolve directly into the asphalt, soften the structure, and eventually cause major damage.

Sealcoating

Asphalt surfaces can be protected with a seal coating providing a barrier between the harmful elements and the pavement.

A **coal tar emulsion sealer** is commonly used as deterioration is caused by water, gas and oil, salt and chemicals and UV radiation.

It's the perfect substance to combat the degradation of your asphalt pavement.

Before we apply the seal coating, we prepare the surface by:

- *Cleaning all dirt, vegetation and debris with blowers, sweepers, brooms*
- *Using high pressure washers, where necessary*
- *Priming oil spots so the sealer will adhere*

We then apply two coats of asphalt sealer using either squeegee or sprayer.

Then we're only 24 hours away from having a parking lot ready for traffic. During this 24 hour period:

- *The coating has its "cure time."*
- *We keep all traffic off the surface. Traffic on the will cause premature wear and increased tire marking.*
- *We complete the striping*

After those 24 hours, your sealed and striped parking lot is ready for traffic.



Crack Sealing

We do crack sealing before applying seal coat. If left unattended, water penetrates into the base, soaking and swelling the limestone, destroying the strength and load-bearing capabilities. That's you'll see "alligator" cracking, sunken areas and eventual potholes.

Cold Pour Sealants

Cracks 1/8' or wider should be treated with at least a cold pour sealant that will seal the cracks for the next 12 months

Hot Pour Sealants

For a longer term repair, hot poured cracks sealant should be used. Hot Pour crack sealant remains flexible for longer periods and can remain effective for 3-7 years.

Show Me the Numbers: What are the Costs?

Maintenance requires a degree of investment.

Will those maintenance costs, after a decade, add up to the costs of a full overlay? No. Seal coating and crack sealing will double or even triple your asphalt's lifespan at a fraction of the overlay costs.

Consider these estimates by the Asphalt Institute:

- *Over 15 years, an unmaintained surface costs \$39.07 per square yard*
- *However, a regular maintenance program of seal coating every three years reduces that cost to \$23.84 per square yard*
- *If your parking lot has 3,000 square yards, you're saving a total of \$45,690, or \$3,046 every year.*