

# HYBRID CHIP SEAL

A multi-layer surface seal formed by placing a ½" chip seal, followed by a ¼" chip seal, followed by a fog seal.

A hybrid chip seal is a surface treatment that can be applied to either a paved surface or primed based course. It is often intended to extend the service life of a moderately distressed asphalt pavement, providing a substantially renewed surface at a reduced cost. For this treatment, a chip seal containing a nominal maximum aggregate size (NMAS) of ½" (i.e., AHTD Class 1 or 2) is placed first. Next, a chip seal with a NMAS of ¼" (i.e., AHTD Class 4) is placed. Finally, the surface is sealed with a fog seal. As with any chip seal, the hybrid seal is not structural in nature and will not correct significant structural failures. For maximum performance, cracking and localized structural failures should be addressed prior to the chip seal application, using crack sealing or full-depth patching.

## PURPOSES:

- Waterproof the surface
- Seal small cracks
- Add skid resistance
- Slow surface aging
- Repair raveling
- Correct surface deficiencies
- Improve surface appearance
- Increase visibility of pavement markings

**Selecting the Project:** A hybrid chip seal is an excellent preservation tool. It is best used for addressing minor cracking or surface deficiencies, and can significantly extend the life of an asphalt pavement or improved an existing chip seal at a relatively low cost. Because the 2<sup>nd</sup> chip seal layer uses smaller aggregates, the surface texture is smoother than the traditional chip seal, yet still provides considerable skid resistance. The fog seal creates an aesthetically pleasing appearance, which increases the visibility of pavement markings while also sealing the surface and enhancing stone retention.



**CAUTION:** Because of the increased texture, hybrid chip seals may generate more noise than a traditional asphalt pavement. Cyclists may prefer the smoother asphalt surface as compared to the hybrid seal surface.

**Materials:** Chip seals most commonly use a rapid setting emulsion, but may also include PG binders, asphalt rubber, or rejuvenating emulsions.



Chip seals depend greatly on material quality. Aggregates should be **single-sized** (usually 3/8" – ½"), **clean** (<1.5% dust), crushed, cubical, and free of clay. Excessive handling creates dust, which the chips from bonding with the emulsion. All materials should come from an approved source and/or meet state specifications.



## Cost:



\$3.00 - \$5.50 / sy  
\$18,000 - \$33,000 / lane-mile

**Equipment:** A **distributor truck** with a calibrated spray bar should be used to apply the emulsion at the design rate and with no streaking. Nozzle adjustments may be necessary for the fog seal. A **chip spreader** should apply complete aggregate coverage in a single layer. **Pneumatic rollers** help set the aggregates, and **brooms** are used to sweep away excess chips. Sweeping prior to placing each layer is critical!!

**Construction:** Place during dry, warm conditions when no rains or high winds are forecasted – (April to Sept.) The surface must be swept clean and should be dry. The chip spreader should closely follow the distributor truck, and multiple rollers should be used if possible. Trucks delivering aggregate should avoid turning movements on the fresh surface, and broom trucks should sweep the surface as soon as practical. Subsequent layers may be placed when aggregate shedding has subsided, but multiple layers should not be placed during a single day.

LIFE EXTENSION GENERATED BY HYBRID CHIP SEAL	LOWER TRAFFIC	HIGHER TRAFFIC
Asphalt surface – 3 to 5 yrs old, good/fair condition	10 – 15 yrs	8 – 12 yrs
Asphalt surface – aged, fair condition	6 – 10 yrs	5 – 7 yrs
Chip Seal – fair condition	8 – 12 yrs	7 – 10 yrs



## Asphalt Surface Treatment Options

Arkansas Technology Transfer  
University of Arkansas  
www.cttp.org/t2

