Chip Seals – The Do's and Don'ts

Chip Seals – What is it?

- A pavement preservation surface treatment that combines a layer(s) of asphalt binder (hot or emulsion) with a layer(s) of embedded aggregate.

Chip Seals – When to apply?

Pavement preservation principle:

The Right Treatment on the Right Road at the Right Time

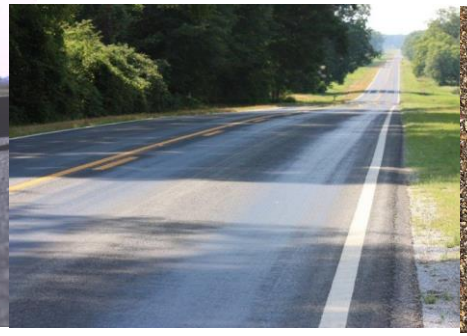
- Factors Affecting Chip Seal Quality
  - Condition of surface
  - People
  - Equipment
  - Materials
  - Application technique
  - Traffic
  - Weather

Chip Seals – When to apply?

Chip Seals do NOT:

- Strengthen the existing pavement
- Increase the load-bearing capacity
- Smooth out rough pavement
- Repair rutting
- Fix bleeding
- Bridge major cracks (wider than 1/4 inch)






<u>Severely fatigued pavement needs rehabilitation, not a chip seal</u>

Chip Seals – When to apply?

- Ideal Candidate would be an existing surface with minor or no cracking with strong structural base

- Realistic candidates are often fatigued pavements or even dirt roads.

Chip Seals – Material Selection

- **Emulsion or Hot AC**
  - Conventional (RS-2, CRS-2, etc.)
  - Polymer-modified (CRS-2P, HFRS-2P, etc.)
  - Hot AC
  - Specifications vary by Region/State

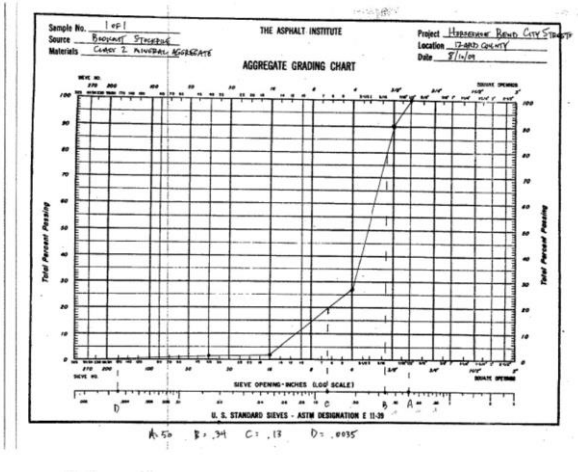
- Size 2 or Size 3
- Cubical
- **Clean**
  - **< 1 - 2% fines**
- Angular
- Durable
  - Non-polishing

2.4 Aggregate:

Use Approved Materials List aggregate that meet gradation requirements of 1003.07, Size 3. The aggregate shall be washed, hard, durable, clean rock such as granite, slag, limestone or other high-quality aggregate and free from coatings or deleterious material. The aggregate shall be crushed with 100% fractured faces. The aggregate shall have maximum loss of 35% when tested with the LA Abrasion procedure as defined by AASHTO T96. The maximum amount of flat and elongated aggregate with a ratio of 3:1 shall not exceed 18% as determined by ASTM D4791. Submit a gradation Certificate of Analysis from a third party lab, with each aggregate shipment of 1000 cubic yards or each project, whichever is less.

Mix Design

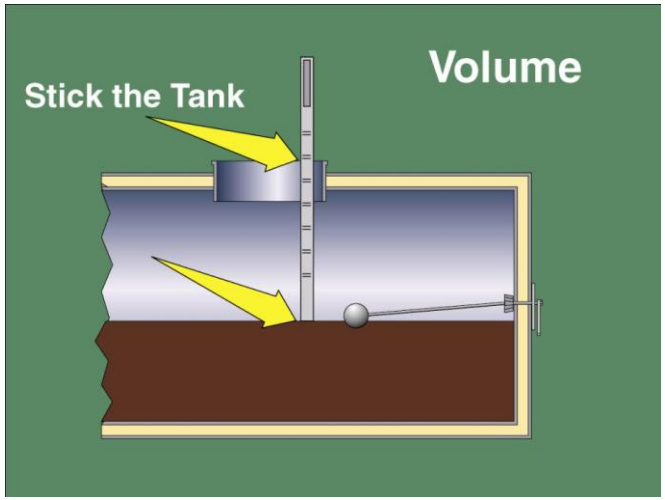
- **A proper design is important!**
- **Material Selection**
  - Compatibility of binder and aggregate
  - Quality assurance
  - Type of roadway
  - Climate
  - Traffic volume

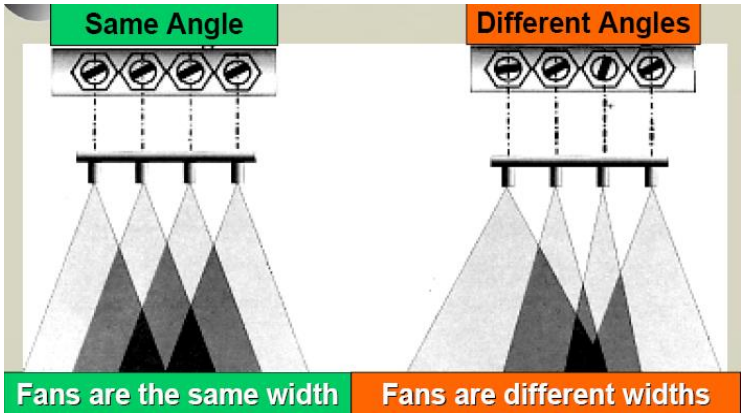


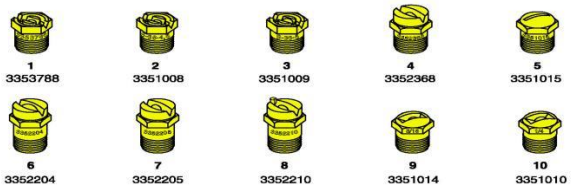
- **The design is a starting point**
- **Be prepared to deviate from the design**
  - Aggregate properties
  - Roadway conditions
  - Traffic

Calibrate Equipment

- Spray bar height
- Nozzle angle
- Nozzle Size
- Spray bar pressure
- Proper rate







Ref.	Part No.	Description	Application Per Square Yard	Application (Metric) Liters Per Square Meter	Flow Gallons Per Minute Per Foot
1	3353788	V Slot Tack Nozzle	.05 - .20	.19 - .75	3.0 to 4.5
2	3351008	S36-4 V Slot	.10 - .35	.38 - 1.30	4.0 to 7.5
3	3351009	S36-5 V Slot	.18 - .45		7.0 to 10.0
4	3352368	Multi-Material V Slot	.15 - .40	.57 - 1.50	6.0 to 9.0
5	3351015	3/32" Coin Slot	.15 - .40	.57 - 1.50	6.0 to 9.0
6	3352204	Multi-Material V Slot	.35 - .95	1.30 - 3.60	12.0 to 21.0
7	3352205	Multi-Material V Slot	.20 - .55	.75 - 2.08	7.5 to 12.0
8	3352210	End Nozzle (3352205)	.20 - .55	.75 - 2.08	7.5 to 12.0
9	3351014	3/16" Coin Slot	.35 - .95	1.30 - 3.60	12.0 to 21.0
10	3351010	1/4" Coin Slot	.40 - 1.10	1.50 - 4.16	15.0 to 24.0

Proper Chip Seal Procedure

- Patch and Repair existing surface
- Set up traffic control
- Clean road surface
- Apply asphalt binder
- Spread aggregate
- Roll
- Sweep excess

Weather Issues

Effects of rain storm before emulsion has cured

Weather Issues

- Emulsion should only be applied when the ambient and pavement temperatures are above 70° F.

Rock Loss, Out of Season Work

1. Select the Right Road
2. Apply Quality Materials
3. Get a Mix Design
4. Follow Proper Chip Sealing Procedures

Thank you.