

Smart Chipseals

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Road Candidate Selection

Where to Chipseal and Why (or not to chip)

Understand the Solution Mission:

Understand Road Surface Condition & Match the Applications

Clean, non-damp roads

Not All Chipseals need to look pretty



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Chipseals Keep Good Roads Great!

PCI's above 65



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“Good judgment comes from **experience**; **experience** comes from bad judgement”.



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*Others have done
this before us*



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If used properly,
the Chipseal toolbox can
help some *not-so-good*
roads



*i.e. Do not chipseal severe
alligator cracking!
(will not address Base Failure)*

Chip Seals:

1. **extend the life of the pavements**
 - **Seals micro-cracks = shedding water**
2. **Improves traction or "skid resistance"**



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Some Factors that Extends Chip Seals Service Life:

- ✓ Condition of the existing road
- ✓ Traffic loading
- ✓ Weather / Climate
- ✓ Quality of materials
- ✓ *Workmanship*



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Double Chip Seal

3/8" - #8

1/2" - 1/4"



Not Chip Seal Candidates **Base Failure**



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Not Chip Seal Candidates **Rutting**



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Not Chip Seal Candidates Fatigue Cracking



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Not Chip Seal Candidates

Traffic
Loading

flushing



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Why *new* Chip Seals *may* Fail ?

✓ Not enough rolling



✓ Dirty rock

✓ Not properly preparing fresh asphalt patches

✓ Not accounting for shade



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Why Chip Seals *may* Fail ?



- ✓ Improper Shot Rates
- ✓ Wet road surface
- ✓ Cool temperatures
- ✓ Chip sealing too late in season



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Why Chip Seals *may* Fail ?

If you have:

2 deficiencies = 50% chance of failure

3 deficiencies = 100% chance of failure



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Emulsions

Oil

Examples

“RS-1” , “HFRS-2” **“Anionic” – positive charge – no letter in front**
“CRS-2” , “CSS-1h” **“Cationic” – negative charge – “C” in front**
- - **“Nonionics”- neutral charge (new - not readily in place)**

“SS-1” ; “CSS-1h” **SS = Slow Setting**
“MS-1” ; “CMS-2h” **MS = Medium Setting**
“RS-2” , “CRS-1” **RS = Rapid Setting**
“CQS1” , “LMCQS” **QS = Quick Setting**

“CRS-1” , “HFMS-1” **Lower numbers – less viscosity (“1”)**
“CRS-2” , “HFMS-2” **Higher numbers – more viscosity (“2”)**

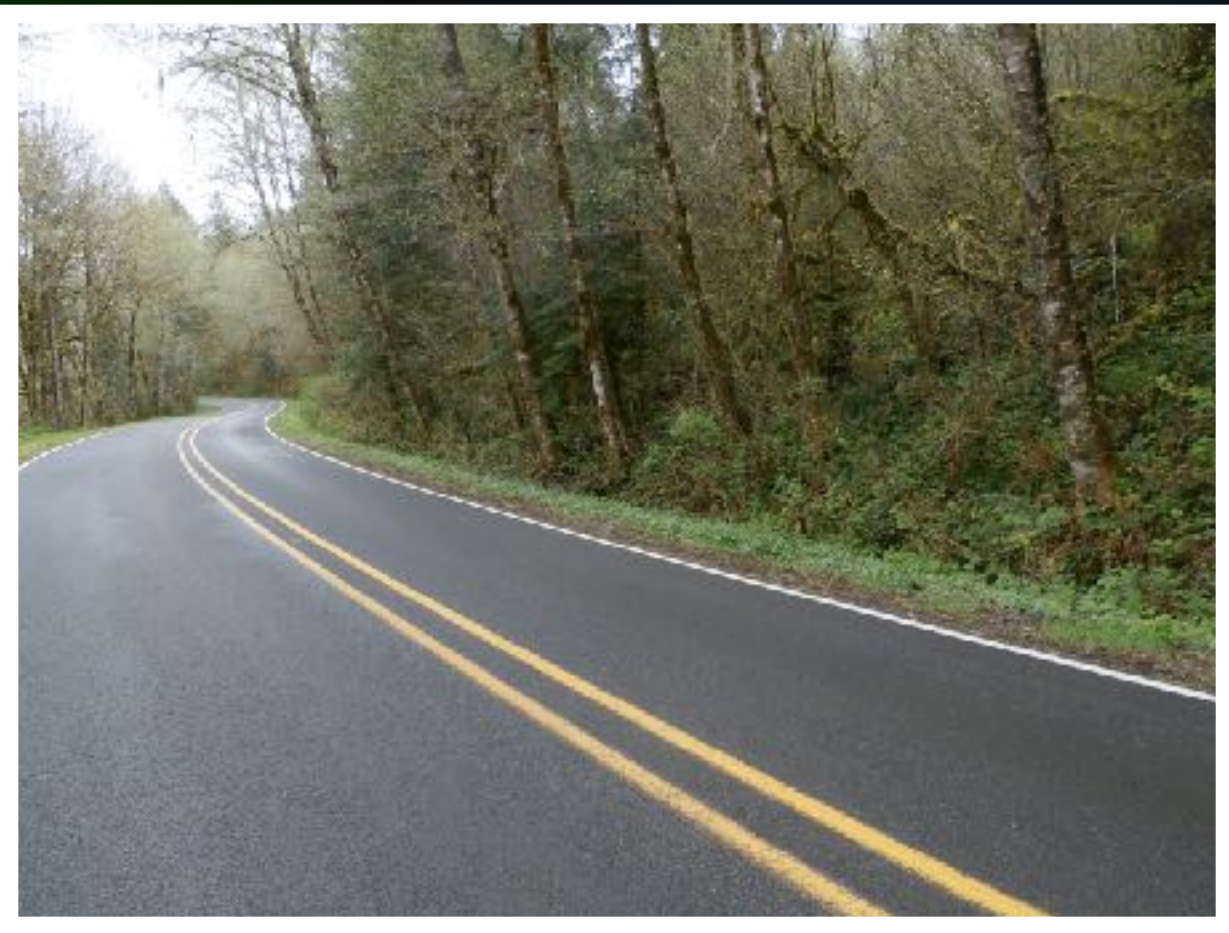
“CRS-2h” , “HFMS-2h” **h = harder base asphalt used**
“HFMS-2s” **s = softer base asphalt used**

“HFRS-2” , “HFMS-1” **HF (preceding) = High Float (Anionic grades only)**
“HFRS-P1” , “CRS-2P” **P = Polymer modified (“S” & “L” are also used**

CRS-2P dilute **dilute = cutback – used in fog seals**

S





**Fog
Seal**

everything !



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WHY FOG SEALS:

- ✓ Helps Prevent Rock Loss
- ✓ Diluted Oil Seals Small Surface Cracks
- ✓ Adds Contrast for Striping
- ✓ Dark Color Adsorbs Heat
- ✓ Positive Public Perception



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Fog Sealing an Emulsion



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Fog Sealing AC-15P *(Hot)*



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Emulsions

- Easy to apply (no specialized distributor verse reheating hot oils)
- **Minimized Crew Training**
- Purchase Rock (Washed or equivalent) anywhere
- Taking advantage of **Polymers** which aid rock retention
 - help address temperature swings
 - increase “stick” =
 - less windshield damages
 - skidding accidents
- If careful, can work with unwashed rock

RSLTP = Rapid Set Low Temperature
Polymerize emulsion



Tillamook County, OR

Chemically breaks

Can use in 40-70
degree temperatures

Heavily shaded areas



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Chip Sealing with **RSLTP**

Tillamook County, OR



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CRS-2P = Cationic Rapid Set –
2% Polymer emulsion



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Yakima County, WA

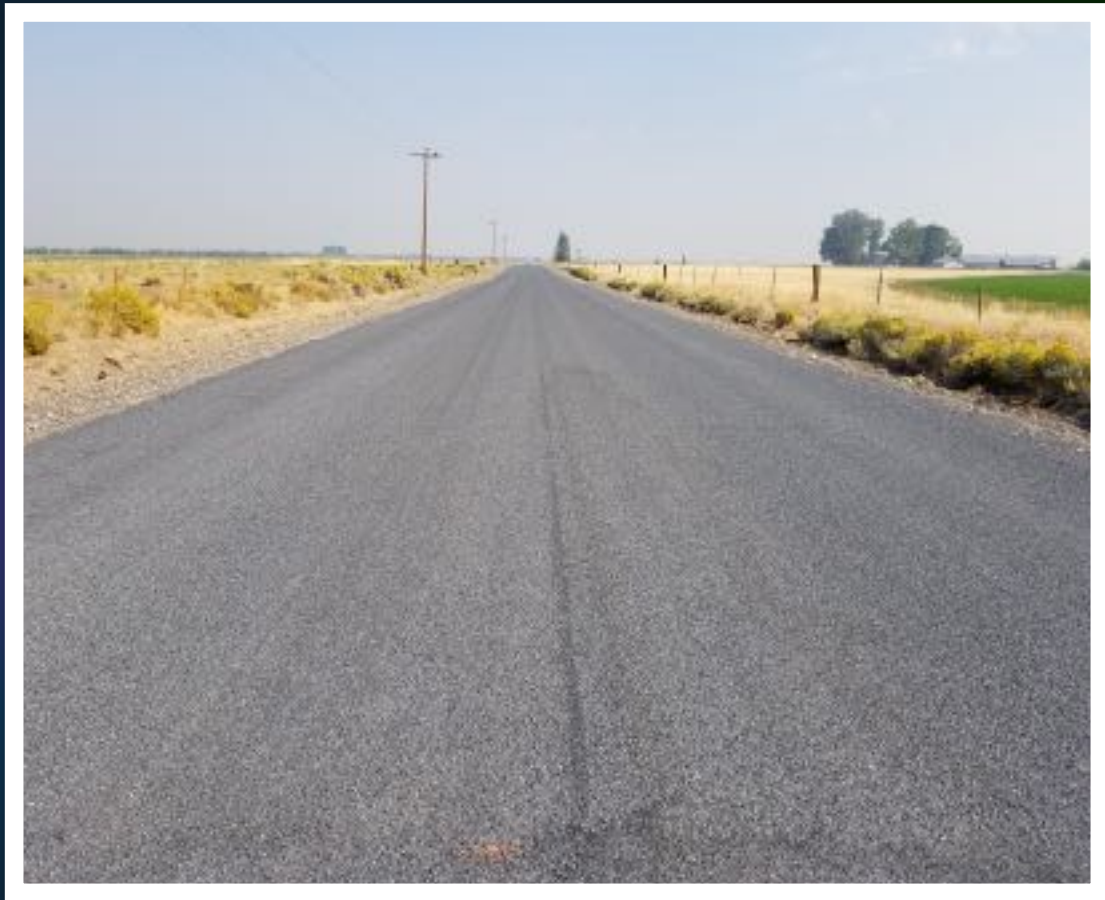
CRS-2P

Rapid set Cationic
Emulsion

Polymer modified

Good chip retention

May work with
unwashed rock



Lake County, OR



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PMCRS-2H = Polymer Modified Cationic Rapid Set – Higher Viscosity (2) Harder Penetration

High viscosity

Rapid set

Stiffer asphalt for
hotter climates



Siskiyou County, WA



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PMCRS-2H



Klamath County, OR



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HFRS-P1 = High Flow Rapid Set – Polymerize (1)

**Also known as:
HFE-901S**

High Float Rapid Set
Emulsion

Has 1% polymer

Polymers improve rock
retention



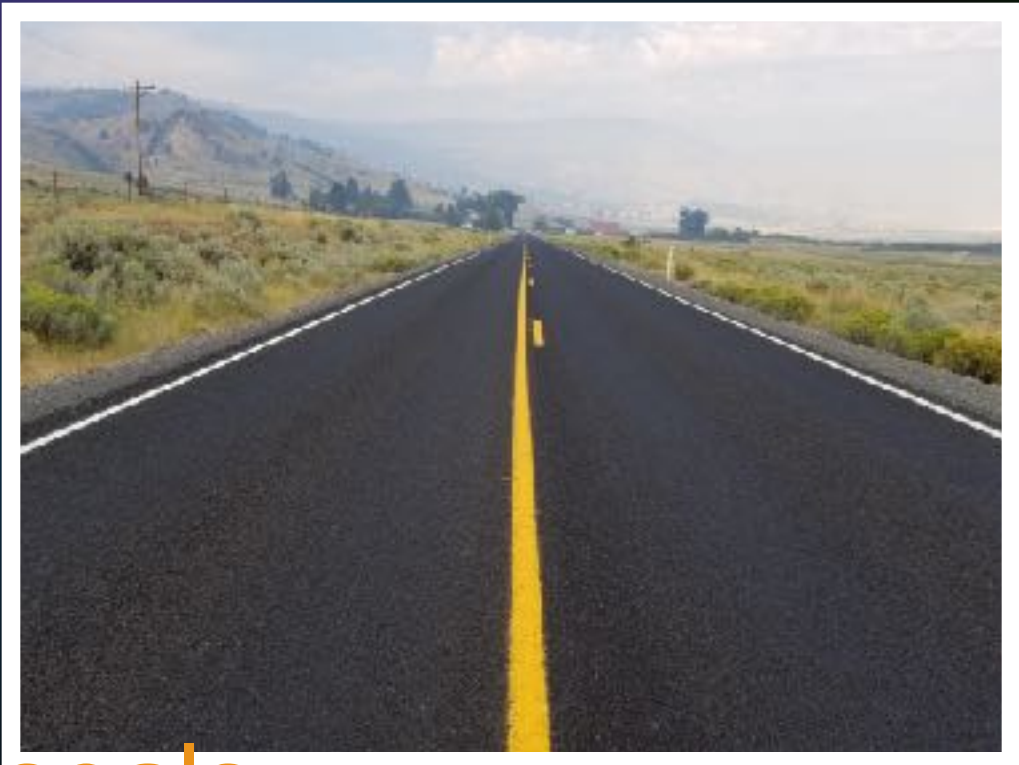
Marion County, OR



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HFRS-P1

ODOT



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HFRS-P2 = High Flow Rapid Set – Higher Polymerize (2)



Also known as HFE-100S

High float rapid set
emulsion

Has 3% polymers

Bonds to chip quickly

Can be used on high
volume roads

Marion County, OR



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HFRS-P2



Marion County, OR



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Hot Oils

- Works effectively in dry climates – minimal shade!
- Will work better if area is prone to surprise thunder storms
- High Traffic / High Speed corridors = less fly rock (windshields)
- Will work in intersections
- Paint Strip the same day – less temporary markings (tabs)
- Traffic can have it back within hours
- Use less Rock, Less Float Rock & Less Excess Rock
 - Must have a heated distributor
 - Additional Crew Training
 - With Pre-coated rock, need to govern quality at the plant

AC-15P – Asphalt Concrete Hot Oil with Pre Coated Chip



Deschutes County, OR

Can put traffic back quickly

Less float/fly rock

Sweep and stripe same day

Can work up to a thunderstorm



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AC-15P

Hot Oil/Pre Coated Chip

Need heated distributor

Heavy canopy hard to keep temperature

Early season chip seals work well

As with any chip seal need time to cure



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AC-15P

Hot Oil/Pre Coated Chip

Need to monitor coating process – can overcoat

Use less rock than other chip seals

Oil works best when applied at 350 degrees

Works well in intersections – mat will not tear



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Better Planning

Start Earlier – avoid Sept chip seals

Crew training

Pre-Trip / Fuel the night before



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Expect Rain Days in Schedule



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Consider starting season earlier

- plan for rain days
- distributors can be in short supply

Late season chip seals may not cure

Need at least 160 hours of
110 surface temperature

Budgets sometimes impact starting date

SUCCESS IS A TEAM EFFORT

Develop a Skilled Labor Force With High Degree of Training

Quality Control



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more
discussion