



## RoadSaver II Question and Answer Guide



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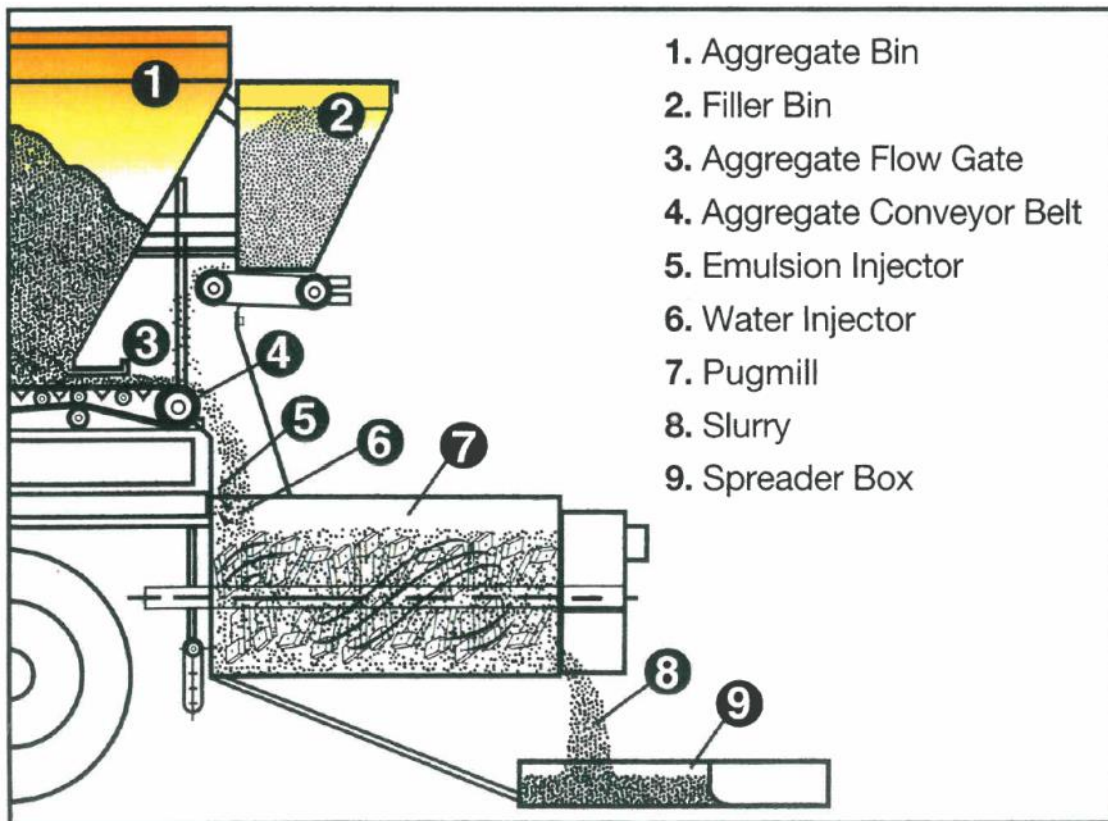
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Introduction

**In the world market, the RoadSaver is established as the top performer for production Slurry/Micro Surfacing.**

**How does a Slurry/Micro Surfacing Machine work?**



### Why should I look into Slurry/Microsurfacing as a solution for our Road Maintenance?

In many geographic locations pavement damage is heavily influenced by harsh sun loading resulting in oxidized hardening which causes a loss of elasticity and results in a loss of fines, cracking and deteriorating.

Assuming your pavements have been built to proper standards, the best line of defense against pavement deterioration is a good offense. Put simply, this means preventing deterioration, stopping further deterioration and correcting deficiencies as they occur. *This answer will address the surface protection part of this equation.*

Your potential preservation tools may include sealcoat, fog seals, slurry seals, micro surfacing, chip seal and cape seals.

**Sealcoat** is typically an asphalt emulsion based sealer with mineral filler to give it strength and durability. Many times sealcoat has aggregates to improve friction and replace lost fines from the asphalt surface. 2 to 3 year life is typical.

**Fog seals**, made of asphalt emulsion cut with water, are relatively low cost but also are generally low performance and short lived. *Typically less than a year, often only 6 months.*

**Chip Seals** are an application of liquid asphalt, either hot liquid or emulsified asphalt, spread on the pavement followed by a coating of stone of specified size. Chip seals requires a chip machine, rubber tired rollers, loader, emulsion storage and application equipment and sweeping capabilities. Chip seals are a good tool where the use is appropriate.

**Cape Seal**, residential chip seals are usually topped with slurry seal or Micro Surfacing to smooth them out and lock in the aggregate. A chip seal with a slurry seal or Micro Surfacing on top is referred to as a Cape Seal.

**Slurry seal and Micro Surfacing** (a form of slurry with a high polymer modification) both use the same equipment. Slurry and Micro Surfacing both perform the same function and that is to block the UV degradation of the road surface, fill small cracks and provide a new, high friction wearing surface. All this is done at a fraction of the cost of new asphalt and should last approximately 7 to 9 years before additional maintenance is required.

Slurry and Micro Surfacing bring raw materials together and mix them in accordance with a laboratory designed mix design. The understanding and complexity of the application can be challenging. However with proper training a very successful program can be established.

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### How is emulsion loaded into the machine?

The RoadSaver has several options but the most common is to either load through the incoming valve using an external pump on the supply tanker or to load by using the RoadSaver pump and the 3 way valve to load the emulsion. You may also top load through the top hatch. The RoadSaver comes standard with the various valves necessary to allow self-loading through the emulsion pump. In situations where high production is required and multiple machines are being serviced, customers often will have a separate, dedicated, emulsion pump on site to load more quickly.

### How are inert materials loaded?

Aggregate loading requires a loader capable of reaching over the sides. Cement is usually delivered in bags and placed in the bucket of a loader which then raises the material to where a person can break the bags into the fines feeder.

### How much pavement can be treated (m<sup>2</sup> or y<sup>2</sup>) with one fully loaded RoadSaver II?

The machine holds 10 to 12 metric tons of aggregate. The rate of application will be determined by the coverage specified for the project or by the "surface demand" of the pavement being covered. For a Type II slurry, expect the rate to average 6.8 kg/m<sup>2</sup> (12.53 lbs./yd<sup>2</sup>) for a Type III slurry it would be closer to 11 kg/m<sup>2</sup> (20.27 lbs./yd<sup>2</sup>). Using these rates you can calculate how much a area a load of material will cover.

Example: 
$$\frac{12,000 \text{ kg} \setminus 6.8 \text{ kg}}{26,455 \text{ lbs.} \setminus 12.53 \text{ lbs.}} = 1764 \text{ m}^2 = 2111 \text{ yd}^2$$

**The following is the International Slurry Surfacing Association's coverage rate.**

AGGREGATE TYPE	LOCATION	SUGGESTED APPLICATION RATE
Type II	Urban and Residential Streets Airport Runways	10 - 20 lb/yd <sup>2</sup> (4.5 - 9.1 kg/m <sup>2</sup> )
Type III	Primary and Interstate Routes  Wheel Ruts	15 - 30 lb/yd <sup>2</sup> (6.8 - 13.6 kg/m <sup>2</sup> )  As Required (See Appendix B)

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### How much material can a RoadSaver II apply in one day?

Unrestricted by traffic or other construction requirements, the RoadSaver II can process a full load of material on average in 15 minutes and is capable of a faster processing time with a skilled crew and optimal climatic conditions. The number of loads that can be applied per day will depend on how close the aggregate, emulsion, and other needed materials are to the job site, and how quickly the crew can reload the machine.

#### Example:

- 8:00 AM RoadSaver II is on location, loaded, and ready to begin placing slurry.
- 8:15 RoadSaver II is empty and travels 10 minutes to the stockpile where the material is located.
- 8:25 Arrives at the stockpile.
- 8:40 RoadSaver II is loaded and leaves the stockpile back to the job.
- 8:50 RoadSaver II arrives at the job, hooks to the spreader box, and begins to lay material.
- 9:05 RoadSaver II is empty and travels 10 minutes to the stockpile where it begins the material loading process again .

### How many machines are needed?

Most customers use two or more machines on larger projects for efficiency due to stock pile locations and reload times. For an experienced crew with two machines and a close source of materials (stockpile), we schedule 180 metric tons (198 US tons) per day for residential type areas. Depending on the surface conditions or the specifications, the square meters covered in a day will vary. Residential streets using Type II slurry at a 6.8 kg per m<sup>2</sup> (12.53 lbs. per yd<sup>2</sup>) will cover a lot more area than a highway requiring 11 kg per m<sup>2</sup> (20.27 lbs. per yd<sup>2</sup>).

Keep in mind that in the Slurry and Micro Surfacing world, all application rates are expressed in kg or lbs. of dry aggregate. The emulsion and other additives are not usually counted in the weight (although this can vary by country and local location).

**What equipment would I need to get into the slurry seal or Micro Surfacing business?**

You would need:

- A. One or more slurry trucks. A new slurry/micro machine with truck (very heavy duty). *We recommend the best quality truck and machine for longevity, low maintenance cost, productivity, and resale value.*
- B. One spreader box. There are many spreader box options that you have to choose from.
- C. A Cat 930 loader or equivalent.
- D. An emulsion storage tanker ample capacity, usually 22,700 Liters (6,000 gallons) or more.
- E. If a set/break control additive such as aluminum sulfate is to be used, a storage container is necessary.
- F. CQS-1h emulsion.
- G. Aggregate.

**Production with one machine is often:**

6,643 to 10,630 M<sup>2</sup> (7,945 to 12,713 yd<sup>2</sup>) per day in real numbers.

*Experienced crews do this and with the right conditions, much more in a day.*

**Production with two trucks and experienced crews can be:**

20,000 to 26,000 M<sup>2</sup> (23,919 to 31,095 yd<sup>2</sup>) per day.

*This would require a 5 man crew (minimum) plus traffic control and cleaning people.*

**What are typical costs to apply Slurry and Micro Surfacing?**

1. Work area preparation:

- A. Asphalt repairs and crack filling.
- B. Thermal paint removal or protection (if it's a small amount and in good condition, you can tape over it)
- C. Posting and notification of residents as required.
- D. Location and referencing of manholes and water valve covers (we stick a temporary marker on to them)

2. Materials for the project.

**Example: 92,903 m<sup>2</sup> (1,000,000 ft<sup>2</sup> or 111,111 yd<sup>2</sup>) project:**

A. Aggregate:

Type II – 6.5 - 7.59 kg per m<sup>2</sup> (12 - 14 lbs. per yd<sup>2</sup>.)  
 $6.5 \times 92,903 \text{ m}^2 = 603 \text{ MT of rock}$   
 $(12 \times 111,111 \text{ yd}^2 = 666 \text{ T of rock})$

Type III – 9.76 - 14.1 kg per m<sup>2</sup> (18 to 26 lbs. per yd<sup>2</sup>.)  
 $9.76 \times 92,903 \text{ m}^2 = 907 \text{ MT of rock}$   
 $(18 \times 111,111 = 1,000 \text{ tons of rock})$

**Rock prices vary but typically \$24 - \$26 USD per ton delivered.**  
*The length of haul will affect rock price.*

B. Emulsion:

Type II - Typically about 14.5%.  
 $603 \text{ MT of rock} \times .145 = 87.4 \text{ MT}$   
 $(666 \text{ tons of rock} \times .145 = 96.5 \text{ tons})$

Type III - Typically about 13.3%.  
 $907 \text{ MT of rock} \times .133 = 120.6 \text{ MT}$   
 $(1,000 \text{ tons of rock} \times .133 = 133 \text{ tons})$

**LMCQS-1h** varies by location but **typically about \$560 USD a ton +/-** in Southern California, 2015.

*Freight could add \$25 to \$30 USD a ton.*



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### C. Liquid additive or cement:

Consumption varies but typically .25 to .5% of aggregate.  
Bags of cement at from your local hardware supply store.

### 3. Equipment:

- A. Machine operating costs run about \$65 USD per hour without driver. Use the local city pay structure for a garbage truck or similar costs.
- B. Disposal or replaceable items; box rubbers, squeegees, burlap, roofing felt, No Parking signs, notices, etc. can run \$40 - \$50 USD per day.

### 4. Application:

- A. Water, usually from a hydrant. Can be from a water truck if recycled water is required or no local water available. Water will be about the same quantity as emulsion plus 10 to 15%
- B. With one truck you'll need a driver, machine operator, and one or two squeegee people. When the truck is "shuttled" to reload, the driver and operator usually will both go with it. If you have two trucks, the driver would do this alone while the crew uses the other truck. With two trucks you need a second driver.

**A single RoadSaver II with a reasonably productive crew can lay 6,643 to 10,630 M<sup>2</sup> (7,945 to 12,713 yd<sup>2</sup>) per day.**

- C. This area would require about 2 - 4 hours of mechanical sweeping.
- D. A mix design will cost about \$3,500 (maybe less) and will be usable for one year unless you change materials.
- E. Posting, notifying, manhole covers, cleanup – two people can do this for a large schedules is an 11 hour day.
- F. The slurry crew, using one truck, will be composed of the driver, operator and two squeegee people.



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**Are the percentages given for the mix design as a whole? Or as a percentage to the amount of aggregate?**

**In other words, is the emulsion 14.5% of the 6.5 - 7.59 kg (12 - 14 lb) of aggregate? Or 14.5% of the whole mix?**

In slurry speak, all percentages are based from dry aggregate.

For each amount of aggregate chosen to use as a sample

Example:	Aggregate	100	kg	100	lbs.
	Emulsion	14.5	kg	14.5	lbs.
	Water	8	kg	8	lbs.
	Sulphate	0.25	kg	.25	lbs.
	<b>Whole mix</b>	<b>123.0</b>	<b>kg</b>	<b>123.0</b>	<b>lbs.</b>

Application rates are measured based on weight of dry aggregate per m<sup>2</sup> (yd<sup>2</sup>).

The reason for this is that the emulsion, water, and additives percentage can and will vary according to the gradation of the aggregate, the absorption values of the aggregate, the outside air temperature, the pavement temperature, the humidity, and a host of other factors. Variances are small but the one constant is the dry aggregate, so this is chosen as the item that everything else is measured to.



# The RoadSaver II

*“For those that are serious about  
pavement preservation...”*

