



# SMM

TAILGATE ASPHALT RECYCLER



# SMMT

TRAILER MOUNTED ASPHALT RECYCLER



# STEPP MFG™

ASPHALT MAINTENANCE EQUIPMENT

# *Industry Leading Asphalt Recycling Equipment*



# Solving Problems, Addressing Needs

## Solving Problems, Addressing Needs

*At Stepp Manufacturing, our engineers produce equipment that is known in the industry for its durability, reliability, and functionality. Since our beginning in 1942, our family owned operation has always produced equipment specific to your needs. We use high quality material, innovative engineering, and quality personnel to match your needs as they grow.*

### Recycle

***“To make something new from something that has been used before.”***

*Webster's definition is exactly what we do: We recycle asphalt. We transform old, broken chunks and millings into a like new or better state. How do we do this? With the Stepp SMMT asphalt recycler. Asphalt is one of the few 100% recyclable products on the earth. When recycled properly, you can make a material that will perform like new, or sometimes even better than new. With a reusable resource, we not only reduce the waste of old asphalt, but we do it at a fraction of the cost to produce new asphalt, and we also become better stewards of the environment.*

### Produce Hot Mix 24-7-365 for Under \$20.00 per Ton!

*Stepp's SMMT is fully mobile, and needs no extra equipment on the job. The SMMT will produce 1/4 ton batches of high quality "Hot Mix Asphalt" from millings or virgin materials any time of the year, at any outside temperature. With the indirect heating system, the SMMT can recycle or produce virgin, custom, or spec mix designs. Make cold patch a thing of the past with permanent hot mix repairs!*

*This asphalt recycler is ideal for pothole patching, repairing utility trenches, water main breaks, and all other types of asphalt repairs.*



# ***Environmentally Responsible Practices***

***•Do you have access to asphalt millings?***

***•Would you like to perform permanent road repairs in the off season when the hot mix asphalt plants are closed?***

***•Would you benefit from being able to perform permanent pothole repairs using 350°F hot mix when the outside temperature is below freezing?***

***•Would the ability to create fresh, 350°F hot mix anytime of the year, at any temperature, be beneficial to your road maintenance program?***



***•Would you be interested in a machine that can recycle asphalt millings into 350°F hot mix at a rate of up to 1 ton per hour?***

***•Does the ability to create custom hot mix blends sound intriguing?***

***If you answered yes to any of these questions, the SMMT Asphalt Recycler/Mixer from Stepp Manufacturing may be what you need!***

***In our daily contact with road maintenance departments like yours, we heard a common concern...***

***"When we use the expensive cold mix for pothole repairs, it seems to last only a few days, a week at best, then we're out there doing the same repair over and over again. There has to be a better way."***

***"How can we make permanent, cost effective road repairs after the hot mix plant closes?"***

***We listened to your concerns and questions, and then our engineers took the challenge to design a portable, easy to use, and affordable machine that can recycle asphalt millings or create hot mix from raw materials at a rate fast enough to keep up with your busy road repair schedule.***

***The result is the Stepp SMMT Asphalt Recycler/Mixer.***

# ***Solution Based Features***



- ① Produce 1/4 Ton, 500#, 5 cu.ft. Batches in 8-15 Minutes**
- ② Recycle Millings or Chunk Asphalt**
- ③ Create Spec Mix or Custom Mix from Virgin Aggregate**
- ④ Pugmil Mixer Produces Uniform, Non-segregated Material**
- ⑤ Convertible Conveyor, Horizontal for Bag Materials, Vertical for Millings**
- ⑥ Easy to use Burner Controller**
- ⑦ Diesel Burner**
- ⑧ Honda Gasoline 13 HP Engine**
- ⑨ Hydraulic Controls for Pugmil Mixer and Conveyor**
- ⑩ Indirect Heat System**

# Knowledge-Technology-Innovation-Safety Driven Designs

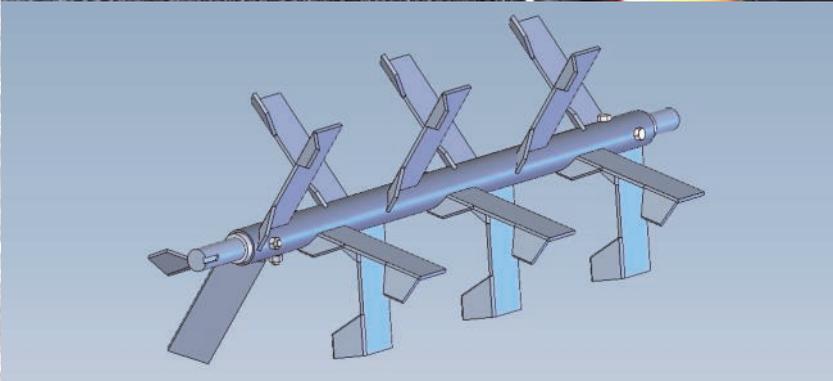
## “Unimaginable Capabilities”

### Asphalt Recycling

*The Stepp SMMT will recycle asphalt millings into new 350°F hot mix at a rate of up to 1 ton per hour. This rate can be achieved even at an outside temperature of 20°F, giving you usable production rates year round. This indirect heating method allows approximately 90% of the oils to be retained while heating, thus only about 1½ to 3 gallons of oil need to be added for each ton of recycled millings.*

### Virgin and Custom Mixes

*Custom mixes from raw materials can also be created with the SMMT. Different sized aggregate, chips, or even sand, can be used to make the perfect mix for your special needs. With the ARP Asphalt Rejuvenator Product you can properly add the precise amounts of Asphalt Cement to make spec mixes on the go.*



### Pugmil Mixer

*The pugmil mixer is the work horse part of the machine. The pugmil mixes the material against the heated Endura liner to get things hot. It does this by a direct hydraulic drive. The pugmil also has opposing, angled paddles to act like an auger when the pugmil is put into reverse. It also has a variable speed hydraulic control to set your discharge to the speed that you need.*

### Self-loading Conveyor

*The SMMT comes standard with a loading conveyor. This eliminates the need for additional equipment on the road to load the machine. The only thing that the SMMT requires is a dump truck, millings, and a grain chute in your tailgate. Dump directly into our chute on the front of the conveyor, and load the preheat bin. Our conveyor system comes with the chevron paddles to help eliminate spilling and puts the material where it needs to be.*

# Engineered Excellence

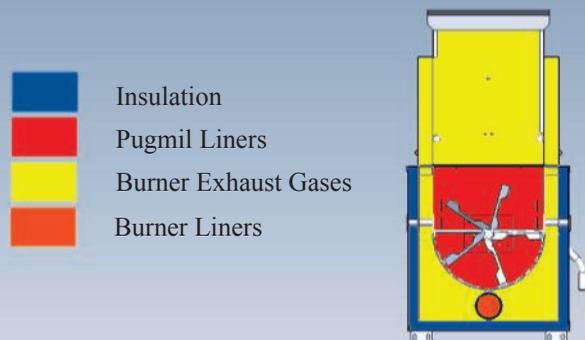
**“Industry Leaders with Industry Leading Technologies”**

## Indirect Heating

*The SMMT pugmil mixer is the only indirect heated asphalt recycler in the world. By heating the Endura liner instead of the material directly, we cook less of the light AC oils out of the millings, thus eliminating the need to replace them. We also produce less visible smoke and emissions because we just aren't burning them out. We also redirect the burners exhaust back into the hopper to aid in the overall heat up. Our top preheat bin also gets the advantage of the free heat from the exhaust.*

## Diesel Heating

*The SMMT is fired with a Beckett forced air, diesel fuel burners. The main pugmil mixer houses the burner with an output of 275,000 BTU's.*



## Burner Controls

*The SMMT has simple to use burner controls. The simple adjustable timer allows you to set the time to get your desired temperature. It also has a manual override if you need to run the burner without the timer.*

## Hydraulic Controls

*The variable speed hydraulic controls operate the pugmil mixer and the conveyor. The pugmil mixer also acts like a discharge auger when run in reverse.*

# Standards that Set the Bar

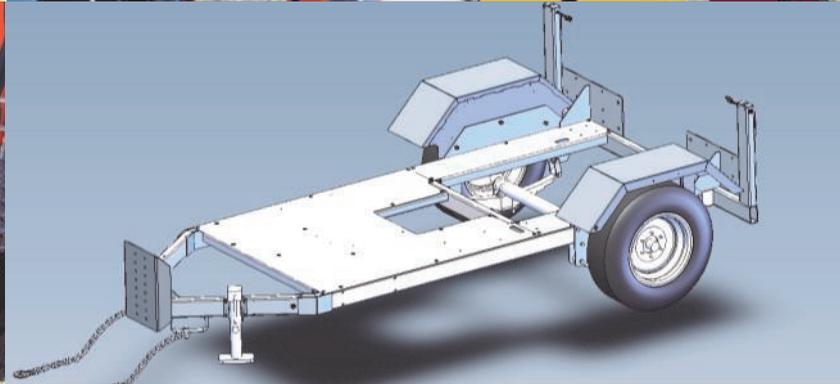
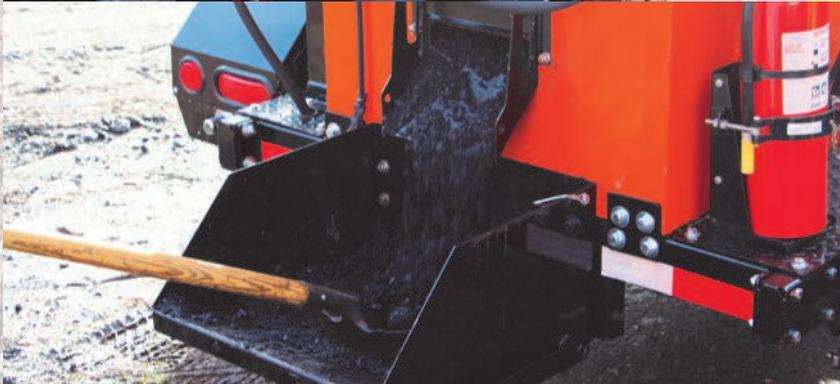
## “Premium Components that Drive Reliability and Longevity”

### Honda® Powered

*Having a quality machine means having quality components, and our engine is no exception. The air cooled, one cylinder, 13HP, Honda GX390 is what powers our workhorse. It uses a direct coupled, hydraulic pump, and come standard with an 18 amp charging circuit to maintain voltage to the burner system.*

### Preheat Hopper

*The top preheat hopper acts as a giant measuring cup for your batch. Having consistent batch sizes every time will help fine-tune your recipe for the amount of additive to add per amount of millings. Our preheat hopper also allows us to have a batch on deck while we are mixing one in the mixer. With the burner exhaust coming up underneath the hopper, we are also pre-heating the material and starting to dry out some of the moisture in the material to speed up the next batch.*



### Shoveling Platform

*The SMMT comes with a shoveling platform that has a fold-up feature for when you need to dispense material directly to the road surface for large repairs.*

### MTF Frame System Shackle Simplicity

*The Modular Tubular Frame (MTF) System is truly the foundation of our units. Our MTF frame offers flexibility, maintainability, and extreme reliability. Our bolt-on module system allows for components and options to be bolted on, allowing flexibility in your configuration. The MTF frame also allows us to use our one-piece, bolt-on shackle system, “Shackle Simplicity”. This true tracking shackle system is 250% more heavy duty than anything else on the market. Our MTF frame with “Shackle Simplicity” is just another example of our industry leading technologies and designs.*

# Options That Bring Value, Productivity and Safety

## Optional Equipment available on the Stepp SMMT Asphalt Recycler

### Trailer Light Options

*The standard trailer lights include grommet style, LED lights. Optional 4 light systems are available.*

### Washdown System

*The washdown system includes a 5 gallon solvent tank, electric pump, 20' of hose and a spray wand. The washdown system is used to spray the hopper and tools with release agent to prevent the asphalt from sticking and building up to make clean up a breeze. Don't forget to add the optional hose reel.*



### Arrowboard

*The LED arrow strip directs traffic in the direction you want. This is a highly recommended option for operator safety and visibility.*

### Strobe Light Systems

*We offer two different strobe light systems. Flush mounted LED strobes are located above the rear taillights (shown in the picture to the upper left) and shall be grommet style. The beacon style is mounted on a post in the center of the unit on the rear.*

# Options That Bring Value, Productivity and Safety

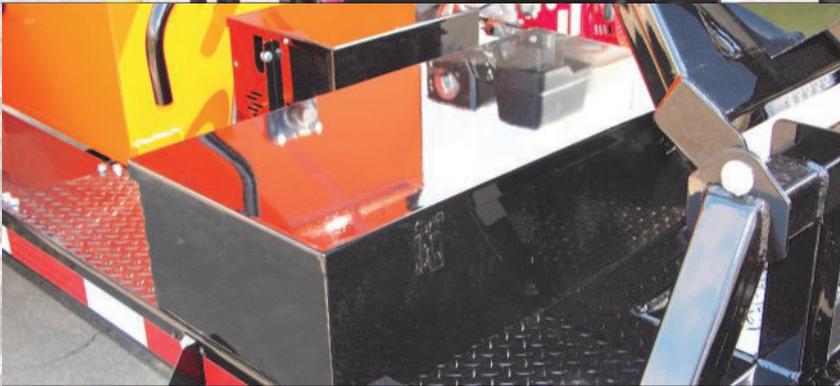
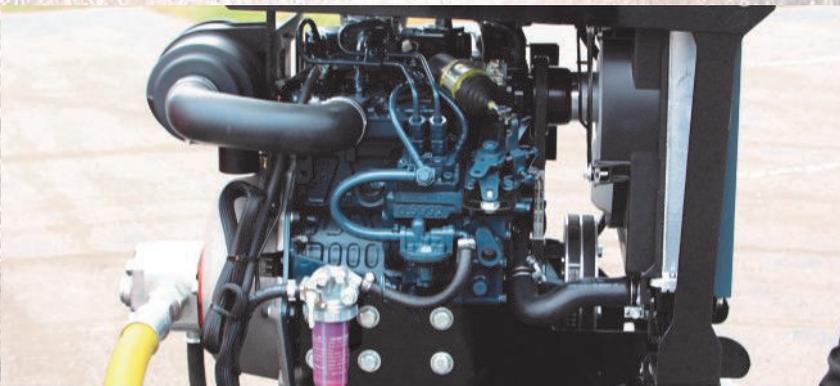
## Optional Equipment available on the Stepp SMMT Asphalt Recycler

### Diesel Engine Upgrade-Kubota® Powered

*The liquid cooled, two cylinder, 16HP, Kubota z602 is the diesel engine upgrade. The diesel engine option gives you a single fuel source power plant to operate your SMMT. The Kubota is direct coupled to the hydraulic pump to get you years of trouble free operation. Includes a Deep Sea® engine management system. Also available with optional sound damping engine enclosure.*

### Stainless Steel Tool Holders

*The all stainless steel spring clamps will hold anything with a handle. Mounted on top of the fenders for convenient access. This is a must have option to carry lutes, brooms, shovels, and tampers.*



### Material Additive Bin/Tool Box

*The lockable, steel tool box is located on the front of the unit to conveniently keep your ARP asphalt additive, tools and accessories handy.*

### LP Hand Torch

*The LP hand torch includes a 20# LP bottle, bottle rack with strap, pressure regulator and hand torch. The LP torch helps heat up tools and dry out wet potholes. An optional hose reel is also available.*

# Options That Bring Value, Productivity and Safety

## Optional Equipment available on the Stepp SMMT Asphalt Recycler

### Engine Enclosure

*A lockable, sound damping enclosure is available for the Honda gasoline engine as well as the optional Kubota diesel engine.*

### Spare Tire with Holder

*The optional spare tire with holder is conveniently mounted on the frame.*



### Shovel Cleaning Compartment

*This is a must have option. The shovel cleaning compartment consists of a 12 gauge metal tank with splash guard, drain plug, and top cover. The top cover has slots to allow your shovel handles come through them. Will hold up to four shovels.*

### Compactor Plate Carrier

*The most important thing in making a patch last is compaction. We have made it easy to use the compactor plate with the compactor plate carrier. The carrier not only carries the plate, but also has a hydraulic lift to lift it off of the ground. It also folds up and out of the way when you're not using it.*

# Specifications For SMMT Trailer Asphalt Recycler

<b>Hopper Capacity</b>	5 cu.ft. (Approx. 500# batches)
<b>Hopper Weight (approx.)</b>	3650 lbs.
<b>Overall Dimensions</b>	166"L x 78"W x 85"H
<b>Fuel Tank Capacity</b>	28 Gallons
<b>Preheat Hopper</b>	
Capacity	5 cu.ft. (Approx. 500# batches)
Opening Dimensions	23"x20"
<b>Loading Conveyor</b>	
Belt	16" Wide Cleated Chevron
Hydraulic Motor	4.5 cu.in. Hydraulic Motor w/ Forward-Reverse
<b>Mixing Chamber</b>	
Chamber Type	Continuous Batch Mixing
Mixing Style	Rotating Pugmil
Liner Type	U-shaped, Replaceable Endura Wear Resistant Steel
Combustion Chamber Liner Material	Steel
Insulation Type and Thickness	2" Fiberglass & 2" Cerwool
Pugmill Drive, Hyd Motor	24 cu. In Direct coupled, Variable Speed
<b>Mixing Chamber Heating System</b>	
Burner Type	Indirect Diesel, Forced Air
Number of Burners	One (1)
Fuel Type	Diesel
Manufacturer	Beckett®
BTU Output	275,000 BTU
<b>Chassis</b>	
Number of Axle	One (1)
Axle Capacity	6000 lbs. each
Tire Size	225/75R15
Brake Type	Standard- Electric, Optional-Hydraulic
Landing Gear Static Capacity	5,000 lbs. each
Hitch Type	3" Pintle Ring or 2-5/16" Ball Type. Adjustable from 15" to 27" from the ground
Frame Material	2"x 4"x 3/16" Rectangular Tubing

# Specifications For SMMT Trailer Asphalt Recycler

<b>Pugmil Control</b>	Red Lion C48TS, Resettable burner Timer
<b>Engine Controls</b>	Honda Std Ignition—Optional Deep Sea Digital Engine Management with Kubota Diesel Engine Upgrade.
<b>Engine</b>	
Manufacture	Honda®
Model	GX390
Displacement	389 cu.cm
Number of Cylinders	(1)
Horse Power	13 HP
Fuel Type	Gasoline
Cooling	Air
<b>Optional Diesel Engine</b>	
Manufacture	Kubota®
Model	Z602
Displacement	36.56 cu.in.
Number of Cylinders	(2)
Horse Power	15.6 HP
Fuel Type	Diesel
Cooling	Liquid
<b>Hydraulic System</b>	
System Type	Eaton Open Center
Pump Displacement	.4 cu.in
Control type	Forward/Reverse Variable Flow Control, Manual Operated, Hydraulically Powered Hopper Agitator, and Loading Conveyor
Reservoir Capacity	17 Gallons
Filtration	10 Microns

# SMM Tailgate Recycler



# *Solution Based Features*



- ① **Produce 1/8 Ton, 250#, 2.5 cu.ft. Batches in 8-15 Minutes**
- ② **Recycle Millings or Chunk Asphalt**
- ③ **Create Spec Mix or Custom Mix from Virgin Aggregate**
- ④ **Pugmil Mixer Produces Uniform, Non-segregated Material**
- ⑤ **Tailgate Mounted– Self Loading**
- ⑥ **Easy to use Burner Controller**
- ⑦ **Diesel Burner**
- ⑧ **Honda Gasoline 13 HP Engine**
- ⑨ **Hydraulic Controls for Pugmil Mixer**
- ⑩ **Indirect Heat System**

# Knowledge-Technology-Innovation-Safety Driven Designs

## “Unimaginable Capabilities”

### Asphalt Recycling

*The Stepp SMM will recycle asphalt millings into new 350°F hot mix at a rate of up to 1/2 ton per hour. This rate can be achieved even at an outside temperature of 20°F, giving you usable production rates year round. This indirect heating method allows approximately 90% of the oils to be retained while heating, thus only about 3/4 to 1 1/2 gallons of oil need to be added for each ton of recycled millings.*

### Virgin and Custom Mixes

*Custom mixes from raw materials can also be created with the SMM. Different sized aggregate, chips, or even sand, can be used to make the perfect mix for your special needs. With the ARP Asphalt Rejuvenator Product you can properly add the precise amounts of Asphalt Cement to make spec mixes on the go.*



### Pugmil Mixer

*The pugmil mixer is the work horse part of the machine. The pugmil mixes the material against the heated Endura liner to get things hot. It does this by a direct hydraulic drive. The pugmil also has opposing, angled paddles to act like an auger when the pugmil is put into reverse. It also has a variable speed hydraulic control to set your discharge to the speed that you need.*

### Tailgate Mounted

*The SMM mounts conveniently on the tailgate of your dump truck. Loading is accomplished by tilting the dump body up and hooking the adjustable tailgate hooks. The telescopic legs of the SMM make adjusting to different trucks simple and quick.*

# Engineered Excellence

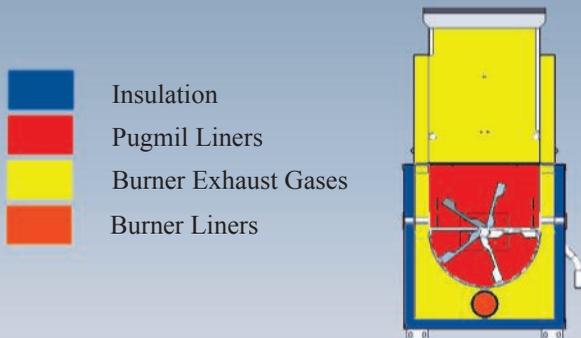
**“Industry Leaders with Industry Leading Technologies”**

## Indirect Heating

*The SMM pugmil mixer is the only indirect heated asphalt recycler in the world. By heating the Endura liner instead of the material directly, we cook less of the light AC oils out of the millings, thus eliminating the need to replace them. We also produce less visible smoke and emissions because we just aren't burning them out. We also redirect the burners exhaust back into the hopper to aid in the overall heat up. Our top preheat bin also gets the advantage of the free heat from the exhaust.*

## Diesel Heating

*The SMM is fired with a Beckett forced air, diesel fuel burners. The main pugmil mixer houses the burner with an output of 205,000 BTU's.*



## Burner Controls

*The SMM has simple to use burner controls. The simple adjustable timer allows you to set the time to get your desired temperature. It also has a manual override if you need to run the burner without the timer.*

## Hydraulic Controls

*The variable speed hydraulic controls operate the pugmil mixer. The pugmil mixer also acts like a discharge auger when run in reverse.*

# Standards that Set the Bar

## “Premium Components that Drive Reliability and Longevity”

### Honda® Powered

*Having a quality machine means having quality components, and our engine is no exception. The air cooled, one cylinder, 13HP, Honda GX390 is what powers our workhorse. It uses a direct coupled, hydraulic pump, and come standard with an 18 amp charging circuit to maintain voltage to the burner system.*

### Preheat Hopper

*The top preheat hopper acts as a giant measuring cup for your batch. Having consistent batch sizes every time will help fine-tune your recipe for the amount of additive to add per amount of millings. Our preheat hopper also allows us to have a batch on deck while we are mixing one in the mixer. With the burner exhaust coming up underneath the hopper, we are also pre-heating the material and starting to dry out some of the moisture in the material to speed up the next batch.*



### Shoveling Platform

*The SMM comes with a quick detach shoveling platform for when you need to dispense material directly to the road surface for large repairs.*

### Side Discharge

*The Smm Conveniently discharges out the passenger side. The shovel pan can easily be removed to discharge on to the road surface.*

# Options That Bring Value, Productivity and Safety

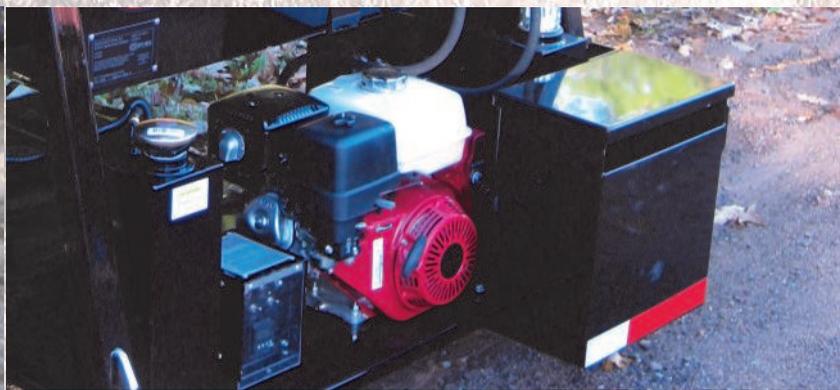
## Optional Equipment available on the Stepp SMMT Asphalt Recycler

### Light Options

*The standard trailer lights include grommet style, incandescent lights. Optional LED light systems are available.*

### Shovel Cleaning Compartment

*This is a must-have option. The shovel cleaning compartment consists of a 12 gauge metal tank with splash guard, drain plug, and top cover. The top cover has slots to allow your shovel handles come through them. Will hold up to four shovels.*



### Arrowboard

*The LED arrow strip directs traffic in the direction you want. This is a highly recommended option for operator safety and visibility.*

### Strobe Light Systems

*Flush mounted LED strobes are located next to the rear tail-lights*

# Specifications For SMM Tailgate Asphalt Recycler

<b>Hopper Capacity</b>	2.5 cu.ft. (Approx. 250# batches)
<b>Hopper Weight (approx.)</b>	1660 lbs.
<b>Overall Dimensions</b>	166"L x 78"W x 85"H
<b>Fuel Tank Capacity</b>	10 Gallons
<b>Preheat Hopper</b>	
Capacity	2.5 cu.ft. (Approx. 250# batches)
Opening Dimensions	13"x30"
<b>Mixing Chamber</b>	
Chamber Type	Continuous Batch Mixing
Mixing Style	Rotating Pugmil
Liner Type	U-shaped, Replaceable. Endura Wear Resistant Steel
Combustion Chamber Liner Material	Steel
Insulation Type and Thickness	2" Fiberglass & 2" Cerwool
Pugmill Drive, Hyd Motor	24 cu. In Direct coupled, Variable Speed
<b>Mixing Chamber Heating System</b>	
Burner Type	Indirect Diesel, Forced Air
Number of Burners	One (1)
Fuel Type	Diesel
Manufacturer	Beckett®
BTU Output	205,000 BTU

# Specifications For SMM Tailgate Asphalt Recycler

<b>Hydraulic System</b>	
System Type	Eaton Open Center
Pump Displacement	.4 cu.in
Control type	Forward/Reverse Variable Flow Control, Manual Operated, Hydraulically Powered Hopper Agitator, and Loading Conveyor
Reservoir Capacity	10 Gallons
Filtration	10 Microns
<b>Pugmil Control</b>	Red Lion C48TS, Resettable burner Timer
<b>Engine Controls</b>	Honda Std Ignition.
<b>Engine</b>	
Manufacture	Honda®
Model	GX390
Displacement	389 cu.cm
Number of Cylinders	(1)
Horse Power	13 HP
Fuel Type	Gasoline
Cooling	Air

# Asphalt Rejuvenator Product

## “The Key to Recycling is in the Additive”

The key to recycling is in the additive. Without adding new oil into the product the quality of the material and the longevity are just not there. Stepp offers a prepackaged solution to use with our recycling equipment: ARP.

ARP is a blend of virgin AC, warm mix additive, and a small amount of recycled rubber.



The product consists of 95% AC or PG graded asphalt cement. This is the ultimate key to recycling success. It is the same oil as what was put into the hot mix at the hot mix plant when it was new. It usually only takes 1-2% new oil to make the mix look and PERFORM like it is new mix. The warm mix additive aids in the workability of the material. Recycled millings that don't have the warm mix additive are stiff and hard to rack and shovel. The rubber that is added into the ARP aids in the material's ability to melt at lower temps, and helps the flexibility of the end product.

Because ARP is 95% AC, it also works excellent as a tack oil. This makes the need for two different products a thing of the past.

The ARP comes in two convenient sizes. 1# pound pucks to add right to the conveyor, and 25# pound blocks to melt into the SRM's

# Recycling vs Reclaiming

## Asphalt Recycling vs Reclaiming (Recyclers vs Hot Boxes)

### What is the difference between recycling and reclaiming?

Asphalt recycling and reclaiming are two very different processes. Asphalt recycling is taking broken chunks or asphalt millings from an older road surface, and reheating and mixing the material to a hot, usable state. With recycling, you must add a small amount (usually 1-2%) of new binder (asphalt) to make the material workable and to replace oils that have dissipated or oxidized from the original material. Without this key ingredient you will end up with a dry patch material that just won't bond. The reason that the pavement needs to be re-placed in the first place is because it has oxidized and become brittle, which then cracks and forms potholes. Using this pavement for recycling is a great option because most of the binder (about 5-7%) is still in the materials.

Reclaiming is a much different processes that can be a very good solution if done properly. Reclaiming is reheating materials in a hot box. With the equipment that is used for reclaiming, there is no mixing or adding a binder (asphalt). When reclaiming, you must be very careful on the material selection that you wish to use. If you start with bad material you will end up with bad material. One of the best ways to reclaim asphalt is to start with high quality mix. One solution to quality mix is to purchase hot mix from your local hot mix plant and lay out brick or cubes. When the product has cooled you can stack and store them for long periods of time and use them as your patching demands it. This gives you a high quality of mix with the ability of patching potholes when your hot mix plants are closed in the winter.

#### Asphalt Recycler



#### What is the difference in equipment?

Recycling equipment has much different requirements than a reclaimer. Recyclers must have the ability to heat and mix with a drum or a pugmill (arms that mix like a mortar mixer). This gives you the ability to make mix in very short time frame. De-pending on the size of batch being mixed, you can produce recycled materials from as quickly as 8 mins on a ½ ton batch to 30 mins on a 4 ton batch. The other very necessary key is the ability to add new binder (asphalt) to the machine. Without the ability to add new oil to the patch material you will not pro-duce a quality mix. You can add new binder to the material by introducing liquid asphalt or palletized asphalt to the material when it is mixing and heating.

Reclaiming is accomplished with nothing more than a heated box (hot box). There are many different types and styles of hot boxes: Trailer mounted, hook truck and chassis mounted, slip-in style, and skid mounted hot boxes. To reclaim you must have a long period of time for the material to accept the heat. Unlike the recyclers that have a mixer, the hot box must transmit the heat through the material. Aggregates do not transfer heat well, so we must have longer periods of heating to migrate the heat to the center of the unit. This usually requires 3-8 hours depending on the size of the load and the quality of material. Most reclaimers are equipped with an over-night electric heater or an overnight timer to run the burner system and accomplish the long, slow, even heating cycles.

Many manufacturers have designed additional heating surfaces in the unit to heat the center, as well as the bottom and sides of the unit. Units requiring additional burners are not the answer due to the fact that you just need time, and the burner that is in the hot box is down fired for more consistent heat. Adding the additional burner is an additional maintenance and cost, a well designed hot box has heated surfaces in the center of the unit.

The biggest difference in Recyclers and Hot Boxes is the price. Recycling equipment is a more expensive machine due to the mixing and oil additive equipment. Hot boxes range in size and configurations and tend to be a more affordable option up front.

#### Asphalt Hotbox



# Recycling Vs Reclaiming

## What is better? Recycling or Reclaiming?

Both have their pros and cons.

### Recycler Pros

- Can produce quality mix with just about any material.
- Can produce mix in a very short time frame.
- Most recyclers can produce custom mixes from virgin aggregate.
- Can produce quality hot material at any time of year and with any material.
- Requires little planning and preparing: Load the truck and start the unit.
- Can produce high quality material for under \$20.00 per ton.

### Recycler Cons

- Price. Recycling equipment is a large investment and you have to justify the equipment cost with the savings on material.
- Requires a dump truck or other equipment to load the machine.

### Reclaimer Pros

- Affordable units that can be used for other patching material when they are available (hot mix and cold patch).
- Can reclaim materials any time of the year.
- Simple to operate.

### Reclaimer Cons

- Requires quality mix to produce quality mix.
- Slow. Usually takes 3-8 hours for initial startup.
- Unit is usually fired unattended.
- Planning. You must plan ahead to make sure that you have enough time to reheat the material.
- Material costs. Most people buy new hot mix from the plant and lay it out to get hard and use it when they need it. \$50.00-\$80.00 per ton, plus the cost of trucking the material to your location, and the labor to lay it out, and then come back and pick it up and store it. Don't forget about the fuel cost to reheat also.
- Limited to one load per day. Because of the time it takes to reclaim the material, you can usually only get one load per day.
- Reclaimers cannot mix or add additive (asphalt) to the material.

**Make sure to weigh all of your options when deciding on the machine that works for your patching needs. At Stepp, we have many products that can fit your patching needs for recycling or reclaiming. Please feel free to contact us to find the right fit for you.**

### Stepp Mfg. Co., Inc. Patching Units that Recycle

- SMM Stepp Master Mix- Tailgate mounted mixer that heats a 250 lb. batch in 5-7 minutes.
- SMMT Stepp Trailer Master Mix- Midsized trailer mixer that heats a 500 lb. batch in 5-10 minutes.
- SRM10x120 Stepp Recycler Mixer- Trailer mounted unit that mixes, heats, adds additive, and sprays tack. Can produce a 1,000 lb. batch in 7-15 minutes. Unit is self-contained with a load conveyor, mixer, and 120 gallon asphalt tank with sprayer.

### Stepp Mfg. Co., Inc. Patching Units that Reclaim

- SPH Stepp Premix Heater- 2, 3, and 4 ton trailer mounted hoppers with LP or Diesel burners.
- SPHD Stepp Dump Style Premix Heater- 3 and 4 ton hoppers with diesel burner and oil jacketed heating system. Unit includes a truck hoist to dump material.
- SPHOJ Stepp Oil Jacketed Premix Heater- 3 and 4 ton hoppers with oil jacketed heat and auger discharge.
- SSPH Stepp Slip-in Style Premix Heater- 5.4, or 6.75 tons, LP or diesel heated hopper that slides into a dump truck.
- SSPH-Hot Pack Stepp Slip-in Style Premix Heater- 2, 3, and 4 ton hoppers, diesel fired oil jacketed hopper that is de-signed to slide into a small dump truck (15-26,000 GVWR)
- STPH Stepp Truck Mounted Premix Heater- 5.4, 6.75, 8.1 and 9.45 ton chassis or hook truck mounted hopper. Diesel fired, oil jacketed, auger delivery.

# Recycling Tips

1. **Have your millings tested for asphalt content.** This will help you decide how much additive you need. The average ton of asphalt top mix has 5-7% oil by weight. This translates into 100-125 pounds of asphalt (per ton) added to virgin aggregate to make top mix. PG grade asphalts are approximately 7.5 pounds per gallon. So, if you convert that to gallons, there is approximately 13.3 gallons of asphalt in 100 pounds to make 1 ton of mix.  $100/7.5=13.3333$ . Most millings need 1-2% of new oil to give you a quality patch material. The SMMT makes an approximate 500 pound batch, so on average you need to add 1/4 gallon to 3/4 gallons, or 1.875 pounds to 5.625 pounds, of asphalt additive to make a quality mix.
2. **Recycled materials have huge variables.** Different asphalt contents, different moisture contents, different aggregates, base material containments, and different size aggregates will all vary the batch times and material quality. Making your first batches in your SRM will take some experimenting. You will need to find the right recipe. Start with shorter batch times and check your material often on the first batch or two. Start with a little oil and add more as you need it. Once you come up with your recipe for the materials that you are using you should see consistent results. The next batches will be very similar and you should only have to make minor adjustments.
3. **Keep materials dry.** Moisture content is the number one cause for slow batch times. If you can, keep your millings inside or covered. It takes more BTUs to dissipate a gallon of water than it does to melt a gallon of asphalt. Moisture acts as a refractory in the material, and cannot be dispersed until turned to a gas (steam). High moisture content can double or triple batch times, so having dry millings is key to higher production.
4. **Quality of materials.** Using quality materials also aids in faster batch times. Materials with large aggregates take longer to drive the heat into the stone. Contaminated materials with base also take longer to heat because of the lack of oil in the materials. Materials with higher asphalt contents also heat up faster. The SRM does not care, it just may affect the heat up times.
5. **The SMMT is capable of making materials from virgin aggregates.** You can make virgin materials with the SMMT, you just need more oil. Using the reference above in #1, you can make your own custom mixes. Sand mixes, fine mixes, and mixes from virgin materials. Again, you will need to do some experimenting to get the right mix design. If making virgin mix, use the 5-7% to get you started (2.5-3.5 gallons). Always start with a smaller amount of oil; you can always add more oil, but you can't take it away. Different oils will also give you different results in materials.
6. **Pre-made cold mix materials.** You can use your SMMT to warm your cold mix materials. Use extreme caution when doing so. Most cold patch materials have a high content of cutter (solvent) in the oil. This makes the material soft and pliable, but also makes them very easy to catch on fire. If you are using the SMMT to heat cold patch material, only fire the burner in 1-2 minute cycles and check the temperature often to prevent the material from flashing.



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