Hawk Seale Application and Equipment Guide for Preserving Asphalt and Re-Bonding Millings-

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This detailed guide is intended to provide you with the information needed to use Hawk Seale to rejuvenate and re-bond millings (RAP) and or to seal and preserve asphalt pavement with confidence.

Hawk Seale is a proprietary concentrate developed with guidance from Iowa State University and is formulated as a "cold process" to re-bond *Recycled Asphalt Pavement (known as RAP or Millings)* to create a non-tracking and non-eroding durable surface that stands up to cold and hot climates and all types of traffic.
Hawk Seale treated millings can save 40% to 60% over using "hot mix asphalt" depending on cost of the millings.

Hawk Seale Millings- HS treated millings may not have the luster or look of "Hot Mix" asphalt, finished surfaces can vary in smoothness, color and overall look due to a multiple of factors including quality and composition of the millings. Any box store sealer can be used after application for a blacker color if desired.
Consistency and Color- HS-concentrate is a thin viscosity concentrate and when mixed it will penetrate the voids and fissures of existing asphalt pavement and to penetrate and soak into millings to rejuvenate and re-bond the aggregate.
Final color of millings or existing pavements will depend on surface applied to.
We recommend using Hawk Seale within 90 days of receipt as shelf life is limited.

Preserving and sealing existing asphalt pavement- HS prevents air and moisture from entering the pavement which are the two main causes of asphalt deterioration thus extending the serviceable life of asphalt for many years. It works similar to Thompsons Wood sealer for wood filling the pores in wood. HS fills the voids and fissures in asphalt from the bottom up.
Existing pavements may need to be re-striped after sealer application.

Mixing Ratio

The recommended ratio for mixing is 1-gallon HS Concentrate to 9 gallons water.
Mix ratio can be varied from 1 gallon HS to 8 gallons water up to a maximum stretch of 1 gallon of HS to 9.5 gallons of water.
Do not over dilute or under apply the HS solution as it will reduce the effectiveness of the solution to re-bond the millings and may not prevent continued raveling of the millings.
* Concentrate mix ratio can be adjusted 5% leaner or richer to better match the quantity of solution needed to provide sufficient solution for your project.
**Caution- While less than 1% of waters may cause a separation of the copolymers - We suggest testing a small amount of HS concentrate with the water to be used for any separation of the copolymers before mixing a large quantity. Allow the mix to sit for up to one hour.*
****HS needs minimal mixing -- Avoid whipping or aggressive and prolonged agitation. Do not use roller or impeller for transferring or spraying as the can separate the copolymers.***
*** Shelf Life – *Max shelf life is not known at this time.***
****We strongly recommend applying the Hawk Seale within 90 – 120 days of purchase.***
Do not allow HS concentrate or mixed solution to freeze.

Application does not require expensive equipment; however, it does require sprayers to have sufficient volume to saturate or soak the millings in a timely manner.

- **The goal is to soak and saturate the millings or pavement to the point of puddling and or running off.**
- **Compact or Re-compact the millings after HS solution has been absorbed.**
- **** Small backpack or lawn sprayers "do not" deliver the volume necessary to attain a saturated depth of 2 inches or more.**
- ****Think of a sprinkling rain versus a good soaking rain.**
- **Use clean un-contaminated pumps, caged tanks or drums or other large containers for mixing.**
- **Water Trash pumps will require a return line back to the tank to prevent churning of solution and gelling.**
- **Avoid using Impellor style pumps, roller pumps or any pump that can churn the solution or develop higher pressures.**
- **Hawk Seale will leave a residue, which may lead to some tools being a one-time use.**

Sprayers- Pumps - **Our Sprayer Tool Guide and Constructing a Sprayer Setup Guides can be found online at hawkseale.com for more information on pumps and sprayers.**

Garden Sprinkle cans be used for small projects by drilling 3/16ths holes vertically in the diffuser to provide a fan like application.

The simplest sprayer system is a 12-volt 5.5 GPM or larger diaphragm pump with "Auto Pressure Shut Off" and a 25' to 50' non-kinking garden hose with an adjustable sprayer nozzle or wand all of which can be purchased for around $120.00.

Click on this Link for ***12 Volt 5.5 GPM RV Pumps*** *--* ***12-Volt RV pumps with Auto Shutoff***

** A larger12 volt 7.0 GPM can be used for transferring HS Concentrate, the 12 volt 5.5 GPM diaphragm pump will not pump the concentrate.*

Click on this Link for - ***-Spray-Wands***

Link for sprayer tips- ***Sprayer Tips***

(See the HS Sprayer and Tool Guide and HS **Sprayer Construction guide attached or on our website)**

Small Boom sprayers -- 12-Volt 7.0 GPM RV Pumps can be used with a wand or with 3 to 4 (*1/2 or 1 GPM*) fan jet sprayer tips attached to a boom. Vevor- 12 Volt 7.0 GPM pump with auto shut-off

We recommend this Larger 12-volt 7.0 GPM Pump as it can be used to transfer the Hawk Seale concentrate and spray the HS solution.

Larger Booms can be constructed using low-cost Water Trash Pumps and (80-50) Fan Jet Sprayer tips

1 or 2 inch Trash pumps are available for under $250.00, but will require more plumbing with a return line back to the tank with a valve in the line to direct the solution.

Click here for trash pumps - ***Water-Trash-Pump***

Larger compressor driven diaphragm pumps can also be used.

*** DO NOT use Impeller, Roller or Gear Pumps as they run too fast and will cause separation of the HS solution.**

*** Restricted flow can cause separation of copolymers. (Small diameter valves and Hoses can be restrictive)**

****Pump-Up and Small backpack, and small lawn sprayers setups "do not" deliver the volume necessary to attain a saturated depth of 2 inches or more for millings efficiently.***

"Think of a sprinkling rain versus a good soaking rain for penetration.

Recommended Hoses for larger volume pumps-

Use either 5/8" diameter up to max of 50 Feet in length or **¾" diameter and maximum of 75 feet can be used with higher volume pumps as the adhesive solution can build up in longer hoses and reduce flow.**

Wand and Boom Sprayers can be constructed using a 1 or 2 Inch Trash Pump— Pumps should be run at a slowest speed and still provide adequate pressure to the boom or wand. Hose to wand should not exceed 50' as adhesive can build up in longer hoses.

A return line will be required back to the tank with a valve to control flow to tank and pressure to the wand or boom to prevent deadheading or cavitation in the pump which can cause gelling.

The return line must allow some solution to flow back to the tank to prevent the pump seals from seals being pushed out when flow is turned off at the wand or boom.

Adjusting the valve on the return line will control the pressure to the nozzles. Avoid prolonged agitation or circulation before actual application.

Water Trash Pumps are available for under $250.00 They can be purchased locally or online- Click this link to trash pumps – Water-Trash-Pump

Electric Sump pumps or other impeller or gear pumps are NOT recommended for application of the mixed solution as the high rpm impeller can cause separation and gelling of the copolymers.

Sump Pumps can be used for "unrestricted" transfer of the HS concentrate by turning power on and off. Do not use a valve to stop or restrict the flow or gelling can occur.

SEE OUR SPRAYER AND TOOL GUIDE- for more information for constructing a Boom sprayer

NOTE- Millings - Application requires sufficient volume to saturate the millings in a timely manner to the point of puddling; ideally you should achieve a saturation depth of 2 to 2.5 inches of depth. Incorporation will increase uniformity and depth.

Application rate is self- determining as Traffic lanes may not absorb the HS solution as deep while softer shoulders and centers of roadways will absorb more solution.
When applying large quantities or multiple tanks of HS solution we recommend a screen (similar size to window screen mesh) be installed in the intake line to catch any heavy material ahead of the pump.

We do not recommend application below "60 degree "ground temperature" or if there is risk of night time temperatures dropping into the freezing range as penetration and bonding is reduced.
Warmer temperatures provide better penetration and shortens the curing time.
Cooler temperatures - will slow the curing process significantly adding up to a week to 10 days to fully cure before the surface is safe from damage from turning traffic and over-night parking.

Traffic- "LIGHT TRAFFIC " can begin Immediately. Some tracking of the solution can occur while surface is still wet.
Avoid turning traffic, overnight parking and aggressive tired treaded vehicles such as 4 wheelers and farm tractors, heavy trucks, tractors, multi-axle trailers, 4-wheelers and dirt bikes with aggressive tires until millings have fully cured.

NEW MILLINGS CONSTUCTION - Millings do not have structural strength and rely on the base underneath to provide strength for a lasting roadway. We recommend there be an existing solid base, or constructing a new base with 3 to 5 inches of 2" rock or similar base material to support your millings. Spread and grade the millings to a minimum depth of 3 to 4 inches is recommended. Expect "HS treated" millings to compact about 30% when matching adjacent surfaces.

NEW Construction with Depths over 4 inches should be done in lifts or layers for optimum penetration and compaction.
Increased depths may will require more HS solution to obtain saturation.

NEW or UN-COMPACTED MILLINGS APPLICATION RATE- Un-compacted millings will typically absorb approximately 1- Gallon +/- of HS- solution per square yard in 3 passes or coats.
Expect to use about half of your HS- solution on the first pass application applying the HS-solution to the point of puddling. Apply the 2nd coat immediately after the 1st coat has been absorbed, the 3rd coat can be applied immediately after the second coat is absorbed. Each coat will take less solution to reach the point of puddling and or running off. Saturation should be 2 to 2.5 inches in depth. Incorporation of the Solution will improve depth of saturation and uniformity.
*Note- Rate of absorption is self-determining, areas that need more will absorb more solution.
Over all it is better to apply more solution as less than recommended rates may not provide the adhesion necessary to prevent raveling and erosion.
Applying more than 1 gallon per sq/yd may be needed in some areas where millings do not have enough asphalt for good adhesion.
Re-compaction of Previously Compacted millings can be done immediately after application of HS solution with a heavy roller or smooth tired vehicle.

SEALING AND PRESERVING EXISTING ASPHALT - See next page below the Millings application for information –

COMPACTED MILLINGS APPLICATION- On Average millings will still absorb approximately 1- gallon +/- of HS-Solution per square yard over 3 passes. The amount of HS-Solution is self-determining; apply each coat until it puddles or begins to run off. The 1st coat will absorb approximately ½ gallon per sq/yd, the 2nd coat will absorb approximately a third of a gallon per square yard and should be applied as soon as the 1st coat is absorbed.
The third pass will generally absorb the balance of a total of approximately 1 gallon per square yard. Each successive coat can be applied as soon as the previous coat has been absorbed.
*Note- Rate of absorption is self-determining, areas that need more will absorb more solution. Traffic lanes may not absorb as much solution while center and shoulder areas will need and absorb more solution.
* It is better to apply more solution versus less than the recommended amount when applying to millings.
*Less than recommended rates may not provide the adhesion necessary to prevent raveling and erosion.

COMPACTION CAN BEGIN AS SOON AS HS SOLUTION HAS BEEN ABSORBED.
Using a heavy 4 - FT (5,000 # or larger) "ride on" compactor or other rubber-tired compactor will provide a more uniform and smoother finish. Steel roller compaction will need the water option to prevent treated millings from sticking to the roller.
Vibration can be used as needed for the first four or so passes, then smooth rolling is advised.
Heavy smooth tired vehicles can also be used for compaction.

Do not over compact- 3 to 8 passes over and back with a heavy roller or heavy smooth tired vehicle is usually adequate. Over compacting can cause rippling or flaking of the surface. Avoid short back and forth motion. Long full-length runs will provide a smoother surface.
Plate compactors -can be used for smaller projects and trimming close to buildings etc.
Extra care in leveling the surface before compaction will be required to prevent an uneven or wavy surface.

You may notice a carpet like feel as you walk on the treated millings after initial compaction, this will disappear as the millings cure and harden into a hard durable surface, which will take 1 to 10 days in depending on temperature.

* **Do not use heavy Vibrating Compactors after initial compaction as heavy vibration during the curing process will damage the adhesion and bonding process. Once compacted allow the curing process to harden the millings surface.**

*Rejuvenation of millings with HS is a "cold process" versus "HOT Mix" process and requires a curing time similar to concrete to cure into a hard surface.
Curing time varies from 12 hours to 10 days depending on temperature.
Alternate driving patterns to compact the surface evenly and avoid creating tire paths or rutting. Fully.

"Light" straight line traffic can begin immediately or as soon as solution is absorbed and dry.
Avoid turning traffic and overnight parking as well as aggressive tired treaded vehicles such as 4 wheelers and farm tractors and tandem trucks until millings have fully cured.

SEALING AND PRESERVING "EXISTING ASPHALT" PAVEMENT-

Hot Mix asphalt will still have 5 to 8 percent air voids in it after compaction. HS solution is designed to fill the air voids and fissures from the bottom up to prevent air and moisture from entering the pavement which are the two main causes of asphalt deterioration.
Application- HS- Solution can be applied with a sponge or heavy knap roller, or sprinkle can and broom, or with a sprayer for larger areas.
Existing asphalt pavement will typically absorb .35 to .42 tenths of a gallon.
Very porous pavements may require more than 3 coats to fill the fissures and voids.
Apply HS in 3 coats or passes to the asphalt pavement, the 1st coat will absorb approximately half the HS solution with each successive coat absorbing less solution to the point of running off. Each successive coat can be applied as soon as the previous coat has been absorbed.
Application rate is self-determining as areas that are more porous will absorb more solution while other tighter areas may not absorb as much HS solution to "fill" the pavement to point of run-off.
Once the pavement fissures and voids have been filled the HS Solution will puddle and or begin to run off signaling the fissures and voids in the pavement are "full".
Traffic can begin as soon as surface is dry to prevent tracking usually in a few hours.

Cracks larger than 1/4 inch should be filled with crack filler, also dirt, sand, trash and other materials should be removed from the surface of the pavement prior to application.
We recommend using Hawk Seale within 90 days of receipt as shelf life is limited.

POT-HOLE PATCHING-

Remove any loose aggregate and dirt from the hole, then apply a coat of HS Concentrate to the pothole and the surrounding 6 to 8 inches.
Fill the hole with millings or Pot-Hole patch material.
Saturate the patch and an area 6 to 8 inches larger to prevent air and moisture from entering the patch from sides.
Compact the patch--- Light straight traffic can begin immediately.
Screening the millings with ½ inch hardware cloth to eliminate larger aggregate, this will make it easier to blend the surfaces.

Maintenance of your millings project –

While HS- treated millings make a very durable non-tracking, non-eroding surface similar to hot mix asphalt. Treated millings can be damaged from heavy vehicles and snow plows as an example.
Repairs to failed or damaged areas can be done with clean screened millings or Cold Patch material and treated with HS.

Re-sealing Pavement or Millings with HS-

Expect normal sun fading, Resealing with HS- will require approximately .25 to .35 tenths gallon of HS- solution per square yard to preserve and extend the life of your asphalt.

MIXING and HANDLING- Used Cage Tanks, large Drums or other larger containers can be used for mixing HS-Solution.
HS is non -toxic and will not cause skin irritation. Keep out of eyes.
Old clothing, Boots, Gloves, goggles and disposable coveralls is recommended.
Un-used Hawk Seal concentrate and mixed solution can be stored in an airtight container similar to latex paint for longer periods.
Spills- Immediately flush with water to dilute the concentrate. Dirt, sand, Lime or millings can be used to soak up spills.
Grass areas should be flushed with water to dilute product as much as possible. Dirt, sand, lime or other materials can be used to soak up the spill to be removed. WD-40 or similar products can be used to remove HS from hard surfaces.
Asphalt or Concrete pavements will be stained black, but also sealed and waterproofed.
Clean Up- Once HS gets exposed to air it become very tacky requiring WD-40 or Oil Vanish, Zep Industrial Cleaner or similar products for cleanup.
WD-40, Paint stripper or Acetone can be used to clean dried on HS from metal or other surfaces.

Visit our website at-- hawkseale.com for more tutorials and information.

Email us at - hawkseale@gmail.com or call -563-379-3233