APPLICATION GUIDE

Millings Application Guide

REJUVENATING AND RE-BONDING MILLINGS (RAP) • REVISED 11-10-26

Hawk Seale is a proprietary concentrate formulated to be applied to Recycled Asphalt Pavement (RAP, or millings) to create a non-tracking, non-eroding durable surface that performs similar to hot-mix — as a cold process versus the typical hot process. HS rejuvenated millings stand up to cold and hot climates and all types of traffic with similar longevity to hot-mix.

1 : 9
1 gal HS Concentrate + 9 gal water = 10 gal HS Solution

~1 gal / sq yd
Total solution for millings, applied in 3 coats

3 coats
Each coat goes on to the point of puddling or run-off

2–10 days
Typical cure to a hard, durable surface at 65–85°F

Why millings need HawkSeale

Hawk Seale treated millings can save 40% to 60% over using hot-mix asphalt, depending on the cost of the millings. The finished surface can vary in smoothness, color and overall look due to the quality and composition of the millings, the amount of HS applied, and compaction. Treated millings will be black after application; some older millings may not have the very black luster of hot-mix. Any box-store sealer can be used after application for a blacker color if desired.

A cold process that cures like concrete

Rejuvenating millings with HS is a cold process versus hot-mix, and requires a curing time similar to concrete to form a hard, durable surface — typically 2 to 10 days depending on temperature and humidity.

Also sealing existing asphalt? See the **Sealer Application Guide** at hawkseale.com/guides/application-guide.

Mix ratio

The recommended mix ratio is **1 gallon HS Concentrate to 9 gallons water**. The ratio can be adjusted 5% leaner or richer to better match the quantity of solution required for your project.

- Minimal mixing is needed. **Do not** whip or aggressively mix — stirring is preferred, similar to paint.
- **Do not** agitate for long periods prior to application.
- Any clean tank, tote, drum, large trash can or other large container can be used for mixing HS Solution.

> **Do not over-dilute** beyond a 1-to-10 ratio or under-apply, as it will reduce the rejuvenation and re-bonding of the millings.

Applying the solution

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Millings will typically require spraying approximately **1 gallon (+/-) of HS Solution per square yard**, depending on the condition of the millings. Both compacted and un-compacted millings absorb about the same total. Apply each coat until the solution puddles, stands, or begins to run off.

COAT	ABSORBS ABOUT	WHEN TO APPLY
1st coat	1/2 gallon per sq yd	Apply to the point of puddling or running off.
2nd coat	1/3 gallon per sq yd	As soon as the previous coat has been absorbed.
3rd coat	The balance of ~1 gallon per sq yd	As soon as the previous coat has been absorbed.

Absorption is self-determining

- Areas that need more solution will absorb more solution.
- Traffic lanes may not absorb as much, while center and shoulder areas will need and absorb more.
- Very fine, double-ground millings (pea-size aggregate) will require more solution.
- Very poor-quality millings may need more solution to rejuvenate them satisfactorily.

Saturation is the goal

The goal is to saturate and soak the millings to a depth of approximately 2 or more inches to rejuvenate the bitumen in the millings. If HS Solution does not puddle or stand on un-compacted millings, lightly compact them to keep the solution from going too deep. Ideal saturation depth is 2 to 3 inches. Saturated millings move easier than dry millings when leveling and shaping.

Applying less than the recommended rate or over-diluting will not provide the adhesion necessary to prevent future raveling and erosion. It is better to apply more solution than less when treating millings.

Dry climates

In high heat and low humidity (as in southern Texas or Arizona), wet the millings down prior to application and increase the mix to 1 gallon HS to 10 gallons water to offset rapid evaporation.

Compaction & curing

Compact or re-compact after all 3 coats of HS Solution have been applied, or within 2 to 4 hours. Compaction is very important to the re-bonding process. Expect approximately 30% compaction for saturated millings, and about a quarter inch for previously compacted millings.

Recommended compactors

- A 4-ft (5,000 lb or heavier) ride-on steel roller gives the smoothest, most level finish. 4 to 6 passes over and back is usually adequate.
- Steel rollers may need a light application of water to keep treated millings from sticking as the adhesives turn tacky in the air.
- Vibration can be used for the first 2 to 4 passes, then smooth (non-vibrating) rolling for 2 to 3 passes.
- Rubber-tired rollers work well on steep inclines where steel rollers cannot be used.
- Vibrating plate compactors can be used for small projects and trimming close to buildings. Extra care in leveling before compaction is needed to prevent an uneven or wavy surface.

Not heavy enough

- Lawn rollers are not heavy enough for adequate compaction.
- Single-drum skid-steer rollers are not heavy enough.
- Light-duty trucks are not heavy enough. If necessary, a loaded one-ton or larger heavy truck can be used when no roller is available.

After compaction

The surface will feel carpet-like when walking on it; this disappears as the millings cure and harden. Avoid short back-and-forth motion — long, full-length runs make a smoother surface.

Do not over-compact. Once the compactor leaves no seams or ridges, stop and let the treated millings cure. Excessive heavy vibration can loosen the surface. **Do not** use heavy ride-on vibrating compactors after initial compaction — the vibration damages the adhesion and bonding process while curing.

Curing & temperature

- Typical cure to a hard, durable surface: 2 to 10 days at 65–85°F; warmer temperatures penetrate better and cure faster.
- Ground temperature should be above 55°F with no chance of freezing for 72 hours.
- Cooler temperatures (below 60°F) can extend full curing to 2–4 weeks for hard-use traffic.
- Extreme heat (90°F+) with high humidity can extend full curing to 3 weeks or more for heavy vehicles and overnight parking.

Rain & traffic

- Avoid applying if rain is expected within 3 to 6 hours. Millings can be moist (not soggy) at application; rain drains through millings quickly.
- Light, straight traffic can begin immediately after compaction. Tracking can occur while the surface is wet.
- Until fully cured, avoid in-place turning, overnight parking, dirt bikes, ATVs with differential lock, forklifts, farm tractors, and multi-axle trucks and trailers.

Construction & equipment

New millings construction

- Millings have no structural strength — they rely on the base underneath. Use an existing solid base or build a new base with 3 to 5 inches of 2-inch rock or similar material.
- Spread and grade millings to an average depth of 3 to 4 inches (2 to 5+ inches in low areas).
- Depths over 4 inches should be built in separate lifts, each saturated with HS and compacted. Deeper sections require more solution.
- Edges have no lateral strength and can push out under heavy load: bevel the edges or support them by digging in the project, backfilling with dirt or rock, landscape blocks or timbers.

Older millings projects

We recommend applying HS at the time of construction. However, customers have used HS on 2- and 3-year-old compacted millings with satisfactory results to stop ongoing raveling, tracking of fines and erosion, and to prevent weeds and grass from growing in the millings.

Re-sealing treated millings

Expect normal sun fading. Re-sealing with HS requires approximately 0.2 to 0.3 gallon of HS Solution per square yard to preserve and extend the life of the surface.

Sprayer equipment

Application does not require expensive equipment. The simplest system is a **12-volt 5.5 or 7.0 GPM diaphragm pump** with auto pressure shut-off, a 25–50 ft non-kinking garden hose and a lever ball-valve sprayer wand, drawing from any larger container or tank.

- The 5.5 GPM pump can supply a 4-ft boom with 4 “80-20” 2-GPM 80° fan tips; the 7 GPM pump supplies a 6-ft boom with 6 tips. Either pump can run two booms in tandem for 8–12 ft widths.
- The 7 GPM pump can also transfer the heavier HS Concentrate; the 5.5 GPM pump will not pump undiluted concentrate.
- For larger projects: 1- or 2-inch water trash pumps with (80-50) 5-GPM fan tips, or clean commercial seal-coat applicators. Run trash pumps at the slowest speed that still gives adequate pressure, with a valved return line back to the tank to control pressure.
- Maximum hose: 5/8 in × 50 ft for small pumps, up to 3/4 in × 75 ft for higher-volume pumps.
- Sample pumps: **12-volt RV pumps with auto shut-off** (also at Home Depot or Amazon, typically $46–$85). Wands: **sample spray wand**. Tips: **nacsupply.com**. Trash pumps: **water trash pumps**.
- Pump kits and a parts list to build your own setup: **hawkseale.com/shop**. Full details in the Sprayer & Tool Guide at **hawkseale.com/resources**.

> **Keep the solution flowing.** HS must have constant flow to prevent dead-heading or cavitation, which can cause gelling and push out pump seals. Avoid long periods of agitation or circulation before application. Electric sump pumps and other impeller or gear pumps are **not** recommended (high-RPM impellers can separate and gel the copolymers); PTO roller pumps will not work. Sump pumps may be used only for unrestricted transfer of concentrate — switch power on and off, never stop flow with a valve. Pump-up, backpack and small lawn sprayers do not deliver enough volume; garden sprinkle cans work only for very small areas (drill 1/8-inch holes vertically in the diffuser for a fan-like pattern).

Repairs, handling & storage

Pot-hole patching

1. Remove loose aggregate and dirt from the hole, then apply a coat of HS Solution to the pothole and the surrounding 6 to 8 inches.
2. Fill the hole with millings or pot-hole patch material about an inch higher than the surrounding surface.
3. Saturate the patch and again an area 6 to 8 inches larger, to keep air and moisture from entering from the sides.
4. Compact the patch. Light, straight traffic can begin immediately.

Screening millings through 1/2-inch hardware cloth removes larger aggregate and makes it easier to blend the surfaces.

Curbs & drains

HS can form curbs, roll-over speed bumps, water diversion and shaping around drains: mix millings and HS Solution (1 gallon HS to 8 gallons water) into a thick slurry similar to mixing concrete. Use forms as needed and allow to cure like concrete.

Maintenance

HS-treated millings make a very durable, non-tracking, non-eroding surface, but can be damaged by heavy vehicles and snow plows. Repair failed or damaged areas with clean screened millings or cold-patch material and HS, similar to repairing hot-mix asphalt.

Mixing & handling

- Gloves, boots, old shoes and clothes, coveralls and eye protection are recommended.
- Use clean, uncontaminated pumps and tanks. Some tools may be one-time use.
- HS is an adhesive product and will leave a residue inside tanks, pumps and hoses.
- Rinse pumps, hoses and tools immediately after use.
- Once exposed to air, HS becomes very tacky — use mineral spirits, Oil Vanish, Zep Industrial Cleaner or similar products for cleanup. Dried-on HS requires paint stripper or acetone.
- For hands and personal cleanup, common hair conditioner cuts most adhesives without irritation.
- HS is non-toxic and does not cause skin irritation. Keep out of eyes.
- HS will not harm pets or fish, shrubs or grass when diluted with water.

Storage

- Store in a cool, dry area; avoid freezing and direct hot sun.
- Mixed HS Solution stores in an airtight container, similar to latex paint.
- We recommend using Hawk Seale within 3 to 6 months. Maximum shelf life is not known at this time.

Questions about your project?

Visit **hawkseale.com** for tutorials, videos and the full guide library, call **515-517-2288**, or email **info@hawkseale.com**.

DISCLAIMER: While we provide a proven product that has performed as represented for thousands of satisfied customers for over 15+ years, we cannot and do not offer or imply any warranty or guarantee, return, or refund due to variables beyond our control, including the mixing, handling, storage, application process, compaction, weather conditions, and quality or condition of the millings or surfaces applied to.