

RENOVA Mobile Asphalt Plant

SPECIFICATIONS



The RENOVA 4000 Mobile Asphalt Recycler is an American-made asphalt pavement recycling machine designed to combine proper heat and mixing with an effective rejuvenator to convert 4,000 lbs.-per-cycle of reclaimed asphalt into new high-quality recycled asphalt with improved properties providing. The RENOVA 4000 can be both mobile and stationary. The machine can be stationed next to stockpiles of old asphalt millings and Recycled Asphalt Pavement (RAP) to make hot mix, or it can be transported (1,000 lbs. mix max) to the site of a needed repair where it can process chunks of reclaimed asphalt pavement extracted directly from the repair area itself into quality mix. Recycling with the RENOVA allows the operator to avoid purchasing and transporting hot mix from the local asphalt plant. In winter, when asphalt plants are typically closed, the RENOVA eliminates the need to resort to the use of cold patch which is a costly, less durable solution for wintertime asphalt repairs. The RENOVA converts millings or RAP into high-quality hot mix year-round in cold (-20°F) temperatures or wet conditions for half the cost of hot mix from hot plants and, in winter, up to 80% less in cost than cold patch. Repairing permanently with hot mix in winter eliminates the certainty of springtime repairs on work completed in the winter with cold patch. RENOVA is Made in the USA.

Functionality

Size

Processes 2-tons (max. 4,170 lbs.) of RAP, millings or excess asphalt in 12 to 30-minute cycles; up to eight (8) tons of premium-grade quality hot asphalt mix per hour, (assumes 2nd batch run at an ambient temperature >70° F starting with dry, screened millings).

Speed

12- to 30-minute process cycle time (varies by heat of steel in drum) results in lower operating costs and increased production proficiency. Even in coldest climates, recycled hot mix is ready in less than 30 to 35 minutes from a cold initial start-up on first batch.

Mobility

RENOVA, on its dual-axle trailer (weight capacity: 21,000 lbs.), from site to site transports fully loaded with 4,170 lbs. of Reclaimed Asphalt Pavement (RAP) or millings on board, all of which may be processed simultaneously as a batch. RENOVA's batch process discharges all the material at once or as little as is desired for the size repair needed (by hydraulically lowering the mixing drum to dump) and always doing so above 300F.

Can travel at full capacity with RAP on board to be processed at repair site or travels with already-made hot mix contained in its drum. No supporting hot box or truck is needed to transport the hot mix produced. The RENOVA machine, itself, performs multiple services; thus, eliminating other heavy equipment as required by other technologies as with primarily stationary recyclers. The transportability of previously-processed left-over mix and the ability to reheat that mix is of vital concern as the recycler moves from repair to repair. Ideal discharge temperature is 300F with a safe range of 275-325F. RENOVA has the flexibility of reheating left over hot mix in the machine with no risk of overheating by lowering the burner and running it for 3 to 5 minutes to raise the mix temperature back up over 300F.

The only heavy accessory equipment required with a RENOVA at the spot of the needed repair is a small front-end loader or skid steer. No large wheel loaders are needed, nor a hot box. RENOVA is more economical and efficient. Accepts chunks of RAP up to 24-inches wide, 6-inches thick and 72-inches in length.

Dual hydraulic lifts for tilting of the RENOVA drum assembly facilitate multiple options in loading and discharging. Loading with the RENOVA can be done within 2-feet of the ground or at any desired height into the RENOVA hopper which, by hydraulics, lifts and dumps the loaded material directly into the mixing drum. Discharging the processed material is accomplished at the same end by lowering and tilting the drum assembly frame until the desired angle is achieved. The open-end arrangement permits discharging 100% of mix (all at same time) into a frontend loader, skid steer, bobcat, wheel barrel or directly into the repair area.

Safety

RENOVA burner is lowered into place from above and retracted safely without any probability of harm to the operator or others standing nearby. All appropriate safety regimens including adequate cover plates over pinch points and signage warnings of pinch points, hot surfaces and electrical hazards are identified.

Economy

Requires only a two-man crew (plus a flagger, if required), allowing operators to avoid lengthy, inefficient conventional process of pavement repairs - saving time, money, and idle crews. Produces hot mix at the spot of the needed repair for half the price (or better) of hot mix from asphalt plants. Allows crew to patch when asphalt plants are closed or unavailable to

patching contractors when producing asphalt for large jobs. Reduces or eliminates repeated same-pothole re-repair work and expense typically associated with repairs done with cold patch or hot mix material that has cooled down in route from the asphalt plant to the job.

Structure

Robust quality construction from the steel mixing drum, steel flighting and fins, to the high-grade globe gear drive and steel casters on which the drum rotates. All hydraulically powered with no chain drives assures highest power transfer.

Serviceability

Minimal moving parts, American-made parts and components readily available, simplest of controls, ease of maintenance. Cleaning (removing residual deposits inside the drum is a simple matter of loading ¾ to 1" stone, tumbling at 300° F for 20 to 30 minutes wherein all residual material adheres to the stone, leaving the steel inner shell and flighting clean. No tools, chamber entry or cleaners are required and no excessive man-hours required. Requires occasional, simple cleaning by heating bare aggregate ¾-1" in size which, when heated and tumbled in mixing drum, removes residual deposits from inner wall of mixing drum in 20-30 minutes.

Drying Wet Millings

RAP and millings get wet sitting outdoors in stockpiles. When millings get wet, that moisture must be removed before the asphalt renewal process can begin. This drying is accomplished in two ways. One is the dump/reload/reprocess process cited in previous paragraph. If millings are significantly wet, the dump/reload/reprocess method must be repeated. Required time add: 8-10 minutes/load. Equipment required: Frontend loader. The second means of moisture removal is RENOVA's method: Simply keep the mix in the drum and heat until the moisture is removed. Required time add: 2-3 minutes. Equipment required: None. The difference in effort, time and equipment between methods is significant. RENOVA's extended drum-heat time is far simpler to address the common condition of wet millings.

In-Process Mix Quality Checking

Asphalt recycler operators find it advantageous to assess the quality of the product while it is in the process of production, to remove some of the product to view it in process. A 3-stage, closed process recycler prohibits this access. With the RENOVA, an operator merely reverses drum rotation to bring mix toward nose of drum (and 27-inch opening) to remove shovel-full of mix for inspection.

Hot Mix Overheating Avoidance

The RENOVA deploys direct-fire, no-contact heating methodology, leveraging radiative heat, the highest method of source-to-load heat transfer possible. Drum contents do not have direct contact with burner flame. The drum has internal flights to create a flow direction of loaded materials keeping them separate from flame. The drum has internal baffles to create shear, cascade mixing of material. The burner shuts off automatically when an excessive drum shell temperature is sensed indicating a potential for overheating of the asphalt material. Only the

RENOVA has this temperature sensor device with a digital display to cut the burner off if the hot mix gets above 350°F to enable the operator to avoid overheating the mix.

RENOVA deploys direct-fire, no contact heating methodology that achieves highest source-to-load heat transfer possible. Drum contents do not have direct contact with burner flame. The flighting in the mixing drum directs the material being processed toward the rear of the drum and as the material reaches the 9:00, 10:00, 11:00 position of the circumference of the drum (hugging the side of the rotating drum as it is directed to the rear by the flighting) it travels away from the flame which is located at the entrance of the mixing drum until at the 11:00 to 12:00 position, the material cascades down to the bottom of the drum, completely avoiding the flame. Heat transfer is accomplished by radiation of heat energy from the flame. The drum has internal baffles to create shear mixing of material. The old material is properly heated, agitated and vigorously mixed in quantities desired with mix temperature maintained at optimum level throughout the entire process. The burner shuts off automatically if an excessive drum temperature is sensed indicating a potential for overheating. The RENOVA process eliminates waste by using 100% recycled materials.

Accessories

RENOVA has accessory electrical receptacles on board for assorted tasks including optimum night lighting for illumination at the material load, discharge and operating control locations or to illuminate the area being repaired. RENOVA's digital weight indicator on the drum supports, using highly-accurate strain gauge sensing technology, allows the operator to know the exact amount of material that has been placed into the drum and to calculate the proper ratio of additive required to rejuvenate the depleted asphalt cement content contained within the old material being recycled. The competing technologies have no such options.

Specifications

Trailer

1. Mobile RENOVA asphalt recycling machine mounted on a dual-axle (7,000 lbs. each), 4-wheel, diamond-plated steel-floored 18-foot trailer (8.375' wide x 18' long) equipped with electric brakes. Machine and trailer 8.5-foot high. Minimum dual-axle rating: 1.2 x gross vehicle trailer weight. Minimum landing gear capacity: 1.2 x tongue weight. Trailer by Gator Made (Somerset, KY).
2. Trailer and machine with all attachments weigh 13,200 lbs. with trailer Gross Vehicle Weight Rating (GVWR) at 14,000 lbs. in compliance with all USDOT requirements. Includes maintenance-free LED tail lights and adjustable-height properly sized ball-type or pintle hitch with lunette eye hookup – 18" to 42" in height installed at the center front of the recycler. If adjustable ball coupler, easy-connect to vehicles with different ball heights and sizes (2 to 2-1/2"). Mechanical adjustment requires no tools to adjust. Reflective markers and tape applied on sides and rear of trailer.
3. 2" x 6" 1/4" high-strength steel wall box-beam side rails (not channel rails) with all-enclosed wiring in steel tube or conduit.

4. 2" x 6" 1/4" high-strength steel wall box-beam tongue (not channel tongues) extends the full length to the front axle hangers, with 3/8" DOT-approved safety chains and latching hooks.
5. Dual jack stand levelers with safety pins for mounting on side of trailer (not rear) detachable for mounting on fenders with bracket on fenders to do so.
6. Tires are 235R/80/16 10 ply load range E. 8 lug on 6.5 wheel.
7. Trailer is shot blast, then powder-coated and baked for fade and scratch resistance. Machine component is automotive grade primer/paint, standard color: dark green and black, as per RENOVA drawings. Hydraulic and electrical lines are installed after painting.
8. Specially fabricated 3/8" steel mixing drum (approximately 56" diameter x 111' long). Hexangular cone to prevent mix from spilling out rear of drum. Drum has internal flights to create a flow direction of loaded materials to prevent contents from having any direct contact with burner flame to prevent product from burning or scorching. Drum has internal baffles to create shear, cascading mixing of material.
9. Reversible drum rotation via direct (chainless) drive variable speed hydraulic motor driven planetary reducer for 0 to 9 RPM operation with relief valve capable of controlling drum speed at 1/4/9 RPM in either direction. (Best Choice Fluid Power supplies). Nord locks (not lock washers) to secure drum motor to drum.
10. Enclosed drum assembly with removable access panels for inspection of all moving parts. Gears, sprockets, belts, pinch points are all guarded in compliance with 29 CFR Part 1910 OSHA Standard 1910.219.
11. Self-loading hopper, chute, mixing fins fabricated with 1/4" steel.
12. Dual-pivot hopper for knee-level loading (24" above ground) or (when in mid-position) frontend loader loading-drop and lifting of material to slide into drum.
13. Dual hydraulic lifts on hopper and burner assembly with operator controls.
14. Dual hydraulic lifts for tilting of drum assembly (aids in loading and discharging).
15. Industrial-grade single-stage 1.4-million BTU burner (R. W. Beckett, CF1000 RENOVA) with automatic fuel & flame cutoff switch with no external auxiliary fuel pump at the engine, with properly-sized fuel filters and fuel-rated nylon fuel line to burner. Burner is electrically ignited, easily accessed and removable. Burner operates automatically based on operator selected control settings at operator location. Burner positioned to attain maximum heat transfer without burning or scorching of mix. Operating temperature of the mix between 270°-350° F, monitored by handheld digital laser thermometer/continuous infrared temperature readout gun pointed directly at mix (laser thermometer not included in this proposal). Any system fault automatically shuts down the system and illuminates a visual fault indicator. Burner has a separate backup means of operation in the event of a normal control failure with a system fault indication. Burner fuel pump pressure and fuel

line suction pressure is indicated at the operator location. Adjustable time delay relay keeps burner fan in Post Purge Mode to keep firing chamber (with electrodes and photo eye) clean after flame is shut off.

16. Chimney exhaust stack (12" wide) with properly-sized exhaust fan to discharge heat and dust. Temperature sensor in exhaust stack provides relative/indicative temperature of mix with a digital readout of that temperature at the control panel. Potentiometer dial control links to burner cutoff contacts permitting operator to set a point at which burner turns off automatically to avoid overheating of the asphalt material.
17. Single-keyed electric start 26-HP, 3-cylinder, liquid-cooled diesel engine by Kohler or Yanmar. Both engine and burner run on diesel #1 and #2. Includes hour meter & pressure gauge. Engine coolant, oil & battery heaters included. Heaters operate on 110 volts @ 60Hz alternating current. 3-wire, 25' long weatherproof cable adequate for all heaters used simultaneously. Deep cell marine battery (950-amp heavy duty battery) with disconnect to shut off power to unit to avoid power drain during off periods, provides extended run time and lifetime for battery. Engine equipped with emergency shutdown system with fuel cutoff solenoid. Engine air filter is dry-type air cleaner.
18. 91-gallon fuel tank with fuel pump, dual fuel filters, cartridge type, and shut-off valve. Fuel tank level measured by dial-type sensor Moeller Marine Products Sender-mechanical 17.75-inch sensor.
19. Engine driven gear pump generates hydraulic flow. 28-gallon hydraulic oil capacity reservoir with spin-on filter sized for adequate cooling with no dedicated cooler required (sized to maintain proper oil temperature). Hydraulic pump pressure of two circuits is indicated at operator location. Proper-ratio hydraulic pump (Best Choice Fluid Power or equal with latest iteration of pump) generates 5.5kw power and turns 2 tons of mix. Easily-accessible components and hoses (205-foot flexible hydraulic hose).
20. Two (2) external enclosed 8-inch diameter propeller fans, one to introduce 1590 CFM ventilation air onto burner intake and the second to keep motor and transformer post cycle at under 150°F tolerance level using ambient temperature.
21. 120V, 5500-watt generator (naturally aspirated) with electrical outlet to run accessory equipment for associated tasks (120-volt tools; electric saw, jack hammer, lights, etc.). Generator to supply 125/250 volt, 60 hertz power via a 30-amp power cord with a NEMA 10-30 plug, 12 volt ground electrical system. Stationary idler on generator power transfer including 1.5-inch-wide serpentine pulley belt.
22. Vulcan V320 Scale System/weight gauge with sensors using strain gauge sensing technology located on trailer frame to know exact amount of material being processed and proper ratio of rejuvenator.
23. Asphalt recycler is protected by steel guards to withstand a front-end loader bucket impacting the rear components (lights) mounted on the box beam structural rear end.

24. Welding and post heat treatment procedures performed in accordance with American Welding Society Welding Code.
25. Component adjustment and lubrication points easily accessible.
26. All appropriate safety regimens including adequate cover plates over pinch points and signage warnings of pinch points, hot surfaces and electrical hazards.
27. One-year parts and labor warranty for defects in workmanship.