

Stepp OJK Crack Sealer Bidding Specifications

1.0 INTENT

It is the intent of this specification to provide for the purchase of one (1) new and unused STEPP OJK Oil Jacketed Crack Sealing Kettle to be used for the purpose of melting and applying crack sealing material to the road surface.

The following specification is based upon a STEPP OJK-275.

TANK:	<u>YES</u>	<u>NO</u>
Tank to have a capacity of 275 gallons with 5 gallons extra capacity for material expansion.		
Shall have dimensions of 210"x 90"x 90" (LxWxH) and weigh no more than 6000# empty.		
The inner tank shall be constructed of 10 gauge material, with the tank's bottom sloping a minimum of 23 degrees towards a center low point to allow heating of a small amount of material.		
The design shall allow complete removal of the contents and agitation of the material until the tank is empty.		
A minimum 2-1/2" draw-off cock with inside closing feature to eliminate valve freeze-up shall be located near the rear of the machine.		
The tank shall contain an oil jacket constructed of 12 gauge steel and to be insulated with 2" of 1-1/2# hi-temp fiberglass insulation and an outer insulation jacket constructed of 16 gauge steel.		
The tank shall be oil jacketed on all four sides and the bottom of the tank.		
LOADING CHUTE: The insulated, dual safety loading chutes shall be incorporated into the top cover to allow splash free loading of block material into the kettle.		
Loading height shall not exceed 48" measured from the ground.		
Each loading chute shall have opening dimensions of 26"x22".		

AGITATOR SHUTDOWN SWITCH:		
The unit shall be equipped with a proximity sensor that shuts the auger off when the safety loading chute is opened. Ensures safe loading of the kettle.		
LIGHTS:		
Combination stop, turn, and clearance lights with license plate bracket wired in protective loom with 7 pin RV connector. Shall be a 2 light LED system.		
TRAILER:		
Trailer to be A-frame style with axles rated to carry a loaded tank at highway speed. (225/75/R15 LR D Tires)		
Frame constructed of 2"x 6"x 3/16" high strength, rectangular steel tubing reinforced at all stress points with 1/4"x 6"x 15" fish plates. (Open channel shall not be accepted.)		
Suspension shall be of leaf spring type.		
Shall have a one-piece bolt-on shackle.		
Shall have electric brakes with break-away kit to allow for breakaway protection by applying brakes in case of accidental breakaway from towing vehicle.		
Hitch to be 3" ID pintle ring, adjustable from 21" to 34", adjustable screw jack, and 12 gauge heavy duty fenders constructed of bolt-on design and able to support 500 lbs. without damage.		
The electrical system shall be 12 volt DC battery with charging system, and 7RV light plug.		
Turn signals and brake lights shall be sealed beam, LED, grommeted.		
Side markers shall be mounted at the rear and sides of unit.		
A minimum 5000# capacity tongue jack, with swing away feature for road clearance, shall be installed.		
Safety chains shall be grade 40 with attached eye bolts. Eye bolts will be attached to the frame with sleeved bushings.		

All wiring and fuel lines shall be run through the inside frame for protection from outside elements. All wiring shall be soldered and or weather tight connectors.		
HEATING SYSTEM		
HEAT TRANSFER JACKET: The heat transfer oil jacket shall be constructed of 12 gauge material.		
Shall be capable of holding a minimum of 118 gallons of heat transfer oil.		
Shall use ISO VG 68 heat transfer oil with a COC flash point of 498 degrees F and a pour point of -15 degrees F.		
A cold seal expansion tank shall be provided to eliminate moisture condensation and reduce oil oxidation in the heat transfer oil. Shall have a 1-1/2" overflow/vent pipe directed to the ground in the event of an overheat situation.		
The oil jacket shall include a W-shaped flue, completely submerged in oil, making four (4) passes the full length of the bottom of the oil jacket. The flue shall be constructed of 6" diameter x .188 wall tubing designed to last the life of the machine.		
The minimum heat transfer surface area to the heat transfer oil shall be no less than 7375 sq. in.		
Oil jacket shall be insulated with a minimum of 2" of high temperature fiberglass insulation. The outer shell that covers the insulation shall be fabricated from 16 gauge steel.		
FULL FLOW HEAT EXCHANGER COMBUSTION CHAMBER: Shall be engineered and constructed in a configuration that assures the highest efficiency available from the burner based upon the BTU output of the burner.		
Shall use a minimum of 2" of ceramic refractory insulation in the combustion chamber.		
Heat transfer oil shall be heated in a full flow heat exchanger/combustion chamber equipped with a replaceable type 309 stainless steel diffuser/liner then circulated through a coil that		

surrounds the agitator in the tank. The liner shall prevent the internal 1" coil from heat damage. The heated exhaust gases will then flow to the W-shaped flue that is submerged in the oil tank, giving optimal efficiency from the burner system.		
The heat transfer oil shall be circulated by a gear type pump, with 20 GPM minimum output, driven by a hydraulic motor.		
For operator safety, the burner and combustion chamber shall be located in front of the product tank to keep noise and exhaust fumes as far away from the operator as possible.		
The full flow heat exchanger/combustion chamber shall be engineered as a separate component of the machine, and be easily replaceable, thus making the tank last indefinitely.		
The burner shall not fire directly on the oil jacket.		
An integrated combustion chamber and oil jacket will not be acceptable.		
CONTROLS: Shall be equipped with the Stepp AKC Advanced Kettle Control, can-buss PLC control system. It shall monitor and control all burner functions, pumping and agitation controls, kettle interlock safety systems, autoloader controls and operations, auger safety shutdown, and diagnostics for the burner control system.		
The AKC control shall be capable of the following functions: Pump: on/off, adjustable pump speed control, and pump speed indication.		
Auger: on/off and forward/reverse		
Wand and hose heat: on/off		
Heat transfer oil: actual temperature and set temperature		
Material: actual temperature and set temperature		
Hose: actual temperature and set temperature		
Pumping system interlock: shall not allow the operator to start the pump or auger until product and hose have reached 275 degrees F.		

Burner control diagnostics: turns warning light on when component fails.		
Burner lock out with warning: warning light flashes until temperature is reached.		
US/metric conversion: user selectable US or metric temperature controls.		
User adjustable lock out settings.		
Optional features the AKC operates: Exact flow wand control: controls pump speed from wand.		
Autoloader: on/off.		
Autoloader auto/manual: auto mode automatically dispenses a block into the kettle when one is pumped through the wand.		
Pump hour meter: totalizes pump hours with autoloader option.		
Block counter: totalizes the blocks used with autoloader option.		
Material dispensed: totalizes gallons used with autoloader option.		
Strobe light control		
CONTROL OPERATIONS: AKC controls shall operate the automatic spark ignition and shall light the burner with the flip of a switch and include flame-out protection to shut off the fuel supply if the flame is blown out.		
Shall have an easy-to-adjust thermostat with a setting range from 0-550 degrees F.		
Shall have a large, color display for easy monitoring of the product temperature in the tank.		
Once the operator sets the desired temperature, the burner operation and temperature controls shall be fully automated with this system.		

Controls shall be located in a weather proof enclosure. Enclosure shall have a transparent cover so the temperatures can be monitored without the need to open the cover. The operator shall be able to read the product temperature when standing 6 feet from the machine.		
DIESEL HEATING SYSTEM: Shall be equipped with one (1) ADC Beckett forced air diesel burner with an operating output of up to 350,000 BTU and a firing rate of 2.5 GPH.		
The burner shall fire down a single flue constructed of 8" diameter x .188" wall thickness fire tube, and an 8"x.135" wall thickness on return tube to a vertical exhaust stack.		
Burner shall be completely self-contained with automatic ignition and safety shut off circuitry to stop the fuel flow if the flame goes out.		
Shall operate on 13.5 volt DC power without the need for additional adaptors or apparatus. Power shall be supplied by the 12 volt alternator located on the engine.		
Shall operate on #1 or #2 diesel fuel or kerosene, or #1 or #2 heating oil (ASTM D396). Fuel shall be supplied from a 20 gallon fuel tank.		
PUMPING SYSTEM		
ON DEMAND PUMP SAVER PUMPING SYSTEM: Product pump shall be a Viking K124A with a 60 GPM capacity with the actual output variable from 0-8 GPM for greater operator controllability and extended service life. Pump shall be continuous duty, horizontal, and reversible.		
Shall be driven by a reversible hydraulic motor with variable speed, 4-way pressure compensated flow controls with 0-40 RPM operating range. The reversibility feature shall purge the pump of material to facilitate a cold start up.		
A 0-550 degree F dial type thermometer shall be installed to monitor the discharge temperature of the sealant from the product pump.		
Pump shall be submerged in the tank, allowing it to heat with the product, thus eliminating the need to pre-heat the pump.		

<p>Pump shall be removable without the need for maintenance personnel to enter the tank. Shall be designed and mounted in such a way that clearance adjustments can be made from outside the tank without removing the pump. Any leakage from the pump packing shall drain back into the tank.</p>		
<p>PUMP SAVER: Product pump control system shall be standard equipment. The system shall automatically engage and disengage the product pump based upon demand for product at the application wand to eliminate unnecessary pump wear and increase safety for the operator by only pressurizing the hose system when applying material through the wand.</p>		
<p>ENGINE: Shall be a three cylinder, vertical, liquid cooled, four cycle, Kubota model D1105-E4B diesel engine complete with air, fuel, and oil filters, electric starter, alternator, muffler with rain cover, battery and lockable steel battery box, digital engine management system, engine cover, and all necessary controls.</p>		
<p>The engine shall have a rated power of 18.5kW@3000 RPM. The digital engine management Deep Sea Control shall have a glow plug system for cold weather starting, an automatic engine shutdown to prevent engine damage caused by low oil pressure or high engine coolant temperatures. Shall also include an hour meter and volt meter.</p>		
<p>The engine shall have a minimum 24.8 rated HP.</p>		
<p>A minimum 21 gallon fuel tank, equipped with fuel gauge, shall be provided.</p>		
<p>ENGINE ENCLOSURE: Shall be a lockable, weather protector, vandal proof, vented enclosure for the engine. Sound deadening insulation shall quiet the machine to 40% less noise. Enhances overall security and appearance of the machine. Engine enclosure shall have two service doors with gas assist shocks to hold the doors open.</p>		
<p>AGITATOR/AUGER: The agitator shall be auger type, and located in the horizontal position surrounded by a heating coil in the lowest part of the tank.</p>		

<p>The design will eliminate dangerous splashing and entanglement of blocks of material in the agitator. Shall be driven by a hydraulic motor and include a variable speed, 4-way, pressure compensated, flow control allowing rotation in either direction at speeds from 0 to 30 RPM.</p>		
<p>HYDRAULIC SYSTEM: The hydraulic system shall include a Salami tandem pump with priority flow to the heat transfer oil circulation system. The agitator and product pump shall use independent, 4-way, pressure compensated flow controls allowing rotation in either direction at variable speeds. Hydraulic oil filtration shall be a suction strainer located in the reservoir and by a 25 micron "spin-on" type filter in the return line. An oil cooler with a minimum area of 216 sq. in. shall be installed in the hydraulic system in a location that assures continuous forced air flow through the cooler. All hydraulic lines to be a minimum of 5/8" high pressure steel tubing. Hoses are only to be used where required for component flexibility purposes. For extended component life, hydraulic system pressures shall not exceed 1000PSI. Hydraulic reservoir shall have a 21 gallon capacity.</p>		
<p>HEATED HOSE SYSTEM: A 3/4" Teflon with wire braid hose with internal and external stainless steel braided, insulated hose, specially designed for use with heated petroleum products, shall be attached to a 1" i.d. insulated overhead delivery boom.</p>		
<p>The material shall pass through the inside of the boom to the hose. The boom shall swivel on sealed ball bearings and be mounted at a height that shall allow the boom to safely pass over a 6' 2" person.</p>		
<p>The boom shall be mounted on the right rear corner of the machine to allow crack filling operations across two lanes.</p>		
<p>A safety stop shall be installed to prevent the boom from swinging to the left or right traffic lane when the safety stop is engaged.</p>		
<p>The design of the boom shall allow the use of a less expensive, shorter hose length of 12' while maintaining a work area of no less than 21'. Shall also prevent the hose from contacting the ground, eliminating abrasion damage.</p>		
<p>Hose and boom shall be equipped with individual, internal electric heating elements designed to melt the crack sealant from within.</p>		

<p>The heating system shall operate at no more than 28 volts DC to eliminate the risk of hazardous electrical shock. Shall be capable of heating the crack sealant in the hose and boom from ambient temperature (60 degrees F) to application temperature in 30 minutes or less. This system shall eliminate the need for hose heating components and hose flushing procedures.</p>		
<p>The hose and boom heating system shall add no more than 12 oz. to the total weight of the hose.</p>		
<p>The heating elements shall be a separate component and not part of the hose or boom. For economic replacements, the hose and heating components shall be individually replaceable.</p>		
<p>APPLICATION WAND: A 48" x 1/2" i.d. insulated application wand with insulated handles shall be included. The wand shall be trigger controlled to start and stop the flow of sealant. The wand valve shall be located at the application end of the wand to immediately stop the flow of the product without excessive dripping when the valve is shut off.</p>		
<p>The wand shall be equipped with an internal electric heating element designed to melt the crack sealant from within the wand.</p>		
<p>The wand heating system shall operate at no more than 28 volts DC to eliminate the risk of hazardous electrical shock. Shall be capable of heating the crack sealant in the wand from ambient temperature (60 degrees F) to application temperature in less than 30 minutes. This system shall eliminate the need for heating components and flushing procedures.</p>		
<p>The wand heating system shall add no more than 10 oz. to the total weight of the wand. The wand heating system shall be a separate component and not part of the wand or hose. The wand heating components shall be individually replaceable. The wand shall be attached to the hose with a quick-disconnect 360 degree swivel.</p>		
<p>PAINT: Surfaces of the unit will be properly prepared and primed per standard industry practices. Shall have a two (2) part polyurethane paint.</p>		

<p>WARRANTY: Shall be one year on parts, materials, and workmanship. Product pumps and hoses that handle heated materials shall have a 12 month pro-rated warranty. Component parts such as engines, hydraulic components, tires, etc., shall be covered by the component manufacturer's warranty.</p>		
<p>OPTIONAL FEATURES</p>		
<p>AIR COMPRESSOR: Shall be installed on machine to aid the cleaning of debris from the crack. Shall include 50' of hose and cold air lance with hose rack.</p>		
<p>Compressor shall be direct coupled (no belts) to a Kubota V3300 diesel engine. Engine shall be rated at 44.1HP at 2600 RPM. This engine shall replace the standard Kubota diesel engine model D1105 specified above.</p>		
<p>Engine, compressor, and all other components shall be enclosed in a common cabinet with lockable service doors and include noise reduction insulation.</p>		
<p>Compressor shall be a Rotorcomp ECO3-NK compact encapsulated, oil injected rotary screw compressor with positive displacement. Compressor shall produce 100CFM with 100PSI. Compressor package shall include intake valve, oil cooler, high temp shutdown, oil filter, minimum pressure valve, separator head, pressure gauge, and shuttle valve to maintain constant engine.</p>		
<p>AUTOLOADER: Conveyor shall be mounted on top of the machine with one end extending out over the hitch of the kettle, accessible for loading blocks of material from the bed of the towing vehicle. The other end of the conveyor feeds blocks of material into the kettle through a splash proof hatch. The system is designed for automatic operation once loaded. This shall eliminate the need for personnel to be in a dangerous position in the bed of the towing vehicle while it is in motion. Once the conveyor is loaded, it will automatically advance to place additional material into the kettle at a rate equal to that of the machine being dispensed.</p>		
<p>FIRE EXTINGUISHER: 10 lb. ABC dry chemical fire extinguisher.</p>		

