

Wisconsin County Highway Association

Crack Routing and Sealing Best Management Practices

This document and appendix have been developed to serve as a guide to Wisconsin county highway departments when considering performing crack routing and sealing of highway pavement systems. This Best Management Practice (BMP) draft is the product of the Wisconsin County Highway Association LOS Committee's recent effort to create common sense, workable suggestions to county highway maintenance personnel.

The LOS Committee polled all 38 counties involved in rout and seal performance based maintenance contracts in 2014. Twenty-six counties responded with a wealth of detail relating to their experiences and their current staffing and equipment usage practices. This information was reviewed, sorted, and summarized into the matrix presented as our draft BMP.

This matrix should be used as a guideline for county highway maintenance managers when scoping, bidding, and scheduling crack routing and sealing projects. This information will also be useful to county highway commissions when considering staffing level options and future equipment purchases.

Efficiencies and cost savings can be achieved by many departments immediately by learning some simple adjustments to crew size and equipment changes. Long term goals for major improvements to efficiencies may be gained by replacing existing equipment with more efficient equipment options at replacement time. The cleaning and filling procedure sets the pace...no waiting for the routers.

We consider this Draft a work in progress and welcome input from WIDOT as we finalize the first document for distribution to the Counties. It is also anticipated that all BMP's will need to be updated from time to time as technology, materials and methods evolve.

Attachment Number 1, Crack Sealing BMP

		Equipment						
Road Type	Crew Size	*Routers	Trucks	** # of Kettles and Application Rate	***Blower	Crack Size Routed and Filled	Traffic Control	Bid Submission Recommendation
2 Lane	9-11	1-2	One truck with trailer to pull router. One truck per kettle to pull kettle compressor and extra material.	1-2 Each Kettle should have 2000#/hr. melt rate and application rate of 90' per min. (Based on 3/4" x 3/4" routed crack).	Yes	1/8" to 1/2"	Rolling w/flaggers	By Station or in Lbs. of Material?
4 Lane	9-12	2	One truck with trailer to pull router. One truck per kettle to pull kettle compressor and extra material. Additional trucks to provide and move traffic control based on operations.	1-2 Each Kettle should have 2000#/hr. melt rate and application rate of 90' per min. (Based on 3/4" x 3/4" routed crack).	Yes	1/8" to 1/2"	Lane closure	By Station or in Lbs. of Material?

*Number of routers should be based on level of cracking but be adequate so that crack filling crew doesn't have to wait for the routers to get ahead.

** 1-2 Kettles based on county equipment and operations. Counties should strive to have truck with additional material, tar kettle and compressor all in one unit. Unit could include conveyor. (Insert picture here)

*** Any combination of blower (back pack or walk behind blower, hot air lances or compressor to provide a clean dry crack.

**** **Need to determine the method for detack. Need to determine BMP for lance, wand, squeegee or disk applicators.**

Attachment Number 2 – Crack Sealing BMP Appendix

These items are considered additional options that may be incorporated by highway maintenance crews to further improve the routing and sealing service from a time and cost perspective.

A. Hot Air Lance Equipment

The PBM crack routing and sealing specifications require the county to develop a clean, dry routed crack in accordance with Section C.3(2) of the specifications. A hot air lance may be a good option to eliminate any moisture that may be present in and adjacent to the routed and cleaned cracks. Weather and morning dew conditions may determine when crews employ this equipment and when it is not necessary.

B. Combining Equipment

Whenever possible, it is advantageous to combine equipment to minimize the number of trucks and drivers needed to keep a rolling operation as efficient as possible. An example of this would be to add a stationary air compressor to the truck used to pull the melter and carry crack fill material, consequently eliminating a truck and driver normally used to pull a tow behind air compressor.

Backpack blowers may also be an option for eliminating a tow behind compressor, truck, and driver.

C. Sealing Tips and Material Handling Tools

These are an option to consider when purchasing equipment. These options can minimize the amount of extra material, finishing, or squeegee work needed when applying material to standard cracks.

D. Liquid Detackling Process

Applying a liquid detackifier product with a sprayer is a potential time saving option vs. applying rolled tissue over hot sealant to prevent tracking of material.

E. Determine the Number of Routers Needed

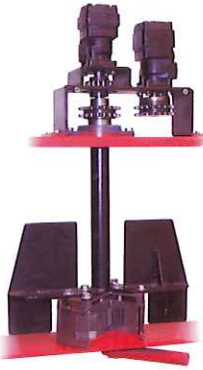
Determining the number of routers needed is really a matter of keeping ahead of the cleaning and crack filling procedures. A highway with minimal crack frequency can be routed with one unit. Conversely a highway with frequent cracking will require two routers to stay ahead of the cleaning and filling procedure.



**THE MOST TECHNOLOGICALLY
ADVANCED MELTER/APPLICATORS
AVAILABLE.**

Longer Pump Life • Efficient and Aggressive Agitation

The patented pump technology of the Crafcro Super Shot melters is what makes the Super Shot the most productive and lowest maintenance melter in the industry. The Crafcro patented pump is mounted inside the sealant tank. Mounting the pump inside eliminates material re-circulation, outside plumbing, and high-pressure lines, while decreasing pump wear. The Super Shot pump will last many times longer than a conventional pump. Internal pumps require no packing which eliminates maintenance and results in more production on the job.



Super Shot 250 with Autoloader



Specifications

	SUPER SHOT 60	SUPER SHOT 125	SUPER SHOT 250
Dimensions	- 110.25" L / 62.00" W / 72.00" H	- 138.25" L / 68" W / 83.25" H (125DC - 152" L / 68" W / 83.25" H)	- 174.00" L / 91.25" W / 81.00" H
Shipping Weight	- 1,500 lbs / 680.4 kg - Actual	- 2,800 lbs / 1,270 kg - Actual (125DC - 4,020 lbs / 1,823 kg - Actual)	- 5,800 lbs / 2,658 kg - Actual
Gross Weight	- 2,000 lbs. / 907.2 kg - Approx.	- 5,200 lbs. / 2,358 kg - Approx. (125DC - 7,000 lbs. / 3,175 kg - Approx.)	- 9,900 lbs. / 4,490 kg - Approx.
Material Capacity	- 60 Gal. / 227 liter	- 132 Gal. / 500 liter	- 250 Gal. / 946 liter
Melt Rate	- 400 lbs/hr	- 1,000 lbs/hr	- 1,700 lbs/hr
Heat Transfer Oil	- 21 Gal / 79 liter	- 34 Gal / 128 liter	- 49 Gal / 185 liter
Tank Construction	- Double Boiler	- Double Boiler	- Double Boiler
Tank Opening	- 12.25" X 15" / 311.15mm X 381mm	- 14" X 18" / 355.6mm X 457.2mm	- 16" X 24" / 406.4 mm X 609.6mm
Loading Height	- 50 in. / 127 cm	- 58.0 in. / 147.3 cm	- 58 in. / 147.3 cm
Heat Input	- 180,000 Btu	- 250,000 Btu	- 290,000 Btu
Diesel Fuel Capacity		- 26 Gal. / 98 Liter (125DC - 32 Gal. / 121 Liter)	- 32 Gal. / 121 Liter
Propane Capacity	- 100 lbs. / 45.3 kg		
Hydraulic Oil Capacity	- 26 Gal. / 98 Liter	- 26 Gal. / 98 Liter (125DC - 32 Gal / 121 Liter)	- 26 Gal. / 98 Liter (250DC - 32 Gal./121 Liters)
Engine Standard	- Kohler Mod. Ch205 17HP @ 3600RPM	- Three Cyl. Isuzu Mod 3CB1 25.4 BHP @ 3,000 RPM	- Three Cyl. Isuzu Mod 3CB1 25.4 BHP @ 3,000 RPM
Engine Option(W/Compressor) NA		- (53 cfm comp.) Three Cyl. Isuzu Mod 3CD1 33 BHP @ 3,000 RPM	- (53 cfm comp.) Three Cyl. Isuzu Mod 3CD1 33 BHP @ 3,000 RPM
		- (70 cfm comp.) Three Cyl. Isuzu Mod. 3CD1TK 41.6 BHP @ 3,000 RPM	- (70 cfm comp.) Three Cyl. Isuzu Mod. 3CD1TK 41.6 BHP @ 3,000 RPM
Axle Capacity	- 2,000 lb. Torsional / 907 kg	- 5,200 lb. Torsional / 2,359 kg (125DC - 3,500 lb. Torsional / 1587 kg)	- 5,200 lb. Torsional / 2,359 kg
Tires	- ST175/80 D-13	- ST225/75R15 (125DC - ST205/75 R14)	- ST225 / 75R15
Air Compressor (Optional) NA		- 53.8 CFM @ 100 PSI / 70CFM @ 100PSI	- 53.8CFM @ 100PSI / 70CFM @ 100PSI
Surface Area-Material Tank	- 2,538 in ² / 16,347 cm ²	- 4,267 in ² / 27,529 cm ²	- 6,632 in ² / 42,787 cm ²
Surface Area-Oil Tank	- 3,335 in ² / 21,516 cm ²	- 5,244 in ² / 33,832 cm ²	- 7,655 in ² / 49,387 cm ²
Ratio of Tank surface Area	- 1.31:1	- 1.22:1	- 1.15:1
Controls	- Standard Super Shot	- Standard Super Shot	- Standard Super shot
Control Location	- Hydraulic Rear, Control Box Curb Side	- Hydraulic Rear, Control Box Curb Side	- Hydraulic Rear, Control Box Curb Side
Hose Style	- Electric	- Electric	- Electric
Wand Style	- Electric	- Electric	- Electric
Hose Compartment	- No	- No	- No
Material Recirculation	- No	- No	- No
Boom	- Dual Pillow Block Bearings	- Dual Pillow Block Bearings	- Dual Pillow Block Bearings
Burner Box	- N/A	- Front Panel Removable	- Front Panel Removable

For bid specifications go to

www.crafcro.com.

+1-800.528.8242

Engineered Tools

Sealing Tips and Material Handling Tools



Super Shot Drip Stopper Use with Crafcro Super Shot sealing tip. Stops sealant drip once wand trigger is released.

- ① - PN# 27114 Tip Adapter
- ② - PN# 50270 Duckbill Valve
- ③ - PN# 27115 Shroud - Tip Adapter



Swivel Applicator

3" Swivel Applicator - PN# 27120
4" Swivel Applicator - PN# 27130

Use with Super Shot Melter & E-Z Pour Melters with or w/o Drip Stopper.



Crafcro Duckbill PN# 50270

Use with Super Shot Melter wands to prevent dripping of material.



Crafcro Sealing Foot / Flush

Used for random asphalt and concrete
PN# 27154 - Sealing tip/ft assembly 1/4" flush
PN# 27155 - Sealing tip/ft assembly 3/8" flush



Crafcro Sealing Foot / Protruded

Use for straight asphalt and concrete joints.
PN# 27159 - Sealing tip/ft assembly 1/4" protruding
PN# 27160 - Sealing tip/ft assembly 3/8" protruding



Crafcro Joint Sealing Tip

Use for straight asphalt and concrete joints.

PN# 27146 - Sealing tip assembly 1/4"
PN# 27147 - Sealing tip assembly 3/8"



Crafcro Round Sealing Tip

Multi-purpose for random cracks and joints. Use with a squeegee for most applications.

PN# 27170 - Sealing tip assembly 3/8"
PN# 27171 - Sealing tip assembly 1/2"



Crafcro Applicator Disk

Used for overbanding, great labor saver.

PN# 27162 - 3" Disk Assembly
PN# 27163 - 4" Disk Assembly
PN# 27164 - 6" Disk Assembly

Crafcro Heavy Duty Squeegee w/Aluminum Handle

PN# 27199

Used for leveling crack sealant and where a sealant over band is recommended.

Crafcro Replacement Blade PN# 27195
4 in. x 18 in. x 3/8 in.

Crafcro Heavy Duty Compact Squeegee

PN# 27245 (Aluminum Handle)
Crafcro Replacement Blade PN# 27241
2 1/2 in. x 17 in. x 3/8 in.
PN# 27245W (Wooden Handle)

Used for leveling crack sealant and where a sealant over band is recommended.

Crafcro Pour Pot with Wheels

PN# 40200

Used to apply a uniform band of sealant to a crack or joint. Wheeled for ease of use. Gravity feed with shut off lever.

Crafcro Hand Held Pour Pot

PN# 40201

For application of thin crack sealant to a joint or crack. Gravity feed with shut off lever.



Crafcro Detack is an economical, biodegradable liquid from Crafcro that eliminates sealant tack when sprayed onto freshly applied hot pour sealant.



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Your local Crafcro Representative:



Engineered Performance Features



QUICK AND EASY START-UP

With the flip of a toggle switch the Super Shot will be ready to operate in less than an hour. Shut down at the end of the day is just as easy.



Webbed Reinforced Welded Frame

HEATED HOSE

The low voltage electric heated hose heats material to application temperature within 45 minutes. The hose has the longest working radius in the industry, a 360° swivel, protective sleeve, and a repairable hose and wand.



Automatic Agitator Shut-Off and Splash Proof Lid

Shut offs are incorporated into the lid, hose, wand, pump, burner, and electrical controls.



Integrated Operator Control System

Controls operate the entire unit and override possible operator error. Integrated control box houses all the gauges, switches, and engine controls.



Optional Compressor

Compressor runs air lance that is used to clean dirt and debris out of cracks, increasing crack sealing efficiency.



Optional Engine Cover

Protects engine from the elements, vandalism, and theft.



Efficient Burner

Burner is positioned safely within the frame providing protection and ample ground clearance. Time saving electric overnight heater option available.



Low Profile

Low center of gravity provides easy loading, yet has ample unobstructed ground clearance for safe towing over the most rugged road conditions.

Engineered Performance Options

Crafcro offers many Engineered Performance Options to increase production, save labor and lower operating costs. The versatility of the Super Shot units allows you to specify options in your time frame, from the initial placement of the order all the way through production. Most Super Shot units have been engineered to accept any option, whether it's an autoloader, compressor, light bar or fire extinguisher. These options will enhance production while increasing safety and security.

Engine covers and battery boxes protect the engine from the elements and adds security. The autoloader increases production, adds safety and decreases operator fatigue. The overnight heater is an on the job must if you want to reduce start up time. The light bar is for added safety to direct traffic and increase driver awareness. No other machine comes as complete or as diversified.



- Engine Cover
- Gravity Feed
- Arrow Board Kit
- Surge Brakes
- Engine w/ Gauges
- Autoloader
- 50 or 70 CFM Compressor
- Custom Paint
- Hitch Selection
- Electric Plug Selection
- Hitch Extension
- Cab Brake Control
- Break-away Battery w/ charger
- Locking Battery Box
- Light Bar
- Overnight Heater
- Fire Extinguisher - 10 or 20 lb
- Tool Box
- Safety Hooks
- Mud Flaps
- Spare Tire Kit
- Strobe Light



LAB Hot Air Lances



High Velocity, High Temperature Hot Air
High Performance Pavement Preparation Equipment

The Hottest Thing On The Road

◆ Be sure you get the facts

We're honored that you are considering our high performance flame free preparation equipment. LAB prides itself on its patented flame free combustion system. Be sure that you do your research when inquiring about other heat lances. Others claim to be "Flame-Free" but proof is the key. Get a demo of each and witness the difference in LAB heat lances from other "so called" heat lances on the market. You'll be glad you did! Don't get burned by look-a-likes.

Additional uses for our heat lances

- Pothole preparation prior to filling
- Dry pavement surfaces prior to line striping
- Removal of thermoplastic and water based paint
- Remove/re-melt excess sealant material from pavements
- Dry concrete surfaces prior to application of coatings
- Reflector casting removal

Plain & Simple...

No Debris – No Moisture



Proper conditions for effective application of crack & joint sealants

LAB
MANUFACTURING

9483 Reading Road, Cincinnati, OH 45215
PH: (513) 577-7200 Fax: (513) 577-7210
Website: www.LABMFG.com
Email: Sales@LABMFG.com

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LAB is a division of BrewPro Inc. Protected under one or more of the following Patents: 3,490,066; 3,926,544; 4,657,503; 4,798,530.

Available Lance Options:

Handle



PN: HAN

Ignition System



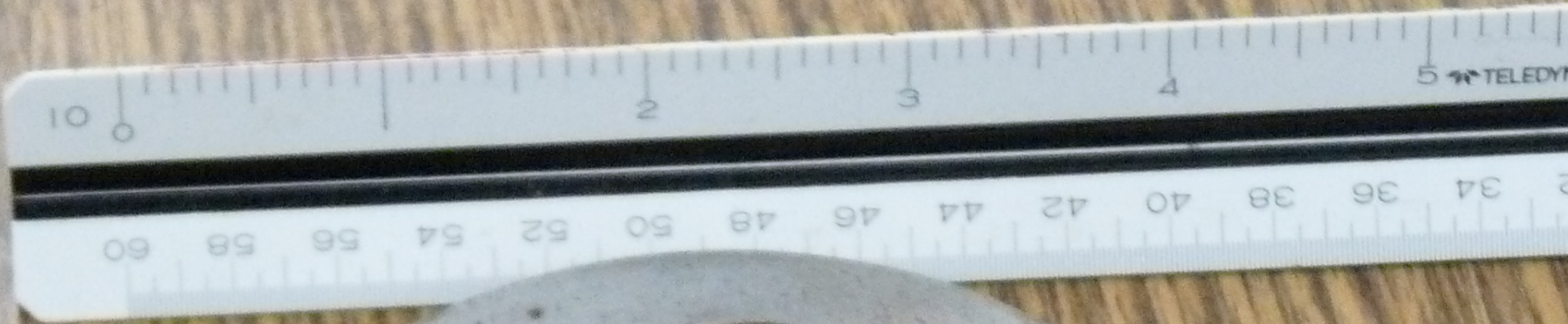
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