



CLEASBY manufacturing company, inc.

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OPERATING INSTRUCTIONS

BOTTOM FIRED KETTLES

WARNING: Read all operation and maintenance instructions before using this equipment. Misuse of this equipment may result in injury or damage. It is the owners responsibility to insure all persons operating this equipment has read all instructions and been properly instructed in its safe use.

USERS RESPONSIBILITY: Caution and warning labels are provided on this equipment. If they become illegible or destroyed it is the owners responsibility to replace with new ones. These are provided on request free of charge from the manufacturer.

This equipment will perform safely and reliably when operated, maintained and repaired in accordance with the instructions in this manual. Equipment must be checked periodically and maintained and repaired as necessary to insure safe and reliable performance. Worn or broken parts should be replaced with genuine factory parts manufactured or sold by Cleasby Mfg. Co. The user of this equipment has sole responsibility for any malfunction which results from improper use, damage, or modification.

WARRANTY: This equipment is warranted to be free from manufacturing defects for a period of 90 Days by Cleasby Mfg. Co. provided that equipment is operated under normal use and regular periodic maintenance and service is performed. Warranty does not apply to expendable parts and is limited for parts that are purchased by Cleasby Mfg. to the period extended to Cleasby Mfg. by the vendor of these parts.

Parts returned to Cleasby Mfg. during the warranty period will be replaced or repaired if found defective by factory inspection. Cleasby Mfg. Co. is not liable for damage caused by accident or misuse, nor is it liable for delays or consequential damages. No other warranties or guarantees are in effect except those stated above.

INTENDED USE: This machine is a bottom, or direct fired heater, for heating various crack filling compounds that are compatible with direct heat. It is the owner/users responsibility to verify material manufacturers specifications with respect to heat methods.



ROOFING & PAVING EQUIPMENT

BEFORE LIGHTING BURNER:

1. Make sure no water is inside the kettle.
2. Make sure all fuel connections are tight, and check for leaks.
3. Check to make sure a suitable fire extinguisher (40BC) is within easy reach.
4. Make certain you or your operator is clad in proper safety attire according to OSHA regulations.
 - A. Hard hat w/face shield.
 - B. Long sleeved shirt buttoned at the wrist.
 - C. Knit wrist gloves.
 - D. Long cuffless pants.
 - E. Safety toed work boots.
5. Make certain area around kettle is clear and absent of debris and flammable materials.
6. Make sure you are using the proper fuel for the kettle.

LIGHTING INSTRUCTIONS 30 GAL. B/F

WARNING: READ OPERATING INSTRUCTIONS BEFORE LIGHTING

WARNING: WEAR PROPER SAFETY ATTIRE

1. CONNECT LP HOSE FROM FUEL TANK TO KETTLE OR BURNER.
2. MAKE SURE ALL CONNECTIONS ARE TIGHT.
3. CHECK PRESSURE REGULATOR AND ALL LINES AND FITTINGS FOR LEAKS.
(SOAPY WATER CAN BE USED FOR THE TEST. WARNING DO NOT USE A FLAME.)
4. MAKE SURE NO WATER IS INSIDE THE KETTLE.
5. MAKE SURE ALL BURNER VALVES ARE OFF.
6. IF THERE ARE NO LEAKS OPEN PILOT VALVE NEXT TO MAIN BURNER VALVE AND LIGHT PILOT AT END OF BURNER.
7. AFTER PILOT IS LIT, SLOWLY OPEN MAIN BURNER VALVE. BURNER WILL LIGHT FROM PILOT FLAME.
8. IF BURNER PILOT SHOULD FAIL TO LIGHT, TURN OFF FUEL SUPPLY AT LP TANK. WAIT FIVE MINUTES THEN REPEAT LIGHTING PROCEDURE.
9. SET REGULATOR ON FUEL TANK TO MAXIMUM OF 10 PSI.
10. TO SHUT DOWN BURNER, TURN OFF VALVE AT LP TANK FIRST. THIS WILL DRAIN THE FUEL FROM THE FUEL LINES. NEXT SHUT OFF BURNER AND PILOT VALVES.

WARNING: MAKE SURE ALL LIDS AND DRAW OFF VALVES ARE LOCKED WHEN THE KETTLE IS SHUT DOWN OR LEFT UNATTENDED.

WARNING: NEVER LEAVE BURNER ON WHEN KETTLE IS UNATTENDED.

BF30/97

WARNING

READ OPERATING INSTRUCTIONS AND WARRANTY ENCLOSED

IMPROPER OPERATION OF THIS EQUIPMENT MAY RESULT IN ACCIDENT OR INJURY. BEFORE OPERATING KETTLE, READ AND UNDERSTAND ALL OPERATING INSTRUCTIONS. ONLY TRAINED PERSONNEL SHOULD BE ALLOWED TO OPERATE THIS EQUIPMENT.

DUE TO THE POSSIBILITY OF FLASHING AND FIRE, NEVER HEAT HIGHER THAN MATERIAL MANUFACTURERS RECOMMENDATION OR 50° BELOW FLASH POINT.

IT IS UNLAWFUL TO OPERATE KETTLE WITHOUT HARD HAT W/FACE SHIELD, LONG SLEEVED SHIRTS, KNIT WRIST GLOVES, LONG PANTS AND OTHER SAFETY EQUIPMENT AS REQUIRED BY OSHA.

WHEN KETTLE IS COLD LIFT ALL VENTS AND COVER LID TO BE SURE THEY WILL OPERATE FREELY. OPEN COVERS ON EXHAUST TUBES BEFORE LIGHTING BURNERS. REMOVE ANY WATER OR MOISTURE FROM VAT BEFORE LIGHTING KETTLE.

ALWAYS TOW KETTLE IN LEVEL POSITION. BE SURE SAFETY CHAINS ARE ATTACHED TO TRUCK WHEN TOWING. TIGHTEN WHEEL MOUNT BOLTS AFTER FIRST 200 MILES AND EVERY 6 MONTHS THEREAFTER. REPACK WHEEL BEARINGS EVERY 12 MONTHS. MAKE SURE NOSE BOOM IS IN TOWING POSITION AND PINNED AND LOCKED TO PREVENT SWINGING.

KETTLE LIDS AND DRAW OFF VALVE SHOULD BE LOCKED WHEN KETTLE IS NOT IN OPERATION. DO NOT LOCK A KETTLE LID WHEN KETTLE IS IN OPERATION.

DO NOT START PUMP UNLESS HOSE AND WAND ARE CONNECTED TO DISCHARGE PIPE. BE CERTAIN DISCHARGE IS IN OFF POSITION.

DO NOT OPEN KETTLE LID WHEN AGITATOR IS ENGAGED.

DO NOT DISCONNECT HOSE OR WAND WHEN PUMP IS RUNNING.

BITUMENS— HEAT, FLASH AND FIRE

Over the last six to nine months, we have been asked a number of questions which basically revolve around the problems of safety in asphalt heating and the test procedures used to measure it.

Perhaps it is best to begin by discussing the fundamental nature of flashbacks (fires, explosions). Asphalt and pitch are organic materials, and as such they are flammable (they will burn). This means that, when heated hot enough, they will enter into a chemical reaction with the oxygen of the air and catch fire, producing a mixture of carbon monoxide, carbon dioxide, and steam.

In order for this to happen spontaneously, two things are necessary:

1. There must be a source for the ignition. This can be an arc, spark, flame or simply a hot spot in the vessel. (With direct-fired heating, such hot spots are almost universally present.)

2. There must be a proper balance between the amount of pitch or asphalt vapor present and the amount of oxygen present, or the mixture will not take fire. If there is not enough vapor, there is nothing to

cause a fire. If there is too much vapor, there is not enough oxygen to make it burn. A similar thing happens in your family car, which depends on having an ignitable mixture in the engine cylinders. If the air/fuel ratio is too lean, the mixture will not ignite. If the mixture is too rich it will also not ignite. Ignition or fire is necessary to run the engine, or to cause a fire in the kettle or tanker.

The mixture which will take fire is generally described as being within the "explosive limits". That is to say, any pitch or asphalt which flashes or burns must have a vapor content of pitch or asphalt which lies between the "lower explosion limit" and the "upper explosion limit" under the conditions of use. While every individual material will differ somewhat, the explosion limits for bituminous vapors can be roughly taken as 1½-6% vapor by volume. That is, an air/vapor mixture having less than 1½% vapor (cool, high boiling) will not burn. Also, a mixture having more than 6% vapor (hot, volatile) will not burn. At any concentration in between, the mixture will flash if it comes in contact with an ignition source—flame, arc, spark or hot spot.

Obviously, as the temperature is

raised, larger and larger quantities of vapor are boiled out, and the vapor content of the air/vapor mixture goes up. The various flash point tests which are used to evaluate the safety factor against flash/fire/explosion are based on this fact. In each case, a sample of relatively cold material is heated to the point at which the quantity of vapor produced becomes sufficiently large to pass the lower explosion limit, **under the conditions of the test**. Thus, no single flash point test can provide you with a specific temperature below which heating is absolutely safe, and above which fires will always occur. The flash point is **only a relative measure** of safe temperatures for heating, since no test condition is necessarily directly related to the kettle or tanker conditions on your particular project so far as air/vapor conditions are concerned.

So far as residual roofing materials are concerned, there are four test methods which are normally in use. The methods differ from one another in the way in which the material is heated, and the way in which the flammable vapor is concentrated.

In every case, the heated material is exposed to a gas flame as an ignition source at regular heating intervals, and the temperature at

which the flame produces ignition is recorded as the flash point. The methods are as follows:

1. Cleveland Open Cup (COC). This is used overwhelmingly to characterize the safety aspects of hot bitumens. In this case, the bitumen is heated in a cup, open to the air, at a final rate of about 10°F./min., and a flame passed over the cup every 5 degrees until the material flashes, at which point it may be assumed that the air/vapor mixture above the cup is explosive.

2. Tagliabue Open Cup (TOC). This is identical with COC above, except that the sample is placed in a liquid bath and indirectly heated, rather than directly over an open flame.

3. Tagliabue Closed Cup (TCC). This method is similar to the TOC method except that the cup has a cover (which tends to concentrate the vapors and arrive at an explosive mixture at a lower temperature) and the flame is inserted into holes in the cover, again at regular temperature intervals.

4. Penskey-Martens Closed Cup (PMCC). This is similar to the TCC method, except that an air bath, rather than a liquid bath, is used to heat the sample and the material is stirred while heating.

Three things are important. First, the last three methods are usually restricted to solvent-based cold systems, while COC is used for hot-mopped materials.

Second, each of the methods measures the temperature at which the lower explosion limit is reached (minimum amount of vapor), but each reaches it under a different test procedure and different test conditions: open flame-closed flame; water bath-air bath; open lid-closed-lid; stirring-no stirring; and the test numbers are true only under those conditions which may or may not correspond to the conditions under which the material is used.

Finally, and most importantly, it is a definite and dangerous mistake to view the Flash Point as an absolute safety number. A 575°F. Flash Point material is not necessarily safe at 570°F., and will not necessarily flash at 580°F. It depends on the actual vapor concentration in real usage (which in turn depends on the

kettle or tanker and the heating procedure) and the presence of an ignition source. A nominal 575°F. flash material can flash in real life anywhere between 540°F. and 610°F. depending on the heating conditions. There are tried and true guidelines, based on not only flash testing but years of experience, which are certainly worth keeping in mind, such as: "Never keep a roofing

asphalt within 25°F. of its flash point for any extended period", which is basically sound because it works. But never regard the flash point as a magic number. All four tests were developed to provide relative information about materials and as such are most valuable. None produces an absolute safety number on which to base your heating practice directly.

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WARNING

READ ALL OPERATION & MAINTENANCE
INSTRUCTIONS BEFORE USING THIS EQUIPMENT

ARTICLE 30. ROOFING OPERATIONS AND EQUIPMENT

NOTE: APPLICABLE PARTS OF THIS ARTICLE SHALL APPLY WHEREVER KETTLES OR POTS WITH CAPACITIES IN EXCESS OF 5 GALLONS ARE USED IN PROVIDING HOT, TAR-LIKE MATERIALS FOR CONSTRUCTION OR MAINTENANCE OPERATIONS.

1725: HANDLING OF BUCKETS AND KETTLES.

- (A) Buckets containing hot tar shall not be carried up ladders.
- (B) Not more than 1 bucket of hot tar shall be carried at 1 time by a worker.
- (C) Buckets used in carrying service shall not be filled so full that the liquid surface is within 4 inches of the top. No other container transporting hot tar shall be filled beyond 75% capacity.
- (D) An attendant shall be within 100 feet of the kettle at all times while the burner flame is on, with no obstacles forming a part of the route to be taken to reach the kettles.
- (E) A clear path, free of debris, shall be maintained around the kettle.
- (F) When moving the kettle on any public street or roadway, it shall be drained at least 5 inches below the splash rail.
- (G) When in use, the LPG fuel cylinder shall be installed so that the heat from the burner will not increase the temperature of the tank more than 10 degrees Fahrenheit after 1 hour of operation of the burner at full capacity.

1726: HANDLING COAL TAR PITCH.

- (A) When coal tar pitch is being handled, suitable skin protection substances shall be readily available at the job site for the use of workmen.
- (B) Suitable respiratory and eye protection shall be readily available to workers handling coal tar pitch in confined spaces where ventilation is inadequate to promptly dissipate the fumes and vapors.
- (C) Suitable washing or cleansing facilities shall be available for the use of exposed skin surfaces of those handling coal tar pitch.

CAUTION

READ ALL OPERATING AND MAINTENANCE INSTRUCTIONS BEFORE OPERATING THIS EQUIPMENT.

ONLY TRAINED PERSONNEL SHOULD BE ALLOWED TO OPERATE ANY PIECE OF EQUIPMENT.

CLEAN KETTLES REGULARLY. DO NOT ALLOW CARBON AND COKE TO BUILD UP INSIDE KETTLE.

KEEP SENSING TUBES FOR THERMOMETER AND THERMOSTAT FREE OF CARBON AND RESIDUE.

CHECK THERMOMETER AND THERMOSTAT ACCURACY EVERY 30 DAYS.

AUTOMATIC CONTROL KETTLES

WHEN USING MANUAL BYPASS VALVE (PART #13 INSIDE CONTROL BOX) OPERATOR MUST WATCH THERMOMETER IN REAR OF KETTLE.

CAUTION: THERMOSTAT DOES NOT CONTROL MATERIAL TEMPERATURE WHEN BYPASS VALVE (PART #13 INSIDE CONTROL BOX) IS OPEN.

KNOW THE FLASH POINT OF THE MATERIAL YOU ARE MELTING AND OPERATE AT LEAST 50° BELOW FLASH POINT.

PROTECT BYSTANDERS BY PLACING BARRIERS OR PYLONS AROUND WORKING AREA OF ASPHALT MELTING KETTLES. ONLY EXPERIENCED AND PROPERLY TRAINED PERSONNEL SHOULD BE WITHIN 20 FEET OF AN ASPHALT MELTING KETTLE.

WHEEL BEARINGS ON KETTLES MUST BE INSPECTED AND PACKED WITH GREASE EVERY 12 MONTHS OR 2000 MILES.

KEEP CAUTION SIGNS AND OPERATING INSTRUCTIONS IN CLEAN READABLE CONDITION.

REPLACEMENT SIGNS SENT ON REQUEST FOR EQUIPMENT OF OUR MANUFACTURE.

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