

# **GSA RUBBERIZED ASPHALT MELTER GUIDELINE FIRE SAFETY ELEMENTS**

## **PURPOSE**

The intent of this guideline is to provide information necessary to minimize the risk of fire when using rubberized asphalt melters on roofs of GSA Federal buildings. The use of rubberized asphalt melters can facilitate the installation of roofs without causing undue fire risk, provided a number of safeguards are in place. This guideline recognizes and provides the necessary precautions that shall be taken to minimize the associated risks of fire to an acceptable level when using a rubberized asphalt melter on a roof of a GSA Federal building.

## **SCOPE**

This guideline is applicable to only rubberized asphalt melters used on roofs of GSA Federal buildings. It also addresses the roles and responsibilities of key personnel and delineates GSA requirements when applying roofing materials using a rubberized asphalt melter.

## **DEFINITIONS**

Rubberized Asphalt Melter (RAM): Equipment used for the heating of rubberized asphalt material. The term applies only if both the material being heated is a mix of asphalt and inert material and if any indirect method of heating is used.

Tar Kettle: Equipment used for the heating of tar, asphalt, pitch, or similar material. The term applies if either the material being heated is 100 percent asphalt or if the heating used is direct heating.

## **BACKGROUND**

The International Fire Code (2009 edition), Section 303.2 states that "Asphalt (tar) kettles and pots shall not be utilized inside or on the roof of a building or structure." However, a RAM is different than a Tar Kettle and poses less of a fire risk for the following reasons:

- In a RAM assembly, the flame is enclosed and separated in the assembly and limits the potential of igniting surrounding combustible materials. In a tar kettle the flame is exposed and constitutes an ignition hazard to surrounding combustible materials.
- A RAM uses indirect heating. This is an arrangement similar to a double-boiler. In this arrangement the material is far less likely to stick to the side of the container (due to more even heating of the container surface) and burn/catch fire. Tar kettles use direct heating. In this arrangement the material is more likely to stick to the side of the container and burn/catch fire.
- The operation/application temperature of the rubberized asphalt material is 350-400°F. The tar kettle material application temperature is 475-550°F.
- Both the rubberized asphalt materials and the tar kettle materials are reported to have a flash point of at or above 500°F. However, when using a RAM, the material is not heated to anywhere near its flash point. With tar kettles, the asphalt is heated to (or very near) its flash point.

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- Rubberized asphalt typically consists of 1/3 asphalt, 1/3 crumb rubber & polymers, and 1/3 inert clay filler. The material used in a tar kettle is typically 100% asphalt.
- At the application temperature, the rubberized asphalt has the consistency of molasses. At the application temperature, 100 percent asphalt has the consistency of water.
- The capacity of the RAM is typically between 100-230 gallons. The capacity of a tar kettle is typically between 400-600 gallons. Therefore, less material is ultimately used.
- The RAM is available with the following fuel sources: diesel, electric or propane. The tar kettles are only available with a propane fuel source. Diesel and electric fuel sources are safer than propane.
- The RAM is manufactured with interlocks which prohibit the operation of the device if the controls have been tampered with.

### **ROLES AND RESPONSIBILITIES**

#### **A. GSA Project Manager**

- The GSA Project Manager shall meet with the GSA Property Manager and Contractor to ensure that he/she is familiar with the roof surface application process and that the specific air intakes into the building that may permit contaminants to enter the building have been properly identified.
- The GSA Project Manager shall notify the GSA Property Manager immediately should any indoor air quality concerns arise during the project regarding the shut-off and re-supply of fresh air into the building. This may involve temporarily shutting down certain air intake equipment and/or temporarily covering air intakes to reduce the risk of smoke and undue odors entering the building. Building air sampling may be required to verify that occupants are not exposed to airborne contaminants generated by the RAM.
- The GSA Project Manager shall contact the local fire department so they are aware that a roof project is under construction and a RAM is being used on the roof.

#### **B. GSA Property Manager**

- The GSA Property Manager shall have a process in place for the safe operations of hot work activity in accordance with the requirements of National Fire Protection Association (NFPA) 51B, *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work*.
- The GSA Property Manager shall issue a "Hot Work Permit" to the Contractor prior to commencement of any work by the Contractor.

#### **C. GSA Fire Protection Engineer & Safety Specialist**

- The GSA Fire Protection Engineer & GSA Safety Specialist shall review and approve the Contractor's site-plan, the procedures for applying the roofing materials using the RAM, MSDS's, and manufacturer's literature regarding the RAM. **Note: No work is to commence without approval from the GSA Fire Protection Engineer & GSA Safety Specialist.**

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- The GSA Safety Specialist shall conduct a pre-construction safety meeting with the Contractor's crew on operational safety guidelines for this project prior to commencement of work.

### **D. Contractor**

- The Contractor shall meet with the GSA Property Manager to discuss all operational procedures with the GSA Property Manager.
- Prior to the commencement of any work, the Contractor shall obtain a "Hot Work Permit" from the GSA Property Manager.
- The Contractor shall develop a site plan showing the intended location of all fire protection and emergency equipment; asphalt application equipment (e.g., the RAM, hoist, etc.); diesel fuel storage, and any other storage (e.g., storage locations of the solid rubberized asphalt material).
- The Contractor shall submit a copy of the site plan, the procedures for applying the roofing materials using the RAM, MSDS's, and manufacturer's literature regarding the RAM to the GSA Regional Fire Protection Engineer and Safety Specialist for approval prior to commencement of work.
- The Contractor shall inspect the roof deck daily for any combustible materials and remove any such materials identified.
- The Contractor shall prime the roof deck prior to placement of the RAM on roof to eliminate presence of vapors that may pose a fire hazard and reduce the potential for passage of such vapors into the building.
- The Contractor (e.g., crew chief) shall be in possession of and have readily available upon request, copies of MSDS's and the RAM manufacturer manuals.
- The Contractor shall notify the GSA Project Manager immediately should any indoor air quality concerns arise during project regarding the shut-off and re-supply of fresh air into the building. This may involve temporarily shutting down certain air intake equipment and/or temporarily covering air intakes to reduce the risk of smoke and undue odors entering the building.
- The Contractor's crew shall all be trained on emergency procedures such as using fire extinguishers and notifying the local fire department, the GSA Project Manager, and the GSA Property Manager of any emergency. Additionally, all of the Contractor's crew shall be familiar with the specific RAM emergency procedures such as closing the lid and turning off the heating element.
- The Contractor shall assign and identify a qualified, experienced individual that has been trained by the manufacturer on the use of the RAM being used. That individual shall be present whenever the RAM is in operation and among other things, be responsible for monitoring the RAM temperature to assure it has cooled down to safe levels following the work days activities.
- The Contractor shall assign fire watch personnel to the roof area following each work day and remain in the area of the RAM for a minimum of 1-hour after the RAM is no longer in use.

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### **REQUIREMENTS**

The use of a RAM on the roof of a GSA Federal building shall be limited to only diesel fired burner and diesel powered RAMs provided the Contractor and RAM meet the following requirements. ***Note: Electric, propane, or gasoline fired burners and electric, propane, or gasoline powered RAMs shall not be used unless approved by the GSA Regional Fire Protection Engineer and additional safeguards implemented.***

- 1) The use of a RAM on the roof of GSA Federal buildings shall be limited to only buildings with concrete roof decks.
- 2) Smoking shall be prohibited at all times on roof deck.
- 3) The RAM shall be hoisted empty onto the roof using hoist points specified by the manufacturer. There shall be no diesel fuel or asphalt product in the equipment during hosting.
- 4) Only one RAM shall be utilized on a roof deck at one time.
- 5) The RAM shall be designed to utilize indirect heating and an enclosed flame.
- 6) The RAM shall be provided with a thermostatic control and an automatic shut off to limit the temperatures to which the asphalt may be heated.
- 7) The RAM shall be operated to limit the heating of the asphalt to a temperature not exceeding 425 degrees F, or 50 degrees F below the flash point of the asphalt, which ever is lower.
- 8) The diesel fuel shall be securely stored on ground level in an approved UL listed or FM approved safety container and stored so that vapors do not pose a fire hazard.
- 9) Diesel fuel containers shall not be stored on roof.
- 10) Diesel fuel shall not be transported through the building interior at any time.
- 11) Diesel fuel shall be hoisted onto the roof in secure lifting containers that will not permit shifting or spilling.
- 12) Once a day, when the RAM is cool, the RAM shall be filled with diesel fuel using the approved containers and fill methods.
- 13) Sand and/or kitty litter shall be available on-site for any diesel fuel spills that may occur.
- 14) All empty diesel fuel containers shall be removed from the roof via the hoist following fueling the RAM.
- 15) The RAM shall be placed in a metal or similar containment system acceptable to the GSA Fire Protection Engineer, capable of holding at least 125% of the rated contents of the RAM.
- 16) The wheels of the RAM shall be chocked to prevent movement.
- 17) The frame of the RAM shall be mechanically supported to prevent tipping.
- 18) The RAM lid shall be kept closed at all times except to add the solid rubberized asphalt material to the RAM.
- 19) Only one day's supply of the solid rubberized asphalt material shall be stored on the roof. The solid rubberized asphalt material shall be stored at least 25 feet from the RAM.
- 20) A minimum of two 4A:40B:C dry chemical fire extinguishers shall be located within 25 feet, on opposite sides of the RAM and be readily accessible.
- 21) A minimum of two additional 4A:40B:C dry chemical fire extinguishers shall be located on the roof deck and readily accessible.
- 22) During initial start-up each day of the RAM, a second handheld thermometer shall be used to verify the RAM's thermometer is working properly.