

BURN INJURY FACTS

-Hot Tar Burns in Roofing-

PREVENTION

July 2006

Report # 86-3-2006

The primary application of hot tar in the roofing industry is in commercial, low slope Built-Up Roofing (BUR) systems. In a BUR system, roofers use cotton or fiberglass mops to apply a base coat of hot liquid tar. Overlapping layers of asphalt-impregnated felt (tar paper) are then rolled



Feeding Tar Kegs into a Kettle

over the hot tar. Then more tar is applied to form a leak-proof roofing system. The tar typically comes from the manufacturer in solid 100 pound cartons or kegs. It is either heated and transported in tanker trucks to the job site in liquefied form, or it is chopped into manageable pieces and fed into heating kettles for melting and use at the job site. The hot tar is then pumped to a hot lugger, which is a holding tank on the roof. From there, it is transferred to buckets or mop carts by the roofers for mopping onto the roof.

Job Site Hazards

- Contact with hot tar can result in serious burn injuries. The kettle operator is at risk of being splashed while feeding chunks or whole kegs into the kettle.
- Slipping or tripping hazards can cause workers to stumble or fall. If the workers are carrying buckets of hot tar, they can be splashed with the hot tar. Freshly applied hot tar is very slick then becomes sticky as it cools. Both conditions are hazardous.
- Carrying buckets of hot tar up or down ladders is very dangerous and potentially exposes the worker and those below to tar burns, in addition to the fall hazards of unsafe ladder use.
- Ignition sources anywhere near the kettle or hot-lugger may result in fire because the vapors created by the high temperatures in these pieces of equipment are flammable. The flash point (the point at which a material will burn with an ignition source) of asphalt is 560°F. To avoid fire or explosion the kettle temperature should always be maintained at least 25°F below the flash point.



Transferring Tar from Hot Lugger to Mop Cart

Consequences of Hot Tar Burns

- When hot tar makes contact with the skin it cools, solidifies and sticks. Because of the very high working temperatures described above, the resulting burns are often severe.
- Eye exposure to hot tar, even a small amount, can be very damaging and an ophthalmologist (eye doctor) should always be consulted.
- Physically, victims may suffer from chronic pain and scarring. Socially, workers may have difficulty re-integrating into the community, and may experience anxiety, depression or other psychological symptoms.
- The economic costs may also be high. Workers' Compensation pays only a portion of lost wages. Some workers may not be able to return to their pre-injury job. Employers bear the costs associated with lost productivity, reduced competitiveness, employee rehiring and retraining as well being subject to increases in Workers' Compensation premiums.

Washington State Workers and Hot Tar Burns

From January 1, 2001 through March 31, 2005, 12 roofers in Washington State received burn injuries while working that were serious enough to require hospital admission. Nine of these workers were burned from hot tar; while three additional workers received burns from electricity.

Just a Few Workers' Stories...



Mopping Hot Tar onto Tar Paper

Worker 1: A roofing apprentice was filling buckets with hot tar and transferring them to other roofers. Tar splashed in his face, causing him to knock over a bucket of hot tar. He then slipped in the tar and fell hands down in it. He was wearing gloves. He sustained partial thickness burns to his wrists, face, and eyes.

Worker 2: A roofer was bringing down what he thought was an empty bucket; however, the bucket was full of hot tar that spilled down his arm. He received 3rd degree burns to his left forearm, that required skin graft surgery.

Worker 3: A worker was carrying two buckets of hot tar when he tripped and fell, landing with his left hand in the tar. The tar splashed onto his wrist and left ear.

Burns from Hot Tar are Preventable

Following are recommendations you can take to reduce worker exposures and prevent burn injuries from hot tar:

Engineering and Substitution Controls

- Use tankers to pump hot tar directly to the roof. This eliminates the need for a kettle and the dangers that are associated with it.
- Instead of hand-held buckets, use mop carts with wheels and push handles to transfer tar to the application point.
- Keep lids closed on kettles, hot luggers, mop carts, buckets, and other accessories used to transport hot tar.
- If hot tar must be brought to the roof in buckets, use a hoist and line that are adequate for the load. Never allow anyone to stand below a bucket that is being hoisted. Never climb a ladder with a bucket of hot tar.
- Prevent unnecessary employee and bystander exposure to hot tar by using barriers to keep people away from tar kettles.



Transferring hot tar with mop carts is safer than using hand-held buckets.

Administrative and Work Practice Controls

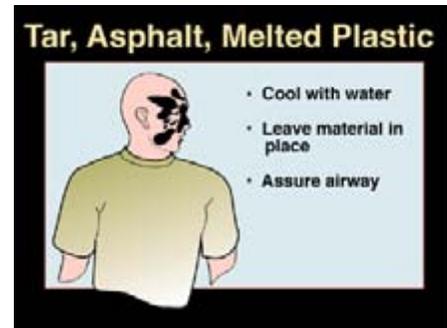
- Always practice good housekeeping. Debris on the roof can cause slips, trips, and falls.
- If manually transferring hot tar in buckets is necessary, ensure the hot tar is at a safe level for hoisting and carrying. Never fill a bucket more than three-fourths full. Carry the bucket on the down slope side of the body. Use buckets with splash guards.
- Twist mops instead of pulling or jerking to un-stick them from buckets and twist buckets to un-stick them from the roof.
- Implement an Accident Prevention Program that includes all necessary training and equipment. To be successful it must have the strong support of management and labor.
- Ensure workers are trained on the hazards of hot tar and safe work practices. Supervisors should encourage, and when necessary, enforce safety rules and best practices.
- Keep fire extinguishers near the kettle and hot lugger. Train workers to use them properly.

Personal Protective Equipment (PPE)

- Ensure workers wear leather or heat-resistant gloves, long pants without cuffs, long sleeved cotton shirts, non-skid shoes and safety glasses with side shields or goggles when working with hot tar. Kettle workers should wear hard hats and full face-shields. Respirators may be necessary.

Initial Response to a Hot Tar Injury and First Aid

- Prepare for emergencies. Train personnel in first aid. Keep a source of cool water available to immerse a burn injury. Have a plan to help an injured worker off the roof.
- Make sure the injury scene is safe before rescuing or administering first aid to an injured worker (e.g., ensure that the injured worker can be accessed without walking on slick tar).
- Do not unnecessarily move an injured person, further injury may result. If the person is unconscious check for an open airway and pulse. If needed, begin rescue breathing or CPR.
- If the injured worker has tar in his/her eyes, flush with cool, clean, low-pressure water or saline. All eye injuries should be evaluated by a physician as soon as possible.
- If tar is on skin, **cool the tar immediately with large amounts of water** to prevent the burn from going deeper.
- Do not use gasoline to remove tar, this may cause a chemical burn, be absorbed systemically and cause organ damage! Removing the tar is not a medical emergency. Tar should only be removed by a medical professional.



Source: University Health Care

For More Information

For Consultation Services:

Division of Occupational Safety and Health Services Consultation Program
Washington State Department of Labor and Industries
www.LNI.wa.gov/Safety/KeepSafe/Assistance/Consultation

- Region 1 – (Northwest Washington) Everett, 425-290-1300
- Region 2 – (King County) Seattle, 206-515-2800
- Region 3 – (Pierce, Kitsap, Clallam, and Jefferson Counties) Tacoma, 253-596-3800
- Region 4 – (Southwest Washington) Olympia, 360-902-5799
- Region 5 – (Central and Southeastern Washington) East Wenatchee, 509-886-6500
- Region 6 – (Eastern Washington) Spokane, 509-324-2600

For More Information on Burn Injuries in Washington State:

Curwick CC. (2006). Hospitalized Work-Related Burns in Washington State. Technical Report 86-2-2006. Safety & Health Assessment & Research for Prevention (SHARP) Program, Washington State Department of Labor and Industries, Olympia, Washington
www.lni.wa.gov/Safety/Research/Files/Burns2006.pdf

Or contact the SHARP Program for a copy of the report: 1-888-66-SHARP

For Information on Asphalt Fume Exposures:

Reducing Roofers' Exposure to Asphalt Fumes, NIOSH Publication No. 2003-107
<http://www.cdc.gov/niosh/docs/2003-107/>

Please consider the above information as you make safety decisions or recommendations for your company or constituency. The information in this narrative is based on preliminary data only and does not represent final determinations regarding the nature of the incident or conclusions regarding the cause of the injury.

Developed by the Safety & Health Assessment & Research for Prevention (SHARP) Program at the Washington State Department of Labor and Industries, supported in part by a cooperative agreement from the National Institute for Occupational Safety and Health (U60 OH008487).