



OSHA Hazard Information Bulletins

Cleaning of Asphalt Truck Hopper with Diesel Fuel.

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- **Information Date:** 19951206
- **Record Type:** Hazard Information Bulletin
- **Subject:** Cleaning of Asphalt Truck Hopper with Diesel Fuel.

December 6, 1995

MEMORANDUM FOR: REGIONAL ADMINISTRATORS

FROM: STEPHEN MALLINGER
Acting Director
Directorate of Technical Support

SUBJECT: **Hazard Information Bulletin(1)** - Cleaning of Asphalt
Truck Hopper with Diesel Fuel

FOOTNOTE(1) The Directorate of Technical Support issues **Hazard Information Bulletins (HIBs)** in accordance with OSHA Instruction CPL 2.65 to provide relevant information regarding unrecognized or misunderstood health hazards, inadequacies of materials, devices, techniques, and engineering safety controls. HIBs are initiated based on information provided by the field staff, studies, reports and concerns expressed by safety and health professionals, employers, and the public. Information is compiled based on a thorough evaluation of available facts, literature and in coordination with appropriate parties.

The Ministry of Transportation of Ontario, Canada has brought to our attention that a truck which is manufactured in the United States for patching asphalt may cause hazardous conditions during the cleaning process. Prior to the use of this type of truck, hot asphalt (about 250 degrees F) was loaded into a dump truck, taken to the worksite, and used for road surface patching until the material cooled to the point when it could no longer be used. It was then discarded.

The vehicle, which is made in California, is capable of keeping the asphalt hot. It has an insulated hopper/conveyor unit, with both an indirect propane and an electric heater in the insulation layer of the double wall unit. The unit is top loaded at an asphalt plant and unloaded from a conveyor belt on the bottom interior of the hopper. The hopper is usually precoated with diesel fuel at the asphalt plant prior to loading. The hose between the metal spray wand and the hopper pump is not made of conductive material. Cleaning of the unit usually takes place while the hopper is not

yet fully cooled, so the residual asphalt is more easily removed.

An explosion occurred during the process of cleaning the hopper. The operator was standing at the rear of the vehicle, wearing rubber boots, holding the spray wand inside the rear of the hopper through the conveyor chute. The top doors of the hopper through which asphalt is loaded were closed. It is believed that a static electrical charge had accumulated on the spray wand due to the flow of the diesel. The charge resulted in a spark jumping from the wand to the metal hopper, as the wand came close to the side wall, while atomized diesel was being sprayed from the nozzle. The hopper interior was above the flashpoint (105 degrees F) of diesel fuel. This led to the ignition and explosion of the diesel vapors contained inside the hopper. The explosion force was directed out of the rear conveyor chute opening, since the top doors were closed. The operator was blown backwards, suffered 2nd degree burns to 45% of his body and 3rd degree burns to his hands and arms.

It should be noted that any source of ignition, not just a static electrical spark, could also have caused this explosion. However, the presence of such sources could not be verified.

As a result of this incident, the Ministry of Transportation of Ontario has recommended that the asphalt trucks be immediately taken out of service until completion of the investigation and implemented the following recommendations:

- * Standard operating procedures for operation and cleaning of the asphalt trucks must be established;
- * A mechanism for mechanically grounding the truck and hopper to earth ground prior to cleaning or spraying must be provided;
- * The worker must consciously make contact with the truck immediately prior to spraying, to ensure no charge is on his or her body;
- * The asphalt patcher unit must be sprayed when the unit is cold and only for precoating;
- * The spray wand and supply hose must be bonded and grounded;
- * Asphalt residues must be removed with a long handled mechanical tool to minimize the diesel fuel needed for cleaning once the hopper is cool;
- * The interior of the hopper must be allowed to cool to below 86 degrees F (30 degrees C) prior to spraying diesel;
- * A non-atomizing nozzle to spray the interior of the hopper and tools must be used;
- * The top loading doors must be opened during diesel spraying, and the operator must spray the diesel into the top (larger) hopper opening;
- * A hopper internal temperature gauge must be installed for operator information;
- * Explosion proof switch must be installed to replace current diesel pump/propane burner power switch at rear of the unit, and wired so that only one unit can function at any time; and
- * "No Smoking Within 10 feet" signs must be posted on all four sides of the tank.

Workers involved in the cleaning of the hopper also must use appropriate personal protective equipment and receive training on this procedure.

The Ministry of Transportation of Ontario also recommended that a safer substitute material for the diesel fuel, such as a water soluble product to be sprayed on the interior surface of the hopper to minimize the quantity of material that clings to the walls, be reviewed and considered.

Compliance and consultation personnel should be aware that such asphalt trucks are in use and that improper cleaning procedure can result in explosion and has caused injuries to workers. Additionally, they should be aware of the recommended cleaning procedures to control this hazard.

Please distribute this bulletin to all Area Offices, State Plan States, Consultation Projects and appropriate local labor and industry associations. Copies of this HIB may be used for outreach purposes.

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