



Safety Alert

From the International Association of Drilling Contractors

ALERT 03 – 10 (REVISED)

DECANTING SYNTHETIC BASED MUD CAN RESULT IN A FLASH FIRE

WHAT HAPPENED:

The purpose of this alert is to remind everyone of a frequently overlooked hazard involving Synthetic Based Mud (SBM) additives. SBM is typically shipped to rig locations in tote tanks. Once on location, it is usually gravity fed to mud pits through flexible hoses. Synthetic Based Mud additives with a flash point of 73F (23C) meets the standard of a **Class 1C flammable liquid**. (Check the SBM additive MSDS sheet for flammability.) Decanting SBM additives with a low flash point without bonding and or grounding can result in an explosion.

WHAT CAUSED IT:

Among the many variables that can determine when and where a liquid transfer explosion and fire takes place are the following: the temperature of the liquid (which influences vapor quantity); the air temperature; the flash point of the liquid; the upper and lower explosive limits of the material being transferred (there may be too much or too little vapor to explode when a spark occurs); the relative humidity at the time of the transfer (which has a bearing on static buildup); the clothing worn by the worker (wool, for example, can generate more static than cotton); the type of containers used; and whether or not the source container has built up a charge before decanting begins. Plastic containers can accumulate a significant static electrical charge, but the charge cannot disperse uniformly throughout the material. Because of this bonding and grounding are not effective on non-conducting containers.

Electrical charges can build up in flammable liquids when the liquids flow through piping systems or when they are agitated in their storage containers as a result of mechanical movement or splashing. The proper bonding and grounding of the piping system is often enough to control this static buildup. However, if rapid flow rates are used to transfer the liquid into a storage tank, high electrical potentials can occur on the surface of the liquid in the tank. The rate of accumulation of static charge may be much greater than the liquid's ability to transfer it to the grounded metal storage vessel.

CORRECTIVE ACTIONS:

Bonding can be done to eliminate the difference in electrical potential between two or more objects.

- The size of the bonding wire is usually based on mechanical strength rather than on current-carrying capacity. The maximum resistance of the grounding conductor should be less than one megohm to ensure the dissipation of static electricity.
- The attachment point on both objects must be solid and secure and should be made on a bare metal surface.
- Using a pressure clamping device (screw-on or spring-loaded) is a good way to ensure a positive connection.
- The connection must be made *prior* to beginning the transfer of material between the containers. If the bonding is done after the transfer, the static charge buildup could result in a spark as the bond wire is connected to one of the containers.

Grounding

Grounding an object serves a different purpose than bonding. Bonding eliminates the difference in potential between containers that are bonded together, but it will not eliminate the potential difference between an object and the ground. To ensure that a static charge will not create a spark as a result of this difference, a conductive path must be provided to the earth. A proper ground will provide a means for continuously discharging a charged, conductive body to the earth. It is important that the grounding system be checked to ensure that there is continuity and proper resistance.

The Corrective Actions stated in this alert are one company's attempts to address the incident, and do not necessarily reflect the position of IADC or the IADC HSE Committee.