

Earthing requirements for loading and unloading bulk trucks

Loading

During loading silo trucks or Bag in Box containers, static charges are generated onto the product due to friction during the long chute.

In case of silo trucks, the charges can flow away easily by proper earthing of the truck but for Bag in Box containers, the plastic liner, which is made of electrically non conductive material, will cause the electrostatic charges to remain within the liner.

Polyethylene and polypropylene in **granular form** do not represent any risk of dust explosion.

If the static charges generated during loading can not flow away, the stored energy may rise up to several thousands of volts but sparks generated when a person touches the product (e.g.; to take a sample) have very low energy and therefore do not constitute any hazard apart from an 'unpleasant' feeling.

In case of **powder** loading there is a potential risk of dust explosion which depends very much on the particle size, the specific resistance, the minimum ignition energy, the air humidity etc...

The zones in which powders are handled should be ATEX classified and therefore adequate measures need to be taken to avoid ignition of dust clouds. Earthing of all the equipment including the truck is therefore a requirement. As mentioned above, earthing of Bag in Box containers has little value but should still be done. Additional measures could be taken like keeping the product under inert atmosphere. Also, operators/ drivers should not be standing near the manholes as an ignition in the truck will very likely cause a flash fire which could hurt a person nearby.

Unloading

When discharging silo trucks or Bag In Box containers, the charges accumulated on the resin will be much higher because of the friction with the hoses and (long) lines and the high unloading speed . Proper earthing of all metal parts in the transport system; lines, silo's, rotary valves etc... is therefore obligatory both for granules and powder.

Summary

For loading silo trucks or Bag In Box containers:

- 1: With granules which do not contain flammable vapours, earthing **is NOT** a requirement.
- 2: With granules which may contain flammable vapours earthing **IS** a requirement
- 3: With powders, earthing **IS** a requirement

For unloading granules and powders from silo trucks or Bag In Box containers:

earthing **IS** a requirement.

Drivers/operators must be aware of the risk of electrostatic discharges when taking samples after loading a truck.

It is recommended to take a sample with a device which is made of a non-conductive material.

Earthing specs

- Earth lead to connect the vehicles: 16 mm² tri-rated
- All metal parts of the loading/ unloading system must be bonded.
- Grounding connections (bridges) on flanges
- Resistance to earth of the whole system: Max 10 Ohms and yearly test.
- For powders, the system should preferably be fitted with an earth proving device (red/ green light)
- Install earthing plates with pictograms both on the truck and at the unloading place.

Pictures



Earthing cable and earthing pictogram



Earth proving device