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## THE GROUNDING DURING LOADING / UNLOADING OPERATIONS OF TRUCKS

What justifies the high cost of grounding clamp that, in the common thought, is nothing more than a simple cable that connects a vehicle to a earth plate? In this article, we will explain its operation and the reason its cost.

First of all, it's necessary to analyze what a grounding clamp is and why it's essential in an area where loading/unloading operation of materials that can cause an explosive atmosphere, such as gasoline, solvents or flammable dust.

It's well-known that sparks caused by static electricity are one of the main factors which may trigger an explosive atmosphere.

We also know that a vehicle that travels on rubber wheels through the air is charged with particles of static electricity that can be discharged to ground through various ways.

We have all experienced the unpleasant "shock" that we can take touching some metal once got out of our car. This is caused by the discharge of static electricity from our body to the ground.

Therefore, think about what could happen when a valve is opened to drain the gasoline from the tank truck to the underground tank: two bodies with a huge potential difference that could cause a spark in the most dangerous moment, which is when the gas is mixed with air generating explosive vapors.

For this reason, it's necessary to "discharge" the energy accumulated by truck during the race before starting to transfer the potentially explosive material from the truck to the tank or vice versa.

At this point, you could argue that to achieve this goal, it's sufficient to use any metal clamp attached to a copper conductor, connected to an earth plate. This is true, but what would happen when the clamp, with its potential, approaches the truck with a different potential? Inevitably, when the two metals are neighbors and are about to touch, the potential difference would cause an arc with an energy absolutely sufficient to ignite an explosive atmosphere.

When the clamp is closed, the connection will be ensured by the thrust generated by two springs that guarantee the perfect adhesion of the pin (made from tips that allow a secure grip) that, in the rear, generates the contact with the grounding cable. This contact, as we have seen, occurs within a small explosion-proof housing that prevents leakage of the spark, and consequently, avoids the trigger of any surrounding explosive atmosphere.

In theory, the grounding of a truck should occur in the absence of an explosive atmosphere, which is when it approached the charging door (closed) and shut off the engine.

But in the interests of safety should be taken into strong consideration the human factor and the rush that now affects every job. Therefore, you should avoid that the contact between the clamp and the frame of the vehicle generate a spark.

## TECHNICAL NEWS



To be sure to be safe.

This is possible through a specially designed system which represents the heart of the grounding clamp. The grounding clamp is composed of two metal jaws in which is positioned a metal pin that slides inside a cylinder of insulating material which enters a small explosion-proof room in which the contact takes place. In practice, when the clamp opens and it's in contact with the frame of tank, only a very small metallic mass comes into contact with the sheet, thus avoiding the possibility of creating sparks.

When the clamp is closed, the socket will be ensured by the thrust generated by two springs that ensure the perfect adhesion of the pin (made from tips that promote a secure grip) that, in the rear, it goes to generate the contact with the cable grounding. This contact, as we have seen, occurs within a small explosion-proof housing that prevents leakage of the spark, and consequently, avoids that generate a trigger of any surrounding explosive atmosphere.

The grounding clamp can be directly connected to the ground plate, but often is connected to an electronic grounding equipment, such as the GRD 4200 of Cortem Group.

The electronic GRD-4200 ensures the grounding of the tanker during loading and unloading of flammable liquids in areas with risk of explosion. The operation is based on the relief of the resistive parameter which ensures the grounding and the control of the loading and unloading pump.

The equipment is made of aluminum alloy with low copper content and stainless steel screws. It's complete with a clamp and connecting cable of 8 meters. Have a look at the catalog.