

Operators receive shocks from static electricity in many areas of industry. The shock is rarely dangerous, but is unpleasant and in most cases is avoidable. The energy in the shock can be from the product, or it can be from the operator's body.

## 1) Shocks from the Product

This occurs when the operator's hand or body concentrates the electric field until it reaches its breakdown level and "zaps" to the operator. The energy in the discharge can be high, giving a painful shock.

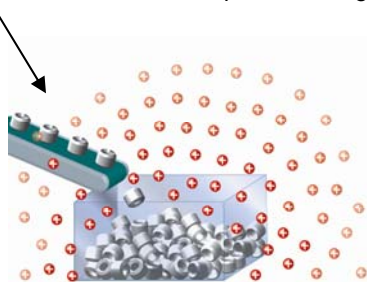
Film winders and containers full of plastic parts are typical cases:

The electric field around reel can extend more than 1m.



The operator's fingers concentrate the electric field until it reaches its breakdown level (3MV/m) and forms a spark discharge.

The same happens with a container full of mouldings or plastic granules. There can be a large electric field around the container which can be concentrated to make a spark discharge.



## Solutions

There are some measures which the engineer should take to reduce the risk of shocks from the product. These include making sure that all metal or conductive parts in the electric field are earthed. This can include metal rims on plastic containers etc.

Unearthed metal parts (or floating conductors) are particularly dangerous in hazardous areas as the charge is mobile and can form a spark easily. The ATEX regulations give comprehensive instructions on earthing in these areas.

Earthing does not play an important part with non-conductive materials because the charge will not move - so ionised air is used to neutralise the charge.

Fraser Ionstorm equipment or Ionised Air Blowers can neutralise the charge in the reel of film or the container of mouldings shown opposite. A large application is shown below.



Ionstorm Static Eliminator Bar

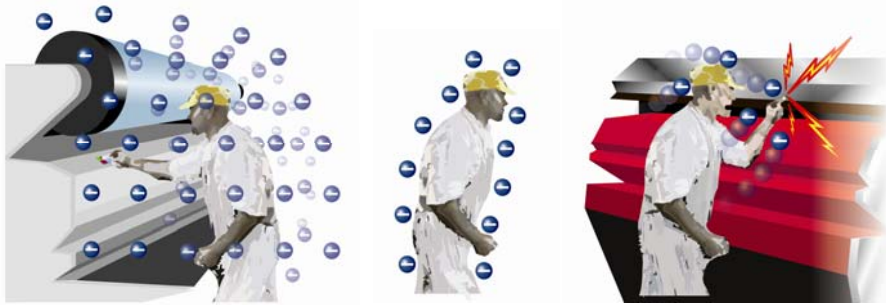
A large hopper of plastic bottles was giving shocks to operators at a distance of up to 1m.

The installation of a Fraser Ionstorm Bar at the top of the hopper neutralised the charge in the bottles and stopped the shocks.

## Shocks from Induced Charge in the Operator's Body

This occurs when the operator is handling plastic parts or is working in the electric field around a large static charge.

In both cases the charge builds-up in the body. When the operator touches a metal part of the machine the charge zaps to earth giving a shock.



When walking in the electric field around the reel, the operator's body becomes charged by induction. The charge cannot escape to earth because of insulative shoes. When the operator touches a metal part of the machine, the charge zaps to earth giving a shock.

This happens in many areas:

- Handling shrink wrapped or other plastic products,
- Injection mouldings - handling, cleaning, trimming etc
- Film production and converting
- Packaging applications using film

## Options

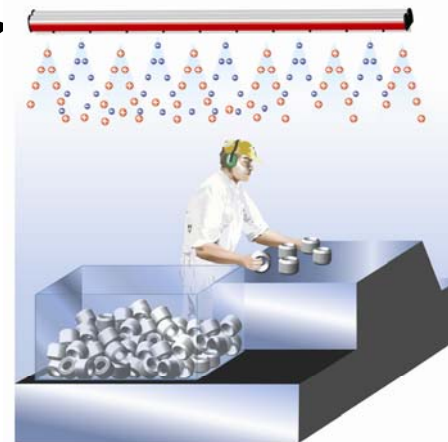
Wearing anti-static shoes can help drain the charge from the operator's body, provided that the floor is not insulative. The operator can also use "touch pads" to reduce body charge levels. This involves regularly touching a semi-conductor, such as a wooden panel, to allow the charge to go slowly to earth without "zapping".

But the most common solution is to use ionised air to neutralise the charge in the product.

Fraser offers many different products to do this.

A popular solution uses long range Ionstorm Static Eliminators to produce an ionised air shower above the area where the operators are working. This neutralises the products being handled and ensures that the charge never builds up in the operator's body.

Ionstorm Bar showering the whole area in ionised air to neutralise the charge in the person and in the parts.



Ionstorm Static Eliminators