

Digital printing is susceptible to static charge in many ways, both in graphic colour work and document printing. These notes concentrate on the graphics side of the market. The two most common static problems here are:

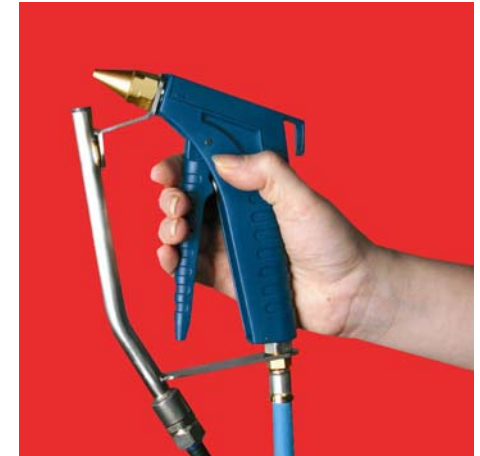
**Dust Contamination  
Printing Quality**

- mainly on rigid plastic substrates, especially when the protective film is removed.
- image distortion and shading on non-image areas when using UV inks.

Removing the protective film from a plastic sheet can generate a charge in excess of 50,000V. This can attract airborne dust from over 1 metre away. The resulting contamination of the product can be very expensive.

The most versatile and economic solution is the 4100 Ionised Airgun which not only removes the dust but also kills the charge, preventing re-attraction of the dust.

It is important that this operation is performed correctly. If the sheet is large, the operator naturally lies it on a table, pulls away the backing strip and then cleans it with an Ionised Airgun. This will have only a *limited effect* in neutralising the charge. For best results the sheet should not be lying on the bench. When the sheet is on the bench the charge couples with it and is not available to be neutralised. If the sheet is not touching another part the charge is available to be neutralised. This is important and is shown in the sketch on Graphic Digital Printing sheet 2



There are alternatives to using a 4100 Ionised Airgun, especially where the process is automated. Options include:

- Ionised Air Nozzles and Airknives to clean and neutralise,
- Or our Ionstorm long range static eliminators to neutralise the charge.

The photo shows an Ionstorm Bar neutralising the charge after the film has been pulled off the sheet on a Durst printer.

Fraser also supplies hand-held antistatic cleaning brushes models 914 and 928.

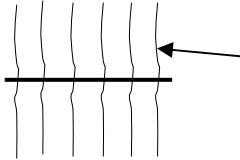
Ionstorm Bar



# SOLUTIONS TO STATIC PROBLEMS

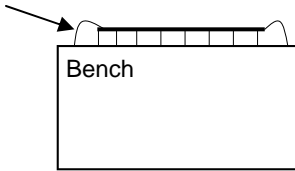
When a charged sheet is in free air the electric field radiates in all directions and is available to be neutralised

Electric field lines



Pulling off the protective film generates a huge static charge which can attract dust from over 1m away

When the sheet is flat on a bench the electric field couples with the bench and is not available to be measured or neutralised.



**The wrong way.**

With the sheet lying flat on the bench the 4100 Ionised Airgun is not being allowed to do its job efficiently because the charge in the sheet is Coupled with the bench

With very large sheets it is difficult to hold them in free air, but dramatic improvements will be seen if the customer can hold the sheet as shown here, or put it on a vertical jig for cleaning with the Gun

Bench



Sheet tilted to break the coupling Of the electric field.

**The right way.**

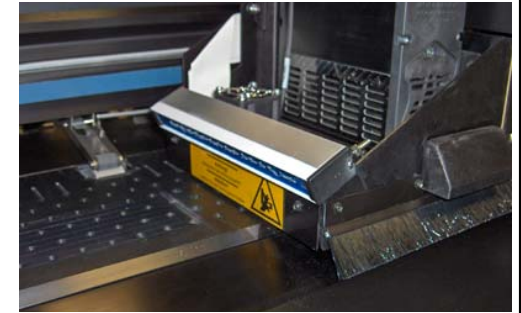
For effective cleaning and neutralisation Hold the sheet in free air by tilting it on the bench or holding it in a vertical jig. This is difficult with very large sheets but the results will be worth the extra effort.

## Printing Quality Problems

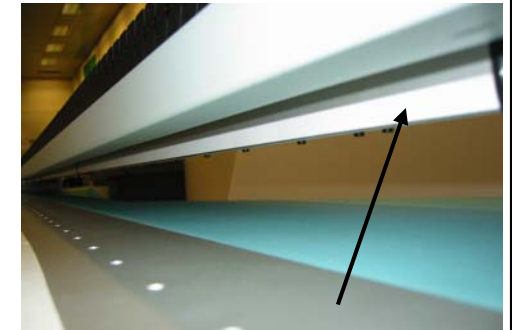
The electric field from the static charge can distort the imaging process causing various quality problems.

There are 3 ways of solving this:

- 1) Use two 1250-S Static Eliminators, one on each side of the printing head, as shown in the photo. The Bars should be angled 20-45° from the vertical for maximum effectiveness. The Power Unit can be mounted on the Head (it weighs 2kg) or longer cable can be specified on the Bars for routing along the caterpillar track.
- 2) One Long 1250-S Bar can be positioned beneath the gantry on some designs of machine to cover the whole width of the printing area. The Power Unit can be mounted on the side of the machine.
- 3) One or two Ionstorm bars can be positioned above the bed to shower the whole area with ionised air. This neutralises the static charge without any mounting of equipment on the printer.



1250-S Bar on the Print



1250-S Bar below the gantry.



One / two Ionstorm Bars above the bed