

# packaging



## **INDUSTRY APPLICATION GUIDE**

**Packaging  
Industry**  
Static Solutions to  
Improve Production  
and Profitability



## Meech International

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More than 6000 customers worldwide have benefited from the expertise and product-based solutions provided by Meech International. With an unparalleled knowledge of the effects of static in manufacturing processes, the company has developed an impressive portfolio of static control and cleaning systems. These are designed to enable customers to improve their own production processes and hence profitability.

Throughout the world, businesses benefit from Meech expertise. A truly international company, Meech has its headquarters in the UK and additional operations in the USA, Belgium, Hungary and China, supported by a worldwide distribution network covering over 50 countries.

Meech has built its present success on offering its customers outstanding levels of:

- Applications Knowledge
- Flexibility of Approach
- Innovation
- Speed of Response

...and these are the qualities that will continue to underpin future growth.

## Meech Technology

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For further information, please refer to the Meech web site ([www.meech.com](http://www.meech.com)) or the "Static Electricity: Causes and Cures" booklet.

### Static Elimination

Meech provides solutions based on both AC and Pulsed DC technologies for optimum static control. AC technology takes normal mains voltage and boosts it (typically to 7kV) through a special transformer. This high voltage is carried to an array of emitter pins to create a high energy "corona". A very large number of positive and negative ions are generated following the AC cycle. A statically charged surface of either polarity passing close to this ion cloud will be quickly neutralised.

Meech special Pulsed DC technology transforms mains voltage into positive and negative outputs. Dedicated emitters produce alternating clouds of positive and negative ions. Frequency and ion balance (the relative proportion of positive and negative ions) can be adjusted to optimise long distance neutralisation for specific materials and process conditions.

### Static Generation

Generating a controlled static charge on a non-conductive material will allow temporary adhesion between two or more surfaces of opposite polarity. A high DC voltage of up to 50kV (positive or negative, depending on the application) is carried to a special array of emitter pins to create a "corona". With the emitter pins positioned in close proximity to a grounded surface, material passing into the field will be charged and bonded to adjacent surfaces.

### Cleaning

Dust contamination presents major problems in a wide range of manufacturing industries. The removal of dust can be substantially improved by the use of static control systems. Meech "JetStream" technology combines a specialist knowledge of static control and air flow to provide a unique design of manifold with an integrated ionisation system. Driven by energy efficient fans, the JetStream produces a high velocity blade of ionised air capable of removing contaminants down to 1 micron.

## Static Control Problems in the Packaging Industry

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Problems with static electricity in the packaging industries are numerous. Processes where static can be an issue include blister packaging, bottle conveying and cleaning, labelling, form fill seal machines, bag manufacturing, wrapping machinery as well as clean room and medical packaging and assembly.

The primary problems resulting from high levels of static charge are:

- Process Control & Quality Problems
- Dust Attraction & Contamination
- Operator Shocks

### **Process Control & Quality Problems**

The cost penalties associated with uncontrolled static charge in manufacturing processes are many and varied. Static can force companies to run their machines at much slower speeds than might otherwise be the case. This is because the static charge can be a direct cause of production problems such as particulates or product adhering to the sides of packaging, film wrapping around rollers or film misbehaving during the wrapping process.

Static charge can also cause problems when conveying, palletising or labelling product. The charge will cause the packaging material to stick to itself or to the machine rollers and frame, resulting in mis-registering.

### **Dust Attraction & Contamination**

The attraction of airborne contaminants as a result of static charge on a substrate is becoming an increasing issue as the quality standards of companies continue to be raised.

Dust and particulates attracted by the high static charge on the part can result in high and expensive scrap rates. This is especially the case if the material is to be used in the medical or food packaging industries.

A recent stipulation of food packaging companies is that static control equipment cannot use air to assist long range ionisation, for the fear of blowing additional contaminants on to the products to be neutralised.

### **Operator Shocks**

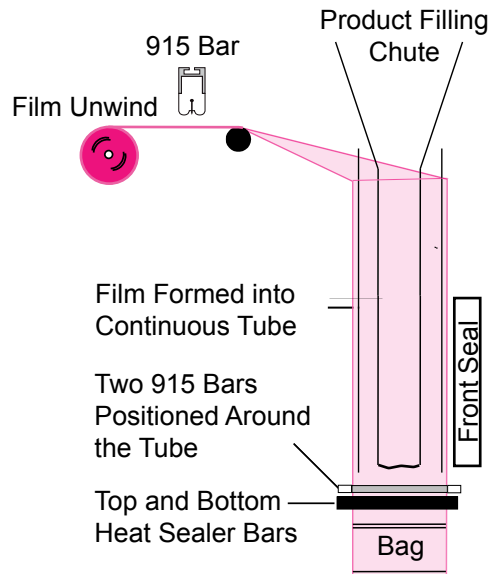
This is becoming increasingly significant as companies strive to improve health and safety standards.

While static-related shocks can be painful, the effects are usually quite safe and short lived. However, the cost implications lie in the “recoil” reaction that is associated with the initial shock. When an operator receives a shock, there can be a moment of disorientation, bringing with it subsequent hazards such as collision with other operators and/or machinery.

Operator shocks are typically the result of an accumulated charge or “battery effect” occurring during the collection of parts in a bin or assembly area, or during the winding of film.

## Applications

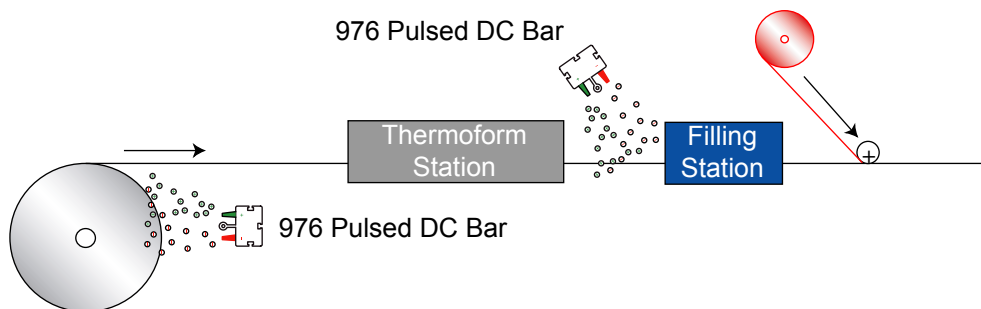
### Form Fill Seal Machinery



**Problem:**  
Static charges are generated when packaging film is fed from a wind off roll. The major problem is that the product to be packaged is statically attracted to the inside of the film and prevents proper sealing.

**Solution:**  
Installation of 915 Ionising Bars before the forming collar and just before the sealing bar will prevent product attraction and allow effective sealing.

### Blister Packaging



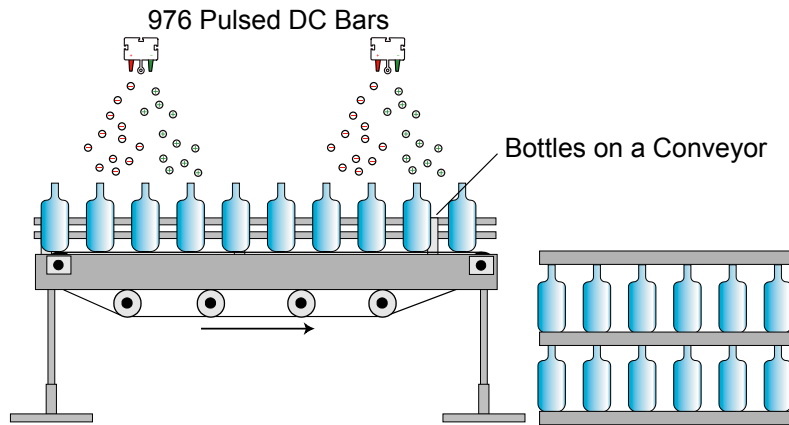
**Problem:**  
Static charges during unwinding of the film and the thermoforming process can result in the following problems:

1. Dust attraction to the film.
2. Product misfeeding in the blister.

**Solution:**  
Long range 976 Pulsed DC Bars provide effective neutralisation of the static charge at the unwind roll to prevent dust attraction and after the thermoformer to prevent product misbehaviour. This solution is ideal for medical or food packaging as no air assistance is required.

## Applications

### Bottle Conveying and Palletising



#### Problem:

Highly charged bottles from the moulding and conveying process suffer the following problems:

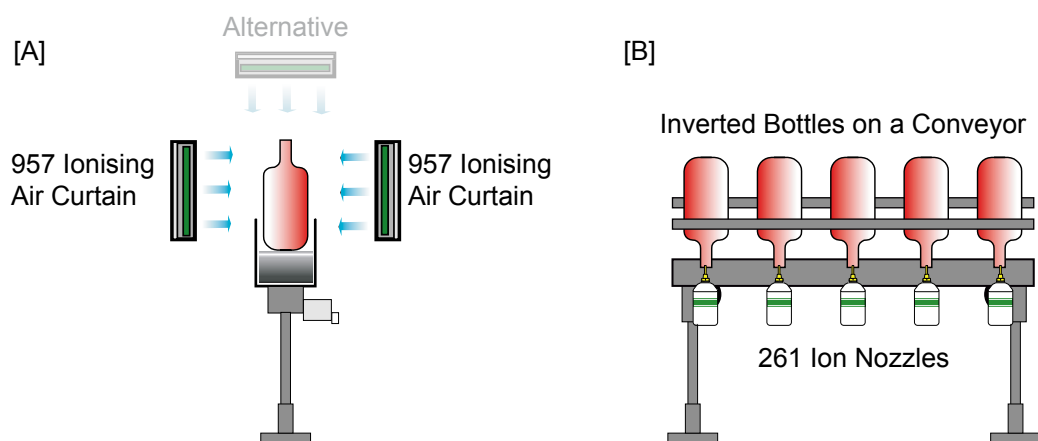
1. Dust attraction and contamination.
2. Bottles repel each other causing them to fall over, jump the conveyor guide rails or repel from the final palletised stack.
3. Severe operator shocks.

#### Solution:

A pair of 976 Pulsed DC Bars installed over the accumulator will effectively neutralise the static charges as they are being created by the friction between the conveyor belt and bottles.

Alternative installation positions are also available. (Please contact Meech)

### Bottle and Part Cleaning



#### Problem:

Statically charged blow molded plastic containers such as bottles can attract dust and other contaminants. This is a particular concern for the food and beverage industry.

#### Solution:

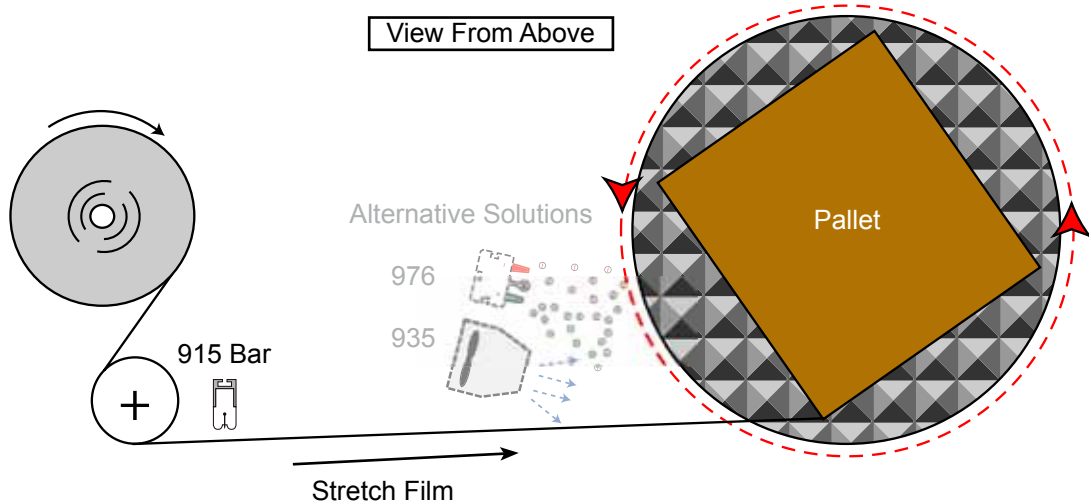
For cleaning the outside of a the container, a series of Ionising Air Curtains can be used. [A]

For interior cleaning, pinpoint Ionising Nozzles are used to blow a stream of ionised air into the container. [B]

Note: For cleaning of larger parts, the JetStream Air Knife System can be used.

## Applications

### Stretch Wrappers

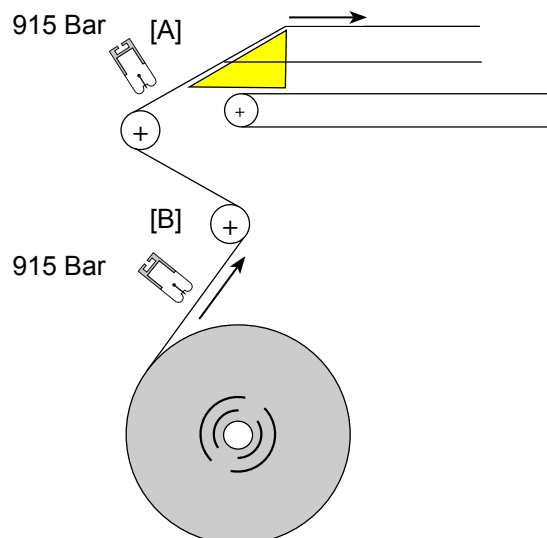


**Problem:**  
The friction created by the stretchfilm unwind and the extra stress of stretching the film can generate static charges, resulting in problems such as:

1. Operator shocks.
2. Dust attraction on to the pallet.

**Solution:**  
The film can be neutralised immediately after the final roller with a 915 Ionising Bar. A 976 Pulsed DC Bar or 935 Ionising Blower can also be used to control the charges built up on the film as it is stretched on to the pallet.

### Over Wrapping

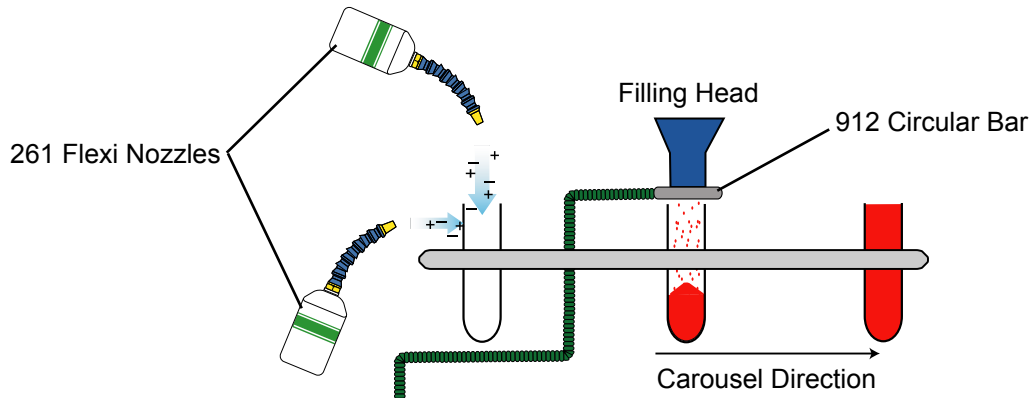


**Problem:**  
A high static charge is built up as film unwinds and passes over various machine parts, rollers and web guides. This results in the film sticking to the machine frame, rollers or itself instead of forming around the product to be wrapped.

**Solution:**  
A 915 Ionising Bar installed at point "A" will prevent the film from wrapping around rollers. A 915 Bar should be installed at "B" if the film is not forming around the product properly and is sticking to itself or the machine frame.

## Applications

### Powder Filling



#### Problem:

Static charge build up on plastic or glass containers during the filling process can result in the following problems:

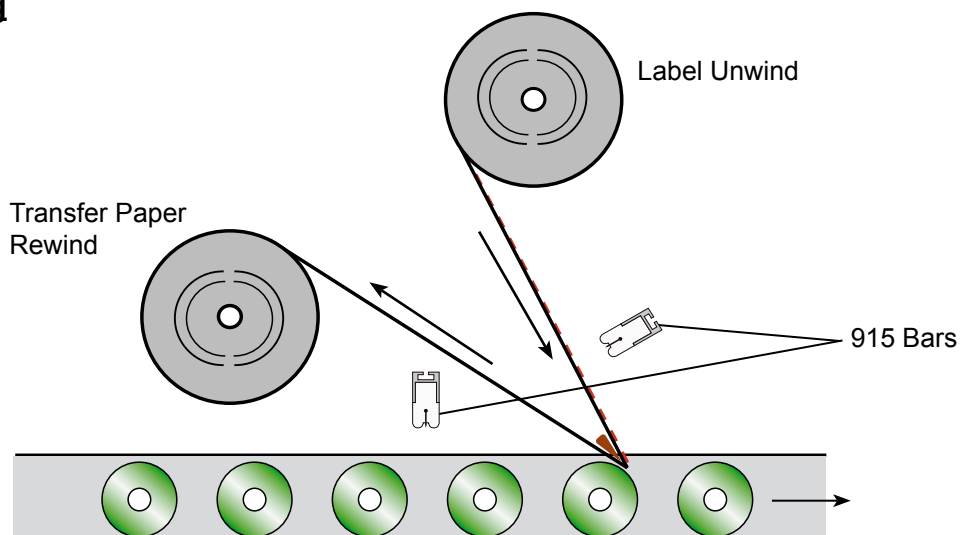
1. Powder adheres to the outside and coats the inside walls of the container.
2. Powder adheres to the filling head.

#### Solution:

261F Ionising Nozzles are positioned at the index position immediately prior to the filling station. One nozzle is directed at the outside of the container, the other at the inside.

A 912 Circular Bar is positioned around the filling head level with the end of the dispensing tube.

### Bottle Labelling



#### Problem:

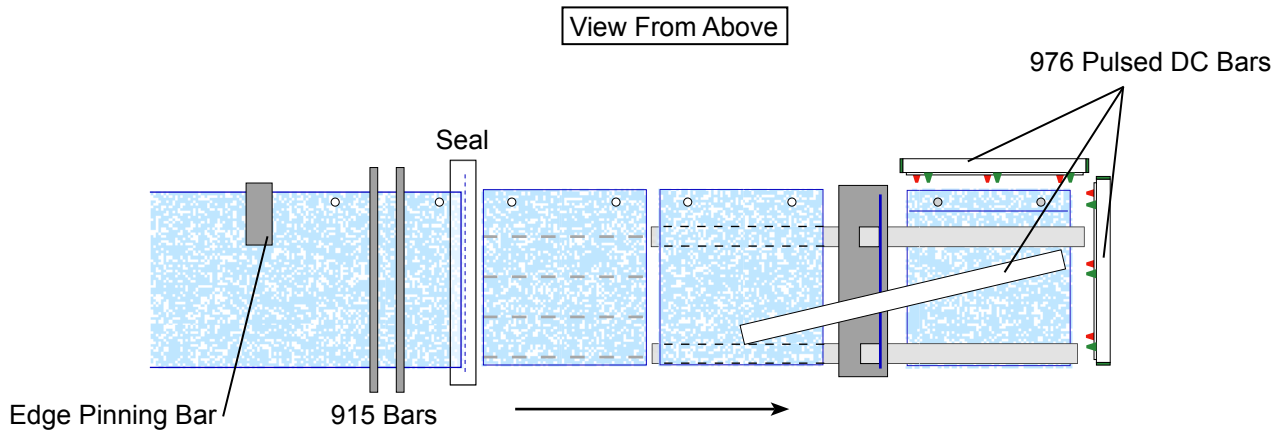
The build up of static charge on the label web or on the plastic bottles will result in poor label feeding or incorrect label placement and positioning. These problems can result in the mislabelling of bottles, slower production speeds and a higher defect rate.

#### Solution:

915 Ionising Bars positioned as shown will neutralise the static charges on the label web and the plastic bottles. This will allow correct labelling and improve process productivity.

## Applications

### Flat/Wicket Bag Manufacturing



#### Problem:

There are numerous static-related issues when manufacturing or converting bags:

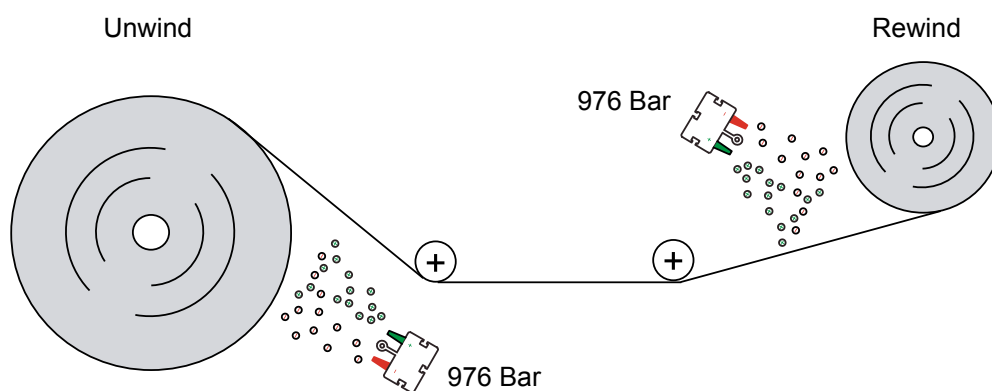
1. After the bag handle is die cut, air can enter the plastic tube causing jams.
2. After bags are cut they will not stack, jog, or collate correctly.

#### Solution:

An Edge Pinning Bar installed in line prior to the handle punch will effectively pin the layers together to prevent air ingress into the bag.

Depending on the machine type, 915 AC or 976 Pulsed DC Bars will remove the charges from the web or bag to allow accurate bag collation.

### Unwinding and Rewinding Stations



#### Problem:

A very high static charge can accumulate on rolls due to the "battery effect". This can cause various problems such as:

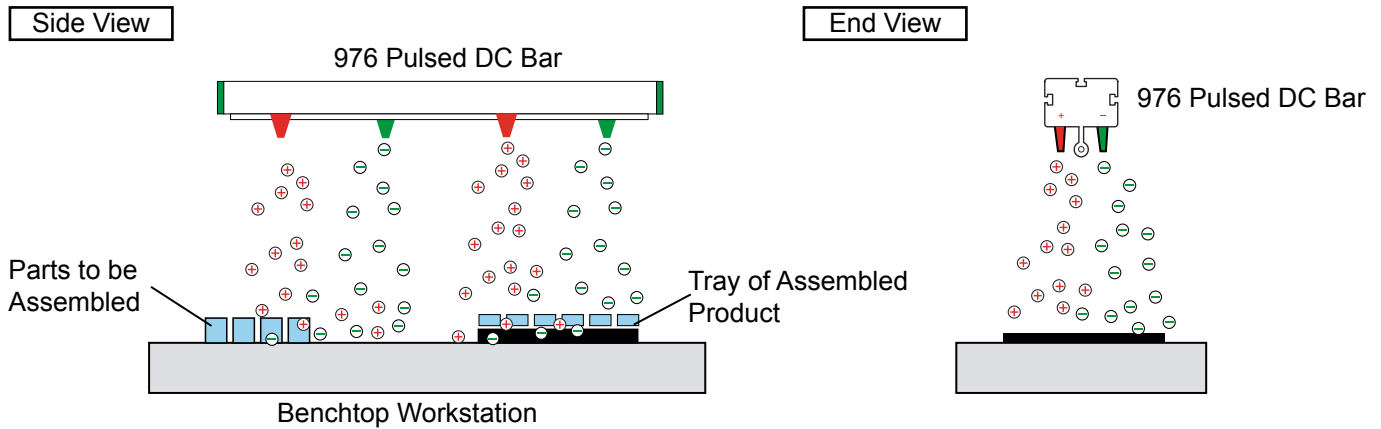
1. Unpleasant operator shocks.
2. Dust attraction, leading to contaminated stock.
3. Poor quality wound reels that can be difficult to fit on to machines and may cause feed problems.

#### Solution:

The most effective solution is to use Meech 976 and 977v3 Pulsed DC technology with 976 Bars positioned as shown above. The positioning of a 976 Bar at the unwind reel is optional and if fitted will provide full control of static charges.

## Applications

### Small Parts Assembly (Medical)



#### Problem:

Constant movement of parts during the manual assembly or conveying process can generate significant static charges, often resulting in:

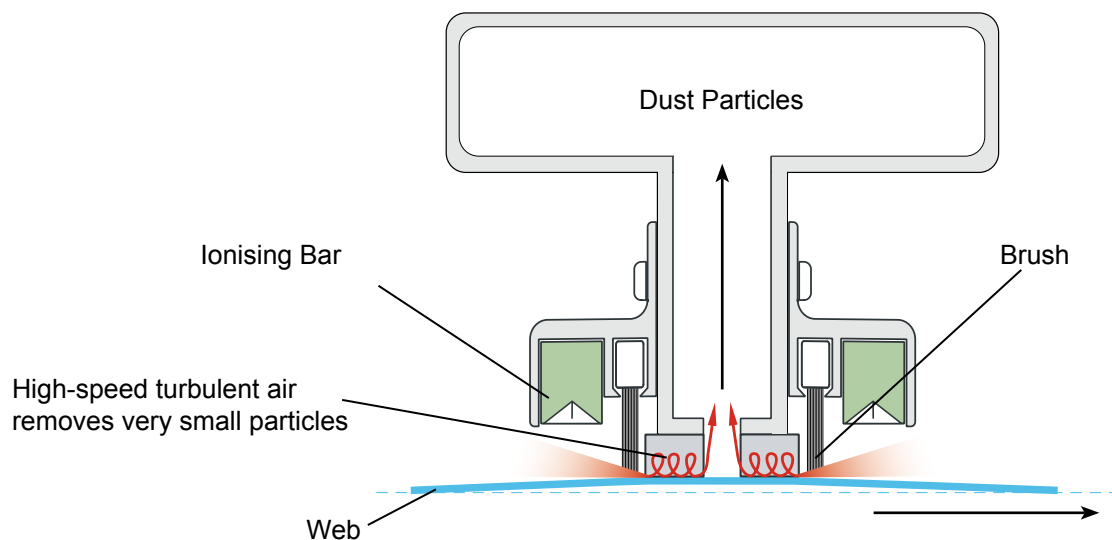
1. Dust attraction.
2. Operator shocks.
3. In the case of very small items, misbehaviour of the parts causing assembly problems.

#### Solution:

The use of a long range 976 Pulsed DC System over the workbench will alleviate this problem without the introduction of air.

The 976 Bar is typically mounted overhead out of the way of the operator. It will remove the charge from the part as well as the operator without the use of blown air (which is very uncomfortable for the operator/ assembler). 976 Bars can also be used with existing HEPA filter systems.

### Web Cleaning



#### Problem:

Dirty webs can cause loss of profit and customer dissatisfaction, excessive down time on printing presses, high reject rates in lamination processes and unacceptable quality in pharmaceutical or food packaging.

#### Solution:

The Meech Web Cleaning System uses a combined process of static elimination, brushing and vacuum, providing effective removal of contaminants from the web.

## Product Summary

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### Model 983v2

The Model 983v2 has been designed to provide accurate measurement of static electrical charges.



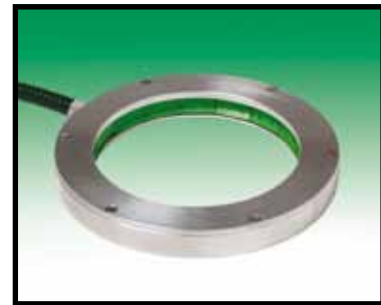
### Model 904

The Model 904 is a constant voltage power supply, designed to provide a 7kV source for Meech AC ionising equipment.



### Model 915

The powerful performance of the Model 915 provides very fast decay times and effective ionisation up to distances of 152mm with a shockless design.



### Model 912

The Model 912 Circular Ionising Bar is suitable for applications where 360° neutralisation is required.



### Model 935

The Model 935 Ionising Blower provides effective long range ionisation over a large area.



### Model 957

The Model 957 is an extremely versatile unit that provides effective static neutralisation, dust removal, and sheet separation capabilities.

## Product Summary



### Model 976

The Model 976 Pulsed DC Bar is unique and has been designed to provide highly effective long range ionisation up to distances of 610mm. It is shockless and is easily maintained.



### Model 977v3 and 977CM

The Model 977v3 and 977CM Pulsed DC Controllers have been designed to operate with the full industrial range of Meech PDC equipment.



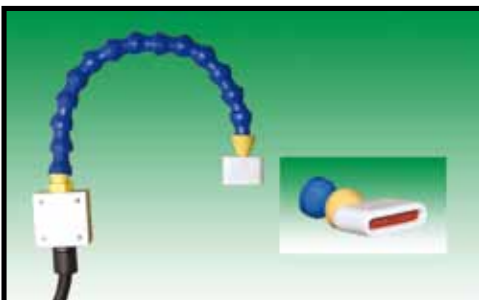
### Model 261

The Model 261 Ion Nozzle is a compact ioniser ideal for installation in tight spaces.



### Model 261F

The Model 261Flexi Nozzle is a small, lightweight ioniser with the discharge outlet extended by flexible knuckle trunking.



### Model 995v3

The Model 995v3 Edge Pinning Bar is designed for use with the Meech range of high voltage static generators.

### Model Tornado F4 and F5

The Series Tornado Web Cleaning System has been designed to provide effective cleaning of the contaminants produced on all types of materials.



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