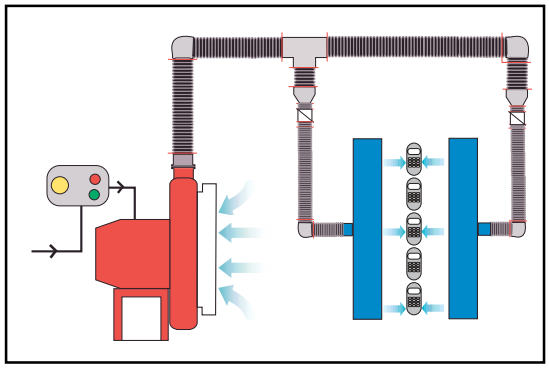
Product Data

Jet Stream Ionised Air Cleaning System

Jet Stream

Description

The Meech "Jet Stream" system provides a highly cost-effective surface cleaning solution. The modular range of equipment, including fans, ducting and ionizing manifolds, allows a system to be configured to precisely suit each particular installation. It also allows its use in a wide range of industrial applications.



A powerful stream of dust-free ionized air impacts the target surface after passing at high speed between static elimination bars in the exit manifold. The unique "tear drop" profile of the manifold, the result of extensive R&D effort, minimizes air turbulence. This is particularly important in dusty or contaminated environments, and ensures that optimum cleaning effectiveness is achieved.

Feature	Benefit
Fan driven blower system	Significant cost savings over compressed air systems (running costs are typically **reduced by 80% or more**).
High volume of air compared to competitive systems	Higher "weight" of air (volume x velocity) provides superior cleaning performance.
System is purpose-designed for cleaning applications	Optimised performance without compromise.
Integral static neutralization system, with bars fitted ~~inside~~ the manifold units	Breaks down statically bonded contaminants, allowing easy removal. The static elimination bars are constantly purged with clean air, preventing build-up of dirt, maintaining ionisation performance and extending product life. Their location makes them less prone to contamination and physical damage.
"Tear drop" profile manifolds	A laminar flow air stream is directed accurately to the substrate. This results in minimal entrainment of dirty ambient air and other contaminants.
System available as component parts	Can be configured to suit individual applications, with the option of sourcing ancillary components locally to reduce overall system cost.
EX option	Allows manifolds to be used in hazardous environments.

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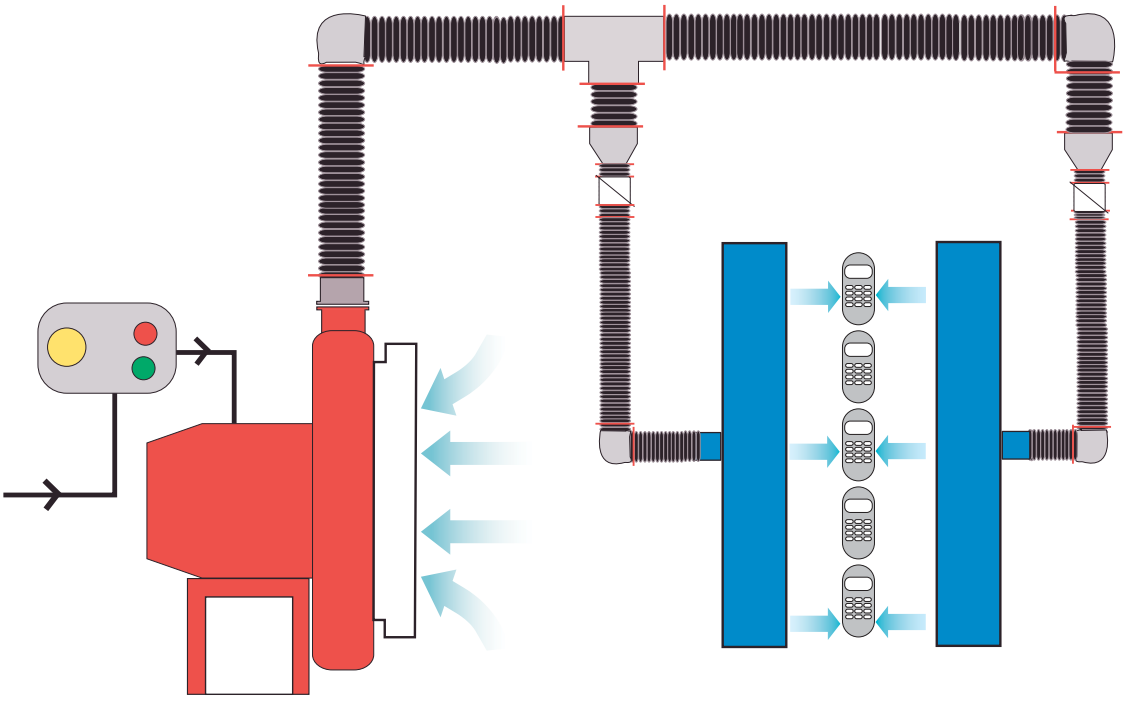


3. Background

The ever-increasing demand for higher finished product quality places additional emphasis on the control of dust contamination. Entrapment of particles in paint finishes or laminates can lead to expensive rejection rates. Based on the proven success of its Combi 2000 system, Meech now offers the Jet Stream system. Sharing similar technology to the Combi 2000, the Jet Stream provides an economic, modular solution for small to medium finishing installations.

Jet Stream is an ionised air cleaning system. High velocity, fan-driven ionised air is delivered to the work surface by specially designed manifolds, thus neutralising static charges and removing contamination. Being fan driven, the running costs are extremely low when compared to conventional compressed air systems.

The use of high velocity ionised air is very effective in removing electrostatically attracted dust. Traditionally this has been achieved by using compressed air-driven systems, comprising an air knife in conjunction with an ionising bar. However, cleaning performance is greatly inferior to that offered by Jet Stream. In some small installations, the compressed air consumption is sufficiently low to make such systems cost-effective but for medium to large systems, the cost of compressed air is punitive. Jet Stream utilises fan-driven air, requiring only a fraction of the power of a compressor.

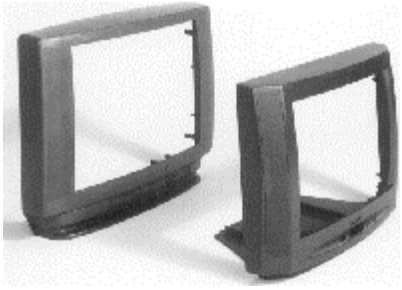
4. Applications

The modular design of Jet Stream allows its use a wide range of applications in many different industries. For example:

Automotive Industry

In addition to body panels, modern cars have many other painted components which are often injection moulded plastic. The high static charges that typically exist on such components cause airborne dust to be attracted to them. The high quality finish demanded by car assembly plants necessitates the cleaning of the component prior to spray painting.

TV Cabinets



TV cabinets are typically injection moulded and spray painted with a decorative finish. The high standards expected by the customer require that statically attracted dust be removed before the decorative finish is applied.

Acrylic

During the production of acrylic sheet, particles of swarf can adhere to the surface after sheeting operations. These particles can cause scratching of the surface if they are not removed prior to lamination with protective film. Jet Stream is ideal for this application as its non-contact operation avoids the risk of causing damage during cleaning.

Small Mouldings

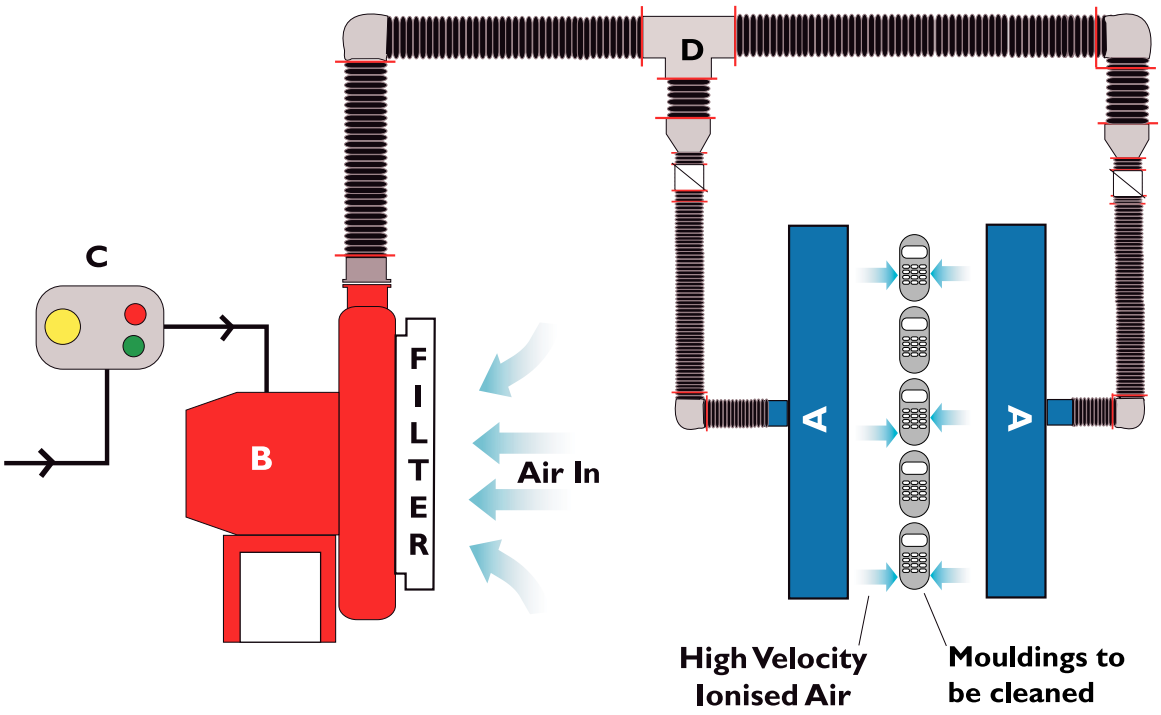
Small mouldings, such as mobile phone cases, are often mounted on jigs to enable them to be spray painted. The jigs hold many mouldings at once, to increase the efficiency of the spraying operation. To avoid inclusions in the finished painted surface, the mouldings are passed in front of a Jet Stream manifold just before being sprayed.

5. System Components

Jet Stream is a modular system. The customer may specify the exact length of manifold required to suit a particular application. The total length of manifold specified defines the size of fan required and the diameter of the ducting.

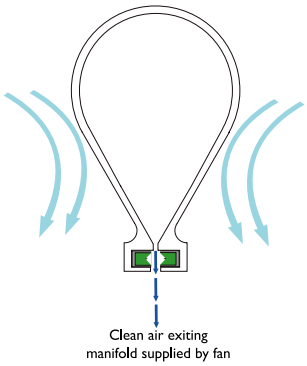
The main components of Jet Stream are:

A) Jet Stream Manifold
B) Fan Unit with Inlet Filter/Silencer
C) Start/Stop box
D) Ducting and Ducting Adaptors



A) Jet Stream Manifold (see Appendix 1)
The manifold is an extruded aluminium construction, which offers low weight with high rigidity. It delivers a laminar blade of high velocity ionised air. The special teardrop design generates the maximum air velocity, and hence maximum efficiency, from the air supply. This can be up to 100 metres/second at discharge, dependent on the fan specification.

Jet Stream Manifolds In Action



Located in the mouth of the manifold are two Meech 910 ionising bars, which ionise the high velocity air as it passes over them. For hazardous area applications, 910EX ionising bars should be used. These are rated Exs IIA T6 and are suitable for use in Zone 1 classified areas. The lugs that enclose the ionising bars help to minimize entrainment of ambient air into the high velocity filtered air.

Each Manifold is supplied with a dedicated Model 904 High Voltage AC unit to power the ionising bars.

Single manifolds are available as standard in lengths from 300mm to 1800mm.

B) Fan Unit with Inlet Filter/Silencer
The fan unit generates the high pressure air flow required by the manifolds. The fan is a 3-phase unit of radial design and is sized according to the length of manifold that it is required to run. Typical sizes range from 3kW up to 22kW.

The inlet of the fan is fitted with a filter/silencer to ensure that the air used for the cleaning operation is itself free of airborne dust. Filtration is to 5 microns.

C) Start/Stop Box
For fans of up to 11kW a direct on-line start/stop relay is specified. For larger fan sizes, a star-delta soft start is used.

D) Ducting and Ducting Adaptors
Meech can provide the ducting required to supply air to the manifolds. The type recommended is a smooth bore flexible duct, which gives the maximum ease of installation whilst retaining good flow characteristics. Reducers, elbows, “T”s and damper valves are used to feed the air evenly to each manifold. These are galvanised steel and attach to the ducting using jubilee clips.

6. Performance

Ionisation
The use of twin 910 ionising bars doubles the available ionisation. The vast majority of particles adhering to products are held by electrostatic attraction. The superior ionisation of the Jet Stream eliminates this attraction and allows the particles to be removed by the high speed air.

By their very nature, the positive and negative ions produced by ionising bars are attracted to each other. This leads to recombination and renders them useless for neutralisation purposes. In other more conventional systems the turbulent air flow assists this process, thus reducing the effective range of the air curtain. The Jet Stream's specially designed manifold delivers non-turbulent air, which greatly reduces the rate of recombination and delivers the maximum ionisation possible to the target surface.

Blow-Off
The two most importance elements of blow-off performance are the ability to remove dust from the target object and the cleanliness of the air used.

The Jet Stream has excellent dust removal qualities based on:

- powerful ionization which destroys the electrostatic attraction holding the dust.
- high velocity of the air - over 45 metres/second at 50mm distance from the target.
- laminar nature of the beam of air, which increases the dust removal "force".
- a high "weight" of air (volume x velocity).

The quality of the air delivered by the Jet Stream is higher than conventional systems for two reasons:

- the filter on the inlet of the fan unit filters the air to 5 microns.
- the manifold is specially designed to minimize the entrainment of dirty ambient air into the high velocity air delivered to the target.

Independent tests have shown that the cleaning capabilities of the Jet Stream are considerably greater than those of conventional systems. Tests carried out by leading car manufacturers in the UK showed a dramatic decrease in post-cleaning particle contamination of car bodyshells following the introduction of the Meech ionised air cleaning system. Several bumper manufacturers in the UK have achieved a reduction in the reject rate of finished painted bumpers. In both instances the reduced cost of reworking has led to increases in productivity and in finished product quality.