INERTIAL FILTRATION SYSTEM

The inertial filtration system is designed to minimise the ingress of foreign particles into an acoustic or other type of enclosure housing. The module is designed to meet the airflow requirements of the housed equipment and is generally maintenance free during its life cycle. The major benefit of this type of filter is the extended life of the combustion air filters on engines in extreme environments.

Design

The complete assembly is a group of components that are tailored to suit the specific application.

A fan (or fans) is selected to provide the airflow required for cooling and combustion air within the enclosure. A filter box complete with vane packs is then matched to the airflow. The sizing of the vane pack area is important to achieve an optimum velocity at which the vanes will separate particles and air.

Depending on the acoustic requirements of the project, an acoustic louvre or splitter silencer will be selected and placed with the assembly between the vane pack and the fan to minimise transmission of noise to external surroundings.

The complete assembly can usually (depending on design & project type) be assembled and shipped on a common base frame. Site installation, especially retro-fits to existing enclosures can be achieved with minimal downtime or disruption to other works.

The system is mostly fabricated from galvanised sheet or stainless steel, depending on the severity of the operational environment. After manufacture the equipment can be powder coated or painted to customer specifications. The structural support is hot dip galvanised.
**Operation**

The filter (vane pack assembly) consists of pressed steel blades, steel housing, collection sump and bleed air fan. The system comes complete with AV mounts and flexible connections for the main fan to the enclosure wall. (This may vary depending on installation type)

Dusty air is drawn through the vane pack assemblies and is made to turn sharply at high velocity. The air is drawn through the vanes, whilst the heavier dust or other type of particles travel past the blades and are collected into a dust chute. These particles then fall to the sump where they are then ejected externally by the bleed air fan. As the bleed air fan ejects the sump catchment there is no requirement for regular maintenance.

The vane pack design also significantly reduces moisture transmission from heavy rain. It is recommended that if the application is in a high rainfall area that consideration be given to fitting moisture eliminator cartridges into the assembly.

![Cutaway section through inertial filter housing to showing air flow pattern](image)

![Inertial Filter-Efficiency to AS1132 - No: 2 Dust](image)

![Inertial Filter - Velocity / Pressure Loss](image)

These graphs display the operational performance of the filter assembly