

PANDA SPRAY BOOTH FILTER INFORMATION

Our Spray Booth has been designed to reduce the risk of potential hazardous situations occurring. You must adhere to the specifications chart listed below when replacing consumables for your Spray Booth Bake Oven i.e. ceiling, air make up unit (A.M.U) and floor filters.

Not following these suggestions will result in multitude malfunctions and severe damages to your Spray Booth, such as inefficient filtration, structural damage and fire.

1. 600 G EU-5 Ceiling Filter

Filter Specifications*	VTC 600 G EU-5 DIN 24185
Weight:	600 g/Square Metre
Thickness:	20 mm
Air Flow Allowance:	900 Cubic Metres/Hour
Minimum Air Flow Pressure:	27 Pascal
Maximum Air Flow Pressure:	400Pascals
Filtration Efficiency:	97.90%
Dust Tolerance:	453g/Square Metre
Maximum Working Temperature:	135 C
Fire Rating:	F-1 Din 53438

2. LH26 EU-3 Fibre Glass Floor Filter

Filter Specifications*	LH26 EU-3 DIN 24185
Weight:	220 g/Square Metre
Thickness:	60 mm
Air Flow Allowance:	5400 Cubic Metres/Hour
Minimum Air Flow Pressure:	18 Pascal
Maximum Air Flow Pressure:	250Pascals
Filtration Efficiency:	84.7%
Dust Tolerance:	4300g/Square Metre
Maximum Working Temperature:	350 C
Fire Rating:	F-1 Din 53438

3. AZ/2 EU-3 Pre Filter

Filter Specifications*	AZ/2 EU-3 DIN 24185
Weight:	200 g/Square Metre
Thickness:	15 mm
Air Flow Allowance:	2010 Cubic Metres/Hour
Minimum Air Flow Pressure:	15 Pascal
Maximum Air Flow Pressure:	200Pascals
Filtration Efficiency:	75.4%
Dust Tolerance:	375g/Square Metre
Maximum Working Temperature:	110 C
Fire Rating:	F-1 Din 53438

This is in accordance with local authority and following AS/NZ 4114 standards recommendations:

“Filters shall meet the requirements of the relevant authorities.” “Filter systems shall be designed to ensure that the maximum air velocity recommended by the filter manufacturer is not exceeded.” – (AS/NZS 4114.1:2 2003_ Section 4)

Filters are closely integrated to ventilation system and environmental requirements which essential factors are affecting the design, construction, location and installation of spray painting booth covered by AS/NZS 4114 Standard. Persons experienced in the fields of spray painting booth ventilation design and environmental regulation should be consulted. Panda Low Bake Spray Oven’s ventilation systems are designed, constructed and installed based on the above standard. The filters selected have to meet the requirement of:

1. Filtration efficiency: 98.6% for Ceiling filter and 75% for intake and floor filters. ***This will ensure the dust free environment and collection efficiency to achieve the ultimium refinishing result.***
2. The maximum air flow and pressure variations (*as shown in the above specification*) of ceiling filter are also of vital importance for performance and safety of Panda Low Bake Spray Booth/Bake Oven since the fan and the computerized control system are designed in relation to the dedicated filter characteristics of filtration performance to meet AS/NZS ventilation standard. This is especially applicable to our selected ***VTC 600 EU-5 ceiling filter.*** *If the filters give too much pressure while running (due to the quality, type or lack of maintenance of ceiling filters) the sealant between the panels of the booth cabin will break up and further structural damage may occur. If the filters generate too little pressure while running, the fans will run too fast and over heat the electric motors. Further more the pressure flow through the ceiling filters are measured by air flow sensors through the*

computer system to ensure the air flow in the cabin exceeds the minimum requirement. Such air flow monitoring systems for spray booths are enforced by the Australia and New Zealand Occupation and Safety Department as stated in AS/NZS 4114.

3. *Dust collection tolerance is also another strong factor for the refinishing result and fire safety. There are hundreds of cases of spray booths catching on fire due to the overload of dust and debris on the filters. Dust can also go onto the paint job and seriously affect the finished paint result.*

We strongly recommend that customers consult Panda/ACL when replacing filters. Specifications and certification of the filters from all suppliers are required. If the suggested standards are not followed the warranty of the purchased booth will automatically expire and Panda/ACL will not be liable for any malfunction, damage or fire caused by such misconduct.

The following are related documents from AS/NZS 4114.1:2 2003
AS/NZS 4114.1:2 2003 Section 4 - Ventilation of Spray Painting Booth

4.1 GENERAL

Ventilation system and environmental requirements are essential factors affecting the design, construction, location and installation of spray painting booth covered by this Standard. Persons experienced in the fields of spray painting booth ventilation design and environmental regulation should be consulted.

4.2 AIRFLOW

4.2.1 General

All spray painting booth shall be provided with a ventilation system complying with Clauses 4.2.2 to 4.4.4.

4.2.2 Ventilation design

4.2.2.1 General

The following requirements shall be satisfactory when designing the booth's ventilation system.

- (a) Only air of an acceptable quality shall enter the spray booth. To achieve this, the source of air supply may be required to be taken from outside the building in which the booth is located,
- (b) The air supply system shall be arranged exhaust air with the intake air thereby maintaining the quality of air (see Figure 4.1 for examples).
- (c) A continuous, uniform and evenly distributed supply of air shall flow throughout the spray painting area to the exhaust outlets; there shall be no pockets of still air in the booth.
- (d) A monitoring system or systems shall be provided for sensing airflow for both hazard removal by air dilution as detailed in Clause 4,2,2,2 and 4,2,2,3 and adequate velocity in the spray painting area as detailed in Clause 4,2,2,3,

NOTE: Monitoring needs to comply with the principles of Ag 1482, Monitoring can be achieved by the use of static or differential air pressure sensing devices where this can be shown to reliably provide satisfactory proof airflow, or by airflow switches, controlling a contactor in the control system.

Airflow sensing devices shall be proven in the no-flow, state prior to each start-up and shall prevent start-up if this self check fails.

The monitoring circuits shall be designed and arranged to fail-safe and cease the spray painting process until the fault has been rectified.

- (e) The difference in air pressure between the spray painting area and air outside the spray painting booth shall not

exceed 50 Pa for both positive and negative pressure type booths; if the positive pressure exceeds 50 Pa the classification of hazardous areas shown in AS/NZS 2430.3.9 does not apply and the hazardous areas shall be assessed to AS 2430.1

If the difference in pressure exceeds +50 Pa or -50 Pa then the booth shall be assessed for the safety of persons accessing or aggressing the booth while the booth is in operation or the components of the booth are operated, and it shall be verified that undue force is not required to open and close doors for persons accessing or aggressing the booth.

4.2.2.2 Monitoring apparatus

Monitoring apparatus that may be exposed to a flammable concentration shall comply with Clause 3,4,2,

4.2.2.3 Spray cycle airflow rate

During the spray cycle, the airflow shall be the greater of--

- (a) that which provides, for the purpose of air dilution, a concentration of flammable vapour in air, six times lower than that specified in AS 1375; or
- (b) that which produces, when the booth is empty and the airflow is tested in accordance with Clause 7,5, the minimum velocities of-
 - (i) Where spray painting is done by an electrostatic process only..... 0.40 m/s;
 - (ii) Full down draught booth.....0.25 m/s;
 - (iii) Special booth (e.g., semi down draught and on floor down draught booth) where Airflow is vertical in part of the spraying area and horizontal in another part-
 - (A) Vertical down airflow area.....0.25 m/s;
 - (B) Where airflow is substantially horizontal0.50 m/s;
 - (iv) Other processes, e.g., cross flow types.....0.50 m/s; and
 - (v) The value specified by the spray painting booth manufacturer or supplier when greater than the value specified in (ii), (iii) or (iv) above.

4.2.2.6 Failure of the ventilation system

Any reduction in the airflow specified in Clause 4,2,2,3 shall cause the spraying system to cease and the heating system to shut down; spraying shall be prevented from recommencing until a pre-purge has been carried out in accordance with Clause 4,2,2,5 and the airflow system is operating and meeting the requirements of Clause 4,2,2,3.

Any reduction in the airflows specified in Clause 4,2,2,4 shall cause the heating system to shut down and prevent it restarting until a pre-purge has been carried out in accordance with Clause 4,2,2,5 and the airflow system is operating and meeting the requirements of Clause 4,2,2,4,

Any reduction in minimum airflows required by Clause 4, 2, 2.4 could cause the heating system to shut down and prevent it restarting until a pre-purge has been carried out in accordance with Clause 4.2.2.5 and the airflow system is operating and meeting the requirements of Clause 4.2.2.4.

- (a) During pre-purge, could cause the purge to abort; and
- (b) During post-purge, could cause the heating system to shut down.

4.3 CONTROL SYSTEMS

4.3.1 Duration of ventilation system

4.3.1.1 General

The control system shall ensure that the ventilation system is kept in effective operation during the entire time spraying is in progress for the periods required by Clause

4.3.1.2 to 4.3.1.4 below.

4.3.1.2 prior to spraying

To remove any residue contaminants, the ventilation system shall provide a pre-purge cycle of a 1 min duration or 5 air changes whichever is greater.

4.3.1.3 Following spraying- with baking

For spray only type booth or where spraying is not immediately followed by a bake cycle a minimum of a 5 min post-purge period shall be provided,

4.3.1.4 Following the spray – with baking

Where spraying is immediately followed by a baking cycle no post-purge cycle is required

4.3.1.5 baking that does not immediately follow after a spray cycle

To remove any residue contaminants, the ventilation system shall provide a pre-purge cycle of a 1 min duration or 5 air changes whichever is greater.

4.3.1.6 Ventilation system with more than one fan

Where the air ventilation system incorporates more than one fan and all fans are required to operate together the control system shall be interconnected so that one fan cannot be operated independently of the others on the spray cycle,

4.4 EXHAUST AIR

4.4.1 Location of exhaust air outlets

The outlets and inlets shall be so located as to avoid unnecessary turbulence and to prevent the formation of pockets of vapour within the booth.

Air shall be exhausted into the atmosphere to a location where it does not cause contamination of other air used for building or equipment ventilation, the requirements of relevant authorities shall be met, as a minimum requirement the outlet shall be 3 mtrs above the building roof and shall discharge vertically.

4.4.2 Exhaust ventilation

All spray painting booth shall have an exhaust fan(s) suitable for their intended use, in addition, fan(s) and fan(s) motors including an axial flow fan(s) installed within the ducts shall be accessible for regular maintenance and cleaning.

The entry of the motor drive shafts or drive belts, through exhaust ducts, shall meet the requirements of Clause 2.10(b) or shall be adequately sealed to prevent the egress of the exhaust air. If these requirements cannot be met explosion-protected drive motors may be required.

NOTE: Without efficient cleaning and regular maintenance motors may overheat and cause subsequent ignition of deposits.

4.4.3 Exhaust air cleaning and discharge

The contaminated exhaust air shall be cleaned before it is discharged into the atmosphere, filters, washing sprays or scrubbers shall be used to remove particles from the air before it enters the exhaust system.

Filter systems shall be designed to ensure that the maximum air velocity recommended by the filter manufacturer is not exceeded.

Filters and filter supports shall be of adequate strength to withstand the loading placed on them.

4.4.4 Filters

Filters shall meet the requirements of the relevant authorities.

