Discussion Subject: Subfloor Punched Vent Air Flow Restriction Due To Bushfire Mesh

Will the introduction of bushfire mesh affect air flow through a subfloor vent?

The answer to this question is yes, it will affect the air flow. However, there are several factors that builders, engineers and building surveyors should take in consideration when determining the necessary number of vents fitted with bushfire mesh required to comply with applicable building codes and Australian Standards. The explanation below describes the current methodology VUETRADE implements in calculating the airflow area of its vents.

VUETRADE has run physical tests and measurements to calculate the airflow area of VUETRADE's Subfloor Punched Vent **not fitted** with anti-spark mesh, which are shown in Table 1 below.

Table 1: VUETRADE Subfloor Punched Vent airflow area

Product Code	Size (width x length) (mm)	Air Flow (mm^2)
VTSFV230X76	230 x 76	6178
VTSFV230X76SLIM	230 x 76	7615
VTSFV230X160	230 x 160	13901
VTSFV190X90	190 x 90	6535
VTSFV190X190	190 x 190	14376
VTSFV390X90	390 x 90	13663
VTSFV390X190	390 x 190	30059

The airflow through bushfire mesh can be calculated using the formula below, based on the wire mesh maximum aperture and its wire diameter. This formula is described as the ratio of area of aperture to the area of mesh. This gives a percentage open area (% Open Area) which describes the percentage of open space in a given wire mesh size. (It should be noted that these open area percentages are calculated solely based on the area of wire mesh, not including the airflow area of the vents.)

$$\%\ Open\ Area = \frac{A^2}{(A+D)^2} \times 100$$

Where A is the maximum aperture and D is the wire mesh diameter.

VUETRADE Stainless Steel Bushfire mesh has an estimated percentage open area of about 41%. Based on the airflow of VUETRADE Subfloor Punched air vents, the airflow through the vents fitted with anti-spark mesh will then be reduced to the airflow values that follow in Table 2. However, these values assume the following factors:

1. The anti-spark wire mesh fits tightly in the subfloor vent;
2. No space is present between the vent's face and the anti-spark mesh.
3. The wire mesh has the same amount of air flow through it as the subfloor vent e.g. 6000mm2 of air flowed through the vents will have 6000mm2 airflow through the wire mesh and will experience in airflow reduction of 41% open area due to the wire mesh.
4. It is assumed that there is no airflow lost or dispersion between the vent and wire mesh.

Table 2: VUETRADE Stainless Steel anti-spark mesh airflow reduction

Product Code	Size (width x length) (mm)	Air Flow without mesh (mm^2)	Net airflow through vents fitted with mesh (mm^2)
VTSFV230X76	230 x 76	6178	2576
VTSFV230X76SLIM	230 x 76	7615	3175
VTSFV230X160	230 x 160	13901	5795
VTSFV190X90	190 x 90	6535	2724
VTSFV190X190	190 x 190	14376	5993
VTSFV390X90	390 x 90	13663	5696
VTSFV390X190	390 x 190	30059	12531

With the reduction in airflow due to the fitting of bush fire mesh, it is necessary to factor this reduction in the design of a building to ensure that the minimum requirements of sub floor ventilation, by various regulations bodies such as the Building Code of Australia, are met. It is also recommended to use bush fire wire mesh that is compliant with the Australian Code AS3959, which specifies suitable apertures and materials for bush fire prone areas.

Important notes:

1. VUETRADE has run various tests to identify the airflow of various VUETRADE Subfloor Punched vents, and has provided general ventilation guidelines based on the Building Code of Australia 2016. A qualified engineer or architect should be consulted to ensure the suitability of a product in providing sufficient ventilation to comply with applicable national or local building codes.
2. This guide is only applicable to VUETRADE Stainless Steel Anti-Spark mesh fitted in VUETRADE Sub Floor Punched Vents. Other non-VUETRADE subfloor vents and anti-spark mesh may produce different results, so this guide should not be used for those products.

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