STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

METHODS OF TESTING SMOKE/HEAT RELEASE VENTS

AS 2428.5
DETERMINATION OF DISCHARGE COEFFICIENT AND EFFECTIVE AERODYNAMIC AREA

1 SCOPE. This standard sets out the method for determining the discharge coefficient and the effective aerodynamic area of a smoke/heat release vent.

NOTE: The value of the coefficient of discharge determined for the tested specimen may be applied to another vent having, with respect to the tested specimen —
(a) similar form of construction
(b) similar width
(c) length within ± 50 percent of the specimen length.

2 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

BS 848 Fans for General Purposes
Part 1 — Methods of Testing Performance.

BS 1042 Methods for the Measurement of Fluid Flow in Pipes
Part 1 — Orifice Plates, Nozzles and Venturi Tubes.

3 PRINCIPLE. The airflow and pressure drop through a smoke/heat release vent is measured. From the measurements, the discharge coefficient is determined and the effective aerodynamic area is calculated.

4 APPARATUS. The following apparatus is required (a typical apparatus is described in Fig. 1):

(a) An wind tunnel capable of providing at least six different air velocities through the vent.
(b) An airflow measurement device to measure the airflow throught the vent to a known accuracy. An orifice plate arrangement to BS 1042, Part 1 or a conical inlet arrangement to BS 848, Part 1, are acceptable for this purpose.
(c) A manometer for measuring the pressure difference through the vent to known accuracy.

5 SPECIMEN. The specimen shall consist of a full-sized vent (see Note to Clause 1) complete with its mounting and additional security devices, if any. Scale modelling is not acceptable.

6 MOUNTING OF VENT. The vent shall be mounted so that the air flow is in the intended direction of the exhaust smoke. Care shall be taken to ensure that the vent is sealed to the wind tunnel.

7 PROCEDURE.

NOTE: A typical form for the recording of observations is shown in Appendix A.

The procedure shall be as follows:

(a) Determine the area of the vent (A).
(b) Determine the air density at ambient conditions.
(c) Ensure that the vent is in the fully open position and operate the wind tunnel.
(d) Record the differential pressure across the vent ($A\Delta p_v$).

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