



Universitat de Girona

Departament d'Enginyeria
Mecànica i de la Construcció
Industrial

This report is developed after carrying out the corresponding trials established in the scientific collaboration agreement of mechanic-fluid behavior of rectangular airflow ducts.

TECHNICAL REPORT

REQUESTER

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TRIAL OBJECTIVE

Determining airflow ducts tightness commercially named "PIR-ALU panel".

SAMPLE CHARACTERISTICS

Duct PIR-ALU 45 of section 800x400 mm² with a length of 1800 mm with a central joint tapped on the ends by the same material.

TRIAL METHOD

This trial is to calculate the head loss on two different type of ducts according to the Norma project "Ductwork standard. Ductwork made of insulation ductboards" CEN/TC156/WG3N207 section 4.3. 4^a Revision (*see annex*), as well as the UNE 100-104-88 about metallic sheet ducts.

RESULTS

The trial was carried out in a way that pressure was gradually increased with a high pressure fan controlled by a frequency shifter calculating the loss flow rate through a calibrated flow nozzle using the following formula:

$$Q(m^3 / min) = 0.0173856 \sqrt{\Delta p(mmca)}$$

The total standard manufacturing duct length is of 4 m., the loss surface is of 9.6 m² and the ducts losses are concentrated on its joints.

According to the trial guidelines, ducts can be classified in three different categories according to loss flow rate. In doing so, the analyzed ducts do comply with the top quality **classification C** regarding losses as it is shown on the results table.



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Duct PIR-ALU 45 : Section 800 x 400 mm2				Q maximum losses
Pressure (Pa)	Δp (mmca)	Q losses (l/s)	Q losses/ m2	Clasif. C
190	2	0.41	0.03	0.09
290	5	0.65	0.05	0.12
410	7	0.77	0.06	0.15
550	10	0.92	0.07	0.18
740	13	1.04	0.08	0.22
920	17	1.19	0.09	0.25
1130	21	1.33	0.1	0.29
1340	27	1.51	0.12	0.32
1500	30	1.59	0.12	0.35

It is observed that for any function losses are less than the maximum loss allowed by classification. Therefore, it can be confirmed that the tested ducts belong to C category according to Norma project "Ductwork standard. Ductwork made of insulation ductboards" CEN/TC156/WG3N207 section 4.3. 4ª Revision as well as the UNE 100-104-88 on metallic board ducts.

Trial date: Girona. July 24, 1998.

O.K.
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This document has two sealed pages.



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ANNEX

(1 page)

European Norm project "Ductwork standard. Ductwork made of insulation ductboards"
CEN/TC156/WG3N207, 4th revision. Section 4.3.