

TESTING PROTOCOL


Data: 2016-11-24


Sample for testing: 160-3


Data of sample arrival: 2016-11-22

Testing data: 2016-11-24

Testing method: LST EN 15727:2010

Measurements are performed by: Tadas Aleksėjus 

Protocol is prepared by: Tadas Aleksėjus 

Technical manager: Sergėjus Rimovskis 

Note: Laboratory does not select samples, samples delivered by customer are tested.
Results of testing are related only to tested object.
Protocol or separate parts of the protocol can not be copied without written consent of laboratory.

Data of measurements

Description of the sample

Duct connection diameter	0,160	m
Area of the sample surface (A_p)	0,444	m ²
Work pressure	2000	Pa
The total joint length (L)	1,005	m
The virtual product surface area (A_c)	0,502	m ²

Environment condition during the measurements

Average air temperature	19,9	°C
Average humidity	39,9	%
Average atmospheric	750,3	mmHg / 100,03 kPa

	Air leakage			
	Pressure, P_s	Air leakage	Adjusted air leakage*	Air leakage factor
	Pa	m ³ /h	m ³ /h	f (m ³ /sm ²)
Negative	198	0,004	0,004	0,000002
	297	0,007	0,007	0,000004
	396	0,017	0,017	0,000009
	500	0,029	0,029	0,000016
	597	0,038	0,038	0,000021
	750	0,052	0,051	0,000028
Positive	297	0,011	0,011	0,000006
	401	0,023	0,023	0,000013
	501	0,035	0,035	0,000019
	1007	0,078	0,077	0,000043
	1505	0,114	0,113	0,000062
	2001	0,149	0,147	0,000081

Note: the equipment is calibrated to fix minimum 0,04 m³/h. If the recorded meaning is lower, it can only be used for information purpose.

Air tightness class
D

* - adjusted to standard conditions (+20 °C temp. and 101325 Pa).

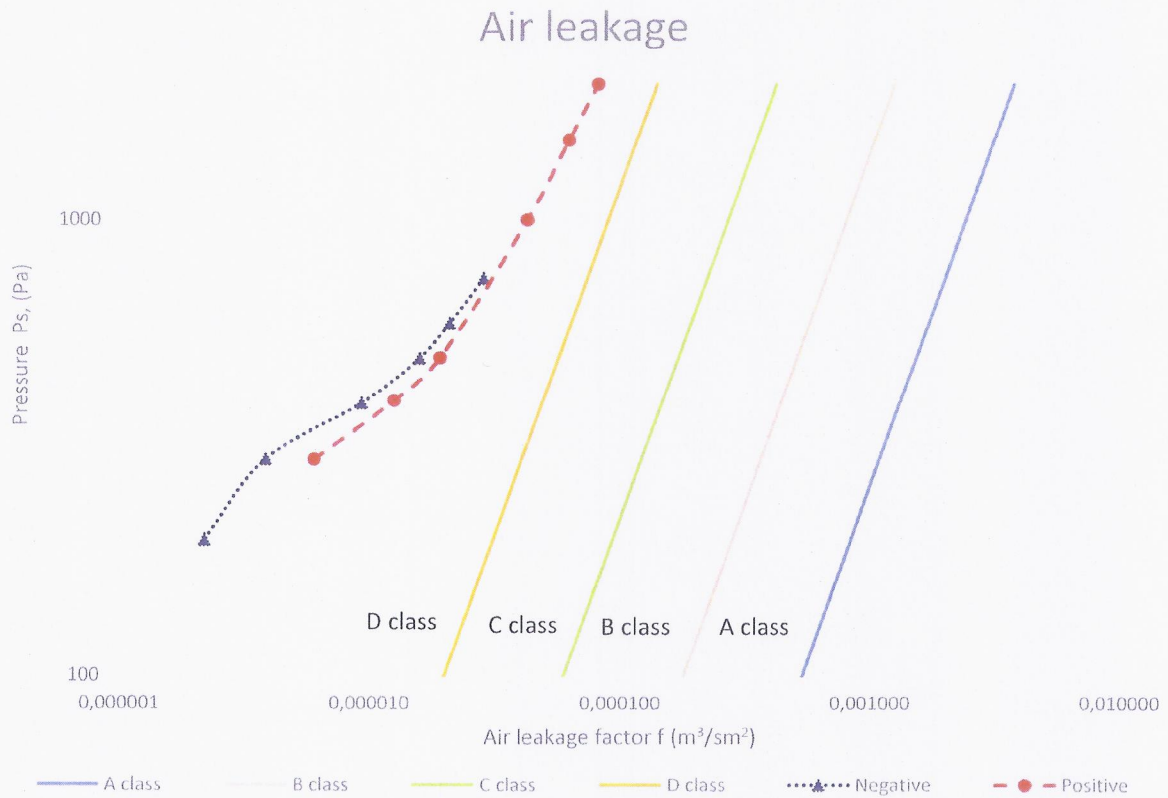
The expanded uncertainties (coverage factor $k = 2$): pressure $p_s \pm 2,0$ Pa; air leakage $\pm 0,005$ m³/h.

The measurement uncertainties conform to EA-4/16:2003 "EA guidelines on the expression of uncertainty in quantitative testing".

Annexes:

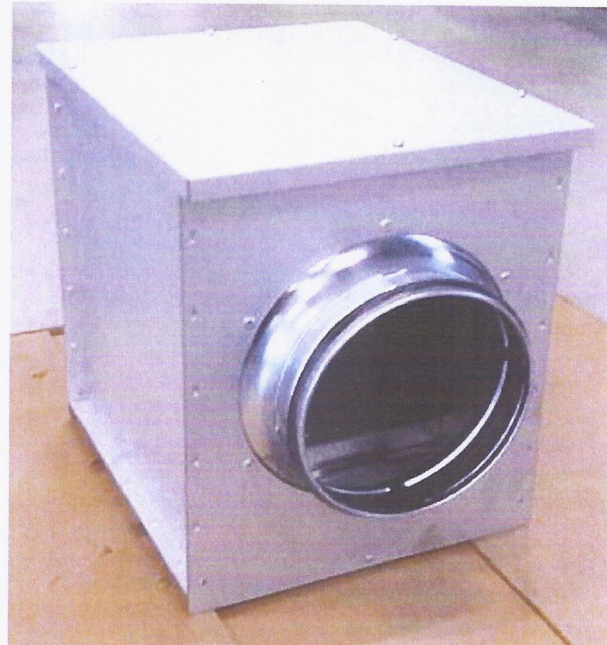
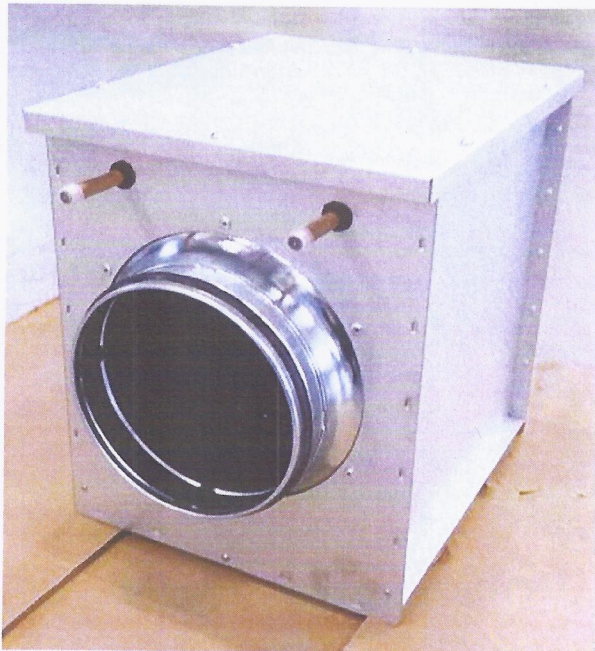
- Annex 1. Pictures of sample.
- Annex 2. Equipment for measurement.
- Annex 3. Test procedure.

Air leakage diagram

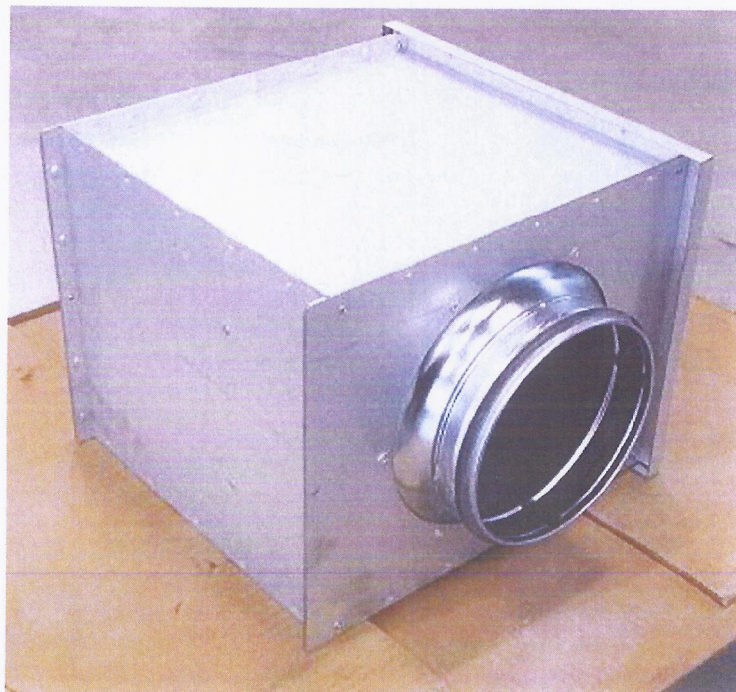


Air tightness class	Static pressure limit (p_s) Pa		Air leakage limit (f_{max}) $m^3 \cdot s^{-1} \cdot m^{-2}$
	Positive	Negative	
A	500	500	$0,027 \times p_{test}^{0,65} \times 10^{-3}$
B	1 000	750	$0,009 \times p_{test}^{0,65} \times 10^{-3}$
C	2 000	750	$0,003 \times p_{test}^{0,65} \times 10^{-3}$
D	2 000	750	$0,001 \times p_{test}^{0,65} \times 10^{-3}$

Annex 1



according to customer's request the plug and the ring were sealed with the insulating tape during the testing.



Annex 2**Equipment for measurement****Pressure measurer**

Manufacturer	TESTO
Name	6351
Range	-5000,0 ... +5000,0 Pa
Calibration certificate No.	37/15-S
Calibration data	2015-12-29

Flow meter

Manufacturer	COMMON
Name	CGR-01 G40
Range	0,65 ... 65 m ³ /h
Calibration certificate No.	28/15-D
Calibration data	2015-12-15

Flow meter

Manufacturer	SIERRA
Name	822S-M-4-OV1-PV2-V4
Range	0,04 ... 2 m ³ /h
Calibration certificate No.	91/15-C
Calibration data	2015-12-21

Environment conditions

Manufacturer	COMET SYSTEM
Name	T7511
Temperature range	-30 ... +105 °C
Relative humidity range	0 ... 100% RH
Atmospheric pressure range	450 ... 825,1 mmHg
Calibration certificate No.	a) 26/15-S b) 14/15-SD
Calibration data	a) 2015-10-02 b) 2015-08-25

Annex 3**Test procedure:****Calculation of the total joint length (L)**

The total joint length, in metres, for a product of circular cross-section is the sum of the joint perimeter of each connection (1 to n).

$$L = \pi \times (d_1 + d_2 + \dots + d_n)$$

The total joint length, in metres, for a product of rectangular cross-section is the sum of each joint perimeter.

$$L = 2 \times (a_1 + b_1 + a_2 + b_2 \dots + a_n + b_n)$$

Calculation of the virtual product surface area (A_c)

The virtual product surface area A_c, in square metres, is:

$$A_c = L \times 0,5$$

or

$$A_c = A_p \text{ (the product surface area).}$$

whichever is the larger.