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2019-06-18
M100827/201 MSG/STEG

Fabric Type Patio
Manufacturer Kvadrat A/S

Determination of airflow resistance according to EN ISO 9053-1

Test Report No. M100827/201

Client:	Kvadrat A/S Lundbergsvej 10 8400 Ebeltoft DENMARK
Consultant:	M. Eng. Philipp Meistring Jan-Lieven Moll
Date of report:	2019-06-18
Delivery date of test object:	2019-04-17
Date of test:	2019-04-24
Total number of pages:	In total 7 pages, thereof 4 pages text, 1 page Appendix A and 2 pages Appendix B.

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Appendix A: Measurement results and evaluation

Appendix B: Description of the test procedure and list of test equipment

1 Task

On behalf of Kvadrat A/S, 8400 Ebeltoft, Denmark, the airflow resistance of the fabric type Patio was to be determined according to DIN EN ISO 9053-1 [1].

2 Basis

This test report is based on the following document:

[1] DIN EN ISO 9053-1: Acoustics –Determination of airflow resistance – Part 1: Static airflow method (ISO 9053-1:2018); German version EN ISO 9053-1:2018. March 2019

3 Test objects

The tested fabric is described in Table 1. The indicated characteristic values were determined by the testing laboratory on the basis of the sample delivered by the manufacturer.

Table 1. Test object.

Test object (manufacturer's information)	**Area specific mass m'' [g/m²]**	**Thickness t [mm]**
Fabric type Patio manufacturer Kvadrat A/S, material 100 % Trevira CS water repellent finish	367	0.87

4 Execution of measurements

The airflow resistance was determined according to EN ISO 9053-1 [1].

The test method, the test facility and the test equipment used are described in Appendix B.

5 Measurement results

For the tested fabric type Patio a specific airflow resistance of

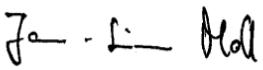
$$R_s = 3086 \text{ Pa} \cdot \text{s/m}$$

was determined.

The measurement results are shown in diagrams and tables in the test certificate in Appendix A of this report.

6 Remarks

The test results exclusively relate to the investigated subjects and conditions described.



M. Eng. Philipp Meistring
(Project Manager)

Jan-Lieven Moll
(Responsible)

DAkkS
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Akkreditierungsstelle
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Durch die DAkkS Deutsche Akkreditierungsstelle GmbH
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Die Akkreditierung gilt für die in der Urkunde aufgeführten Prüfverfahren.

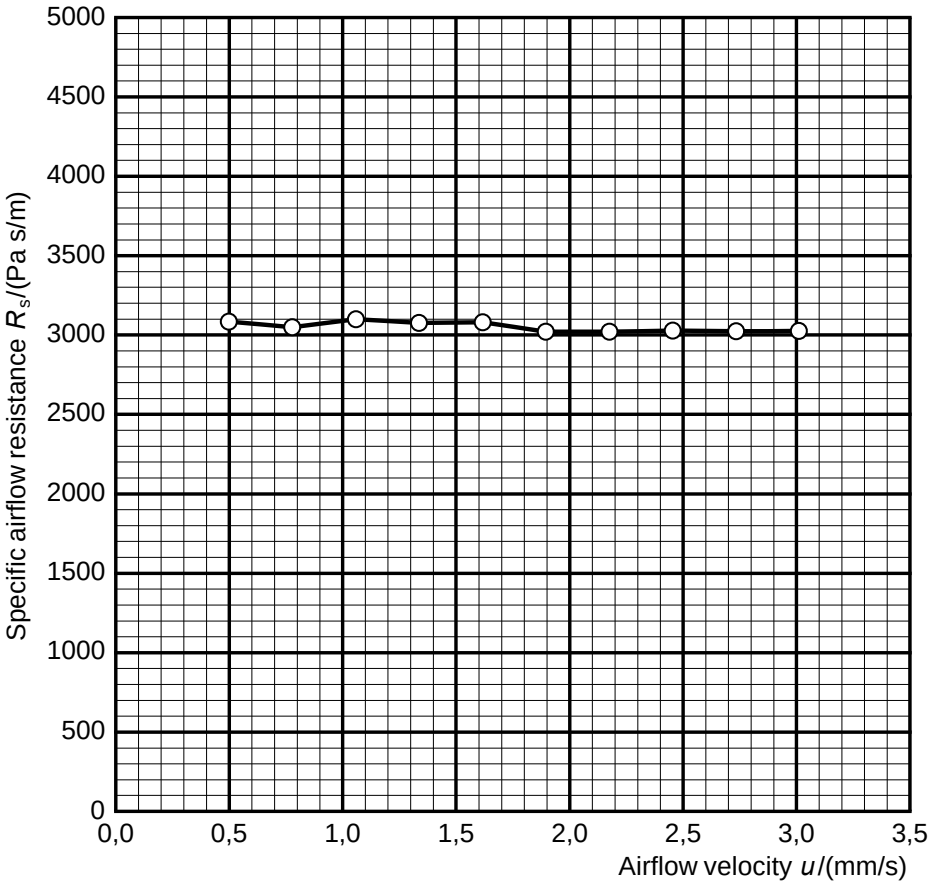
ISO 9053-1
Determination of airflow resistance

Client: Kvadrat A/S
Lundbergsvej 10, DK-8400 Ebeltoft
Project Number: M100827
Sample Number: 13404
Test object: - fabric type Patio,
- material 100 % Trevira CS water repellent finish

Diameter: 100 mm
Thickness: 0.87 mm
Area-specific mass: 367 g/m^2

Barometric pressure:
B = 95,6 kPa
Temperature:
θ = 18,3 °C
Relative humidity:
r. h. = 29,9 %

u/ (mm/s)	R_s/ (Pa s/m)
0.50	3084
0.78	3049
1.06	3098
1.34	3076
1.62	3079
1.90	3021
2.18	3020
2.46	3028
2.73	3022
3.01	3025



Specific airflow resistance R_s = 3086 Pa s/m

Laboratory: Planegg
Responsible: Moll
Date: 2019-04-24

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Description of the test procedure for the determination of the airflow resistance

1 Measurand

The specific airflow resistance R_S of the test object was determined. For this purpose the air pressure difference in front of as well as behind the test object was measured at different volumetric airflow rates. The specific airflow resistance $R_{S,I}$ for each volumetric airflow rate $q_{v,i}$ determined was calculated using the following equation:

$$R_{S,i} = \frac{\Delta p_i \cdot A}{q_{v,i}}$$

With

$R_{S,i}$ specific airflow resistance in Pa s/m;

Δp_i air pressure difference across the test object with respected to the atmosphere in Pa;

A cross-sectional area of the test object perpendicular to the direction of flow in m^2;

$q_{v,i}$ volumetric airflow rate passing through the test object in m^3/s;

u_i linear airflow velocity in m/s;

In addition the linear airflow velocity u_i was determined:

$$u_i = \frac{q_{v,i}}{A}$$

The indicated measurement result is the specific airflow resistance R_S, which is calculated for an airflow velocity of u = 0.0005 m/s by extrapolation with help of the linear regression.

2 Test procedure

The direct airflow method (static airflow method according to DIN EN ISO 9053-1 [1]) was applied. A steady unidirectional airflow with different air flow rates is pressed through the test object in the specimen holder. The resulting pressure drop between the two free faces of the test object is measured.

The specimen holder had a diameter of D = 100 mm.

3 List of test equipment

The test equipment used is listed in Table B.1.

Table B.1. Test equipment

Name	**Manufacturer**	**Type**	**Serial-No.**	**Calibration valid until**
Measurement system airflow resistance	Müller-BBM	M89319-00	315003	2020-03
Software for measurement and evaluation	Müller-BBM Acoustic Solution	m|ars	1.9.6697.32125	
Digital measuring slide	Mitutoyo	CD-15PPR	07019377	2021-03
Electronic balance	Kern	KB1200-2N	W1402353	2021-03