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2022-06-30
M100827/264 Version 1 MSG/STEG

Curtain fabric Hero 2 by Kvadrat A/S

Determination of airflow resistance according to DIN EN ISO 9053-1

Test Report No. M100827/264

Client:	Kvadrat A/S Lundbergsvej 10 8400 Ebeltoft DENMARK
Consultant:	M. Eng. Philipp Meistring Jan-Lieven Moll
Report date:	2022-06-30
Delivery date of test object:	2022-06-17
Date of test:	2022-06-28
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1 Task

On behalf of Kvadrat A/S, 8400 Ebeltoft, Denmark, the airflow resistance of the fabric type Hero 2 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

[2] DIN EN ISO 5084: Textiles - Determination of thickness of textiles and textile products (ISO 5084:1996); German version EN ISO 5084:1996. 1996-10

3 Test object

The tested fabric is described in Table 1. The samples were taken by the testing laboratory from a fabric roll delivered by the client. Each sample had dimensions of 210 mm x 297 mm. The following characteristics were determined by the testing laboratory:

Table 1. Test objects.

Test object (information provided by the client / indication on samples)	**Sample No.**	**Area specific mass m'' [g/m²]**	**Thickness t [mm]**
Fabric type Hero 2, material: 97 % new wool, 3 % recycled nylon	1	395	1.35
	2	391	1.34
	3	388	1.34
Mean		391	1.34

The thickness of the fabric was determined acc. DIN EN ISO 5084 [2] (per sample mean value of three positions, pressure 1.00 kPa, pressure-foot 2,000 mm²).

4 Execution of measurements

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

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

5 Measurement results

The measurement results are shown in the diagram and table in the test certificates in Appendix A of this report.

For the tested fabric the following specific airflow resistance was determined:

Table 2. Specific airflow resistance.

Test object Fabric type Hero 2	**Specific airflow resistance** R_S / (Pa s / m)	**Appendix A, page**
Sample 1	385	1
Sample 2	365	2
Sample 3	390	3
Mean	380	--

6 Remarks

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

M.Eng. Philipp Meistring
(Project manager)

EN ISO 9053-1
Determination of airflow resistance

Client: Kvadrat A/S
Lundbergsvej 10
8400 Ebeltoft

Project number: M100827

Sample number: 14057-1

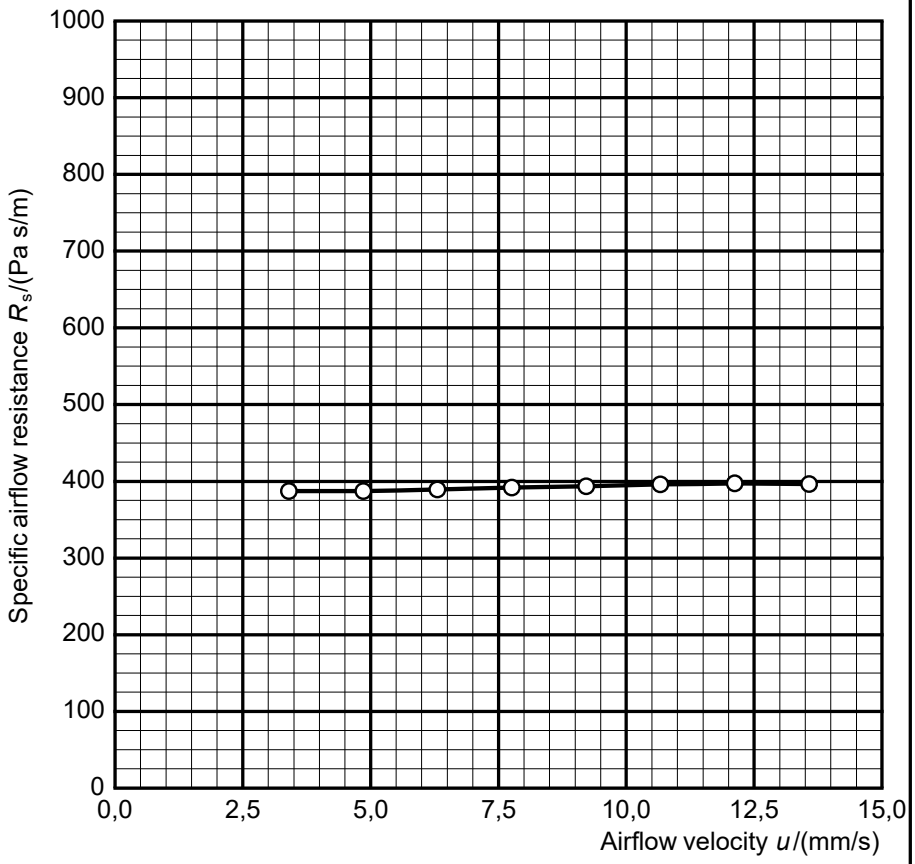
Test object: - fabric: Hero 2
- material: 97 % new wool, 3 % recycled nylon

sample 1

Diameter: 100 mm
Thickness: 1.35 mm
Area-specific mass: 395 g/m^2

Barometric pressure:
B = 95,5 kPa
Temperature:
θ = 26,4 °C
Relative humidity:
r. h. = 27,9 %

u/ (mm/s)	R_s/ (Pa s/m)
3.40	387
4.86	387
6.31	389
7.76	392
9.21	393
10.67	396
12.12	397
13.58	396



Specific airflow resistance R_s(0.5 mm/s) = 385 Pa s/m

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Laboratory: Planegg
Responsible: Moll
Date: 2022-06-28

EN ISO 9053-1
Determination of airflow resistance

Client: Kvadrat A/S
Lundbergsvej 10
8400 Ebeltoft

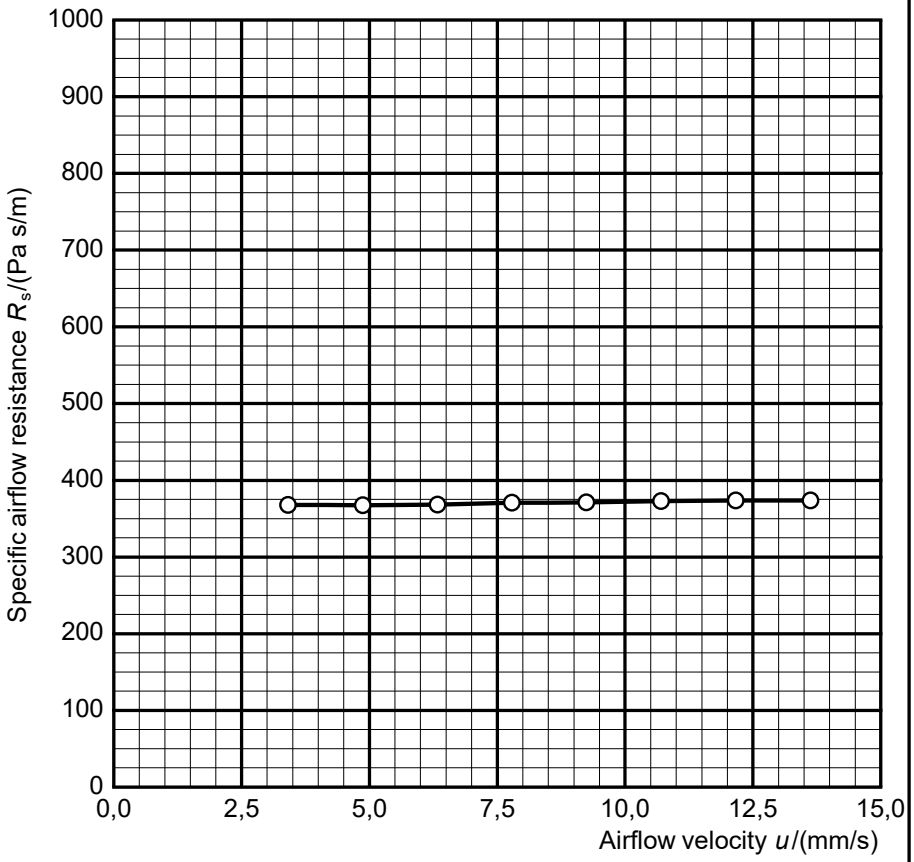
Project number: M100827
Sample number: 14057-2
Test object: - fabric: Hero 2
- material: 97 % new wool, 3 % recycled nylon

sample 2

Diameter: 100 mm
Thickness: 1.34 mm
Area-specific mass: 391 g/m^2

Barometric pressure:
B = 95,5 kPa
Temperature:
θ = 26,5 °C
Relative humidity:
r. h. = 18,0 %

u/ (mm/s)	R_s/ (Pa s/m)
3.41	368
4.87	367
6.33	368
7.79	371
9.24	371
10.70	373
12.16	373
13.62	373



Specific airflow resistance R_s(0.5 mm/s) = 365 Pa s/m

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Laboratory: Planegg
Responsible: Moll
Date: 2022-06-28

EN ISO 9053-1
Determination of airflow resistance

Client: Kvadrat A/S
Lundbergsvej 10
8400 Ebeltoft

Project number: M100827

Sample number: 14057-3

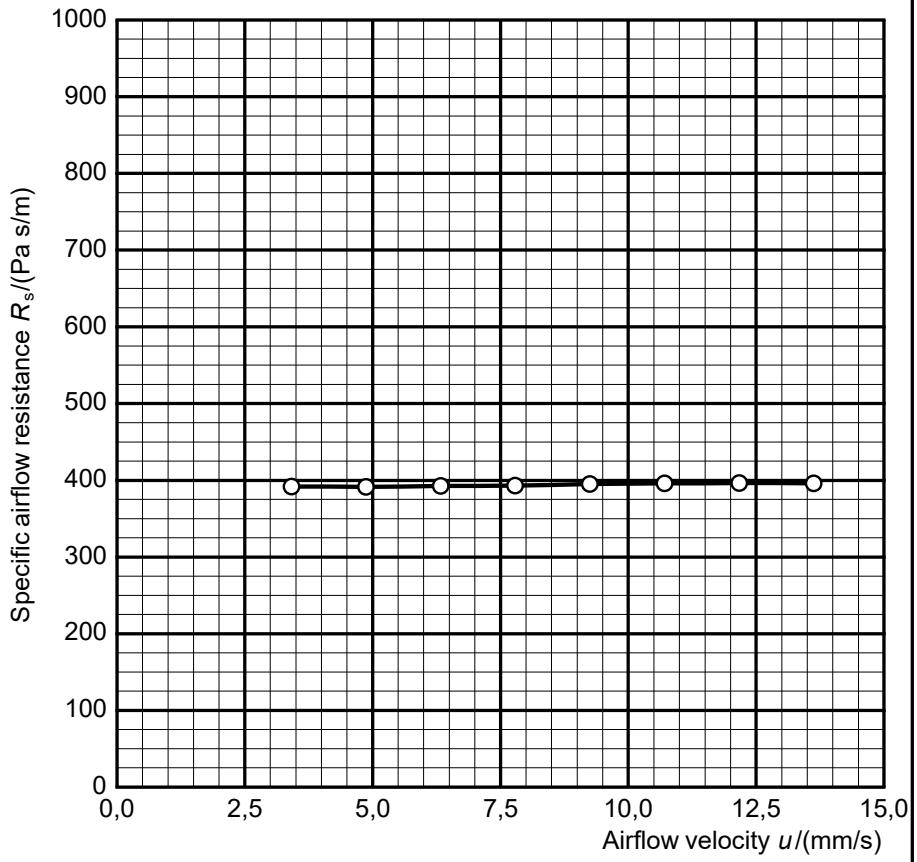
Test object: - fabric: Hero 2
- material: 97 % new wool, 3 % recycled nylon

sample 3

Diameter: 100 mm
Thickness: 1.34 mm
Area-specific mass: 388 g/m^2

Barometric pressure:
B = 95,5 kPa
Temperature:
θ = 26,6 °C
Relative humidity:
r. h. = 15,0 %

u/ (mm/s)	R_s/ (Pa s/m)
3.41	392
4.87	391
6.33	392
7.79	393
9.25	395
10.71	396
12.17	396
13.63	396



Specific airflow resistance R_s(0.5 mm/s) = 390 Pa s/m

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Laboratory: Planegg
Responsible: Moll
Date: 2022-06-28

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.
Measurement system airflow resistance	Müller-BBM	M89319-00	315003
Software for measurement and evaluation	Müller-BBM Acoustic Solution	m|ars	Version 1.14.7256.28813
Thickness gauge	Hans Schmidt & Co GmbH	D-2000-C0913	2985
Electronic balance	Kern	KB1200-2N	W1402353