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Building Solutions
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Müller-BBM Building Solutions GmbH
Helmut-A.-Müller-Straße 1 - 5
82152 Planegg

Telefon +49(89)85602 0
Telefax +49(89)85602 111

www.mbbm-bso.com

Dipl.-Ing. (FH) Dominik Reif
Telephone +49(89)85602 3566
Dominik.Reif@mbbm.com

2022-10-14
B139164/05 Version 1 RFD/STY

Fabric “KING FLEX” Manufacturer FIDIVI Tessitura Vergnano SpA

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

Test Report No. B139164/05

Client:	FIDIVI Tessitura Vergnano SpA Regione Masio 19/bis 10046 Poirino (TO) ITALY
Consultant:	Dipl.-Ing. (FH) Dominik Reif
Report date:	2022-10-14
Delivery date of test object:	2022-10-05
Date of test:	2022-10-14
Total number of pages:	In total 7 pages, thereof 4 pages text 1 page Appendix A 2 pages Appendix B

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1 Task

On behalf of FIDIVI Tessitura Vergnano SpA, Regione Masio 19/bis, 10046 Poirino (TO), Italy, the airflow resistance of the fabric type “KING FLEX” was to be determined according to DIN EN ISO 9053-1 [1].

2 Basis

This test report is based on the following documents:

[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. October 1996

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. The sample had the dimensions of 215 mm x 295 mm.

Table 1. Test object.

Test object (manufacturer’s information)	**Sample**	**Area specific mass m'' [g/m²]**	**Thickness t [mm]**
Fabric “KING FLEX” Sample number: 15138 Composition: 100 % Polyester, Trevira CS	1	302	1.17

The thickness as stated above was determined by the testing laboratory according to DIN EN ISO 5084 [2]. Testing was done at three positions of the sample at pressure of 1.00 kPa and with a presser-foot of 2000 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 diagrams and tables in the test certificate in Appendix A of this report.

The measurement results are also shown in the following Table 2.

Table 2. Specific airflow resistance.

Test object **Fabric type "KING FLEX"**	**Airflow resistance** **R_S / (Pa s / m)**	**Appendix A, page**
Sample no. 15138	295	1

6 Remarks

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

Dipl.-Ing. (FH) Dominik Reif

EN ISO 9053-1
Determination of airflow resistance

Client: FIDIVI - Tessitura Vergnano - S.p.A.
Regione Masio 19 / bis
10046 Poirino (TO)

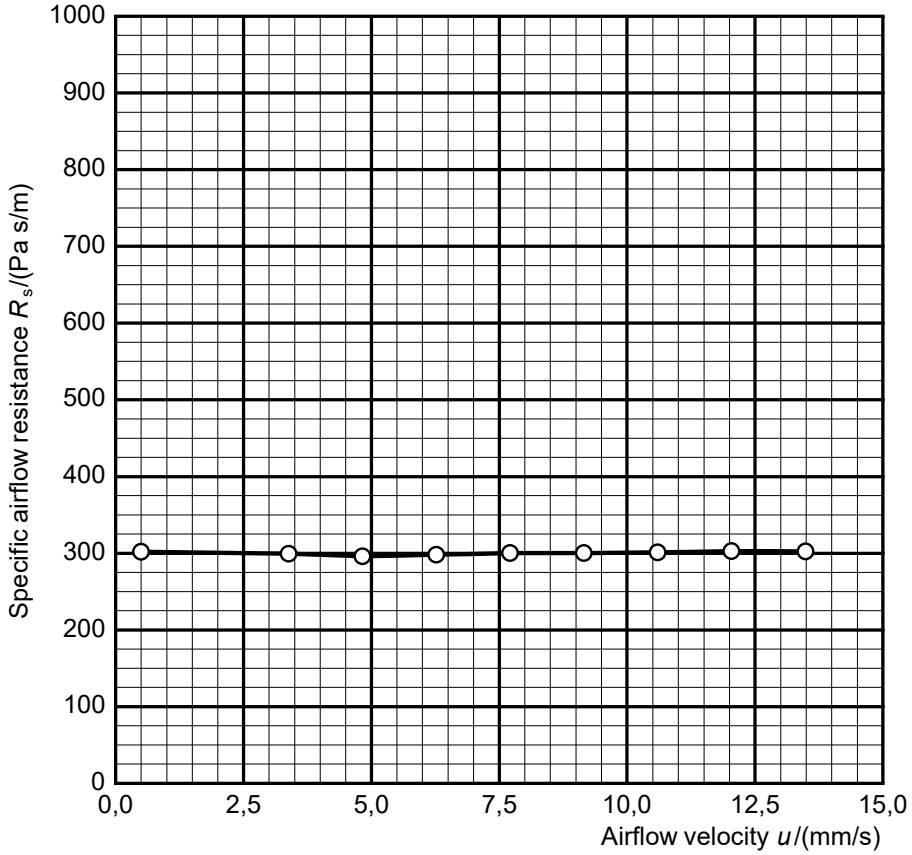
Project number: M139164
Sample number: 15138
Test object: Fabric: KING FLEX

Composition: 100 % Polyester, Trevira CS

Diameter: 100 mm
Thickness: 1.17 mm
Area-specific mass: 302 g/m^2

Barometric pressure:
B = 95,3 kPa
Temperature:
θ = 22,7 °C
Relative humidity:
r. h. = 22,2 %

u/ (mm/s)	R_s/ (Pa s/m)
0.50	302
3.38	299
4.82	296
6.27	298
7.71	300
9.15	300
10.60	301
12.04	302
13.48	302



Specific airflow resistance R_s(0.5 mm/s) = 295 Pa s/m

Laboratory: Planegg
Responsible: Reif
Date: 2022-10-14

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_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 respect 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 airflow 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 Precision

For the test method DIN EN ISO 9053-1 [1] states a reproducibility of approx. 15 % for open porous foam materials. This information was determined on the basis of round robin tests.

4 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 1.23.8256. 29682
Thickness gauge	Hans Schmidt & Co. GmbH	D-2000-C0913	2985
Digital measuring slide	Mitutoyo	CD-15PPR	07019377
Electronic balance	Kern	KB1200-2N	W1402353
Electronic balance	Kern	440-49N	WC0633572