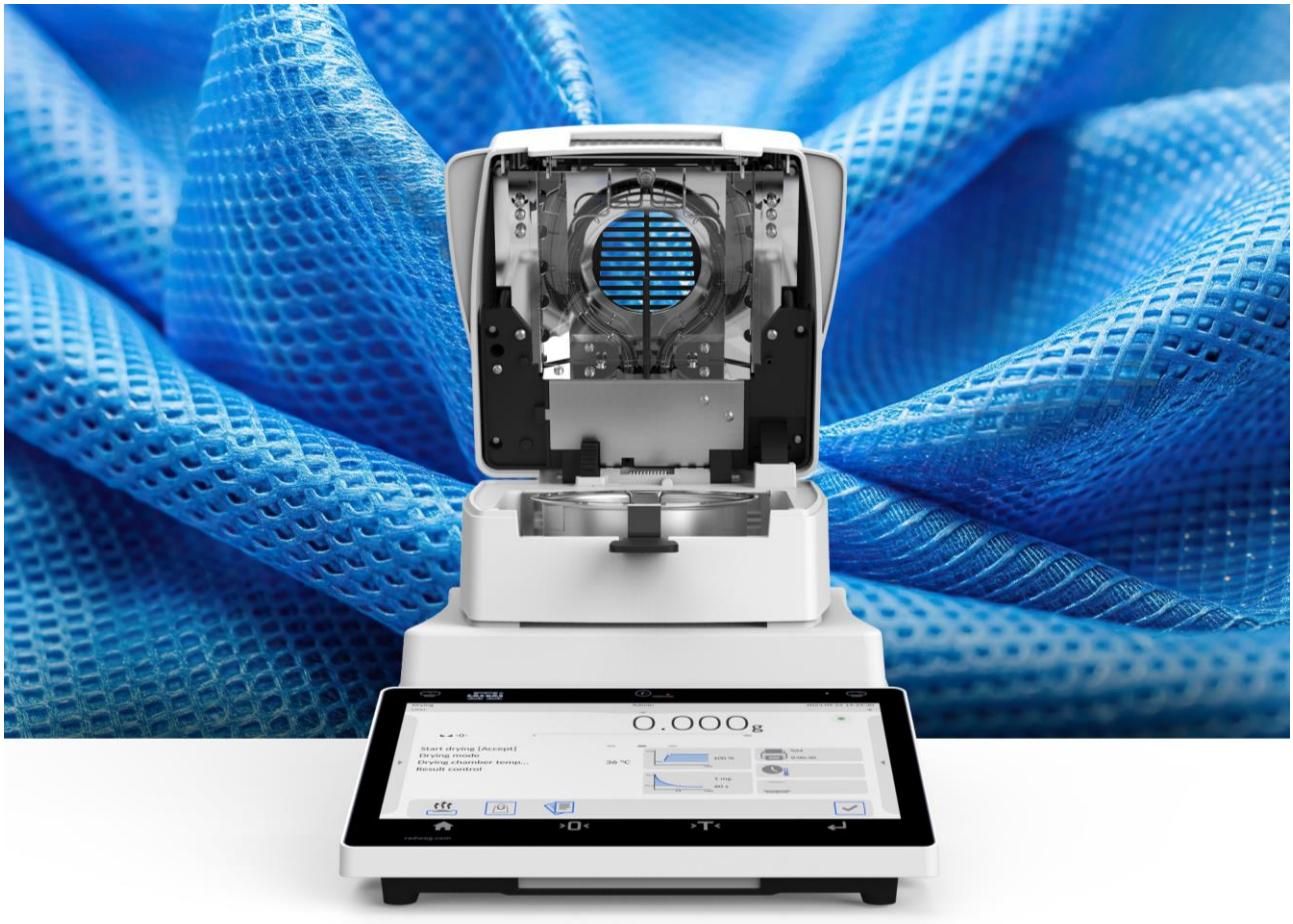
UNWOVEN FABRICS

water content determination

Unwoven fabric is made directly from a fiber ribbon, there is no need to prepare yarn required for weaving and knitting. The structure of the unwoven fabric is an accidental fabric entanglement. The unwoven fabric technology may use rolling (fiber splicing), fiber splicing through needling, water needling with water micro-stream, the so-called “aqua-jet; spunlace” or the method that adopts compressed air to splice fibers (air-jet; airlay method). Eventually unwoven fabric must assure suitable strength parameters because it can be widely used, starting from the furniture industry and ending up with construction. After the end of the engineering process, particularly when the aqua-jet method is used, the unwoven fabric moisture must be at a suitable level to guarantee safe storage and warehousing. The water content testing method must allow for distinctive features of the product in question and required measurement accuracy. In this field it is advisable to use Radwag MA R, MA X2, MA X7 and MA 5Y moisture analyzers with an IR radiation emitter.



The application note includes basic information for validation of the unwoven fabrics drying method with the use of MA R, MA X2, MA X7 and MA 5Y moisture analyzers series by Radwag Wagi Elektroniczne. The application note may be the basis for elaborating own drying method with special regard to distinctive features of the product in question.

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TERMS

ACCURACY of determining water / dry matter content is the difference between the result of the water / dry matter content received in the moisture analyzer method and the result of the water / dry matter content received while drying the same sample through a reference method.

PRECISION is a degree of compliance between independent results of the test, received in specific conditions. The measure of precision is a standard deviation from a series of several measurements.

REFERENCE METHOD

The reference method parameters are usually specified in standards or other discipline-specific documents as the so-called guides. If such documents are unavailable, the drying temperature that does not cause the sample to change colors is used. Such an approach applies to previously dehydrated products and raw products.

SAMPLE PREPARATION

Before testing, the sample must be stored in sealed packaging. Samples of the unwoven fabric must be cut into smaller pieces and distributed throughout the weighing pan.

ACCESSORIES

Laboratory dryer, weighing vessels, AS 220.X2 balance, laboratory spoon.

METHOD DESCRIPTION

Place samples with a mass of ca. 5 g in pre-dried glass weighing vessels. Specify the real mass of the samples in question with the use of the balance whose weighing accuracy is 0.1 mg (AS 220.X2). Put weighing vessels with the sample and lids in the temperature-controlled laboratory dryer. Dry samples at the temperature of 105°C for 3 hours. After this period, remove vessels and put into the desiccator until they cool down and weigh afterwards. Place samples in the laboratory dryer again and keep on drying them for 30 minutes. Cool them down and weigh again. Repeat the procedure until you obtain a stable sample mass or record the sample mass growth after drying.

RESULTS

Sample name	**NOVITEX UNWOVEN FABRIC**		
Type	VE 65 Z 350 – green	EV 40 – yellow	E40 – white
Water content (%)	5.98	4.15	0.23
Standard deviation (%)	0.05	0.06	0.05

UNWOVEN FABRIC – WATER CONTENT ANALYSIS WITH THE MOISTURE ANALYZER

The water content testing with the use of the moisture analyzer (IR radiation) entails two phenomena: convection and radiation. The sample temperature rises from outer layers to the bottom of the sample. The temperature gradient in the sample structure minimizes through optimization of the thickness of the dried sample and drying temperature.

SAMPLE PREPARATION

Before testing, the sample must be stored in sealed packaging. Samples of the unwoven fabric must be cut into smaller pieces and distributed throughout the weighing pan.

ACCESSORIES

MA R, MA X2, MA X7 or MA 5Y moisture analyzer, laboratory spoon, disposable aluminum weighing pans.

METHOD DESCRIPTION

Set drying parameters presented below. Distribute a thin layer of the sample with a mass of ca. 3 ÷ 4 g throughout the weighing pan. Lock the drying chamber manually or automatically to start drying.

DRYING PARAMETERS / RESULTS

	NOVITEX UNWOVEN FABRIC		
Sample name	VE 65 Z 350 - green	EV 40 – yellow	E40 – white
Drying profile	Standard		
Drying temperature	110°C	105°C	50°C
Sample mass (g)	~ 3		~ 4 ÷ 5
End of analysis	Auto 1		Time 2 min.
Water content (%)	6.00	4.18	0.26
Standard deviation (%)	0.05	0.14	0.04
Analysis time $\acute{x}$ (min)	~ 4	~ 2	x

ACCURACY OF THE MA R, MA X2, MA X7, MA 5Y METHOD

	NOVITEX UNWOVEN FABRIC		
Sample name	VE 65 Z 350 - green	EV 40 – yellow	E40 – white
Water content Ref. (%)	5.98 ± 0.05	4.15 ± 0.06	0.23 ± 0.05
Water content MA (%)	6.00 ± 0.14	4.18 ± 0.14	0.26 ± 0.04
Analysis accuracy (%)	|0.02|	|0.03|	|0.03|

RESERVATION

The method in question has been verified by the Research Laboratory, yet the results do not include factors arising from diversity of tested samples, operators' personal skills as well as measuring capability used by moisture analyzer users. For this reason Radwag shall not be held responsible for drying parameters but they can be used to elaborate own drying method.