



## THOMPSON RAISINS water content determination

Raisins come into existence after drying grape leaves in natural conditions. Dehydration leads to drop in the water content from ca. 70% to ca. 15%, while the sugar level rises in the structure that shrinks in a specific way. Another stage involves extra drying and mechanical drying with the use of hot air. The water content in raisins is normatively limited and may range from 13 to 31%, depending on their type (seeded raisins, seedless raisins). Similar to other products, durability of such an item depends on real water content. The water content analysis can be conducted on the basis of various methods, but it is important to find precise instruments. The solution in this respect is Radwag MA/R or MA/X2 moisture analyzers.



The application note includes basic information for validation of the raisins drying method with the use of MA/R and MA/X2 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.



## Raisins – water content determination

The method with the use of IR radiation

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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.

### SAMPLE PREPARATION

Mechanically fragment the sample.

### ACCESSORIES

Laboratory dryer, glass weighing vessels with a lid, AS 220.X2 analytical balance, laboratory spoon.

### METHOD DESCRIPTION

Place the sample with a mass of ca. 5 g in pre-dried glass weighing vessels. Specify the real mass of the sample 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 into 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	THOMPSON RAISINS
Water content (%)	19.36
Standard deviation (%)	0.17

## RAISINS – 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

Mechanically fragment the sample.

### ACCESSORIES

MA/R or MA/X2 moisture analyzer, laboratory spoon, disposable aluminum weighing pans.

### METHOD DESCRIPTION

Set drying parameters presented below. Collect the sample with a mass of ca. 3 g and distribute a thin layer of the sample throughout the weighing pan. Lock the drying chamber manually or automatically.

### DRYING PARAMETERS / RESULTS

Sample name	THOMPSON RAISINS
Drying profile	Standard
Drying temperature	110°C
Sample mass (g)	~ 3
End of analysis	Defined: 1mg / 40 sec.
Water content (%)	19.17
Standard deviation (%)	0.09
Analysis time $\bar{x}$ (min)	~ 36

### ACCURACY OF THE MA/R ÷ MA/X2 METHOD

Sample name	THOMPSON RAISINS
Water content (%) – Ref.	19.36 ± 0.17
Water content (%) – MA R/X2	19.17 ± 0.09
Analysis accuracy (%)	0.19

### 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.

