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**Determination of Headspace Gas Content in Plastic
Packaging Container for Food – Sensor Method**

食品塑料包装容器中顶空气含量的测定 传感器法

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Determination of Headspace Gas Content in Plastic Packaging Container for Food – Sensor Method

1 Scope

This Document describes a sensor-based method for the determination of different headspace gas contents in plastic packaging container for food.

This Document is applicable to the determination of the content of oxygen, carbon dioxide and other gases inside the packaging of food plastics and plastics and other materials composite materials that can be pierced by sampling needles. The detection of headspace gas in airtight packaging container of other materials can be carried out by reference of this Document.

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in this Document. For the dated documents, only the versions with the dates indicated are applicable to this Document; for the undated documents, only the latest version (including all the amendments) is applicable to this Document.

GB/T 2918 Plastics - Standard Atmospheres for Conditioning and Testing

ISO 2602:1980 Statistical Interpretation of Test Results – Estimation of the Mean – Confidence Interval

3 Terms and Definitions

For the purposes of this Document, the following terms and definitions apply.

3.1 Headspace gas

After the packaging containing food is sealed, a certain amount of gas remains or is filled inside the packaging.

NOTE: Depending on the packaging method, the pressure of the gas inside the package may be equal to or higher than the ambient atmospheric pressure, or maybe lower than the ambient atmospheric pressure.

6.4 Sealing gasket

Assist the sampler to pierce the packaging to avoid breakage of the packaging material. If the elasticity of the material of the package to be sampled is sufficient to prevent leakage when the sampler penetrates, the sealing gasket may be exempted from use.

6.5 Sample injection port

Through the sample injection port, the sample gas in the sampler can be introduced into the detection device.

6.6 Sensor

Accurately detect the content of specific gases in the sample gas, and the detection accuracy does not exceed $\pm 0.5\%$ (volume fraction).

6.7 Pipeline

The gas flow path that is used to transmit the sample gas to be tested.

7 Calibration

Use standard gas for equipment calibration; and the corresponding standard gas shall be used for calibration of different gas analysis sensors. During calibration, the gas is drawn from the standard gas source and introduced into the detection device; and the sensor shall be calibrated with standard gases of different gas concentrations.

Usually, various gas analysis sensors use 99.99% nitrogen standard gas for zero calibration. During the calibration process, the carbon dioxide analysis sensor shall use different concentrations of carbon dioxide standard gas according to the range of the sensor; the analysis sensors with three ranges of 0%~100%, 0%~20%, and 0%~5% can respectively use 25%, 10%, 3% carbon dioxide standard gas for calibration. Oxygen analysis sensor shall be calibrated with 21% oxygen standard gas.

8 Test Procedures

8.1 In accordance with the requirements of GB/T 2918, conduct the test in a laboratory environment at temperature of $23^{\circ}\text{C}\pm 2^{\circ}\text{C}$ and relative humidity of $50\%\pm 10\%$. If there are other test requirements, it can be tested under the specified environmental conditions.

8.2 Stick the sealing gasket to the part of the sample to be tested; and pay attention to stick it firmly to prevent air leakage, as shown in Figure 3.

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