

Functions and Services of Labthink Lab - Barrier Property Lab

Abstract: This article briefs on the necessity of package barrier property test. It also presents the functions and services of Labthink Lab.

Keywords: barrier property , transmission rate , permeance , permeability , packaging

With the development of people's living standard, the demand on consumable packages are constantly increasing. The earlier requirements on durability and later on beauty have now turned to aspects of packaging functions and packaging safety. At present, domestic testing of package materials cannot satisfy these test requirements yet. Moreover, the test capability of some material manufacturers and corresponding users is very weak. Therefore, from this year on, to mitigate the irregular situation of test items and test standard, relevant institutes have issued compulsory test items to the production and use of food packaging materials.

1 Test Demands

Since there are external packages outside flexible package, many people are unwilling to attach much importance to the test of flexible package. This is because some packaging practicants do not have sufficient knowledge of the importance of flexible package testing. On the other hand, some manufacturers mistakenly hold that the adoption of some packaging materials can improve certain properties of the finished products. For example, for food package that requires high barrier property and lucifuge, complex materials containing aluminum become the favor of some manufacturers, who takes it as the perfectly safe measure. Speaking in the perspective of microscopic permeation, the barrier property of aluminum foil is much higher than that of organic barrier materials. But it is more easily to have pinholes and creases. (The number of pinholes relates with aluminum thickness. Generally pinholes can be avoided only when the thickness exceeds 16 μ m. However, the increase of thickness will greatly increase product cost). Bending or impacting of materials during production and application may result in flaw of aluminum, which in turn results in obvious decrease of barrier property of materials and is unable to meet package requirements. Flaw materials without barrier property test may result in extremely high content of inner oxygen and water vapor, which will cause food deterioration. That is why even the selection of high barrier materials cannot lower the requirement for property testing of finished products

2. Barrier Property Testing

Functional packing materials possess special protective functions, such as high barrier property, environmental degradation, antistatic, eatable and other special functions. At present, in terms of food package, barrier materials attract the most attention in functional materials. This is because barrier materials can prolong quality guarantee period of inner content more effectively by controlling the internal-external content and exchange rate of gases such as oxygen, nitrogen and water vapor, etc., and by adapting to special packing forms such as controlled atmosphere package and vacuum package. Barrier property test is the most advanced test item in present physical property test of materials. Now as our country is attaching more importance to food package safety, more

and more quality inspection and supervision bodies, scientific research institutes, material manufacturers as well as relevant departments are purchasing barrier property testers to intensify their tests.

3. Labthink Permeability Lab

Being the first domestic manufacturer of package test instruments that sets foot on barrier property test, Labthink not only has products relevant to physical property test of many kinds of materials, but also possesses barrier property testers manufactured according to many test methods (her instruments cover the testing methods of 8 standards worldwide). Because barrier property testers are of high price and the concept of barrier property has just been acquainted by the package users in recent years, these instruments are not well popularized in our country. At the same time, there are not many domestic testing agencies that can be entrusted for permeability testing. All that hinders domestic package material manufacturers from adopting comparative expensive barrier materials. To better researches on barrier property test instruments and to accumulate rich experiences on material testing, Labthink established Barrier Property Lab in 2000 to provide customers with professional barrier property test service formally.

Labthink Barrier Property Lab mainly devotes to the researches on the permeability mechanism and testing of high polymers. All the permeability products of Labthink can provide testing services for lab research subjects and samples from customers. Permeability tests on oxygen, nitrogen, carbon dioxide, air and other common inorganic gases as well as water vapors can be executed in the lab. Meanwhile, the diffusion coefficient and dissolution coefficient of gases to materials can also be tested. Moreover, this lab can perform gas and water vapor permeability test under various temperatures. Among which, equal-pressure oxygen permeability test instrument and sensor method water vapor permeability testers have particular advantage in temperature controlling. The lab can carry out integral oxygen permeability test and water vapor permeability test of packages, such as containers and flexible packaging bags. While researching on its own subjects, Labthink Barrier Property Lab also carries out data comparison of various test methods. Some of the research achievements have been published on some academic journals. Up to 2005, Labthink lab had provided multiple-level professional services to more than 2000 customers in the world. She data comparison and exchange with world known packing labs such as MECADI Lab, Germany and Thailand Packing Center

One thing worthy mentioning here is the barrier property test of container. Container is the common form used in liquid packing. Its special shape makes the barrier property testing rather difficult. In the past, gas permeance of it is estimated by testing sheet of container. However, there is obvious disparity existing between the estimated and the actual gas permeance of the container. Among various test technologies, oxygen permeability testing of container enjoys the rapidest development. The introduction of standard ASTM F 1307 for package oxygen permeability test not only accelerates the research and popularization of package oxygen permeability instruments; test results are also more scientific and accurate. In 2004, Labthink developed the first domestic package/film oxygen permeability tester. Based on electrochemistry principle and possessing double function of film test and package/container test, this instrument meets the requirements of ASTM F 1307 and ASTM D 3985. This year, based on its successful R&D experience of package/film oxygen permeability tester and combining with its water vapor permeability instrument R&D experience, Labthink introduces the TSY-W3 for package water vapor

permeability test. This instrument adopts electrochemistry principle and is accurate in humidity and temperature controlling, which can effectively avoid the influences on test data caused by the difference of constant temperature and humidity controlling in gravimetric method. This kind of instrument provides a favorable test method for the comprehensive understanding of package barrier property. At present, barrier property lab has provided barrier property test service to customers at home and abroad with satisfactory test results.

4. Prospects

Package safety is essential to food safety. Unpacked food is rare nowadays, while package forms relying on the property of packing materials are obviously increasing. Adopting barrier materials reasonably can efficiently prolong quality guarantee period of the food. Barrier property test can provide great help to select packing materials and to the designing of packing structures.