

## Testing Control Solutions for Candy Packaging Quality

Candy is popular in the market with an increasing development tendency. There are many kinds of it, but the main ingredients are granulated sugar, maltose, milk powder and cream, etc.; some candy also has flavoring essence, gelatin or amylum. The package of candy is of significant importance to candy marketing and storage. Therefore, the design of candy package is subject to target customer group. Besides, branding, systematization and advertization have become the functional characteristics of candy packages. Nonetheless, the protective function is the most fundamental and the most important one.

The protective function of candy packages direct relates to the candy quality. Since the ingredients of different candies are varied, there requirements for packaging materials are also varied according to the type of the candy. Candies with low moisture contents are apt to absorb moisture and will result in anddissolution and crystallization; candies with high moisture contents are apt to have dry-shrinkage and mould with the deterioration resulting from oxidization of amylum, cream or other ingredients. Therefore, the barrier function against gas and moisture of the packages should be especially emphasized. Besides, the convenient performance of candy packages would influence customers' evaluation on products. For example, negative influence is caused to jelly marketing by the poor sealing quality and water content spill during transportation.

After retrospective discussions with candy manufacturers on how to perfect quality control, we recommend the following testing and control procedures for candy packages.

### 1. The Barrier/Permeation Testing for Packaging Material and Finished Product

Oxygen and water vapor can lead to candy deterioration; therefore, the control over oxygen and water vapor content around candies is quite important. This problem can be resolved by control the barrier property of candy packages. The barrier property indicates the capability of oxygen and water vapor entering into the packages as well as the fragrance dissipation. However, though high barrier property packaging materials are applied, the barrier property of the finished products is not always good. This relates to the sealing performance of the whole package. So, the writer recommends the barrier property testing should be made for both packaging materials and finished packages. The material testing can help package designer select the most economy and practical materials; the finished package testing can help the manufacturers learn more about the defaults during packaging processing and give more reasonable evaluation for quality guarantee period. Labthink PERME series of barrier property testing instruments can meet the needs for candy package testing.

### 2. Sealing Performance Testing

The aim for sealing performance testing is to detect the leak places. Through sealing performance testing, the maximum pressure of the package and the distribution of leak points can be learnt so that the package designer can evaluate whether the package meet the sealing requirements during storage, transportation and marketing. The fracture of the package is mainly caused by inner pressure increase. And thus, a pressure difference needs to be formed for testing so as to stimulate the actual status. There are two methods, namely positive pressure method and negative pressure method. Positive pressure method is to fill gas into the package so as to increase the inner pressure of the package. Negative pressure method is to decrease the outside pressure by vacuuming. In application, candy packages rarely adopt vacuum packages, and the writer recommends the positive pressure method for sealing performance testing. Labthink PARAM LSSD-01 Leak and Seal Strength Detector can make this testing. Besides, with special testing fixtures, the testing subjects can be extended to include jelly cup, stand-up pouch and tube, etc. This application is quite useful for candy packages with varied shapes, especially

for jelly packages.

### **3 Pressure and Burst Resistance Testing**

This testing is applied for candy package pressure resistance performance evaluation, and burst resistance control for packages during transportation. All these directly relates to the performance of candy packages during storage, transportation and shelf life periods to avoid inferior sealing such as adhesive failure. Besides, there are other relevant testing items including burst resistance force and pierce, etc. Thus, Labthink specially designs a small-size electric universal tester for jelly cups. This tester can simulate the stacking height, maximum burst resistance force, distortion under definite pressure and pressure under definite distortion. This tester can realize every testing item for thorough jelly package comprehensive pressure resistance performance. Besides, Labthink PARAM XLW series of Auto Tensile Tester can test pierce resistance testing for pouches or jelly cup lid/film with customized clamps.

### **4 The Open Force (Tearing Force) Testing and Packaging Material Mechanical Property Testing**

The insufficient seal strength of the candy package would lead to adhesive failure during storage, transportation and shelf-life periods, whereas excessive sealing strength would lead to inconvenience in opening the candy packages. Therefore, a proper seal strength value comes from the comprehensive testing and consideration of film sealing performance, tensile resistance testing, pierce property, elongation rate, peeling strength, vertical tearing and other mechanical properties. Labthink PARAM XLW series Auto Tensile Tester can do the above tests as well as 45°,90°and 180°open force of jelly cups. Furthermore, the coefficient of friction of the packaging material is also a factor concerning open easiness. Labthink PARAM FPT-01 Friction/Peel Tester is specially recommended for material peel strength and coefficient of friction testing, which can realize ambient to 99.9°C temperature control for transportation and storage simulation.

### **5 Printing Test**

The gorgeous printing is always a characteristic of candy packages. But, the poisonous substance in the ink and solutions would do harm to the customers. The rub resistance performance is another concern: the exquisite package may be degraded for inferior rub resistance performance after transportation. The solution residuals can be determined by Gas Chromatography. Recently, Labthink introduces a new Gas Chromatography for package quality testing of food industry with favorable responses. The rub resistance of candy package printing layer can be tested by Labthink PARAM MCJ-01A Rub Tester, RT-01 Rub Tester and PARAM Ink Layer Adherence Tester so as to effectively resolve the ink-layer falling and coating hardness issues and guarantee the best packaging appearance.