

Package Leaks

Replacement of Water Bath Leak Detection

Application

A coffee roaster was using the water bath method to determine leaks in packages. While this method indicated the presence of leaks, it was unable to provide any quantitative data as to actual hole size. They were concerned with the consistency, accuracy and repeatability of their current bubble test. They wanted quantifiable data that could be used to formulate the products shelf life.* The absolute leak hole size was one of the data points needed to determine the shelf life of the coffee.

Instrument Used

MOCON's PAC CHECK® 840 benchtop package analyzer was used in this application to test for leak hole size. The PAC CHECK 840 is designed to provide information for 3 critical shelf life factors.

1. Absolute leak hole size
2. O₂ headspace
3. Package volume



*Some of the data used to calculate shelf life include: oxygen transmission rate through the package wall (barrier), oxygen ingress through holes and leaks, and volume of residual oxygen remaining in the package.

Package Type

Coffee bags containing ground coffee similar to this illustration were tested.



Test Results

13 regular and 13 decaf coffee bags were tested and the following hole sizes (per page) were obtained.

	Regular coffee	Decaf coffee
Hole size (mil)	0.1	0.1
	0.1	0
	0.3	0.2
	0.2	0.2
	0.8	0
	0.1	0.1
	6.1 (hole noted on side)	0
	0	0.2
	0.7	0
	0.6	0
	0	0.2
	0.2	0.1
	0.6	0

Application Note 06-4102

The following notes were recorded

1. The seal length was 11.66mm
2. The septum needed to be adhered to a smooth surface, free of wrinkles
3. The needle head on the PAC CHECK needed to be perpendicular to the testing surface to ensure a good seal
4. The needle may clog with coffee grounds and may need to be emptied/checked after each test

Conclusion

1. The PAC CHECK 840 is a suitable instrument for this type of testing
2. The septum was best placed at the top of the package to avoid sticking the needle directly into the ground coffee
3. The roaster was able to take create a data base of hole sizes per coffee type and use that information to assist in the calculation of shelf life
4. They were also able to use the quantifiable data to track the both quality of the bag supplies and the sealing process

In addition, by removing the bubble test method:

1. They would eliminate a microbiological contamination source
2. Avoid costly downtime to clean the tank
3. Avoid operator error
4. Improve testing sensitivity
5. Provide consistent testing between plants

For more applications notes or for more information on the PAC CHECK 840 contact MOCON or go to our website.

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