White Paper

How leak detection reliably maximizes shelf life and prevents food waste

How food manufacturers keep their promise of quality

Food producers have a great interest in extending the minimum shelf life of their products, to satisfy consumer demands and cope with long transport routes. Flexible and MAP packaging plays a decisive role in this context as one of its purposes is to shield the product from harmful external influences. A key criterion is the leak tightness of the packaging, as it has a significant impact on whether the products will prematurely deteriorate or even spoil. With the mandatory indication of a minimum durability date (MDD) companies are under an obligation to their customers – they must be able to rely absolutely on their packaging as well as the results of corresponding leak detection tests. Innovative testing technology such as the pressure rise method can achieve this. Inside the flexible membrane chamber, the pressure rise method reliably detects both ultra-fine and gross leaks quickly and easily.

MDD – a guarantee of quality from food producers

With the Minimum durability date, the manufacturer assures the consumer that the food products will remain of high quality until at least this date and that it has all the guaranteed product characteristics. These include not only nutritional values and consistency, but also taste, smell and appearance. Additionally, a longer shelf life has become an important criterion when consumers decide for or against the purchase of a food product. Because of this, the MDD has become a competitive factor that food producers must pay close attention to if they wish to be successful. Manufacturers give their customers an objective and comparable promise of quality and therefore must have complete confidence that this promise will not be undermined by inferior or damaged packaging.

Reliably detect leaks of relevant sizes

As stated earlier, with the pressure rise method inside the flexible membrane chamber, both fine and gross leaks can be reliably detected. For measuring, the package to be tested is located between two highly elastic membranes in a test chamber. By evacuating the chamber, the membranes adapt to the contour of the test object,

and a large pressure differential is created between the packaging and the vacuum inside the test chamber walls. This pressure differential inspires gas to escape from the packaging through existing leaks and causes a measurable pressure rise in the vacuum chamber. These leak detectors can even detect leaks that are smaller than 10 µm. In addition, the method – unlike other systems – also reliably detects gross leaks.

Quality assurance in ongoing production

Leak detection is most efficient if employees are able to uniformly carry out leak tests directly on the production line. The leak detector should also work non-destructively for continuous testing during production to reduce waste. The Contura® leak detector assures leak tight packages – its flexible membranes conforming to the package absorb the mechanical stress that such a large differential pressure creates and would otherwise be applied to the sealed seams. For efficient integration of a testing device into the production process, Contura features short test cycles, as well as quantitative and reproducible results. This device provides the operator with immediate testing results by means of a color and sound signal, which is particularly useful in a noisy and busy production environment, as well as by an integrated display showing the exact leak rate. Short test cycles and immediate results pay off significantly in terms of quality assurance and cost-efficiency.

Added value for manufacturers

It is also be possible to use the test results for the further development of packaging materials and machines. With our Contura Family, test results can be read out via network or USB ports for subsequent processing, thus contributing to the continuous improvement process (CIP).

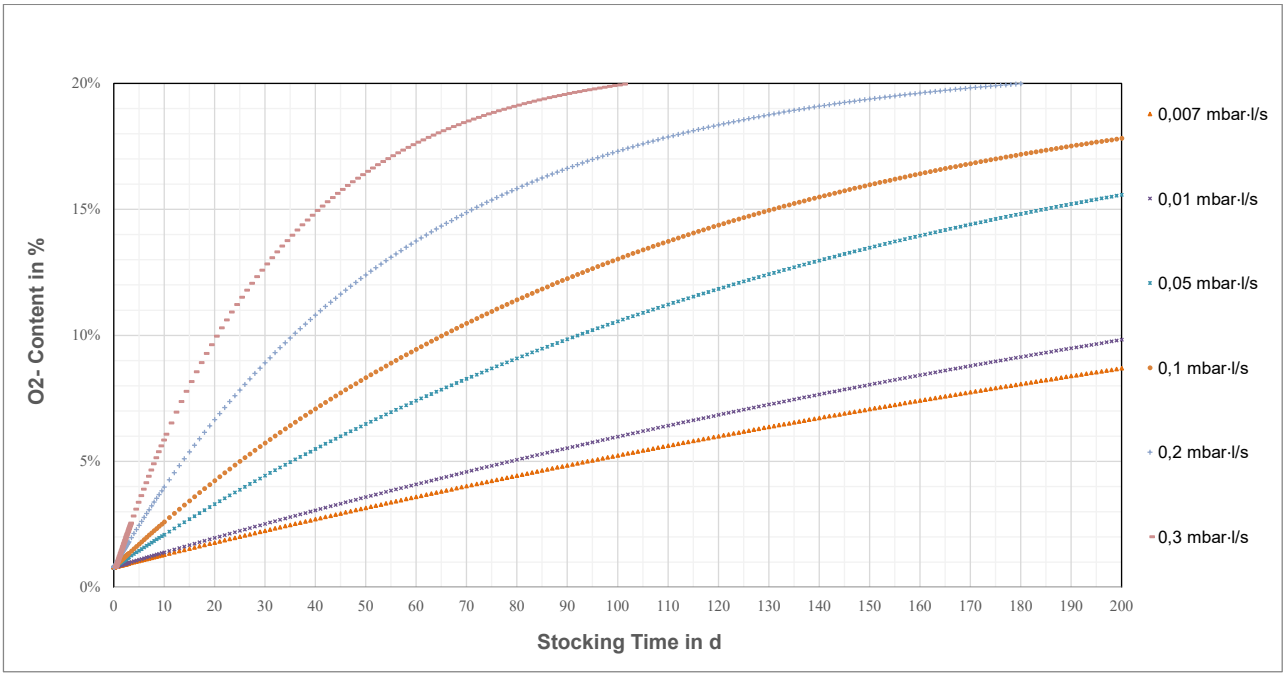
Securing the promise of MDD with Contura

Many food packages can be tested rapidly and reliably with leak detection using the fast, precise and process-compatible pressure rise method in the flexible chamber. As a result, leaking packaging have no chance to reach the market – and food manufacturers keep the quality promise they have made in the form of the best before date.

The leak detector also provides them with the certainty required to label their products with an extended MDD. This pays off and generates new business opportunities, for example by opening up markets that require longer transport times.

Saving good food thanks to innovative testing technology

A lot of consumers fail to distinguish between the expiration date of a food, i.e. the date from which consumption is no longer safe for health, and the minimum durability date. As a result, far too many food products that are still perfectly safe are being disposed of, as numerous studies have shown time and again. With the certainty that their products will not perish prematurely due to leaking packaging, food producers can exploit the minimum shelf life and thus indirectly contribute to stopping waste.



Correlation between leak rate, O2-increase and stocking time

Your benefits

» The Contura leak detector helps food producers avoid consumer complaints and improve customer satisfaction.

» The device reliably ensures the quality of food products.

» Food producers can reliably maximize the Minimum durability date of their products through verifiably leak tight packaging.

» With the assured quality using the pressure rise method, costs are reduced and profits increase.

» A longer shelf life opens up new business opportunities in more distant regions.

Related e-book

Further information can be found in the e-book "Leak Detection in the Food Industry." It shows where the greatest threats to the shelf life of various types of food lay, whether dry, semi-dry or moist products. It also provides an overview of the leak detection methods commonly used in the industry and assesses their informative value and reliability. The e-book is available for free download at www.inficon.com/en/markets/industrial-manufacturing/packaging

About INFICON

INFICON GmbH in Cologne, Germany is one of the world's leading developers, producers and suppliers of instruments and devices for leak detection. The leak detectors are used in the production and quality control of demanding industrial processes and cover a wide range of applications. INFICON'S primary customers include manufacturers and service companies for air-conditioning and refrigeration equipment, the automotive and automotive supply industry, the semiconductor industry and manufacturers of leak detection systems. With its many years of experience in leak testing and leak detection, INFICON now also wants to support the food industry and has therefore developed the patented Contura S400 leak detector.

INFICON has more than 50 years of experience in leak detection technology. INFICON processes worldwide sales through production facilities in Cologne (Germany), Balzers (Liechtenstein), Linköping (Sweden), Syracuse (USA), and Shanghai (China), as well as sales offices in all major industrialized countries and an extended network of sales partners. In fiscal 2022, INFICON AG with its approx. 1456 employees, generated worldwide sales of approx. US$581 million. The registered shares of INFICON (IFCN) are traded at the SIX Swiss Exchange.

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Resources and References

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Reference Study: „Shelf life extension and food waste reduction" by Pegah Amani, Lars-Erik Gadde, SP Technical Research Institute of Sweden - Food and Bioscience, Gothenburg, Sweden, Chalmers University of Technology, Gothenburg, Sweden