

Preventing recalls

Acoustic sensors detect glass breakage

Where food or beverages are filled into containers made of glass, it can happen that they burst. The resulting shards sometimes contaminate other units in the immediate vicinity. If the glass breakage is not detected immediately, the affected products can end up on the market and, in the worst case, all the way to the end customer. At the latest then, elaborate and cost-intensive recalls of entire batches are necessary, which not only annoy the customer base, but also cause lasting damage to the manufacturer's reputation. To prevent this problem from arising in the first place, Schwerin-based ds automation gmbh has developed special acoustic sensors. These can be easily integrated into existing lines and reliably detect

glass breakage incidents by signal level and frequency characteristics. Depending on the degree of automation, the line is then either stopped for manual inspection or the affected units are automatically ejected from the filling line. The sound sensors used here are dustproof and watertight in accordance with protection class IP67 and made entirely of stainless steel, so that they also meet the high hygiene requirements in food and beverage production.

If the glass breakage is not detected immediately, the affected products can end up in the shops and, in the worst case, all the way to the end customer (photo: Laboko/Shutterstock.com)



The sound sensors are dustproof and waterproof according to protection class IP67 and are made entirely of stainless steel (photo: ds automation gmbh)



QA via airborne sound

"The sensors for glass breakage detection are special microphones that continuously monitor their environment," explains Christian Schröder, developer at ds automation gmbh. "They detect any deviation from a noise situation defined as normal." For this purpose, specific trigger thresholds are defined in advance, within which the usual background noise of the production line moves. The noise generated by a glass breakage can be characterised as a bang, which is very broadband and has a relatively high signal amplitude. This exceeds the set threshold and can accordingly be identified as an anomaly by the sensor.

A major challenge in detecting glass breakage events with the help of airborne sound, however, lies in the sound attenuation caused by the air itself and the interference noise of the production line. However, the closer the sensors are placed to the sound event to be measured, the lower the air attenuation and thus also the susceptibility to errors.

Furthermore, the risk of false alarms increases with the usually relatively loud ambient noise of the production lines, because of which employees often have to wear hearing protection. The measurement technology specialists at ds automation get around this problem by not only measuring the sound level, but also performing band-pass filtering. In this way, for example, the measurement signal can be concentrated on the frequency spectrum between 16 kHz and 32 kHz, which is barely or not perceptible to the human ear. In this way, the sound event triggered by breaking glass can be reliably identified and appropriate follow-up steps can be initiated.

"In order to avoid both false alarms and undetected incidents, we always configure the sensors individually to the needs of the application," says Schröder.

The acoustic sensors from ds automation can be easily integrated into existing lines and reliably detect glass breakage incidents by the signal level and frequency characteristics (photo: ds automation gmbh)

Advertising



Worldwide trading

Tel: +31 348 460 009
sales@useddairyequipment.com
www.useddairyequipment.com



Used machines:

Separators, Bactofuges

Brands: Tetra Pak, Alfa Laval, GEA Westfalia

Homogenizers

Brands: Tetra Alex, SPX APV, GEA Niro Soavi

UHT & Sterile / Aseptic units

Brands: Alfa Laval, Tetra Therm, Tetra TBA, GEA

Also complete dairy factories