

## Leak detection and Increasing quality consistency in Spirits Production

### Ensure the angels get no more than their share - Casade

*Get savvy on optimising your spirit operations*

The scotch whisky industry is part of our heritage, with values and traditions that are to be cherished. It is a global success story, with total exports reaching £4.3 Billion in 2017, which amounts to one fifth of UK food and drink exports\*.

It has achieved a global reputation for authenticity and consistent quality. The craft of whisky production is core to this success, but it is the science that has allowed the production processes to be scaled up to meet the growth in global demand whilst maintaining product quality.

From malting, mashing and fermenting, to distillation, aging and bottling, the industry has utilised automation solutions to accurately control the process and ensure consistent quality. Every part of the process is a crucial contributor to the final product, but it is in maturation, the aging process, where the spirit truly realises its character.

No automation is needed while the spirit matures in oak casks for a minimum of three years, or more than twelve for many premium products. It is during this time that the spirit interacts with the wood extracting flavours, aroma compounds and developing its character. Spirit is also pulled to the outside surface of the cask and evaporates - this is the 'angel's share'.

Over the maturation period, on average, the angel share is about 2% of volume per year. That is roughly seven bottles of whisky. This is part of the magic of the whiskey process, but it is not the only cause of spirit loss. What if the cask leaks?

The supply chain for oak casks, sourced from many countries, is as complex as the varieties of whisky you see available on the shelf. How can the distiller know the integrity of these casks? Traditional testing methods are slow, require visual inspection and stress the cask.

At Emerson we have a history of innovation and the introduction of disruptive technologies which deliver significant productivity improvement for our customers. Working with the industry, Emerson has developed a solution which can check the integrity of a cask by fractionally raising the internal pressure and then detecting the leakage of alcohol or a trace gas such as carbon dioxide. This innovative solution incorporates a laser detection technology which has been used to detect leakages in aerosol canisters and the integrity of food packaging. The test procedure is fast, sensitive and identifies cask defects which are not visible to the eye but can cause cask leakage resulting in 50-100% loss of spirit.

There are around 20 million casks of spirit maturing in warehouses in Scotland. If we can save a fraction of a percent of losses per year by ensuring every cask is fit to be filled, then the savings are significant. Consider it Solved. The Angels will still be smiling :-)

[www.emerson.com/en-gb/automation/cascade](http://www.emerson.com/en-gb/automation/cascade)

\* Ref: [www.scotch-whisky.org.uk](http://www.scotch-whisky.org.uk)