



Low Emissions Distilleries

Sustainable Innovation
for the **Future of Distillation**
and bio-ethanol production



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Sustainable Innovation by Frilli

Frilli's Low Emissions Distilleries technology is designed to drastically reduce **CO₂ emissions** and energy consumption, offering sustainable, high-efficiency solutions for both **new distillation plants** and the **revamping** of existing facilities.

It moves the energy use towards electricity, perfectly coupled with renewable sources, without compromising the quality of the final spirit.

The condensation heat is recovered to generate low-pressure steam, which is then sent to a mechanical compressor.

Using electricity, the compressor increases the steam's energy level that, in this way, can be used as heating source, significantly reducing energy consumption and improving overall efficiency.

These configurations are compliant with ATEX standards.

Mechanical Vapor Recompression technology

The phases described below represent the core phases typically found in batch and continuous installations.

1. Alcoholic vapors heat is recovered at falling film condenser, creating low pressure steam.
2. Low pressure steam is sent to the mechanical multistage compressor, where its energy level is increased using electricity as power.
3. Compressed steam is conveyed at the reboiler and used as hot medium for pot distillation.
4. Steam condensates are recycled towards the condenser to generate low pressure steam again.

As a matter of fact, condensation energy is retrieved, valorized and used to heat-up the distillation process itself, generating an energy recovery up to 95%.



Key Benefits

Low Energy Consumption

The system captures alcoholic vapours energy and reintegrates it into the process with minimal net energy input required.

Energy savings up to 95%.

High Efficiency

Thanks to the advanced heat recovery set-up, MVR creates a high-performance system.

Discontinuous distillation energy demand can be decreased to 1.1 kWh/LPA, whereas the index can be further reduced to 0.6 kWh/LPA within continuous processes. MVR system can guarantee COP (Coefficient Of Performance) higher than 10.

Sustainability

Fossil fuel usage and freshwater demand for cooling are drastically lowered thanks to steam demand reduction and energy recovery.

Both CO₂ emissions and water consumption can be cut down of 90%. Electricity is the main source of energy, the technology can be perfectly matched with renewable sources.

Key Benefits

Flexible Integration

Designed for both new installations and retrofit upgrades making it ideal for sustainable revamping of existing plants.

No Impact on Production Quality

If implemented with the correct configuration, the integrity of spirits organoleptic profile is fully preserved, ensuring consistent quality.

Payback time

Typically less than 3-4 years, depending on fossil fuel and electricity local costs.



Sustainable case histories

Midleton Distillery Irish Distillers Limited (IDL)

Client Profile

Midleton Distillery produces pot and grain irish whiskey. Its Spirits are marketed as Jameson, Redbreast and Midleton label.

Irish Distillers was searching for a partner to convert the current Pot Still process to a low-emissions approach.

Project Description

- **Construction and procurement of new steam generators** exchangers able to recover energy from alcoholic vapors.
- **Engineering of the complete distillation unit** to convert the current technology to a **sustainable cutting-edge** set-up.
- **Supply of all new required automation** to ensure **energy demand minimization** in all the process steps.

Sustainable case histories

Midleton Distillery Irish Distillers Limited (IDL)

Main Project Highlights

- Customer decided to work with Frilli, since the company **demonstrated** to know the possible impact of the plant modification on the **final product's flavor**.
- Whiskey **organoleptic profile** has been **certified** with a **dedicated test set-up**.
- A follow-up project aimed at **double** the **plant capacity** with **low-emissions** approach has been already started (engineering phase).



To watch the video





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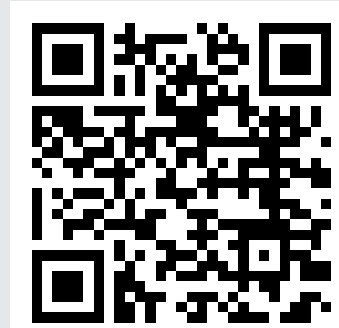
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