

PRAXAIR & ALCOHOLES FINOS DOMINICANOS CO₂ RECOVERY UNIT

A CO₂ RECOVERY JOINT VENTURE

In 2010, the companies Alcoholes Finos Dominicanos S.A. and Praxair Puerto Rico BV jointly commissioned a Pentair Haffmans carbon dioxide (CO₂) recovery plant type LO with a capacity of 1,350 kg/h. This project in the Dominican Republic is unique in two respects. Firstly, the raw CO₂ comes from sugar cane fermentation during rum production, and secondly it is a joint venture between a distillery and an industrial gas supplier which was specifically set up to recover CO₂.

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Juan Carlos Pelaez

Praxair Puerto Rico BV is part of the global player Praxair Inc. with head office in Danbury, Connecticut (USA). As the largest industrial gas company in North and South America, Praxair, which has around 26,000 employees, achieved a turnover of 11 billion US dollars in 2011.

In the Caribbean, Praxair's production activities were originally based in Puerto Rico, but the closure of the refinery there meant that a new CO₂ source had to be found in the region. The Dominican Republic with its abundance of sugar cane offered an interesting option here for obtaining the raw CO₂ from natural fermentation processes.

Around the same time, Alcoholes Finos Dominicanos (AFD), about one hour by car from the capital of the Dominican Republic, Santo Domingo, had decided to set up a new production site for rum. AFD is part of BEICA (Barceló Export Import, CxA) one of the highest profile „rum addresses“ of the island state.

Some years before, Pentair Haffmans had already suggested that Praxair looks at combining fermentation processes and industrial CO₂ recovery, and this idea finally set the project in motion. The two partners agreed on a joint venture to recover foodgrade CO₂. Praxair wanted to supply most of the market in the Dominican Republic with this CO₂ without high logistics costs. So the distillery site was extended by an LO CO₂ recovery and liquefaction plant from Pentair Haffmans.

Juan Carlos Pelaez, at that time Managing Director of Praxair Puerto Rico BV, looked back: “Haffmans presented the most attractive plant design, had the most in-depth knowledge of fermentation processes and finally was able to offer us competent after-sales support.”

The newly constructed distillery began operations in 2010. Every year, the production plant in San Pedro de Macoris produces around 16 million liters of rum. To produce the rum, only high quality sugar cane is used from the company's own plantations in the east of the Dominican Republic. Only the latest European technology is used in the production halls. A visible indication of this quality orientation is that the operation is the first rum distillery in the Dominican Republic, and only the second in the Caribbean, to be awarded ISO 9001:2000 certification.

The CO₂ plant began operations at the same time as the distillery. In the first stage of construction, the recovery and liquefaction plant, from foam separator via collection tank through to liquefier with stripper system, delivers 1,350 kg/h and achieves a final purity of > 99.998% v/v. As the distillery develops, further fermentation lines can be added, resulting in a higher annual CO₂ production.

The crude spirit is finally transported by sea to the major sales markets such as Spain for maturing and filling. The distillery is in production 24 hours a day, 7 days a week. However continuous production is not possible throughout the year since, despite the proximity to the equator, sugar cane can only be harvested for around eight months. The remaining four months are buffered with Praxair liquid CO₂ which is shipped in.

Because the quantity of raw CO₂ was unknown – the distillery was still in the planning phase when the order for the CO₂ recovery was placed – Pentair Haffmans' knowledge in the field of fermentation processes was very important for the correct choice of parameters for the definitive design and later operation. The plant has been running since 2010: time for a review and a summary of practical experiences. Juan Carlos Pelaez: „The design and implementation of the CO₂ recovery system has been a real success. The Haffmans team has fulfilled and even exceeded all our expectations.”

KEY FACTS

Location
Dominican Republic

Application
Rum distillery

Capacity
1350 kg/h CO₂

Start-Up
2010

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