

## **GIL COMES VALENCIA (ES) - FISH PROCESSING COMPANY READY FOR FUTURE WITH A SUSTAINABLE REFRIGERATION INSTALLATION**

For the northern climate, nobody doubts the advantages of CO<sub>2</sub> as a refrigerant, especially in retail and wholesale applications or food processing plants. For the southern climate, however, there are still some doubts in terms of efficiency. Nevertheless, CO<sub>2</sub>-installations are gaining ground, also in the industrial sector. Equipped with efficiency increasing technology such as parallel compression or ejectors, they are becoming more and more competitive. The increasing number of CO<sub>2</sub>-installations and growing experience proves the prediction, that they will outclass state of the art refrigerating systems, in terms of efficiency, even in southern climate.

### **CO<sub>2</sub> FOR FISH PROCESSING INDUSTRY**

In summer 2017, two transcritical CO<sub>2</sub> racks with multi-ejector and parallel compression have been commissioned near Valencia, Spain. The two racks were installed in a fish processing plant and replaced a previous R507A installation. The synthetic refrigerant R507A belongs to the HFC-refrigerant group, which harms our environment due to its tremendous greenhouse effect. Therefore, it was a major concern of GilComes to replace the previous system with R507A by a system with natural refrigerants. R507A's GWP (Global Warming Potential) is 3'985 times higher than CO<sub>2</sub>'s GWP. Furthermore, the CO<sub>2</sub>'s leakage does not strain our atmosphere, as it is a natural part of it, in contrast to a synthetic refrigerants leakage. The new CO<sub>2</sub>-system is designed to maintain four temperature levels: ultra-low temperature at -40°C, low temperature at -20°C, medium temperature at +2°C and medium temperature at +7°C. The total cooling capacity of the systems is 764 kW.



Image 1: Refrigeration installation (cutout)

### **COLD AS ICE**

GilComes needs the refrigeration system for its fish processing plant in order to chill and freeze the fish. The fish with a temperature between +1°C and +3°C are placed in a freezing tunnel to be frozen down to -23°C for storage. To ensure the temperature before entering the tunnel, the fish is placed in ice-water at +0.5°C. With 400 kW at an evaporation temperature of -45°C, the fish is frozen down to -23°C in the freezing tunnel within 8 minutes. The freezing tunnel's processing capacity is 3000 kg per hour or 24 tons per day.



Image 2: Anchovies on their way into the freezing tunnel



Image 3: Anchovies after freezing

## READY FOR FUTURE

In order to fulfil the requirements, two independent transcritical CO<sub>2</sub> boosters were installed. The two installations were designed each to provide medium and low temperature. If there is a failure on one installation, the other one is able to keep operations running. With the new refrigeration system GilComes set its course for the future. The installation, running with natural refrigerants not only allows the fish processing company to reduce its CO<sub>2</sub> footprint, but also to avoid any conflict with EU's F-Gas regulation\*.

*\*As of 2020, EU's F-Gas regulation will ban and limit certain synthetic refrigerants, which will have considerable consequences to operation costs of refrigeration installations. This constriction will lead to a refrigerant quantity shortage and, therefore, will increase prices drastically.*

## THE ROLE OF FRIGO-CONSULTING

Frigo-Consulting offers innovative refrigeration and energy engineering such as:

- Engineering, coordination and realisation of sustainable refrigeration installations and heat pumps
- Engineering and linking together of HVAC/R-systems
- Innovations for primary energy savings
- Application fields: medium (MT) and low (LT) temperature refrigeration, AC and heating
- Maintenance support
- Training and Audits

**Juin 2018, Guillermo Rocha Fraga**

Frigo-Consulting in collaboration with

