Dry condensing

Making vapor removal economical
and less complicated

engineering for
a better world

Lean, green and cool

Dry condensing (DC) provides a simple, environmentally friendly, cost-effective and low-temperature (approximately -30 °C) way to remove the process vapor used for edible oil deodorization.

It's effective because the water vapor is, quite literally, converted into ice.

Conventional "wet" vacuum systems use steam ejectors to boost the pressure to a range in which the steam can be condensed in a heat exchanger. By contrast, DC is a cryogenically driven vacuum system that condenses the water vapor directly into ice, eliminating the liquid phase.

Compelled by ever-increasing effluent treatment and energy costs, refineries all over the world are discovering the benefits of implementing a DC system in new facilities or to retrofit old vacuum plant.

Key Benefits

Less pollution: Compared with conventional "wet" vacuum systems, which produce large volumes of condensed water, it's much easier to separate stripped-out pollutants from the relatively small volumes (approximately one tenth of traditional techniques) expelled by a DC system.

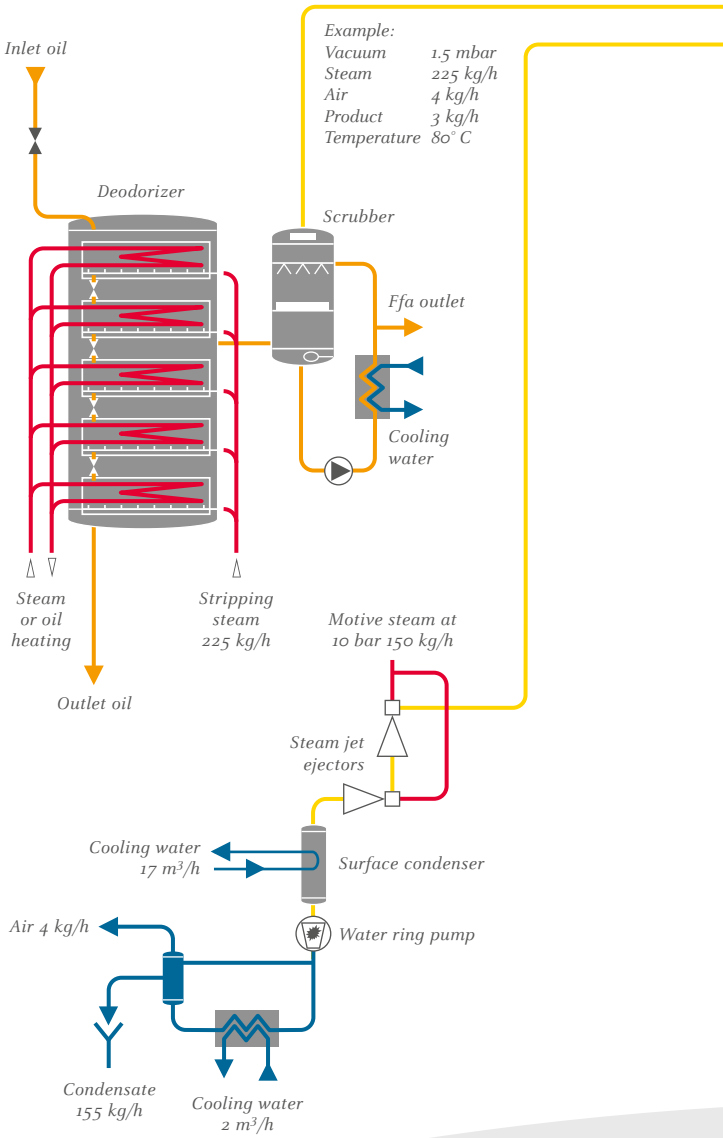
Reduced water and energy costs: A DC system uses just 0.1% of the water and only approximately 10% of the energy consumed by conventional "wet" condensing systems.

Cost-effective: The return-on-investment period for most DC installations is approximately 3 years.

GEA has half a century's experience with DC technology and has successfully completed more than 60 major installations during the past two decades.

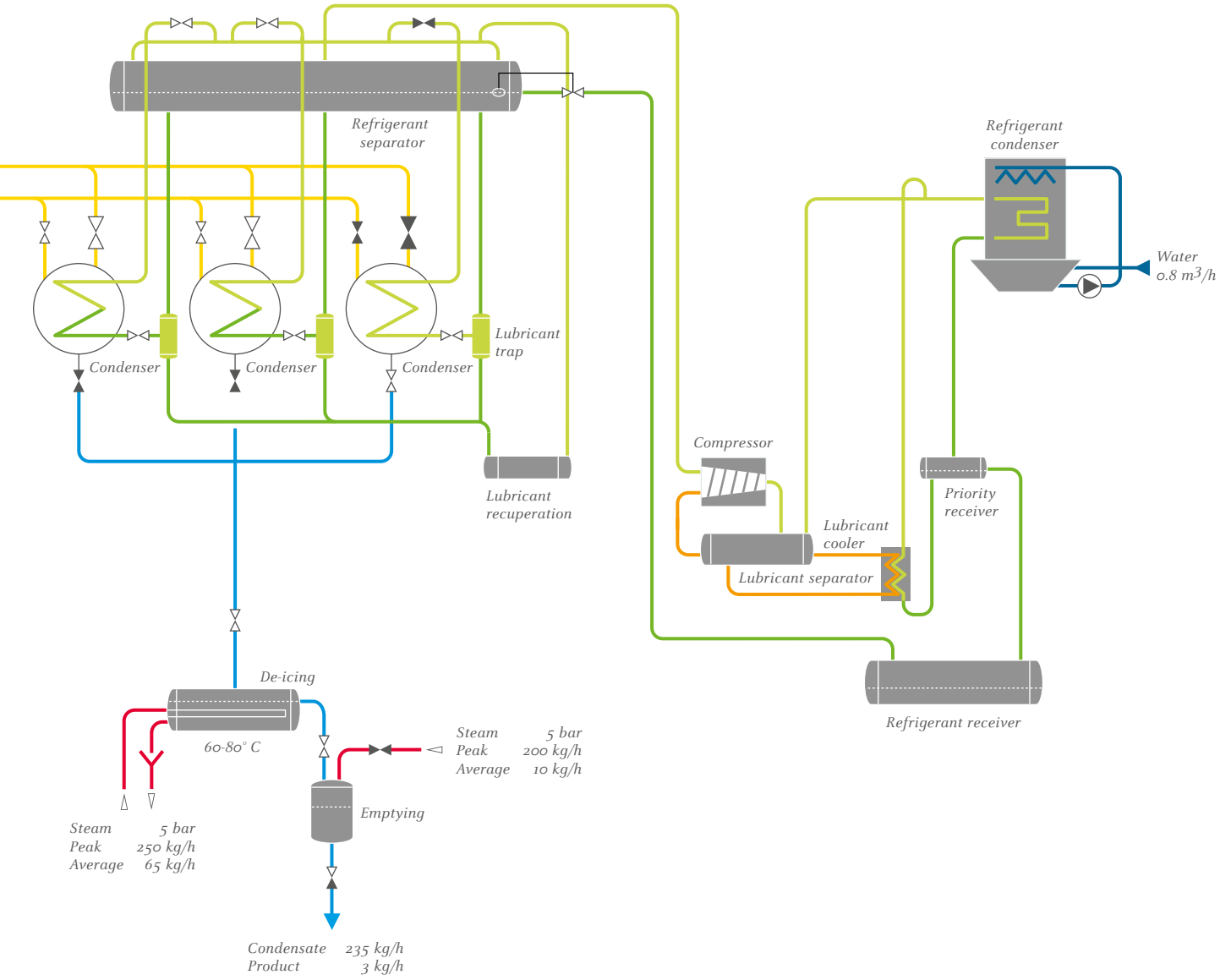
THE DRY CONDENSING SYSTEM FROM GEA

An alternative vacuum system

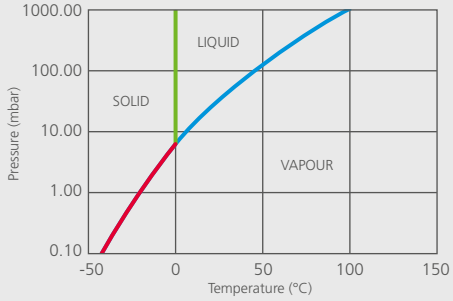


NUMEROUS APPLICATIONS

- Edible oil deodorization
- Fatty acid distillation
- Fatty acid fractionation
- Glycerine distillation
- Water sublimation (freeze drying)
- Water removal under vacuum (<6mbar)



WATER PHASE DIAGRAM: LIQUID – WATER, SOLID – ICE, GAS – VAPOR



There can only be two phases, vapour and ice, in condensation at a pressure below a water vapour pressure of 6 mbar (the Triple Point). Vapour is therefore condensed directly into ice (as de-sublimation). We call it "dry" condensing as opposed to "wet" condensing into water.

- *Melting line*
- *Saturation line*
- *Sublimation line*

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