



**SNC • LAVALIN**

Building what matters

# Mechanical Refrigeration Unit

Production & Processing Solutions

Condenses valuable natural gas liquids from natural gas to create high-quality liquid and residual gas products.

Natural gas is composed of a wide range of hydrocarbon compounds that will condense to form liquids at a particular temperature. The more energy-dense or "heavier" components can condense at operating temperatures and can cause operational problems within pipelines and midstream equipment. These natural gas liquids (NGLs) also have a high market value that provides an incentive for maximum recovery.

SNC-Lavalin mechanical refrigeration units (MRUs) cool natural gas to condense the hydrocarbons and, with product stabilization, distill the liquids to meet precise product specifications. The resulting residue gas is pipeline quality, and the NGLs are safely transported or stored. SNC-Lavalin MRUs are modular, skid-mounted and assembled in a controlled environment for quicker deployment to the field.



## Customer Challenge

*Maximize liquid hydrocarbon recovery with minimal pressure drop.*

In an economy that places a much higher value on NGLs than on natural gas, producers can greatly benefit from maximizing NGL recovery. Also, if natural gas is not processed, then heavy hydrocarbons can condense in pipelines and midstream equipment, causing a variety of operational and safety problems. Between the high market value for NGLs and the decreased operational risk, gas processing is an essential consideration.

## SNC-Lavalin Solution

SNC-Lavalin MRUs are specifically designed to cool rich natural gas for maximum liquid recovery. They utilize a robust exchanger and chiller system in conjunction with flexibility for large and small propane compressors to fit a variety of applications. SNC-Lavalin also provides NGL product stabilization equipment to meet liquid product specifications for safe storage and transportation. SNC-Lavalin's expertise extends beyond equipment design, however.

SNC-Lavalin works closely with our customers throughout the project development process to better understand their needs. One recurring need is rapid equipment availability. SNC-Lavalin proactively stocks long-lead components to reduce delivery times. Furthermore, based on the extensive experience of our subject matter experts, SNC-Lavalin has proven standard designs that minimize time spent in the equipment design phase.

Additionally, SNC-Lavalin provides customers with greater value through a turnkey integrated services agreement. By manufacturing, installing and commissioning the facility, SNC-Lavalin can provide accelerated startup and a process guarantee. This seamless process flow solution is the SNC-Lavalin commitment to making the project successful.

## Features and Benefits

- > **Robust exchanger and chiller system:** MRUs are capable of handling a wide range of gas compositions with minimal pressure drop.
- > **Flexible refrigeration system:** MRUs can be paired with a propane compressor best suited to the customer's needs.
- > **Skid-mounted modular design:** Time-efficient and cost-effective installation.

## How It Works

After inlet separation and sweetening, the customer's gas flows through gas/gas and gas/liquid exchangers for pre-cooling. Prior to the exchangers, ethylene glycol (EG) is injected to inhibit hydrate formation. After pre-cooling, the gas flows to the chiller vessel. The chiller vessel ties into a refrigeration system that utilizes propane as a refrigerant and an electrically-driven refrigerant compressor.

The chiller cools the gas with a minimal pressure drop to a specific temperature that best fits the customer's application. The lean gas, liquid hydrocarbon and EG flow to a cold separator vessel for separation. Finally, the lean gas-flows to the pipeline for sale, the EG circulates to regeneration, and the liquid hydrocarbon flows to product stabilization.

## Standard Sizes

SNC-Lavalin provides mechanical refrigeration units in the following standard nominal configurations. Additional sizes may become available at any time.

- > 35 MMscf/d
- > 100 MMscf/d



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