Low Temperature Separation (LTS) is an effective and efficient method to remove both water and hydrocarbons from natural gas or associated petroleum gas. Low temperature separation is also commonly used to enrich the methane content of fuel gas.

Product Description

At Frames, we have the technical knowhow to integrate low temperature separation technology into your gas stream. By efficiently removing water vapor and heavier hydrocarbons, our clients can supply a continuous stream of clean, high-value gas.

**Joule-Thomson effect or chiller technology**

Designed and delivered to optimize gas value, our LTS units use either the Joule-Thomson effect or chiller technology to remove moisture within defined operating pressures. Combined with absorption technology, our LTS units yield excellent results, even mixtures involving widely varying requirements of water and hydrocarbons.

**Energy-efficient design**

Our team is focused on designing and delivering energy-efficient LTS units that cut operating costs. We work with your business to understand the gas composition and operating conditions, and use the best technology to create an efficient cleaning process. The process includes selected use of heat-integration technology in which dried gas is mixed into the wet gas as it enters the LTS unit. This results in a reduction of pressure loss during the Joule-Thomson process, or lower energy consumption when chiller technology is used.

**Low-cost use of inhibitors**

For hydrate-rich gases, our team of experts may also specify use of the inhibitors methanol, DEG (diethylene glycol) or MEG (monoethylene glycol). Using inline injection technology, these inhibitors will prevent condensates from unwanted clogging of the gas stream.

System efficiency is enhanced by careful design and an integrated regeneration unit that efficiently recovers the selected inhibitor, while cutting energy demands and operating costs.
Low Temperature Separation

Process Description

Low temperature separation uses either Joule-Thomson choke and expansion technology or a chilling mechanism to reduce the temperature of the wet gas. As the temperature falls to the required dew point, water vapor or heavier hydrocarbons condensate out of the gas stream. These are then separated in a knock-out drum to produce a clean, dry gas stream.

To achieve a temperature drop in the Joule-Thomson process, wet gas is forced through an insulated throttling valve which allows the gas to pass into a lower-pressure state. This expansion of the wet gas causes its temperature to fall to the required dew point. Chilling can also be achieved by incorporating chilling mediums such as propane, freon or ammonia.

Our team of in-house experts can help you select the right technology for your gas supply, including the use of inhibitors to optimize the production of dry gas and the recovery of valuable condensates.
Project Management

At Frames, we look at the bigger picture. Our team of in-house experts works with our clients to understand their business, and challenge them to examine better solutions that give them the competitive edge.

From optimizing production to cutting operating costs, we work to fully integrate our Frames solutions into your production system within budget, on time, and in spec for years of trouble-free operation.

We understand your expectations for high performance, and use industry-leading project management and document control to design, construct, and commission quality products where and when you need them. Our centralized engineering and construction teams in the Netherlands work together to find effective answers to each unique project, with our global network of offices, suppliers, and trusted service providers giving us the global reach to fully accomplish the most challenging projects.

Technical Details

- Efficient removal of water and heavy hydrocarbons from wet gas, using the Joule-Thomson effect or chiller technology
- Options to remove both water and hydrates using a single process
- Heat-integration technology to improve energy efficiency
- Options for inhibitors to stop heavier hydrates from clogging the gas stream

Added Value Frames

- Designed according to your system’s unique gas composition and operating conditions
- Developed by specialists in building energy-efficient units, including the use of heat-integration technology
- Easy operation thanks to our modularized design that integrates into your production system
- Worldwide service with expert support
- Robust and reliable LTS units designed with lean engineering methods, using high-end materials

References

- Middelie Developments Phase 1a – Shell, the Netherlands
- Utorogu NAG 2 – Shell Nigeria / SPDC Nigeria
- Stork GLT – NAM, the Netherlands

Contact

+31 172 504800
oilgasprocessing@frames-group.com
Frames Family Tree

Onshore

- Oil & Water
  - Multiphase Separation
    - Production Separators (High & Low Pressure)
    - Test Separator
    - Degasser & Knock-Out Drum
    - Water Oil Separator (WGSEP)
  - Compact Inline Separation
    - SwirlSep
  - Electrostatic Coalescers
    - Dehydrator
    - Desalter
  - Produced Water Treatment
    - Deoiling & Desanding
    - Hydrocyclones
    - Gas Floation
    - Media Filtration
    - Solids Removal & Cleaning
    - Stripping
  - Separation Internals
  - Heat Exchangers

- Gas
  - Gas Separation
    - Demisting
    - Scrubbers
    - Filters
    - SwirlSep
  - Heat Exchangers
    - Shell & Tube Heat Exchangers
  - Air-Cooled Coolers
  - Gas Sweetening ($H_2S$ & $CO_2$)
    - Amines
    - Thiopaq O&G
    - Solid Bed Scavenger
    - Membrane
    - Molecular Sieve
  - Gas Dehydration
    - Glycol (TEG)
    - Molecular Sieve
  - Dew Point Control
    - Low Temperature Separation (LTS)
    - Solid Desiccant
  - Hydrate Inhibition
    - MEG/DEG Recovery
    - Methanol Recovery
    - MEG/DEG Desalination
  - Light Hydrocarbon Recovery
    - Condensate Stabilization
    - Fractionation

- Services
  - Asset Life Cycle Management
  - Maintenance & Field Services
  - Commissioning
  - Spare Parts
  - Operator Training
  - Engineering Studies
    - Conceptual
    - FEED and Basic

- Integrated Solutions
  - Total Plant Solutions
  - Industrial CO$_2$
  - Modules
  - Early Production Facilities
  - Wellsite Packages
  - Biogas

Offshore

- Flow Control & Safeguarding
  - Hydraulic Systems
    - Wellhead Control
    - Subsea Hydraulic Power Units
    - Hydraulic Power Units
    - IWocs (Intervention Workover Control Systems)
    - TUTU (Topside Umbilical Termination Unit)
    - Cargo Ballasting Systems
  - Safety Instrumented Systems
    - High Integrity Protection Systems (HIPS)
  - Chemical Injection Systems
    - Chemical & Methanol Injection Systems
    - Chemical Distribution Systems
    - Seawater Electrochlorination Systems
  - Valve Automation Center
    - Actuators and Actuated Valve Packages
    - Control Systems
  - Automation
    - Buoy Control
    - Tank Farm Control & Safeguarding

Floaters

- Oil & Water
  - Oil & Water Multiphase Separation
    - Production Separators (High & Low Pressure)
    - Test Separator
    - Degasser & Knock-Out Drum
    - Water Oil Separator (WGSEP)
  - Compact Inline Separation
    - SwirlSep
  - Electrostatic Coalescers
    - Dehydrator
    - Desalter
  - Produced Water Treatment
    - Deoiling & Desanding
    - Hydrocyclones
    - Gas Floation
    - Media Filtration
    - Solids Removal & Cleaning
    - Stripping
  - Separation Internals
  - Heat Exchangers

- Gas
  - Gas Separation
    - Demisting
    - Scrubbers
    - Filters
    - SwirlSep
  - Heat Exchangers
    - Shell & Tube Heat Exchangers
  - Air-Cooled Coolers
  - Gas Sweetening ($H_2S$ & $CO_2$)
    - Amines
    - Thiopaq O&G
    - Solid Bed Scavenger
    - Membrane
    - Molecular Sieve
  - Gas Dehydration
    - Glycol (TEG)
    - Molecular Sieve
  - Dew Point Control
    - Low Temperature Separation (LTS)
    - Solid Desiccant
  - Hydrate Inhibition
    - MEG/DEG Recovery
    - Methanol Recovery
    - MEG/DEG Desalination
  - Light Hydrocarbon Recovery
    - Condensate Stabilization
    - Fractionation

- Services
  - Asset Life Cycle Management
  - Maintenance & Field Services
  - Commissioning
  - Spare Parts
  - Operator Training
  - Engineering Studies
    - Conceptual
    - FEED and Basic

- Integrated Solutions
  - Total Plant Solutions
  - Industrial CO$_2$
  - Modules
  - Early Production Facilities
  - Wellsite Packages
  - Biogas

Frames
Oil & Gas Processing
Dr. A.D. Sacharovlaan 2
2405 WB Alphen aan den Rijn
The Netherlands
+31 172 504800
oilgasprocessing@frames-group.com
frames-group.com