Chemical Injection Systems

Product Definition

Chemical injection systems are commonly used in production facilities in the oil & gas industry. They prevent or mitigate a wide range of problems that might negatively affect the production flow and/or process completion. Frames designs, manufactures and supplies custom-built injection systems for a broad range of process applications, including production processes, (produced) water treatment and hydrate control in pipelines and wells.

Product Description

Chemical injection systems typically consist of multiple chemical services with associated single or multi-compartment storage tanks or pressure vessels. The chemicals are transferred from the tank to the injection point by means of chemical injection pumps, while flow rates can be adjusted locally or remotely in order to ensure that the correct amount of chemicals is injected. Frames can advise on sparing philosophy for each application in order to optimize the design. Our systems can include flow, level and pressure instrumentation for local and/or remote indication.

Optionally, we can deliver a chemical injection system as part of an integrated solution, thus reducing onsite installation and commissioning time. Thanks to years of experience in designing and assembling equipment for flow assurance, Frames specialists offer the valuable know-how required for advising effective solutions. Our in-house multi-disciplinary engineering capability ensures that each chemical injection system is designed in accordance with client specifications and local legislation. Being supplier-independent, Frames is in an excellent position to select the best solutions, striking a balance between capital investment (CAPEX) and operating costs (OPEX).
Process Description

One of the main challenges in the upstream processes of the oil and gas industry is to protect pipeline and process equipment against waxes, scaling and asphaltene deposits. The engineering disciplines involved in flow assurance play an essential part in mapping the requirements that reduce or prevent loss of production due to pipeline or process equipment blockage. Frames chemical injection systems play an effective role in optimizing flow assurance.

Production Chemical Injection

Frames production chemical injection packages guarantee that flow assurance requirements are met in pipeline and process equipment and optimize processes in production facilities. Typical flow assurance chemicals used include wax inhibitors, pour-point depressants, asphaltene inhibitors, and scale inhibitors.

In addition to flow assurance, Frames’ chemical injection systems are also used to protect and prolong the lifetime of pipelines and process equipment by hindering agents that can create failure modes. Typical Frames packages are used for corrosion inhibitors, biocides, demulsifiers, and foam inhibitors.

(Produced) Water Treatment Chemical Injection

Crude oil and natural gas is generally extracted along with large amounts of produced water. In addition, the water/oil and water/gas ratio of modern extraction processes has been steadily increasing due to the implementation of secondary and tertiary extraction processes. A Frames chemical injection system provides a convenient solution for adding chemicals to treat the water prior to discharge or reinjection into a reservoir. Our systems are used for a wide range of treatment chemicals, including biocides, antifoam agents, deoilers, demulsifiers, nitrate inhibitors, and (sodium) hypochlorites.

Hydrate Control

Hydrates are crystalline, ice-like structures that are formed under certain process conditions during the natural gas extraction. Hydrates attach to pipelines and equipment walls, and are capable of blocking the pathway in flow lines and other related gas handling equipment. In many processes, adding a chemical is an option reverted to when other solutions are commercially not viable. In such cases, Frames chemical injection systems offer an efficient solution for injecting either methanol, MEG or LDHI / KHI.
**Chemical Injection Systems**

**Project Management**

At Frames, we understand that success depends on sharp project management. As our client, we are driven to supporting your business, with our dedicated project team always on hand for one-on-one contact, providing you with the best possible service.

From concept through to design, production, testing and delivery, our project team will know your operating environment, and will use the latest technology to precisely meet your needs.

We are solution orientated, understand your industry and always use strict document control and professional planning to exercise tight process control and meet all delivery deadlines. Our global office network, international supply chain and partnerships with leading vendors mean we are always able to supply the best systems and meet all of the local requirements and regulations.

**Technical Details**

- Materials ranging from carbon steel to alloys, such as SS316(L), (super) duplex and titanium
- Piping designed to code, such as ANSI, fabrication to ASME Section IX
- Vessels designed to code, such as ASME / PED / PD5500 & National Board Registered as required
- Atmospheric tanks in cylindrical as well as multi/single compartment rectangular design
- Instrumentation tubing, also used as process piping in both twin-ferrule and cone-and-thread type
- Injection pressures up to 15,000 PSI / 1,034 bar(g) and flows from low l/h to high m3/h
- Experts on local legislations, such as PED, Ce, Atex, Nema, Dosh, NR13
- Multi-headed and single-headed pump designs with flow control valves (IRCDs)
- API675/674 double diagram and plunger pump designs

**Added Value Frames**

- Frames solutions are custom-built for best performance in your actual operating conditions
- Being supplier-independent, Frames selects the best available components from a global network of supply partners
- Smart designs by Frames in-house multi-disciplinary engineering teams
- Process guarantee and single-point accountability for the complete design ensures client satisfaction
- Cost-effective modular design which results in low installation and operating costs

**References**

- Valhall redevelopment, BP Norge AS – Norway
- Stones FPSO, SBM Houston / Shell – Gulf of Mexico
- K5A/K4Z platform, Total E&P Nederland B.V. – the Netherlands
- Wheatstone platform, Daewoo / Chevron – Australia
- Replicantes FPSO’s, FPSO P-67 and P-70, Integra / Petrobras – Brazil

**Contact**

+31 172 461 600
flowcontrolsafeguarding@frames-group.com

Frames
Flow Control & Safeguarding
Eikenlaan 237
2404 BP Alphen aan den Rijn
The Netherlands
+31 172 461 600
flowcontrolsafeguarding@frames-group.com
frames-group.com

Frames
a family of oil & gas solutions
Frames Family Tree

Onshore

Oil & Water
- Multiphase Separation
- Production Separators (High & Low Pressure)
- Test Separator
- Degasser & Knock-Out Drum
- Water Oil Separator (WOSEP)
- Compact Inline Separation

Gas
- Electrostatic Coalescers
  - Dehydrator
  - Desalter
- Produced Water Treatment
  - Deoiling & Desanding Hydrocyclones
  - Gas Floatation
  - Media Filtration
  - Sand Cleaning
- 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

Gas Separation
- Demisting
- Scrubbers
- Filters
- Heat Exchangers
  - Shell & Tube Heat Exchangers
- Air-Cooled Coolers

Gas Sweetening (H₂S & CO₂)
- Amines
- Thiopaq
- Solid Bed Scavenger
- Membrane
- Molecular Sieve

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

Valve Automation Center
- Actuators and Actuated Valve Packages
- Control Systems

Automation
- Buoys Control
- Tank Farm Control & Safeguarding

Integration Solutions
- Total Plant Solutions
  - Industrial CO₂
  - Modules
  - Early Production Facilities
  - Wellsite Packages
  - Biogas

Offshore

Flow Control & Safeguarding

Frames
Flow Control & Safeguarding
Eikenlaan 237
2404 BP Alphen aan den Rijn
The Netherlands

+31 172 461 600
flowcontrolsafeguarding@frames-group.com
frames-group.com

Frames
a family of oil & gas solutions

Floaters

Services

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

Total Plant Solutions
- Industrial CO₂
- Modules
- Early Production Facilities
- Wellsite Packages
- Biogas