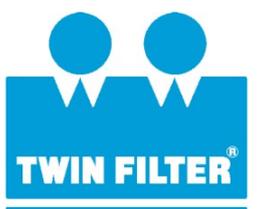


GAS FILTRATION

Passion



for Filtration



OVERVIEW

Twin Filter offers her relations coalescing, filtration and separation solutions to minimize operating costs. We manufacture a variety of filtration and separation products from high performance filter and Coalescer elements to high capacity and high flow housings.

Twin Filter can engineer products that suit your applications. We have experiences with both liquid and gas filtration. Our products can be designed for varying temperature, pressure, chemical and dimensional requirements.

Our commitment to our refinery partners

Specialized in refinery applications

Our products and media are designed and optimized for refinery applications. Our engineers provided solutions for refineries worldwide.

Improving your process performance

Our staff of engineers can work with you to assess and recommend filtration solutions that will help improve performance and increase throughput from your process.

Managing your process contaminants

Our filtration technologies will help you minimize amine fouling, lost of catalysts, damage to burner nozzle due to contaminants and extend the life of your process equipments and allow you to maximize the use of your resources.

Improving your process margins

Our team can work with you to identify inefficiencies and contaminants in your process and provide solutions to reduce and refine your process. We work to reduce maintenance costs and improve efficiency of your process so you can reduce your operating costs.

Risk management and security

Our experience in refinery filtration, the quality of our products, and our staff of engineers work with you to provide optimized products and solutions that offer predictable proven results.

Meeting upset needs

Our manufacturing is setup to meet your urgent needs. From fast turn around time to temporary stock rental vessels, we can provide the tools you need to minimize your loss due to upsets.

New technologies

Our research and development team is constantly working to develop and test new technologies and media to find solutions. We also evaluate existing products and we perform field testing of our products.

OVERVIEW EQUIPMENT AND CONSUMABLES PERFORMANCE

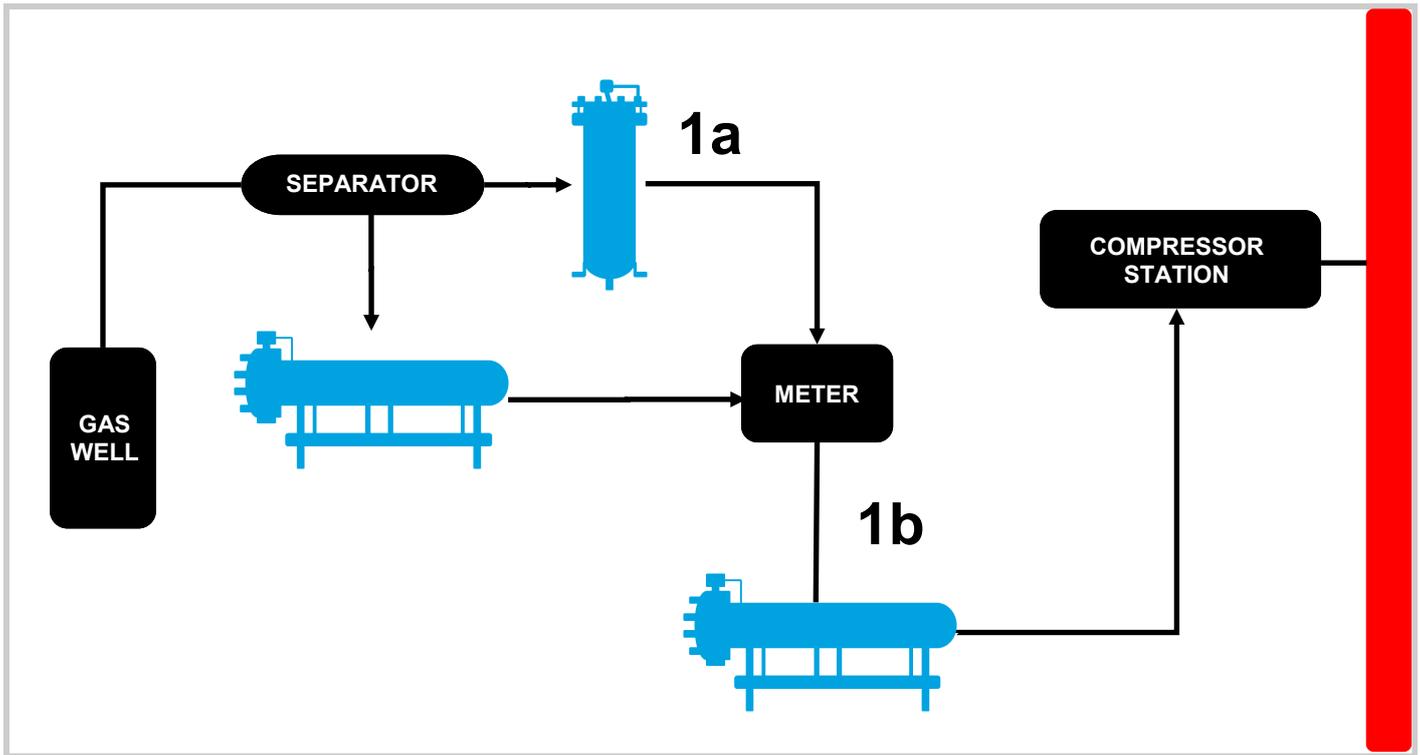
Type of equipment	Slugs	Liquid removal efficiency	Solids removal efficiency
Horizontal filter separator Two stage, cartridge—vane pack	Yes	100% @ 2 µm 99% @ 0.5 to 2 µm	100% @ 2 µm 99% @ 0.5 to 2 µm
Vertical filter separator Two stage, cartridge—vane pack	Yes	100% @ 2 µm 99% @ 0.5 to 2 µm	100% @ 2 µm 99% @ 0.5 to 2 µm
Horizontal filter coalescer	Yes	99.98% mist @ 0.3 µm	99.98% mist @ 0.3 µm
Vertical filter coalescer	Yes	99.98% mist @ 0.3 µm	99.98% mist @ 0.3 µm
Dry gas filter	No		99.98% mist @ 0.1 µm

All equipment / consumables has a turndown ratio of 10–110%.

Twin Filter is using the latest design and high performance double pocket Vane Pack in the filter separators. Efficiency 100% @ 8 µm.

For specifications cartridges see separate datasheets.

PRODUCTION



PRODUCTION

Production is the process of extracting the hydrocarbons and separating the mixture of liquid hydrocarbons, gas, water, and solids, removing the constituents that are non-saleable, and selling the liquid hydrocarbons and gas. Production sites often handle crude oil from more than one well. Oil is nearly always processed at a refinery; natural gas may be processed to remove impurities either in the field or at a natural gas processing plant.

1a: Before gas reaches the meter, send it through a Twin Filter Dry Gas Filter or Filter/ Separator.

1b: Use a Twin Filter Filter/ Separator to filter gas to protect expensive compressor station equipment.

DRY GAS FILTER

Twin Filter range of Dry Gas Filter is multiple elements filter designed for filtering dust and other solids from gas flows with a minimum of pressure drop.

Principles of operation

Twin Filter Dry Gas Filters offer efficient and effective removal of dust and other solids from gas flows at relatively low pressure drop. The larger, heavier particles settle to the bottom of the inlet chamber upon entering. The gas then passes through the filter elements which trap and retain the finer particles. A 'Quick Opening End Closure' is provided for access to and cleaning or replacement of the filter elements. The life cycle of the filter is dependent upon dust and dirt loading and the corresponding increase in pressure drop.



TREATMENT

TREATMENT

2a: Use a Twin Filter Filter/ Separator or Coalescer before gas enters a molecular sieve.

2b: Send gas through a Twin Filter Dry Gas Filter after leaving the molecular sieve to remove carry-over sieve material.

2c: Use a Twin Filter Filter/ Separator to remove liquid of particulate before Amine or Glycol processing.

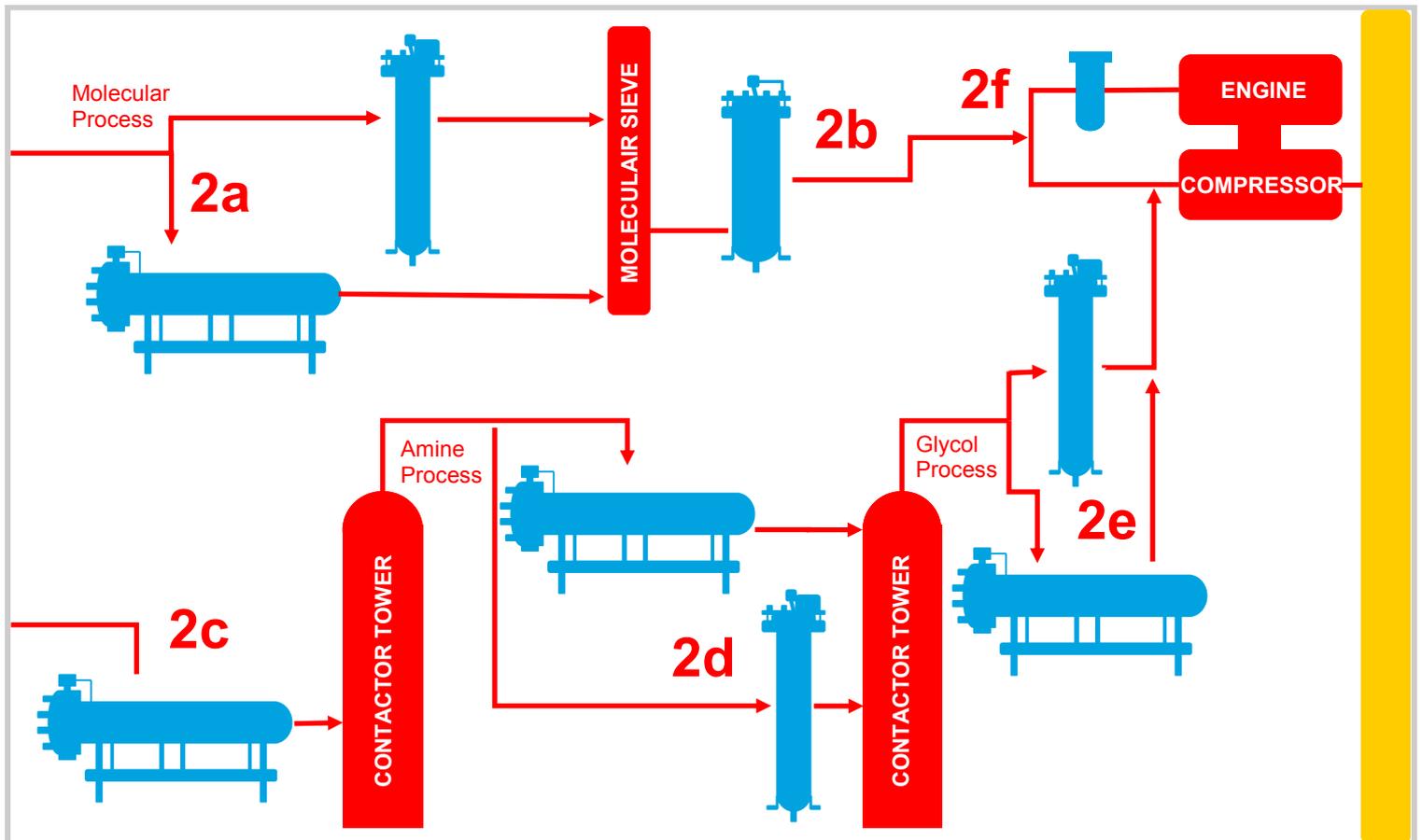
2d: Run gas through a Twin Filter Filter/ Separator or Coalescer after Amine processing to remove carry-over Amine.

2e: After Glycol processing and before pipeline transportation, filter gas with a Twin Filter Filter/ Separator or Coalescer to remove carry-over Glycol

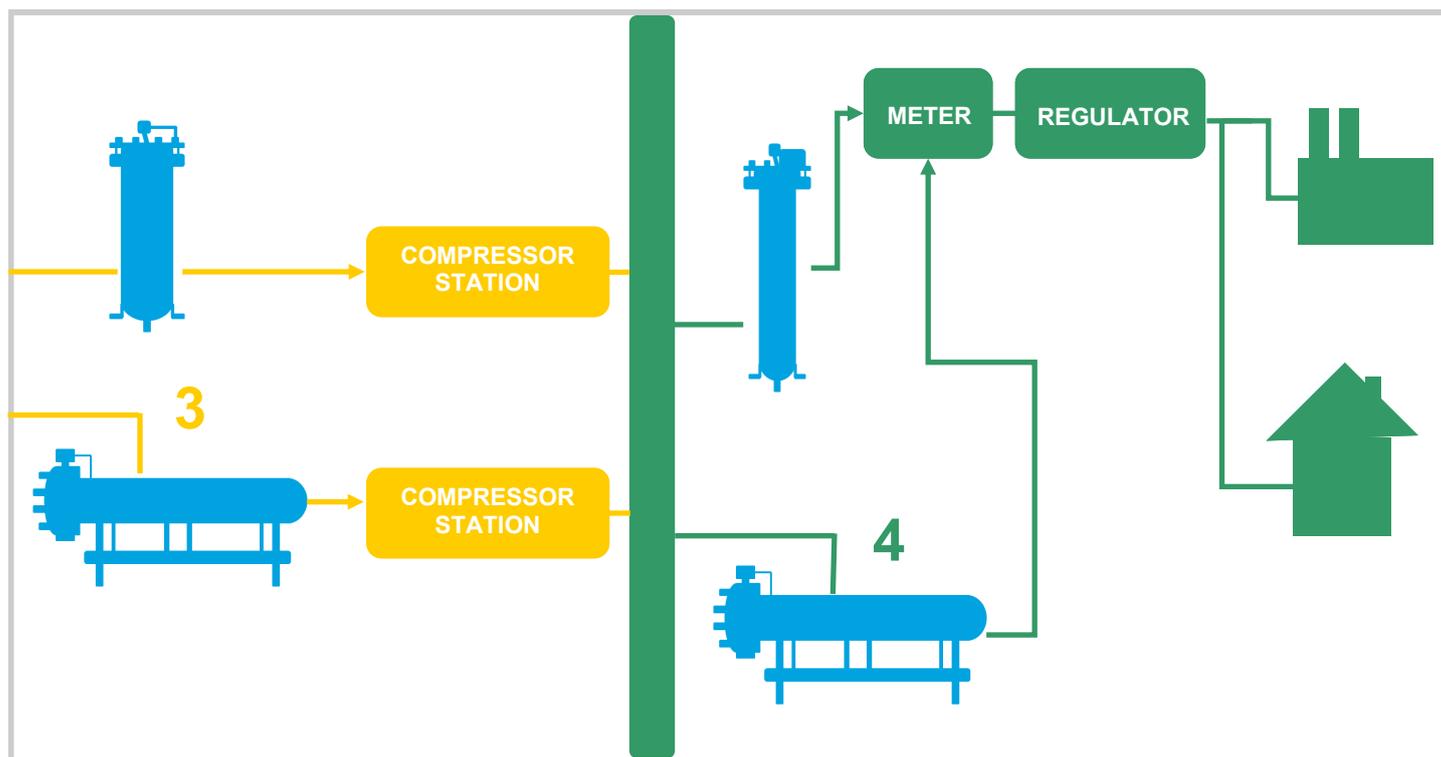
2f: Install a small Twin Filter Filter/ Separator to remove dirt and unwanted liquids from the gas used to fuel the compressor engine.

FILTER/ SEPARATOR

The Twin Filter Vertical Gas Separators are designed for the removal of large amounts of liquids, and will effectively arrest liquid slugs. It is a two stage separator consisting of a settling chamber and distilling baffles at the first stage, and the hook less vane element at the second stage. The vane element is designed for maximum performance at low pressure drop. It is based on an aerodynamic flow concept which eliminates hooks extending into the flow stream by utilizing troughs which are flush with the side of walls of the vane plates. These troughs provide a high liquid removal capacity and positive isolation of the separated liquid.



PIPELINE AND DISTRIBUTION



PIPELINE AND DISTRIBUTION

3: Use a Twin Filter Dry Gas Filter during pipeline transportation for particulate removal. For wet gas, use a Filter/ Separator.

4: Use a Twin Filter Coalescer or Filter/ Separator after a compressor station and before the gas meter in the distribution system.

COALESCER

The Twin Filter Coalescing Filter is a multi-stage separator that provides maximum solid and liquid removal. The primary stage of separation is designed for removal of large particulate and liquid loads through gravitational and centrifugal force. If a high solid or liquid load (slugging) is present, additional separation internals are available to provide bulk removal and extend the life of a coalescing element.

The final stage of separation consists of one or more multi-special layered fiberglass/ polypropylene coalesce elements. The entrainment laden gas flows from the inside to the outside of the coalesce elements. The innermost layer acts as a pre-filter to remove submicron solids. The fibers of the middle layer capture the fine liquid droplets suspended in the gas and cause the droplets to run together and form large droplets within the depth of the filter. These large droplets emerge on the outer surface of the coalesce and drain by gravity to the lower collection chamber. The clean gas passes from the coalesce elements and exits through the vessel outlet.



ABOUT THE OILFIELD DIVISION

Twin Filter Oilfield Division is part of Twin Filter BV. Twin Filter BV is an independent, 100% Dutch company founded in 1985. The Oilfield Division is active all over the world. We design and manufacture filtration solutions for the oilfield and petrochemical industries.

Our manufacturing facilities for equipment and consumables are strategically based in The Netherlands, close to Schiphol Airport and the Port of Rotterdam. Our engineers, with field experience, are constantly improving and designing new filtration solutions. Twin Filter is ISO 9001 certified.

APPLICATIONS

- Completion / Gravel pack fluids
- Work over fluids
- Water injection (water flood operations)
- High pressure applications
- Oily water clean-up
- Wastewater treatment
- Chemical injection
- Bilge water treatment
- Pipeline flushing
- Produced water treatment
- (Sea) water intake filtration
- Powder handling system
- RO pre-filtration
- Gas filters

WHY FILTRATION?

Costs of environmental protection are key issues for oilfield operations. Efficiency, reliability and maximum performance are of the utmost importance.

The main concern in oilfield filtration is to prevent reservoir damage. Many contaminants can plug off the reservoir / production zones during completion and water injection. Filtration will protect the reservoir from contaminants, including bacteria, scale, clay, rust, etc.

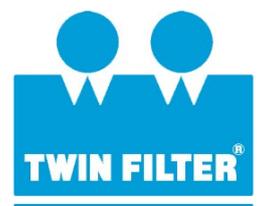
Current environmental laws are becoming more stringent and are aiming for zero discharge. Many waste treatment technologies will not meet the discharge levels of the future.

Twin Filter offers a solution for the removal of more than 99% of all hydrocarbons and emulsions from water streams.

Twin Filter provides total filtration solutions to the oilfield industry.



AGENT, DISTRIBUTOR



Twin Filter B.V.
Zuiddijk 398
1505 HE Zaandam
The Netherlands
Tel. +31 (0)75 6555000
Fax. +31 (0)75 6555015

www.twinfiler.com

info@twinfiler.com