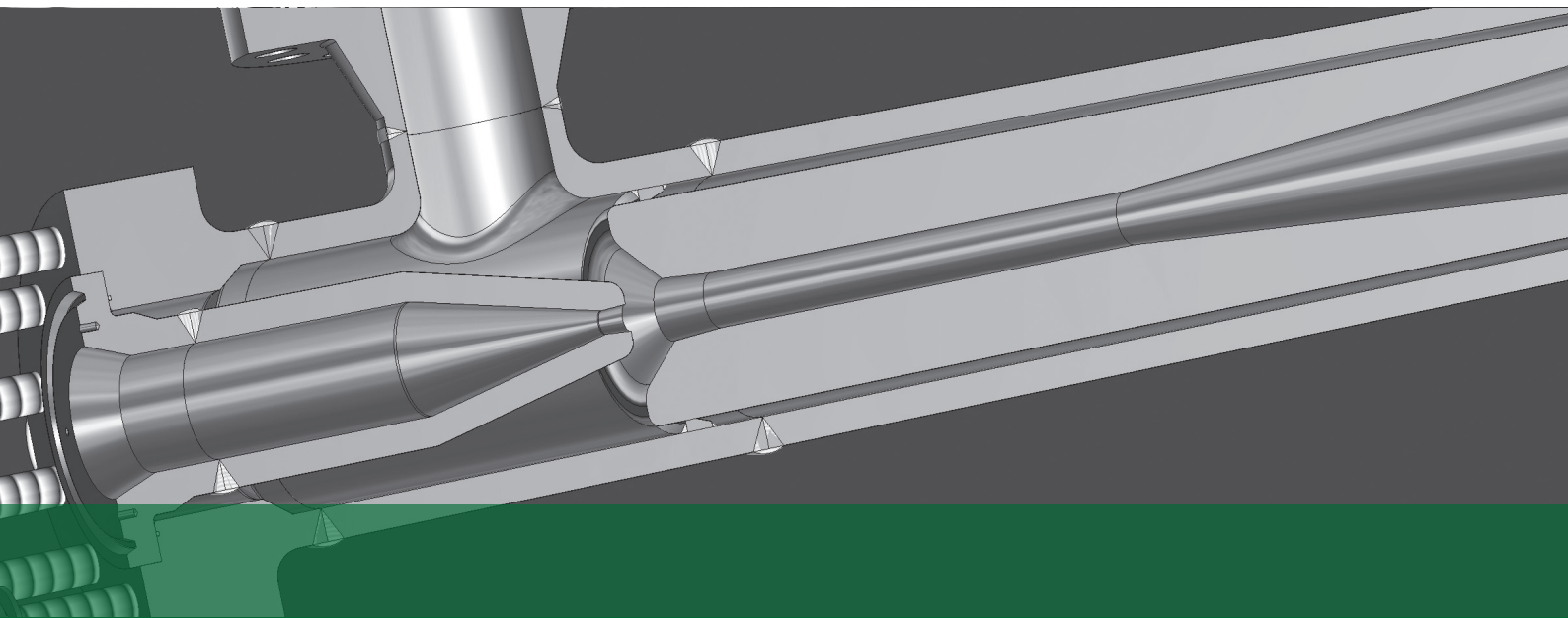
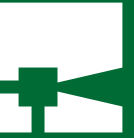


## Ejectors for the Oil & Gas Industry





## Why Choose Ejectors?

- ▶ No moving parts
- ▶ No maintenance
- ▶ Environmentally friendly - zero emissions
- ▶ Handles solids and two-phase without damage
- ▶ Utilise otherwise-wasted energy
- ▶ Performance easily modified to suit changing process conditions
- ▶ Robust construction with proven reliability
- ▶ Easy to install
- ▶ Simple to control
- ▶ Low weight and small footprint
- ▶ Top-side, sub-sea, FPSO or onshore installation
- ▶ Can be fully performance tested prior to despatch

## How Ejectors Work

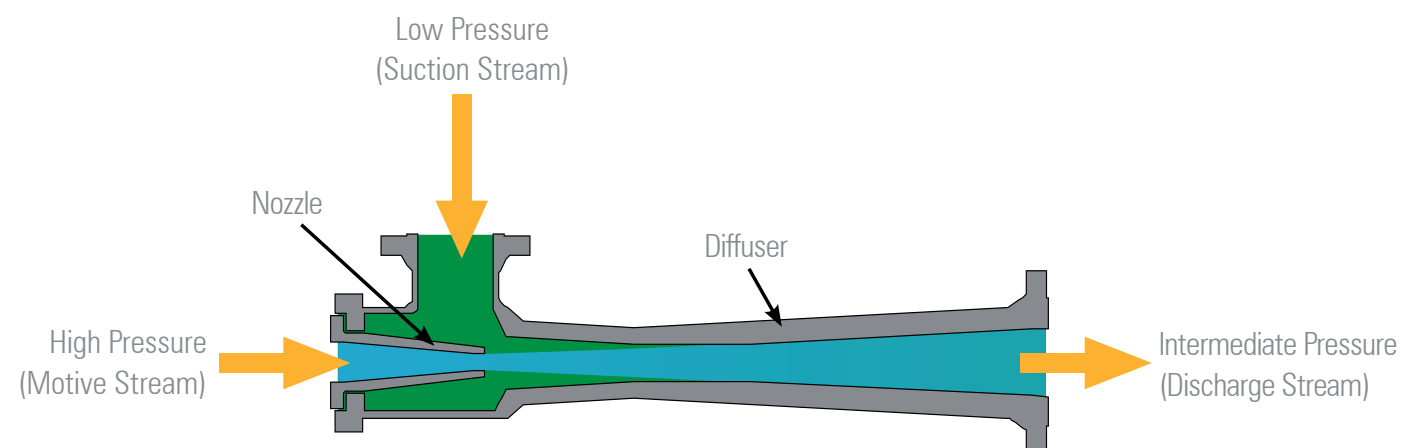
Ejectors (also known as Surface Jet Pumps, Eductors or Venturi's) provide a simple, robust and reliable method of pumping and boosting the pressure of fluids.

The operation is based on Bernoulli's principle, whereby increasing the velocity of a high pressure (HP) fluid as it passes through the nozzle, a low pressure region is created within the Ejector. This region entrains and compresses the secondary low pressure (LP) stream which we call the suction fluid. As the combined HP and LP streams pass through the Ejector's diffuser section, the velocity decreases and the pressure is regained, resulting in an intermediate pressure, which lies somewhere between the LP and HP inlet pressures.

Ejector performance is dependent on the pressure & flow ratio between HP Motive and LP Suction streams.

“Ejectors use a high pressure fluid to compress a low pressure fluid to an intermediate pressure.”

David Hoon, Technical Director



## Ejector Performance - Rules of Thumb

Ejectors are used across a wide range of applications in the Oil & Gas Industry. They can be used effectively for gas compression, fluid mixing and liquid pumping duties. Process fluid streams can vary greatly, from hydrocarbon gas to produced water, to sand slurry and to multi-phase Well-streams.

To achieve the best possible Ejector performance, it is important to ensure suitable HP Motive and LP Suction streams are selected. (Transvac Engineers can assist with this.) Typical applications outlined below can be used as 'rules of thumb';

**8:1**  
Compression  
(Single Stage)

### Gas Ejectors - Using HP Gas to Compress LP Gas

- Single-stage Ejectors can achieve compression ratios of up to 8:1.
- Two-stage Ejector sets can achieve much higher compression ratios.
- Can typically operate with up to 2% liquid by volume on HP Motive or LP suction stream.
- Can handle intermittent liquid slugs on LP suction stream.

**150:1**  
Compression

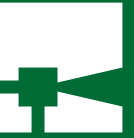
### LJC Ejectors - Using HP Liquid to Compress LP Gas

- Liquid Jet Compressors (LJC's) can compress gas from atmospheric pressure to over 150 barg (2,175 psig); a compression ratio of over 150.
- LJC's offer efficient gas compression when compared with Gas Ejectors, however, separation is required downstream, which should be considered.

**70%**  
Of HP Pressure

### LJP Ejectors - Using HP Liquid to Pump LP Liquid

- Liquid Jet Pumps can boost a low pressure stream up to approximately 70% of HP Motive Stream Pressure.



## Why choose Universal Design?

- ▶ For instances where operating conditions may change gradually over time (e.g. declining well conditions)
- ▶ UD pressure retaining shell can be sized to suit future operating conditions
- ▶ UD Nozzle and Diffuser internals easily changed-out to suit different operating conditions
- ▶ UD pressure retaining shell can be manufactured before operating conditions have been confirmed
- ▶ Manufacture of UD Nozzle & Diffuser can be delayed until the last few weeks of contract, when operating conditions are confirmed (e.g. when a new well is completed)
- ▶ Change-out of the new UD internals can be completed in one day
- ▶ Less risk to project if predicted operating conditions are found to be wrong, because new internals can be made relatively quickly and with no changes to associated pipe work
- ▶ Easier to realise short-term well opportunities with UD design approach
- ▶ Without internals fitted, pressure retaining shell simply behaves as a piece of pipe work
- ▶ Potential to relocate UD to a new site with different operating conditions and different internals

## Transvac's Patented 'Universal Design' Ejectors

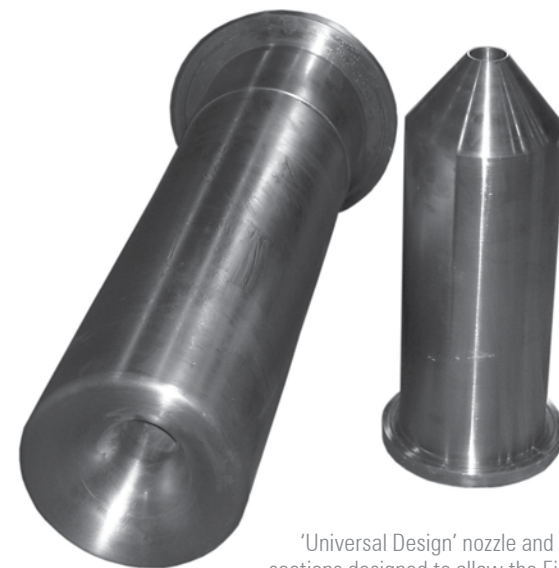
We understand that production is not always predictable. Conditions change over time and facilities need to be able to deal with this.

Ejectors are fixed-design devices. Each of our Ejectors are custom designed to perform at specific operating conditions. That's why we invented our patented 'Universal Design' Ejector.

The patented Universal Design (UD) comprises an external pressure retaining shell into which are fitted two replaceable components which give the Ejector its operating characteristics. These two components are called the nozzle and the diffuser and in the Universal Design, they can be easily changed-out with different ones in order to give the Ejector different optimum operating characteristics.

Thus, as process/well conditions change over time, the internals can be replaced with new ones which are more suited to the changed conditions.

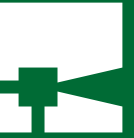
By changing-out the internals at recommended intervals, high performance efficiency can be maintained over the lifetime of the unit, thereby maximising recovery from the LP wells and from the field.



'Universal Design' nozzle and diffuser sections designed to allow the Ejector to operate at new production conditions







## Multi-Channel Liquid Jet Compressors

An interesting design characteristic of the latest Universal Design Liquid Jet Compressors, is that the overall length can be longer than traditional designs. In certain cases, the length can begin to cause practical concerns for transportation and installation at site.

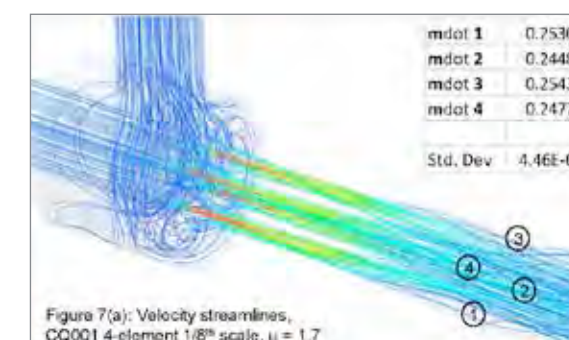
To address this concern, Transvac has developed a new patented design called the Multi-Channel Universal Design Liquid Jet Compressor.

As the name suggests, the Multi-Channel LJC contains multiple Ejectors in one common housing and offers a significantly reduced over-all length when compared with single channel designs. The total number of channels varies depending upon process, with each channel comprising of a single nozzle and single paired diffuser.



There is one common inlet on the high pressure motive side, which feeds into multiple nozzles. In turn these nozzles then discharge into a common suction chamber where the low pressure suction stream is introduced. Finally, this combined flow is sent through a number of diffusers to a common, single LJC outlet connection.

Transvac has carried out in-depth CFD and real-world testing to ensure that the over all efficiency is maintained when moving from a large (long) single-channel LJC to a shorter Multi-Channel design.



## Transvac Universal Design Liquid Jet Compressors

Harnessing the power of the liquid jet.

Transvac Liquid Jet Compressors (LJC's) have long been considered an interesting alternative to liquid-ring, screw or centrifugal turbo-compressors, largely due to the obvious advantages of having no moving parts and no maintenance requirements. However, when power usage was considered, LJC's were often seen as too inefficient.

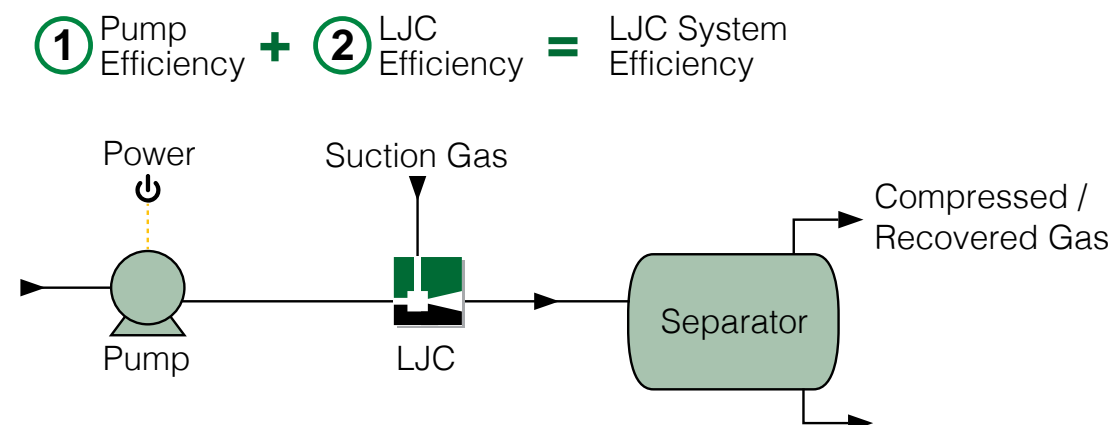
Transvac has changed all that.

Aside from certain applications, where an existing HP motive liquid stream is already freely-available (so the 'cost' of running the LJC is negligible), if a HP stream does not already exist, a pump is employed to provide the motive energy. This pump requires power, which is how LJC systems are bench-marked against other compression technologies for power usage.

Transvac's Research and Development team have made huge advances in the efficiency and capability of LJC's. Offering compression ratios of up to 150:1, these latest designs open the door to a wealth of new LJC applications throughout the Upstream and Downstream Oil & Gas Industry.

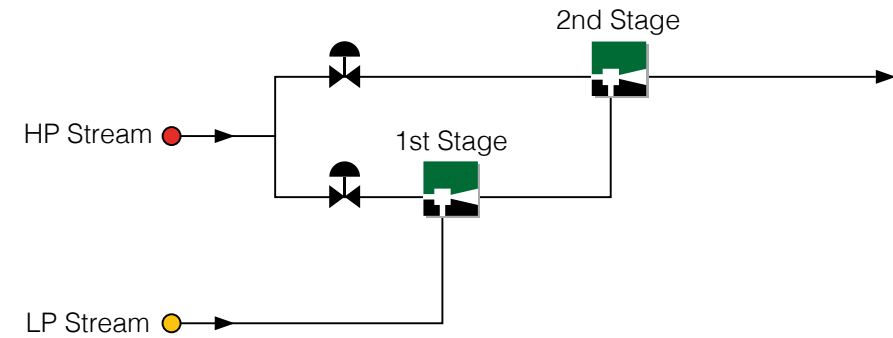
The latest LJC designs use significantly less HP motive flow to achieve a determined gas compression, which reduces the demand on the pump, thereby reducing power usage as well as reducing downstream separation equipment sizing.

The efficiency of a LJC System is therefore determined by two factors; the pump efficiency, and the LJC efficiency, as shown in the diagram below.

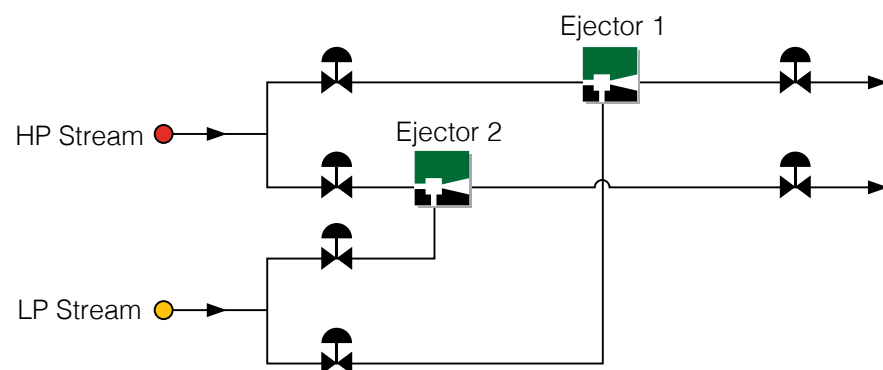


# Multi-Ejector Solutions

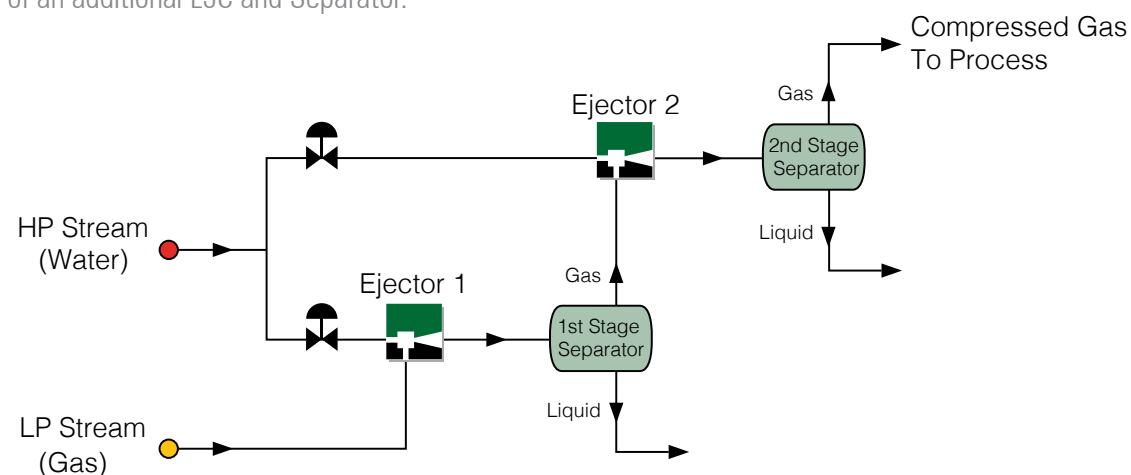
If the required compressions ratio (discharge pressure / LP pressure) is too high to achieve in a single Ejector, then they can be connected in series to achieve the required discharge pressure. The total flow from the first stage Ejector becomes the LP flow for the 2nd stage Ejector. The consideration with this approach, however, is that the second Ejector may require a higher motive pressure or flow rate.



Where high turndown is expected on the LP flow rate, Ejectors can be placed in parallel. This allows switching one Ejector on or off, depending on the duty demand, thereby allowing motive gas to be saved. This is important in some applications, particularly where HP fluid usage has an associated cost. In some applications, more than two Ejectors have been used in parallel.



Liquid Jet Compressors (LJC's) can also be operated in a multi-stage configuration, although this is less common. This is because LJC's offer a high compression capability in a single stage. Further, inter-stage separation is required, which can result in a higher CAPEX for the complete LJC system. However, in some applications, where a high compression is required, it can be more efficient to split the required compression across two stages, using less motive water flow over-all, than in a single stage system. The energy savings can then be calculated and off-set against the additional CAPEX of an additional LJC and Separator.



# Silencers

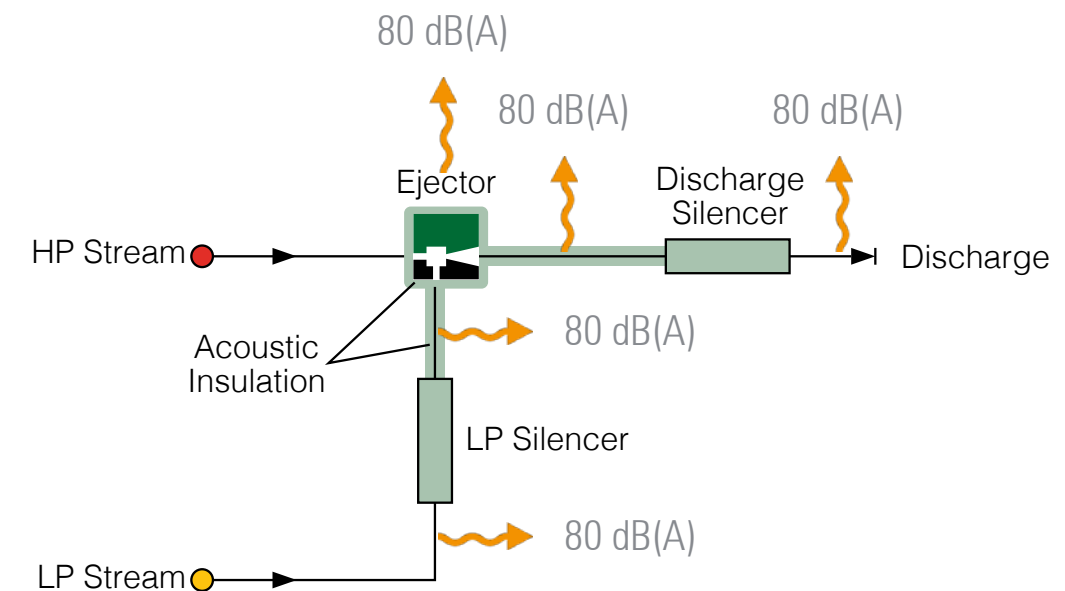
Gas Ejectors (HP gas, compressing LP Gas) can sometimes generate noise in excess of typical site safety limits 85dba. To address this, Transvac often supplies Silencers in conjunction with Gas Ejectors to offer noise attenuation.

Transvac will always perform noise calculations for Gas Ejector projects and advise Clients on suitable measures to ensure the proposed Gas Ejector installation will satisfy any applicable site noise limits.

A number of simple strategies can be employed to ensure noise levels are kept within acceptable site limits as shown below. As noise levels may vary from project to project, one, some or all of the options may be required for a particular application. Transvac will advise on this during the project feasibility stage.

Options include;

- Acoustic Insulation of the Gas Ejector
- Ejector Discharge Silencer
- Ejector Suction Silencer
- Acoustic Insulation of any intermediate pipework



Typical Silencer complete with support feet, before insulation added

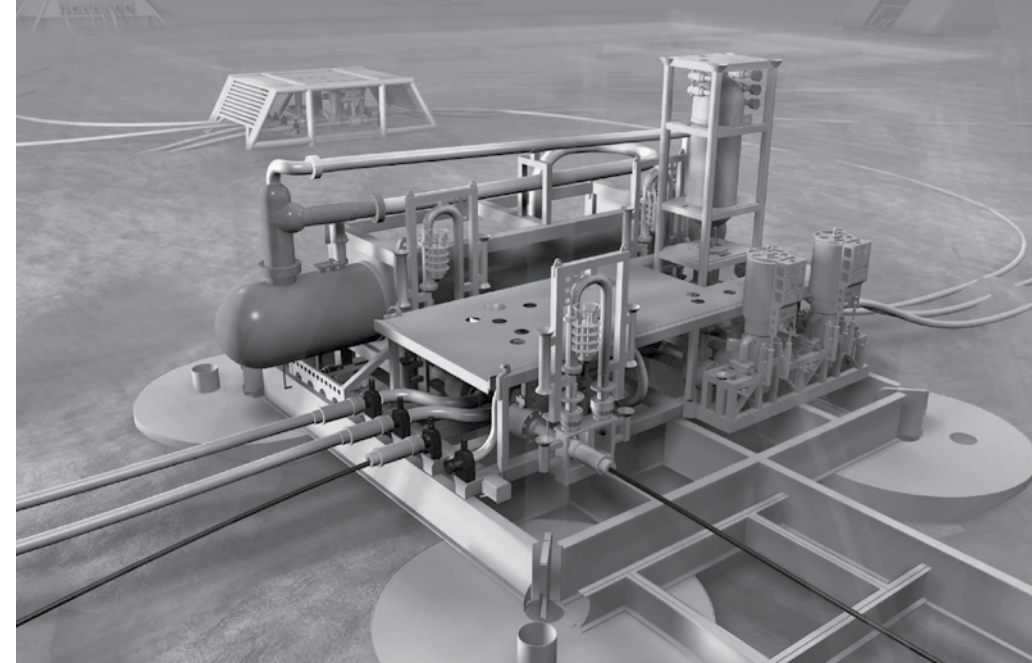


# topside

“ “ as the industry pushes for more processing to be done subsea, many technologies fall by the wayside. With no moving parts or power requirements, ejectors are ideally suited to this challenging environment.

- Philip Ainge, Sales Director

# subsea



## Qualified for Subsea Processing

With no moving parts and no maintenance Transvac's Ejector technology is an ideal solution for subsea processing. To ensure trouble-free operation, all Transvac subsea Ejectors are designed, manufactured and tested in-house.

Operating rotating mechanical equipment subsea requires huge amounts of energy, often megawatts of power. Ejector technology can operate using existing energy and therefore operating costs can be negligible. Rotating mechanical equipment also requires special designs for performing subsea. Ejector designs change very little whether subsea or topside.

In some applications, Ejector flows can be simply calculated using pressure drop data across the Ejector, thereby negating the need for flow metering instrumentation.

Materials of construction and mechanical design meet project specific subsea piping standards and are fully qualified. Transvac also provides ceramic nozzle and diffuser components for abrasive applications which have been proven over many years on topside applications.

Transvac supplied the world's first subsea processing Ejector on the TORDIS project for Statoil and a unique, patented multi-nozzle Ejector for Petrobras' Marlim Project.

Transvac subsea Ejectors are fully proven and qualified to TRL Level 7 for use subsea.

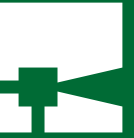


Subsea Ejector for Petrobras - Marlim Field  
Mechanical Design: 345 barg

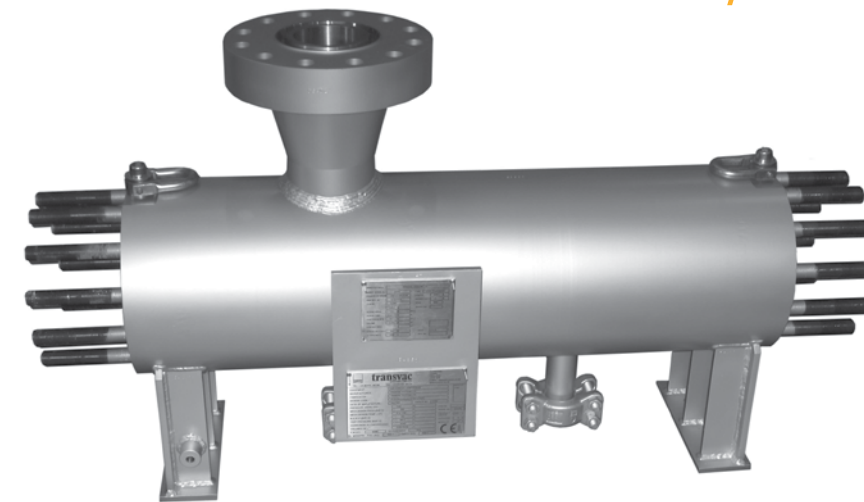


Subsea Ejector for Statoil - Tordis Project  
Mechanical Design: 200 barg





This Ejector recovered  
\$127,000 per day  
of extra gas from a well  
that had been shut-in  
for 2 years.



10,000lb rated Size 6  
Universal Design Gas Ejector

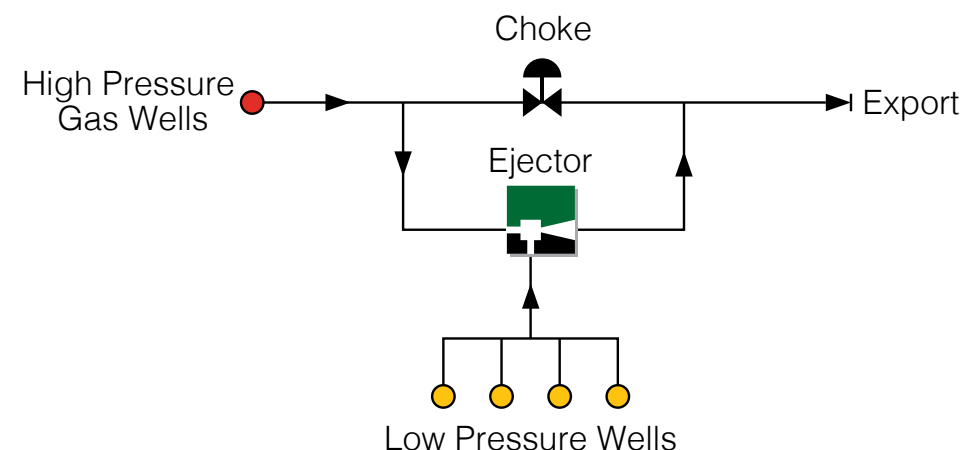
## Increase recovery from LP Wells - for free!

Ejectors offer an attractive solution for generating extra production from LP wells and in the process extending field life. Most commonly, shut-in or liquid loaded wells can be revived, as well as satellite or stranded wells deemed too expensive to recover with 'traditional' techniques.

In this example, gas from HP wells was being choked to a lower pressure to meet downstream process conditions. Wasting 'usable' energy in this way offers no added value to production.

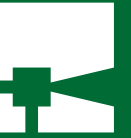
Instead, the HP gas was used to 'drive' an Ejector, which not only delivered the HP gas at a suitable lower pressure to meet downstream conditions, but also lowered the back-pressure on the nearby LP wells, bringing them back to life.

The 'Universal Design' Ejector allowed for new internals to be fitted as HP well pressures declined over time, keeping the Ejector operating at the optimal design point and, as such, keeping production steady.



## Benefits

- ▶ Extra 32 MMscfd of gas produced from shut-in wells
- ▶ New Ejector internals fitted as well pressures declined to maximise production.
- ▶ New internals were fitted in less than one shift.
- ▶ The new internals increased production of well by 17.7 MMscfd.
- ▶ Ejector has no running costs, as it utilises motive gas energy which is normally wasted across a choke valve
- ▶ Ejector requires no maintenance and produces no emissions
- ▶ Universal Design allowed manufacture of new Ejector internals to be delayed until new HP well was drilled, thereby reducing project risk.



“ the gas ejector gave us about a 15% increase in production and we didn't need to install the extra compressor.

- Client comment



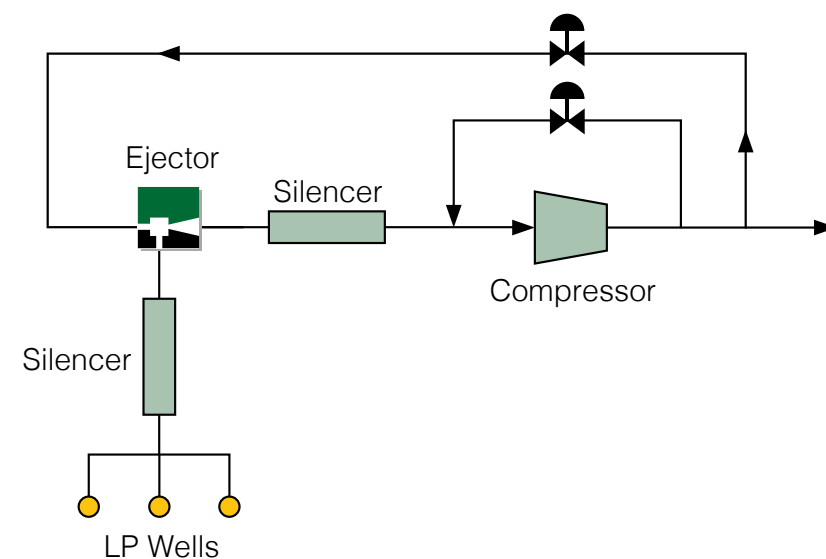
## Boost Production using Compressor Recycle Gas

Many older production facilities have compressors operating in constant recycle as conditions have changed from design point and the compressors themselves are less efficient. Gas is compressed from low to high pressure then some of this is let-down and fed back into the compressor to maintain operating throughput.

By making use of this available energy to 'drive' an Ejector, back-pressure on LP wells can be reduced

by the Ejector to increase production or even restart shut-in wells.

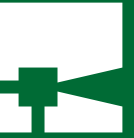
This method of boosting production is achieved 'for free' by making use of otherwise wasted energy. In many instances significant capital savings are also made by eliminating the need for modifications of, or secondary, mechanical compressors.



## Benefits

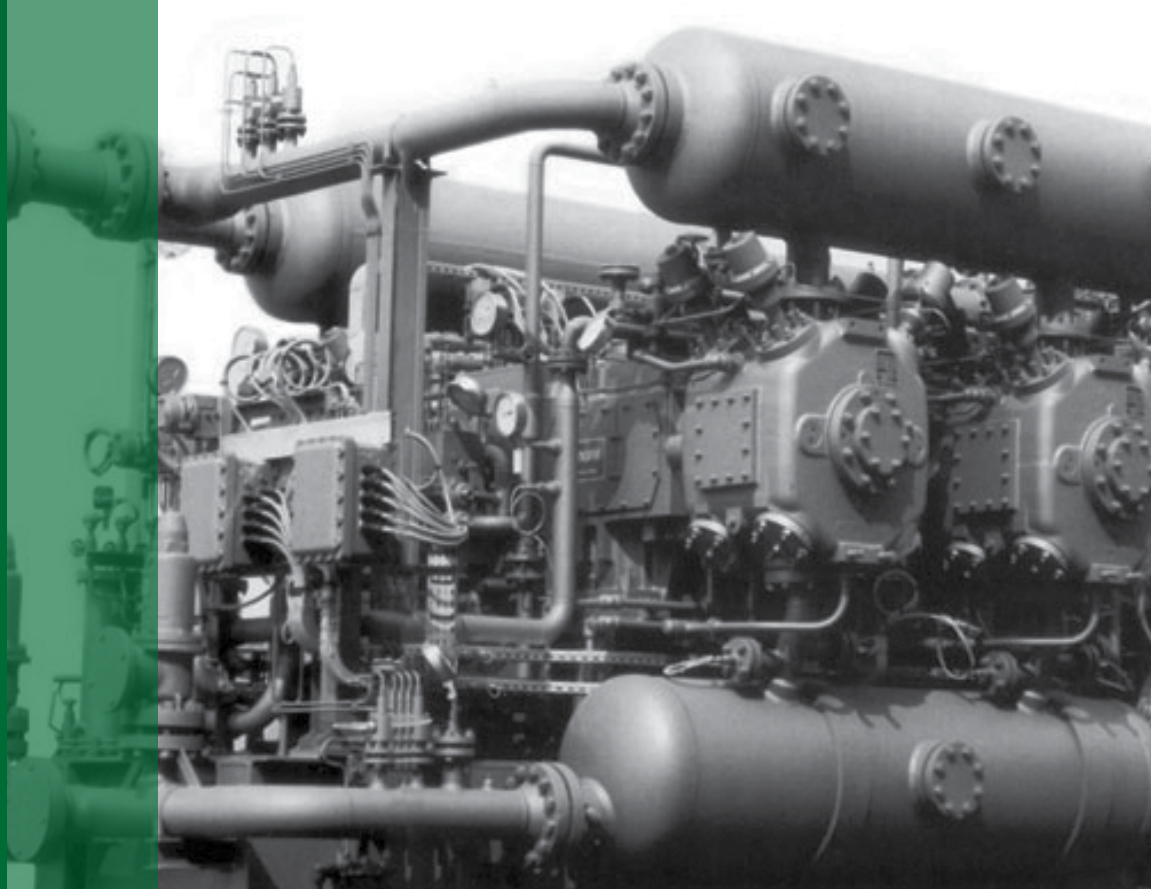
- ▶ Total gas production increased by 91MMscfd.
- ▶ Changeable (Universal Design) Ejector internals allowed production to be maximised as wellhead pressure declined.
- ▶ Replaced requirement for compressor re-wheeling, saving capital and accelerating the benefit.
- ▶ Requirement for 1<sup>st</sup> stage compressor eliminated saving the client over £10m capital cost.





“ When it's such a simple idea people often ask 'what's the catch?' ...but there isn't one, and the benefits are huge.

- Peter Ainge, Business Development Manager



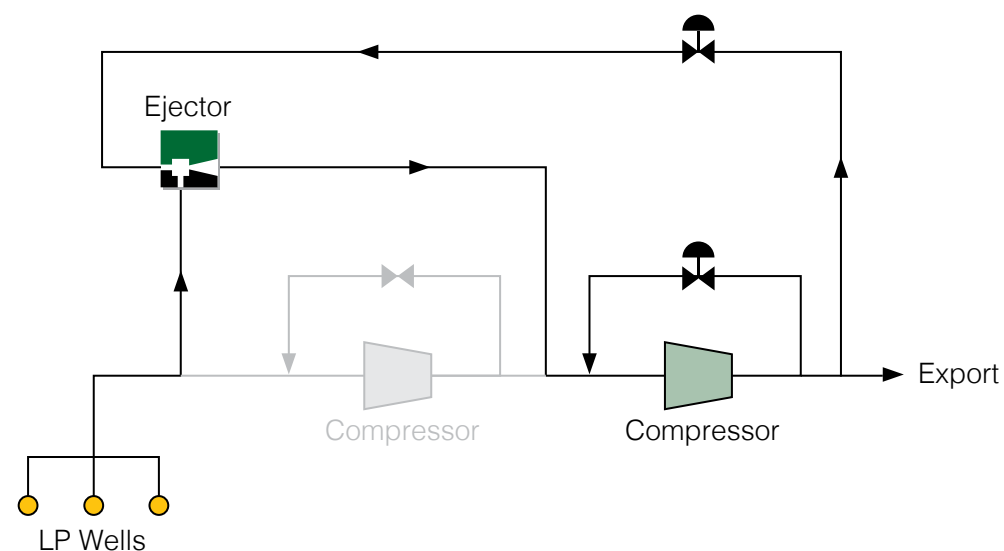
## Replacing a 1st Stage Compressor

Ejectors can be used to completely replace existing mechanical compressors. With no maintenance and utilising available energy, this approach can often be justified on lower CAPEX and OPEX alone.

In this example, high pressure gas from the 2nd stage separator is used to power the Ejector, boosting the pressure of the 1st stage separator gas.

The Ejector discharges at the required inlet pressure for the 2<sup>nd</sup> stage compressor, thus completely eliminating the need for the expensive mechanical 1<sup>st</sup> stage compressor.

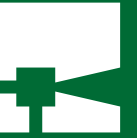
A similar technique can be employed in facilities where suction gas pressure is falling below the minimum inlet pressure of the compressor. The Ejector can act as a booster-compressor to ensure suction pressure is met.



Gas Ejector used to replace 1st stage mechanical Compressor

## Benefits

- ▶ Flare Gas of 2 MMscfd at 1 bar(a) captured and delivered at the suction pressure of 2<sup>nd</sup> stage compressor.
- ▶ Used energy that was already available.
- ▶ 1<sup>st</sup> stage compressor was removed from service. It simplified system operation and reduced maintenance costs.
- ▶ Gas no longer burned to power this compressor.



## Gas Reinjection & SWAG Injection

There are a number of situations in which operators require gasses to be reinjected back into the reservoir. This can include:

- ▶ Stranded gas, where there is no gas export line from oil producing fields
- ▶ Disposal of waste gases as an alternative to flaring
- ▶ Carbon Capture & Storage (CCS) / Carbon Sequestration
- ▶ Increasing reservoir pressure as part of enhanced oil recovery (EOR) process

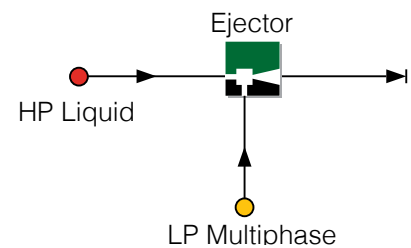
Our latest range of LJC's (which typically utilise injection or produced water as the motive fluid) offer high compression ratios, necessary for overcoming reservoir backpressures. SWAG (Simultaneous Water and Gas injection) is becoming more widely used to stimulate under performing or mature wells. In some instances this offers an additional opportunity for flare gas recovery where otherwise-flared gas can be reinjected downhole.

Making use of freely-available local energy sources in this way, eliminates the need for installation of high CAPEX and OPEX mechanical gas compressors, as well as offering a simple, brownfield-friendly, retrofit solution.

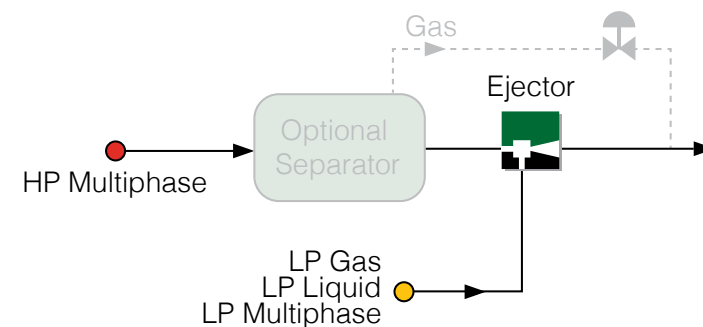
## Multiphase Well Boosting Techniques

Transvac Ejectors are ideally suited for multiphase well boosting applications, where the high cost and maintenance issues associated with mechanical/rotating multiphase pumps are prohibitive.

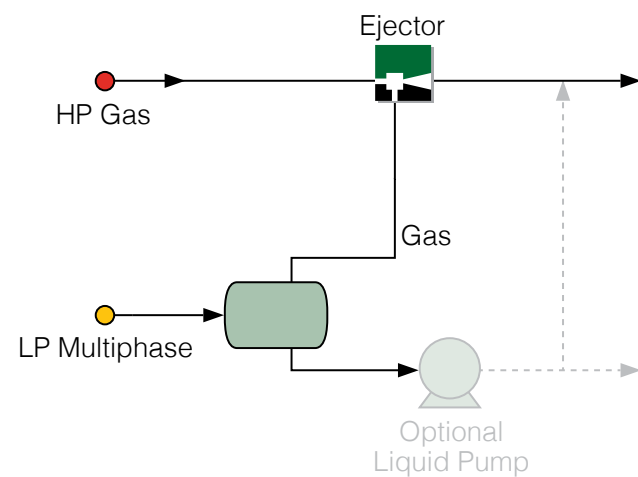
Transvac has developed a range of techniques to improve recovery rates from multiphase wells using energy from available HP liquid, Gas or multiphase streams. Below are a selection of the most common techniques:



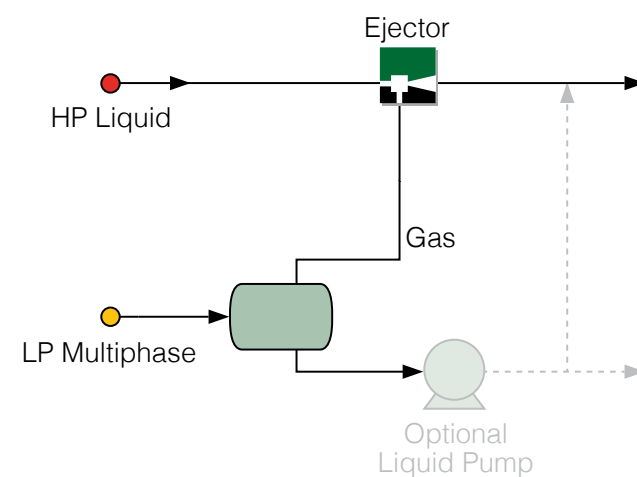
Using HP Liquid to lower backpressure on multiphase wells



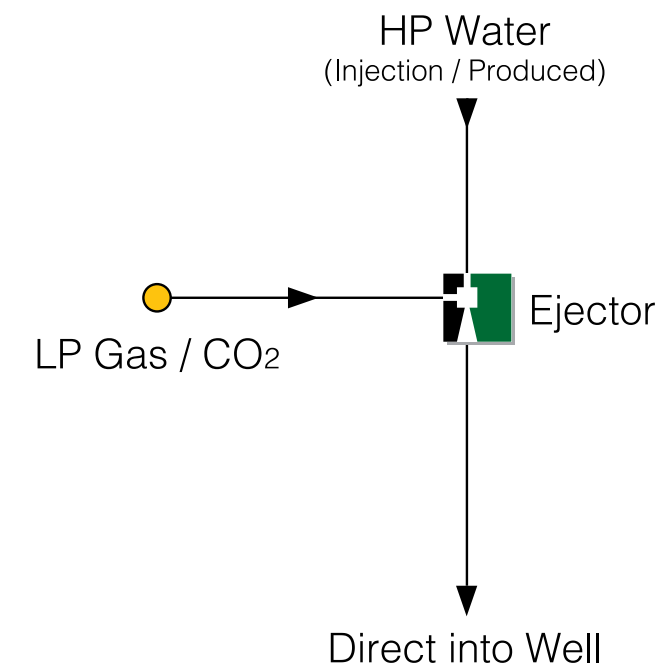
Using HP Multiphase to lower backpressure on multiphase wells

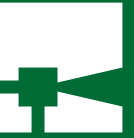


Using HP Gas to lower separator pressure to boost inlet flow



Using HP Liquid to lower separator pressure to boost inlet flow





## Driving Your Ejectors

Ejectors operate with either a gas or a liquid as the high pressure motive fluid. In many cases, only a small compression is required to facilitate waste gas re-entry into the production process. Most commonly, this re-enters the process as fuel gas, is sent to export, or is used as injection/lift gas.

Gas motivated Ejectors offer a compression of up to 8:1 in a single stage. This can be further-boosted with the use of a secondary Ejector, a second compression stage. Liquid driven Ejectors, called Liquid Jet Compressors (LJC's), offer compressions of up to 150:1. Where water is used to drive an LJC, facilities can often provide available separator capacity to handle the discharge water.

## Flare Gas Recovery

Time to change.

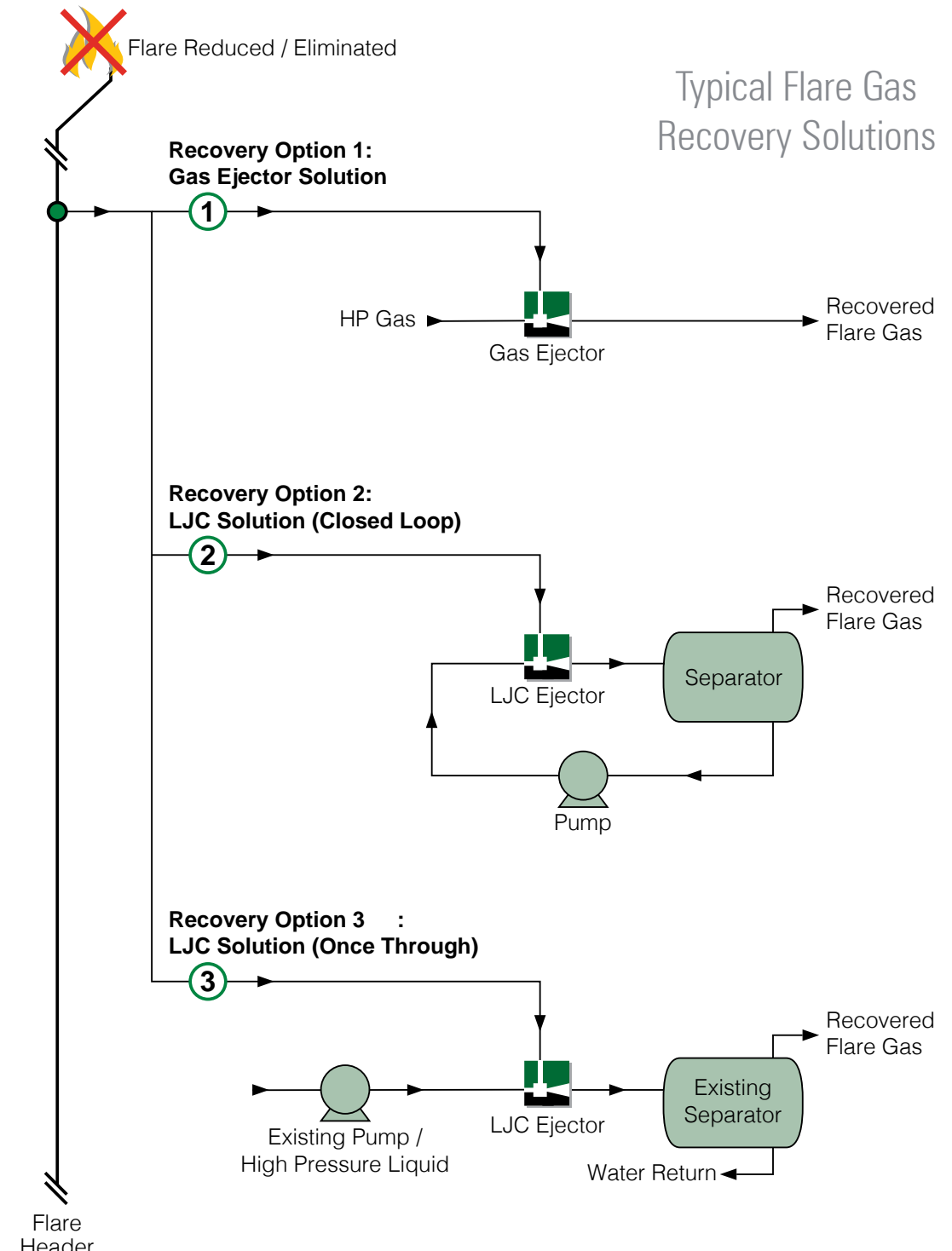
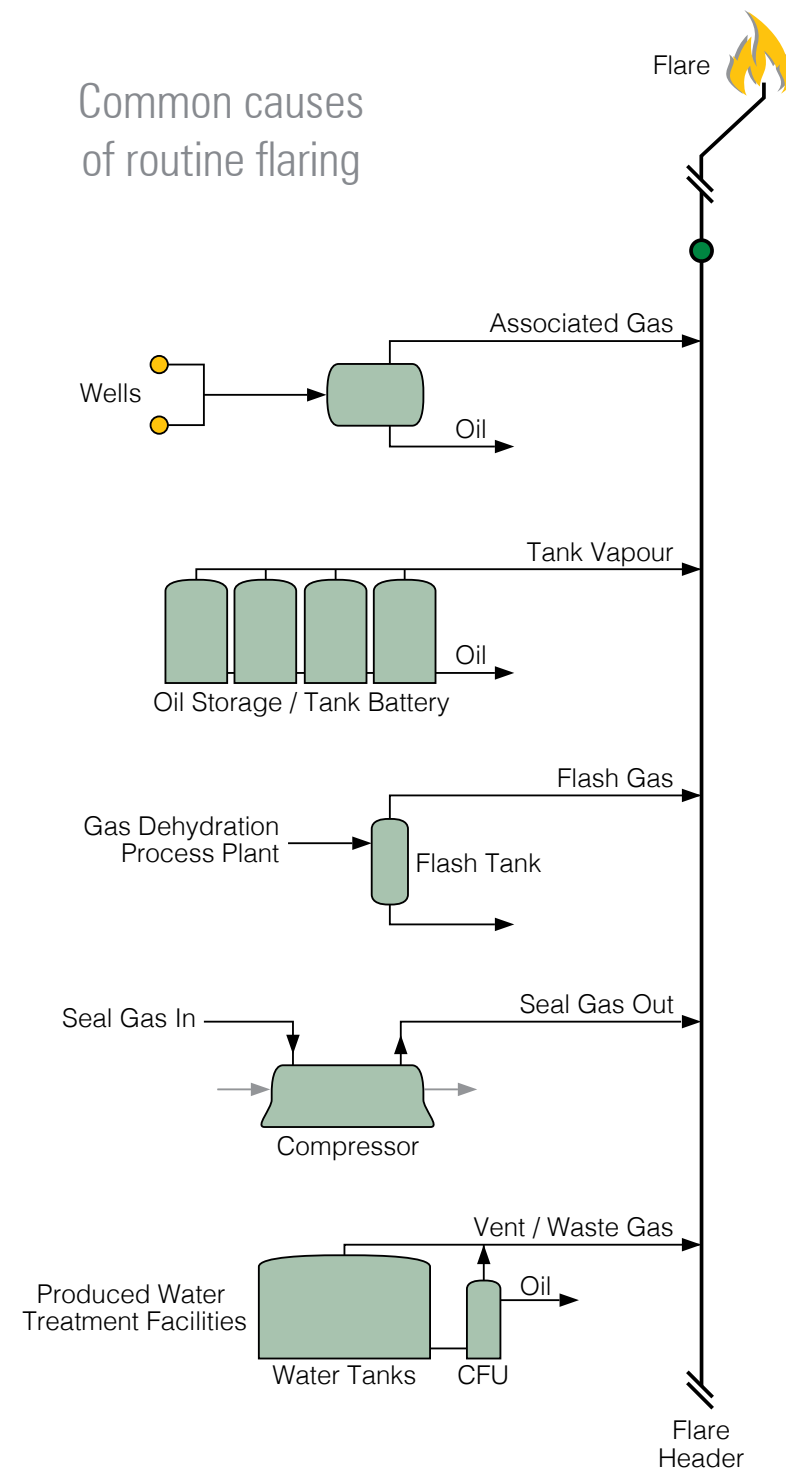
Traditionally, in the Oil & Gas industry, waste and surplus gas has been disposed of by flaring to atmosphere. Today this process is becoming increasingly unacceptable as the industry progresses towards eliminating the emission of greenhouse gases into the atmosphere, whilst simultaneously conserving energy.

Therefore, the demand for equipment that can safely and economically compress waste and surplus gas back into the production process is rapidly increasing.

Ejectors are ideally suited to this application because they employ either the available high-pressure gas or liquid energy to entrain and compress waste and surplus gas to a pressure where the gas can be recovered into production or used as fuel gas.

Simple, proven control methods cater for fluctuating flare gas flows, ensuring stable, consistent performance.

Flare Gas Recovery Ejectors are often employed as a retrofit solution to replace failing compressor types, such as Liquid-Ring or Screw Compressors. With no moving parts contacting the often-dirty and sour flare gas, Ejectors are the only sensible, reliable choice.



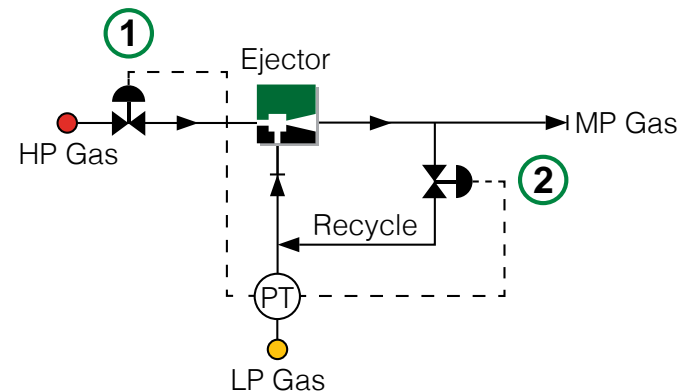


## Typical Ejector Control Options

It is not uncommon for the flow rate of flare gas to vary and, if not controlled, the suction pressure created by the Gas Ejector will also vary. In order to maintain the desired flare gas operating pressure, a number of control strategies are available.

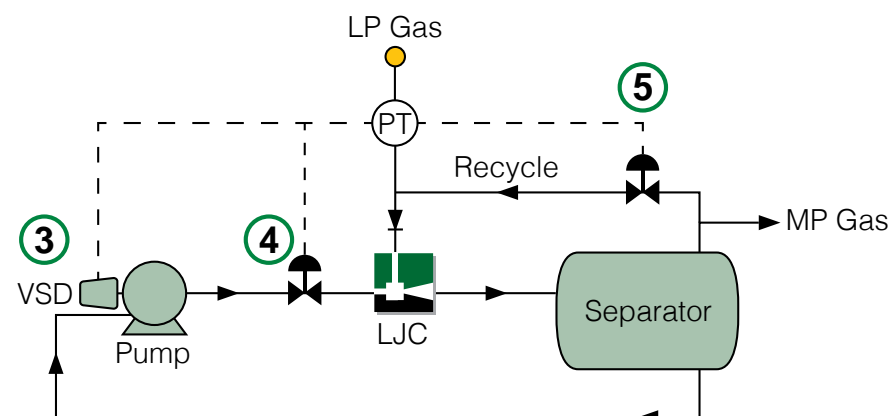
### Typical Control Options for Gas Ejectors

- ① Throttle HP Gas (Minimise Gas Use - Low Compressions Only)
- ② Recycle MP Gas to Ejector Suction (Most Common)



### Typical Control Options for Liquid Jet Compressors

- ③ Control HP Liquid flow to LJC (Reduce Pump Power using VSD)
- ④ Throttle HP Liquid flow to LJC
- ⑤ Recycle MP Gas to LJC Suction (Most Common)



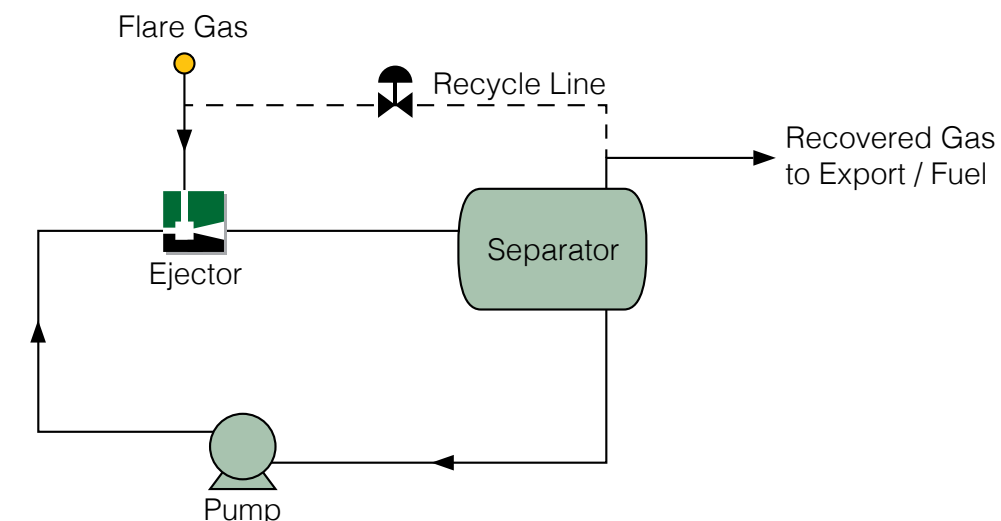
#### Please Note:

In some cases, multiple control strategies can be employed.

Transvac's FlareJet LJC™ solution is a complete, turnkey zero-flare solution for the oil & gas industry. Providing up to 150:1 compression, FlareJet LJC™ recovers waste gasses with ease and eliminates the need for flaring outside of emergency situations.

Using experience gained over 45 years and fine tuned in our state of the art R&D test facility, FlareJet LJC™ offers the very latest in cutting-edge Ejector technology and performance.

Waste gasses are compressed and discharged at a specified pressure to suit required the downstream process. In most cases, recovered gas can be returned to production or is used as fuel gas on the facility.



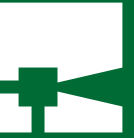
FlareJet LJC™ does not interfere with local ESD procedures and is intended to recover gasses continually sent to flare, such as purge, separator and knock-out drum gasses.

Simple control philosophies cater for varying inlet (flare gas) flow rates and ensure upstream process is not affected.

With no moving parts, the FlareJet LJC™ Ejector can handle both solids (such as sand) and sour gasses without issue. Special-grade ceramic internals are employed to resist abrasion and ensure reliability.

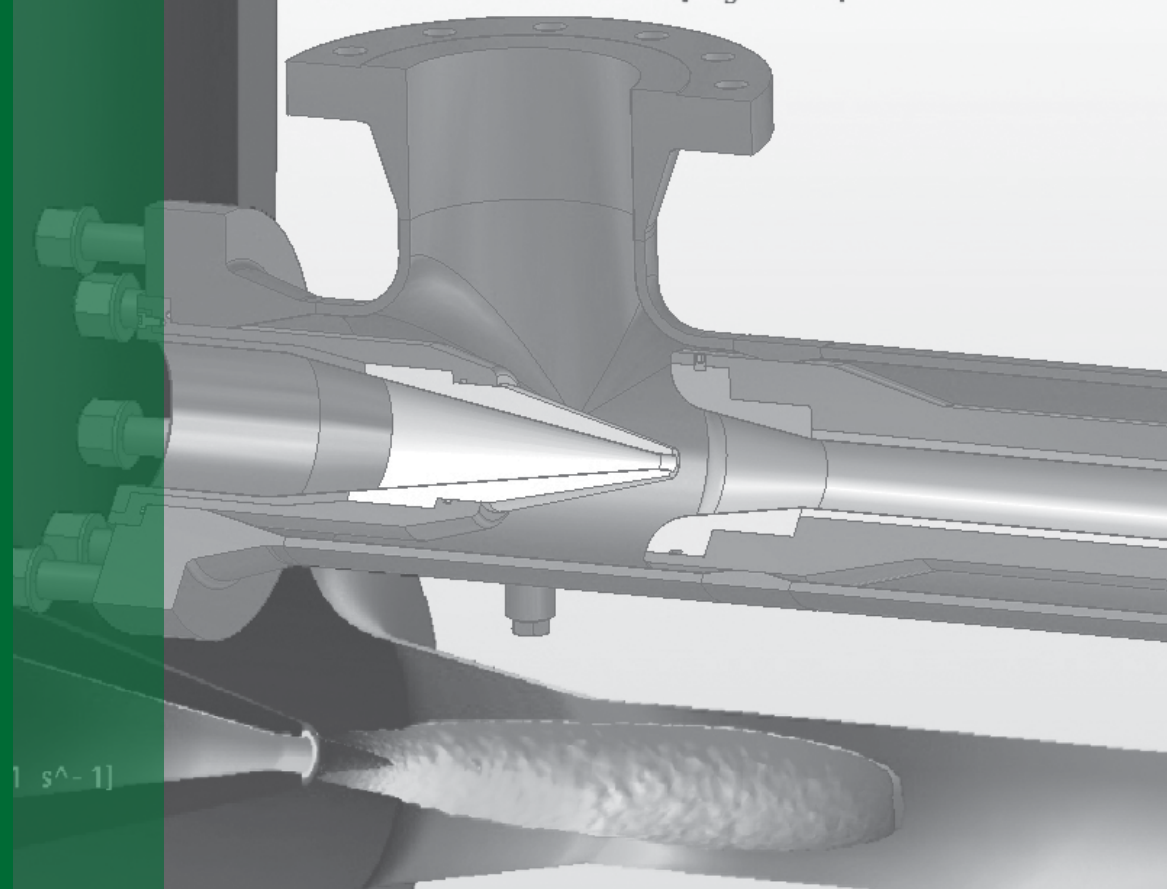
## Gas Sweetening with Amine

Effective process gas sweetening can be achieved when using Amine as the recirculating fluid. LJC's offer an effective, high shear mixing environment, allowing excellent contact between the high pressure Amine stream and the sour process gas. In some cases, this method can be used as a first-stage sweetening process, reducing or eliminating the demand for downstream sweetening processing.



“ when it comes to moving sand around, ejectors offer unrivalled reliability.

- David Hoon, Technical Director



## Produced Water & Sand Management Solutions

- ▶ Pressure boosting after hydro-cyclones
- ▶ Pumping slurry as part of a solids handling / separation system
- ▶ Flow boosting for separator flushing applications
- ▶ Desanding for gas flotation unit
- ▶ Desanding for produced water desanders
- ▶ Sand cleaning / scrubbing
- ▶ Flushing slurry lines following sand removal



Super Duplex Sand Slurry Ejector for Statoil, Norway

## Abrasion Resistance

Where sand is present in the process, special consideration needs to be given to material choice. All of Transvac's sand handling Ejectors are supplied with special-grade ceramic internal parts (nozzle and diffuser section) to resist abrasion.

Transvac has gained extensive knowledge of 'material wear prevention' through intensive CFD studies and real-world testing.

As a result, Transvac has never been required to supply replacement parts due to wear from sand or solids.



Ceramics shown during laboratory testing programme



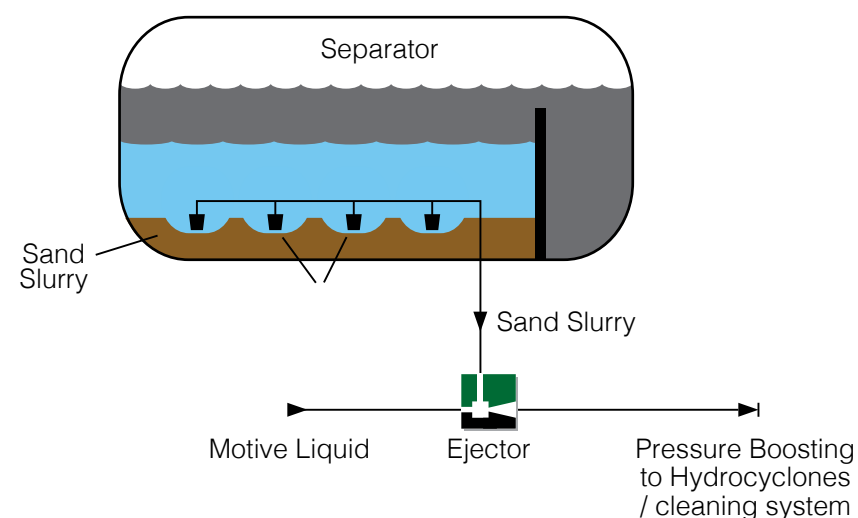
Sand Slurry Ejector complete with ceramic Nozzle and Diffuser



# Slurry Pumping from Separators

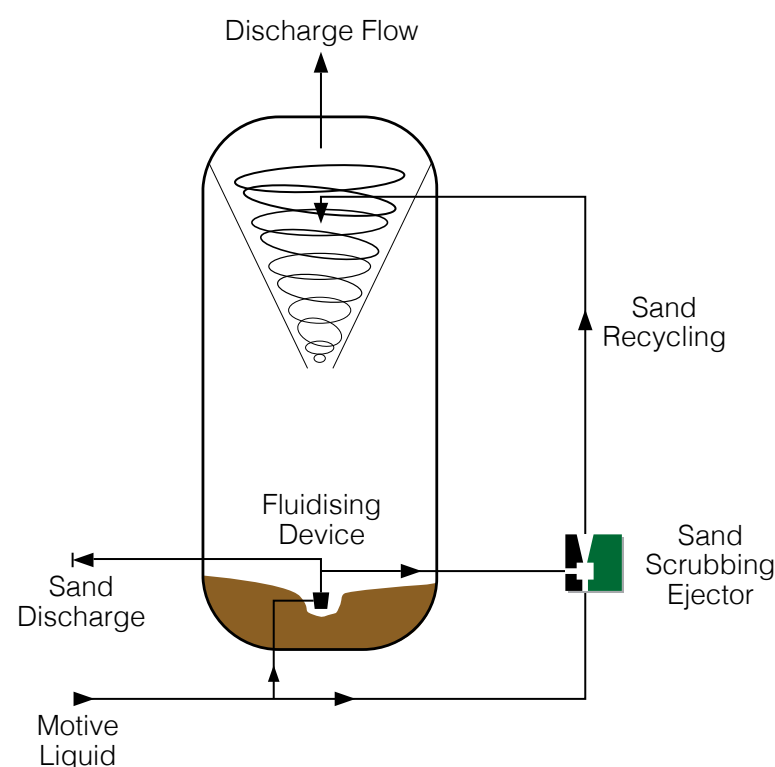
Transvac Sand Slurry Ejectors are an ideal method of transporting sand slurries from separators or cyclones as part of a de-sanding / sand washing system.

Accumulated sand is normally fluidised to ensure it will flow, prior to entering the suction port of the Ejector. The motive fluid can be produced water or pressurised water sources.



## Sand Cleaning & Water Recycle

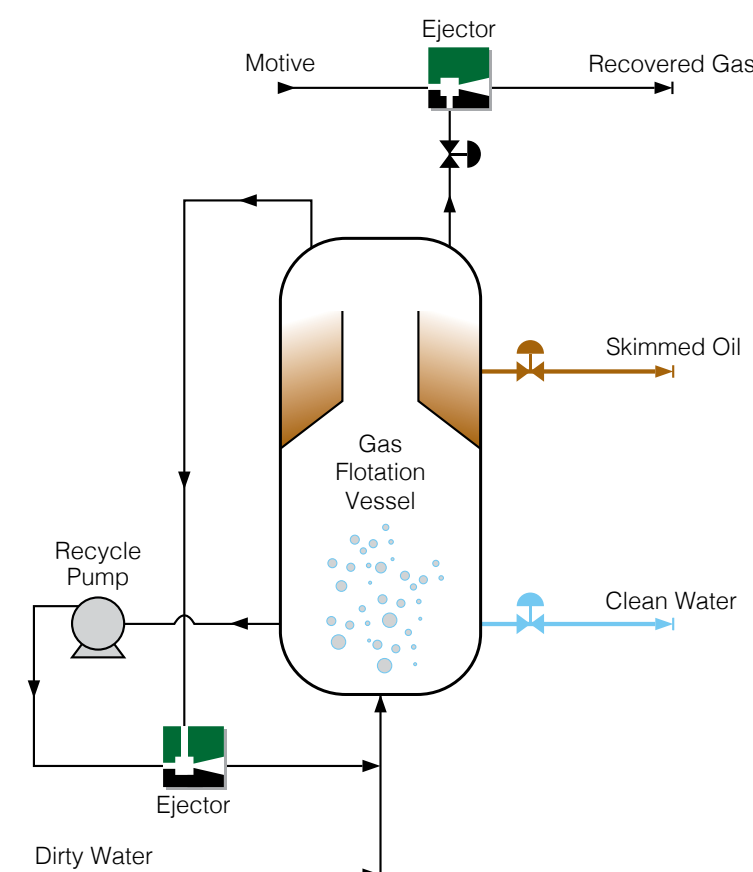
Ejectors provide high-shear pumping, which can be used effectively in the sand cleaning process. Any oil which remains attached to the sand is successfully separated from it as it passes through the high-velocity section of the Ejector. This is then pumped into the separator / cleaning vessel for continued processing.



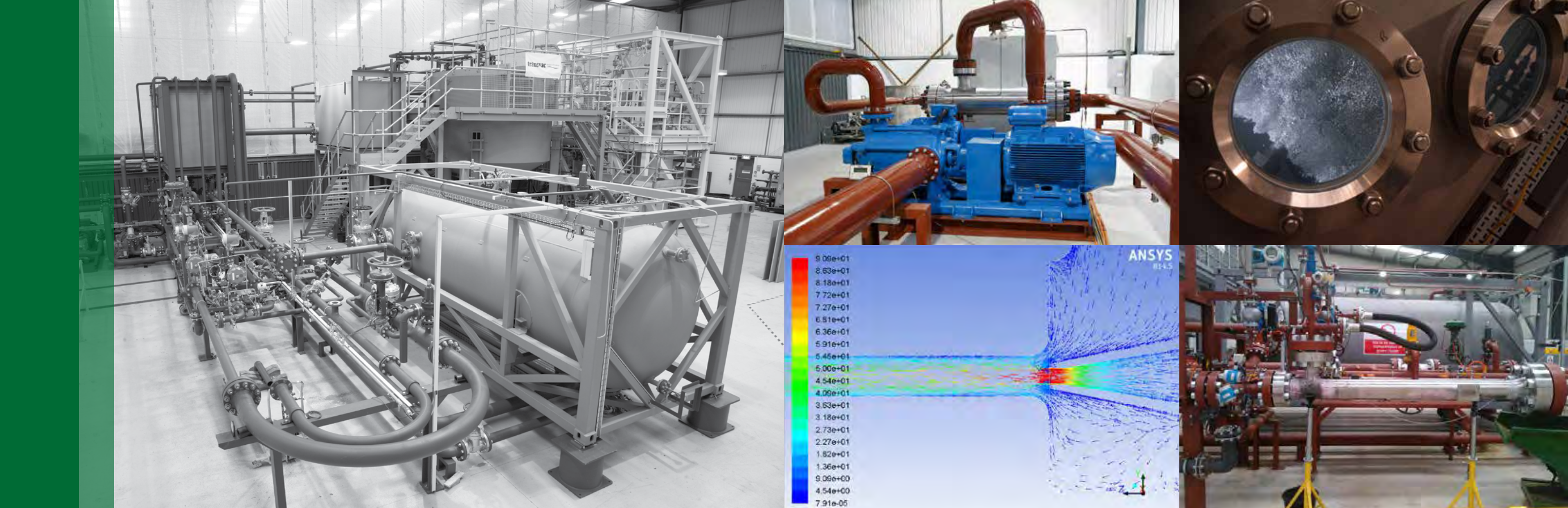
## Micro-Bubble Generation & Gas Recovery

Ejectors can be used to perform a number of duties in the oil flotation process. Transvac has developed a special 'micro-bubble generating' Ejector device capable of producing fine bubbles within a targetted, optimised size range. With a huge surface area created, a more efficient flotation

process is observed. Where excess gas needs to be recovered from the flotation vessel, a second Ejector is available to compress and recover this gas. To maintain gas efficiency, minimal 'new' gas is introduced to the process with this recycle method.







## R&D Test Facility

### Advancing Ejector Technology

Transvac officially opened its R&D Test facility in April 2010. The state-of-the-art facility primarily develops new Ejector technology for subsea processing, flare gas recovery, sand slurry pumping and enhanced recovery & production solutions.

The R&D test facility includes high and low pressure equipment for handling water, oil, gas, multi-phase and slurry. Test programmes are supported by CFD studies and include fundamental University research.

Design improvements can be applied to Client projects quickly, with the comfort that each and every design has been thoroughly tested in both a modelled environment, using FEA and CFD, backed up by comprehensive real-world tests on the Transvac Test Facility flow loops.

A dedicated R&D team now includes five full-time CFD Engineers.

### Client FAT & Performance Mapping

As well as developing and improving Transvac's Ejector designs, Clients often utilise Transvac's R&D Test facility for:

- Factory Acceptance Testing (FAT)
- Proof-of-concept testing
- Performance mapping for design & off-design points

Ejector testing programmes allow Clients to gain a detailed understanding of how their Ejector will perform in the field, with the safety and security of a closed, managed environment.

### Scaled Testing

Ejector performance can be accurately validated through scaled-pressure or scaled flow testing, where actual field operating conditions exceed the pressure or flow capabilities of the facility test flow loops. Transvac has a range of robust testing methods for this purpose.

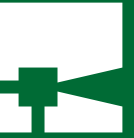
## Test Facilities

- ▶ 9 x flow loops
- ▶ VSD water pumps
- ▶ Pump pressure up to 300 bar (4350 psi)
- ▶ Liquid flows up to 700 m<sup>3</sup>/h
- ▶ Sand slurry flows up to 60 m<sup>3</sup>/h (up to 60% SVF)
- ▶ 400 KvA stand alone generator
- ▶ Stainless Steel test rig - 60 m<sup>3</sup>/h up to 25 barg (365 psig) feed
- ▶ 2 x 9 m<sup>3</sup> clean water tanks
- ▶ 35 m<sup>3</sup> slurry / water tank
- ▶ 6 m<sup>3</sup> calibrated weigh tank
- ▶ 7 x Coriolis meters (liquid / gas) 1/2" to 4", 5 to 150,000 kg/h
- ▶ 1 x 16m<sup>3</sup> 27.5 barg pressure vessel for closed loop multi-phase testing
- ▶ High pressure in-line solids / phase separator (150 barg (2175 psig) and 100 m<sup>3</sup>/h)
- ▶ Fully automatic control and data acquisition system using ASi field bus system (LabView)
- ▶ Flow assurance : flow accuracy 0.1 - <1.0 % FS / Pressure Accuracy 0.1% or better

“ we are focused on turning innovative designs into proven solutions.

- Gary Short, Design & Innovation Director





“ The online tools give our clients direct access to the very latest Ejector designs, at the touch of a button

- Abdullah Rehman, Chemical Engineer



## About Us

Transvac Systems Limited is a privately owned Ejector Solutions provider formed in 1973.

As both a designer and a manufacturer of Ejectors, Transvac has full in-house control over process and mechanical design, supply of raw materials, manufacturing, scheduling and testing. With all of our procedures certified to BS EN ISO 9001:2015 the quality of the final product is assured.

Transvac is accredited to Module H of the Pressure Equipment Directive (PED) and our products are CE marked where appropriate. We are also registered with 1st Point Assessment (FPAL), Achilles and directly with customer's own vendor registration systems, such as Saudi Aramco 9-Com system.

If you would like to see for yourself how we design and build Ejector solutions, we welcome you to visit our facilities where our team will be pleased to offer a tour of our design offices, research and development facility and manufacturing workshops. Please contact [sales@transvac.co.uk](mailto:sales@transvac.co.uk) to make your booking.



## Online Ejector Software

Are you missing opportunities? No longer do you need to wonder...

Transvac now offers a suite of free-to-use online Ejector software that allows access to the very latest in Ejector design. Using the screening tools, you can check to see if your application works, providing valuable information such as motive flow requirements, discharge pressure or maximum compression, to name a few.

A more detailed Ejector sizing program is also available, which allows for full gas composition data to be included in the calculations. Your results can be saved and a data sheet can be printed or emailed straight to your inbox.

If you would like access to this software, please contact [sales@transvac.co.uk](mailto:sales@transvac.co.uk).

## Contact Us

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