



Research & Development





R&D Test Facility

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

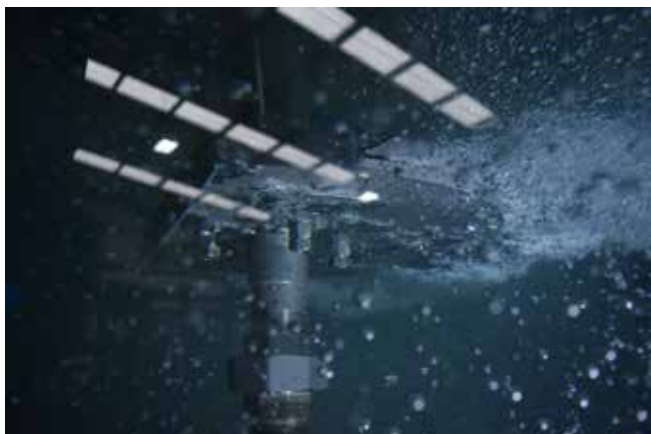
Ejector applications for the nuclear, bio-fuel, chemical and wastewater industries are also under development.

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

The Transvac facilities include liquid flow lines for high, medium & low pressure testing (in excess of 300 bar (g)) and solids handling systems.

Transvac performs functional validation tests for Ejectors used in the oil & gas, nuclear and process industries. A dedicated R&D team now includes 5 full-time CFD Engineers.

Transvac are continually investing in the R&D facility, allowing great progress to be made in their Ejector solutions.

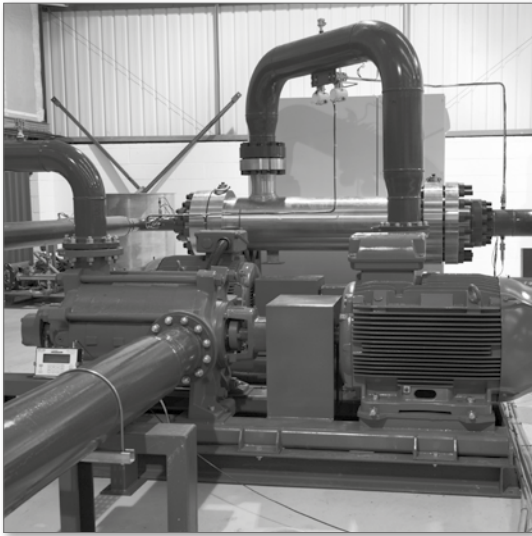


Microbubble Rig



Slug Testing Rig

State of the art facilities





Research & Development - Key Research Areas

Fluid Structure Interaction

- ▶ Jet break up characterisation
- ▶ Coalescing and dispersion of multiphase flows
- ▶ Measurement techniques [laser Doppler]
- ▶ CFD model calibration [new code development]

High Motive Pressure Liquid Jet Compressor

- ▶ Optimisation & characterisation
- ▶ Scaled trials
- ▶ CFD model calibration

Low energy inline micro bubble generation

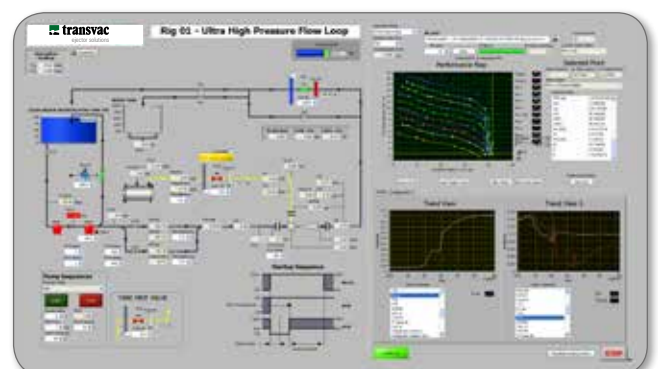
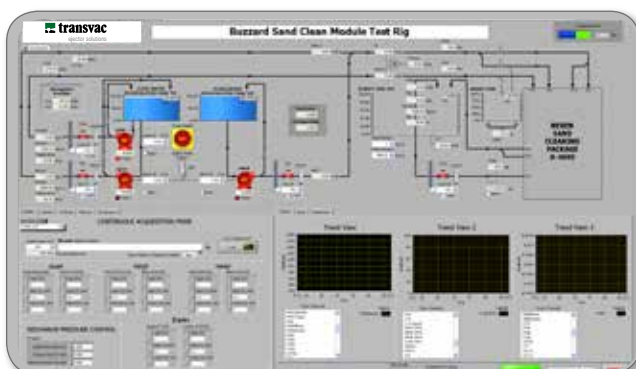
- ▶ Optimisation of new equipment and envelope testing

Gas Motivate Liquid Units

- ▶ Optimisation and stabilisation studies

Liquid Jet Pump Erosion Prediction Techniques

- ▶ Micro scale experimental trials
- ▶ CFD modelling and calibration
- ▶ Full scale Ejector testing
- ▶ Accelerated testing methods





Facilities

| | |
|--|--|
| 9 x Flow loops | 2 x 9 m ³ Clean water tanks |
| 9 x VSD Water Pumps | 1 x 35 m ³ slurry / water tank |
| Pump pressure up to 300 bar | 1 x 16m ³ 27.5 bar(g) pressure vessel for closed loop multi-phase testing |
| Liquid flows up to 700 m ³ /h | High Pressure inline phase separator [150 bar(g) and 100 m ³ /h] |
| Sand slurry flows up to 60 m ³ /h [up to 60% SVF] | 7 x Coriolis Meters (liquid / gas) |
| Nitrogen 100bar(g) @ 200 kg/h | Fully automatic control and data acquisition system using ASi field bus system (LabView) |
| Air 12.5 bar(g) @ 400 Nm ³ /h | Flow Assurance : Flow Accuracy 0.1 - <1.0 % FS / Pressure Accuracy 0.1% or better |



Test facilities include liquid flow lines for high (in excess of 350 bar (g)), medium & low pressure testing, as well as solids handling systems.



Research & Development Facility Slurry Flow Loops

High velocity turbulent gas liquid interface

| | |
|--|---|
| Flow meter in situ calibration | ✓ |
| LJP Performance Mapping - water / slurry [60% SVF v/v] | ✓ |
| Settling and homogeneous mixtures | ✓ |
| Once through or recycle | ✓ |
| In tank fluidisation | ✓ |
| Sand Management Module Testing | ✓ |

Research & Development Facility - Clean Flow Loops

High velocity liquid solid interface/mixture

| | |
|---|---|
| Flow meter in situ calibration | ✓ |
| Ejector Performance Mapping | ✓ |
| Ejector Motive Nozzle Mapping | ✓ |
| Ejector Performance & Nozzle Mapping with gas | ✓ |
| Ejector Dynamic Response Testing | ✓ |
| Ejector / System Noise Survey | ✓ |

Micro Bubble Development

Key principle of separating oil and water.

Transvac R&D is developing Ejector technology aimed at producing micro bubbles dispersed in liquid for the primary purpose of removing oil from water by floatation.

With its new micro bubble measurement rig, Transvac has the capabilities for classifying and optimizing the current Ejector technology according to the exact bubble sizes produced, dependent on process conditions.

A new product is also in development, with high shear, low energy technology to achieve uniform bubble dimensions with an increased control of bubble size. This specific Ejector technology is known as 'IGI' – Inline Gas Injection.

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

- Gary Short, Design & Innovation Director





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 Annexe III Pressure Equipment Directive (PED) and our products are CE marked where appropriate. We are also 1st Point Assessment (FPAL) and Achilles registered.

All products are custom designed to suit the process and mechanical requirements of each application to ensure maximum operating efficiency.

Transvac offers standard and exotic materials of construction including Hastelloy, Duplex, Super Duplex, Titanium etc.





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