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TÜV SÜD · National Engineering Laboratory

Independently validated for subsea density & viscosity measurement

A UK government–funded evaluation selected the Rheonics DVP as the most suitable in-situ density and viscosity sensor for subsea conditions and classified Rheonics “subsea-ready”.

Agenda

1. Importancy
2. Competition
3. Why rheonics was chosen
4. How Rheonics compared
5. Validation
6. Rheonics products
7. Benefits

Why this evaluation carries weight

This was not a vendor demonstration. It was an independent, publicly funded assessment by the holder of the UK National Standards for flow and density measurement.

UK National Standards

Holder of the UK National Standards for flow, density and multiphase flow measurement.

UKAS · ISO 17025

Facilities traceable to primary national standards and UKAS-accredited to ISO/IEC 17025.

Government-funded

Commissioned by the UK Department for Business, Energy & Industrial Strategy (BEIS).

Independent - 50+ years

Five decades of flow-measurement work serving the world's leading oil & gas operators.

Recognized industry-wide:

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Two technologies were “subsea-ready” — Rheonics was the one selected

1

Market reviewed
Every commercially available in-situ density / viscosity sensor was surveyed and screened for subsea capability.

→

2

Market reviewed
Every commercially available in-situ density / viscosity sensor was surveyed and screened for subsea capability.

→

3

Market reviewed
Every commercially available in-situ density / viscosity sensor was surveyed and screened for subsea capability.

The competing subsea-ready system was eliminated for needing a bypass loop and specialist equipment that risks unrepresentative fluid; most other sensors were not subsea-capable at all.

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Why Rheonics was chosen

1. Direct insertion — no bypass

Measures the real process stream through a standard threaded boss. The other subsea-ready system needed a bypass loop that risks unrepresentative fluid.

2. True high-pressure envelope

Rated to 1,500 bar at the probe and to 2,100 bar in the DVM flow-through cell — far beyond the 20–40 bar ceiling of most alternatives.

3. Real process velocities

Validated to 7 m/s liquid in small-bore and 4 m/s in 4-inch pipe — where several alternatives are limited to low velocity only.

4. Tighter accuracy

Density ±1 kg/m³ and viscosity ±5% (±0.1 cP below 1 cP) — finer than the other subsea-ready system's ±12 kg/m³ and ±10–12%.

How Rheonics compared

Criterion	Rheonics	Other subsea-ready candidate	Typical alternatives
Pressure rating	to 1,500 bar; 2,100 bar flow-through	to ~1720 bar	only 20–40 bar
Installation	Direct insertion, no bypass	Bypass + specialist equipment	Bypass required
Density accuracy	±1 kg/m³	±12 kg/m³	n/a (low pressure)
Viscosity accuracy	±5% (±0.1 cP < 1 cP)	±10–12%	varies
NEL verdict	Selected — most suitable	Eliminated	Not subsea-capable

Validated against national standard reference meters

< 2.5%

density error vs the national-standard reference on all but one liquid-only point

−0.06% ± 2.1%

mean density error, to a 95% confidence level

Within rig uncertainty

the ~0.6% average difference from reference meters was within the facility's own measurement uncertainty

An honest note on scope

Like every sensor in the study, Rheonics is a single-phase instrument density and viscosity are validated in liquid and low gas-volume-fraction flow. High-GVF multiphase remains an industry-wide challenge, addressed by suitable mounting and pairing with phase detection. That transparency is part of what makes the independent result credible.

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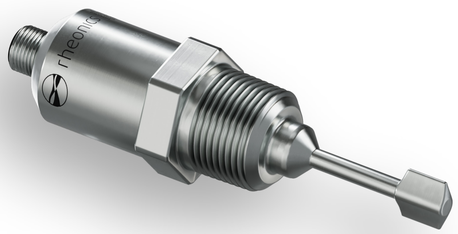
The Rheonics family

Both SRD and DVP were validated by NEL; DVM extends the same technology to reservoir-conditions flow-through (not part of the study).



SRD

Modular liquid density & viscosity — fits virtually any installation

DVP

Gas, LNG & lower-density / viscosity fluids — NEL's selected sensor

DVM

Reservoir-conditions flow-through for PVT / EOR (not in this study)

Specification	SRD	DVP	DVM — not in study
Best for	Inline liquids	Gas/LNG & low-density; HP liquids	Reservoir PVT/EOR (flow-through)
Density	0–4.0 g/cc	0–1.5 g/cc (incl. gas)	0–1.5 g/cc
Viscosity	1–3,000 cP	0.2–300 cP	0.2–300 cP
Pressure	to 1,500 bar	to 1,000 bar	to 2,100 bar
Wetted material	316L SS (C22 option)	Titanium Gr5	Titanium Gr5

What this means for your operation

Real-time density & viscosity at subsea, HPHT and high-pressure conditions

MPFM verification & diagnostics between costly recalibrations

Live density and viscosity for mass-flow and Reynolds-number corrections

Less reliance on sampling a direct, low-maintenance single-probe install

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Questions?

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