



Titan Enterprises Ltd.

Coldharbour Business Park

Sherborne, Dorset DT9 4JW

Tel: 01935 812790

Fax: 01935 812890

Email: sales@flowmeters.co.uk

www.flowmeters.co.uk

www.atratoflowmeters.co.uk

VAT No. GB 365 9701 23

Under Pressure – When Flow Measurement Accuracy Matters

Titan Enterprises' [high-pressure Oval Gear](#) liquid flow meters address the need for precise flow measurement across extreme operating conditions and harsh industrial environments, such as those seen in hydraulic system applications and the oil and gas industry.

Measuring the flow of fluid under high pressure, such as in hydraulic fluid monitoring, chemical additive injection and other challenging fluid power systems, ensures optimum operational performance as well as minimising wastage.

Hydraulic systems perform significant work in a broad range of industrial applications, such as:

- Aerospace: in deploying and retracting landing gear on planes, flight control actuators, etc.
- Mining, Construction, Agriculture: in lifting heavy loads with earth-moving equipment or processing materials with [rock-crushing machinery](#).
- Oil and Gas industry: in drilling wells in oil fields or [chemical additive injection](#) to improve oil recovery.
- Marine: in pushing and steering the ship through water using propellers and thrusters powered by hydraulic systems.
- Automotive: in [Formula One cars](#) incorporating sophisticated hydraulic systems to handle multiple applications, such as power-assisted braking, clutch, gearbox, and throttle actuation.



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The **oil and gas sector** also drives a significant portion of the flow meter market, with conventional flowmeters, such as positive displacement ([oval gear](#)) devices, still having the advantage of being proven across a large installed base. These flow meters are crucial for applications like high-pressure additive injection and custody transfer, where accuracy and chemical resistance are vital.

Pressure Testing – ensuring operational readiness

Pressure is a key factor when selecting hydraulic components and pressure testing each component within a hydraulic system helps to verify its structural integrity and fitness for purpose. A device's pressure rating indicates its maximum operating pressure.

Conducted during the manufacturing process, pressure testing helps identify defects (such as leaks) early, preventing potential failures and reducing costly downtime caused by faulty components. Additionally, it also ensures that the hydraulic system meets safety standards set by regulatory bodies, safeguarding compliance. By confirming that both components and the entire system can endure and function effectively under the required operating pressure, pressure testing plays a crucial role in validating the system's overall performance and reliability.

Custody Transfer

When a fluid (or gas) is transferred from one party to another, as in custody transfer, accurate and repeatable flowmeters are critical components in a complete metering system. Metering accuracy is vital as even small measurement errors in custody transfer can be very costly.

Positive displacement flowmeters, such as [Titan's Oval Gear devices](#), are designed to accurately measure high-value products such as refined fuels and



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Titan's Onsite Pressure Test Facility

Due to the demand for their high-pressure oval gear flowmeters, Titan made a capital investment into an in-house pressure test rig. This not only enables rapid turnaround of both new and refurbished flowmeters, but from an R&D perspective, allows Titan to pressure test new materials in development.

The Hydratron pressure test rig is capable of testing to a pressure of 1400 bar allowing for testing over the whole range of [Titan's oval gear flowmeters](#), including the 950 bar high-pressure options. The rig has also proved invaluable when testing new products and simulating the effects of cavitation within a hydraulic system. Alongside a refinement of gear design and standardising the flowmeter designs to improve product interchangeability, [Titan's pressure test rig](#) has proven the design modifications, allowing a potential increase to the maximum operating pressure of its standard oval gear flowmeter range by around 50%.

Key features and benefits of Titans' Oval Gear flowmeters

1. High Accuracy and Chemical Resistance

The Oval Gear flow meters improve in measurement accuracy as liquid viscosity increases, from about 1% to around 0.1% of reading at higher viscosities. They are designed to handle a broad range of physical and chemical properties, essential for petrochemical additive injections which vary in viscosity and density.



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2. Robust Construction

Compact and rugged design ensuring long-term performance with minimal maintenance. Models offer pressure ratings from 10 bar to 950 bar and can operate at temperatures up to 150°C. Intrinsically safe options for potentially explosive atmospheres, such as ATEX compliant models, are available.

3. Reliable Performance

Proprietary oval gear design providing high performance and 0.1% repeatability. Suitable for high-pressure applications such as marine fuel flow measurement, grease supply monitoring in wind turbines, offshore oil drilling additive injection, and biodiesel production.

4. Custom Solutions

Titan Enterprises collaborates with [OEM customers](#) to develop bespoke flow meters that meet specific high-pressure, [high viscosity](#) and chemical compatibility requirements, enhancing their application in various industries including oil, petrochemical, and green energy sectors.

By ensuring reliable and accurate flow measurement, Titan's Oval Gear flow meters contribute significantly to the efficiency and safety of oil and gas processes, from additive injection to fuel measurement; and hydraulic systems in diverse and demanding environments.

To discuss a bespoke flow measurement solution for your [unique OEM application](#), contact Titan Enterprises on +44 (0)1935 812790 or sales@flowmeters.co.uk



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Drawing upon over 40-years of flowmeter innovation - Titan Enterprises Ltd is a leading manufacturer of high-performance flow measurement solutions, including the Atrato® & Metraflow® ultrasonic flowmeters, Oval Gear flowmeters, low flow Turbine flow meters and a flow instrument range. Titan's company philosophy of "pushing the envelope by trying to do things a little different and better" has resulted in sales of over 2 million flowmeters and components into 50 countries worldwide and a repeat purchase percentage of 95%. All flowmeters produced by Titan Enterprises are designed and manufactured to ISO 9001 and calibrated to an uncertainty of $\pm 0.25\%$.

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For more information please contact:

Media: Mrs Samantha Hannay, Marketing Manager, Titan Enterprises
+44 (0)1935 812790 / marketing@flowmeters.co.uk

Illustrative image

