



National Engineering  
Laboratory

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## Oil Flow Measurement Test Facility

### Introduction

TÜV SÜD National Engineering Laboratory's Oil Flow Measurement Facility is a modern purpose-built flow meter calibration and evaluation laboratory. The facility has four separate flow lines, covering a wide range of flow rates with a selection of different oils. Combining these oils with TÜV SÜD National Engineering Laboratory's unique temperature control system allows independent variation in the test temperature and viscosity. The test sections can be constructed to offer long straight lengths upstream and downstream or, if necessary, specific configurations designed to replicate actual installations.

### Oil Flow Measurement Standard

TÜV SÜD National Engineering Laboratory operates the UK primary oil flow measurement standard. The facility is operated by multi-skilled teams supported by technical experts and TÜV SÜD National Engineering Laboratory is a UKAS accredited calibration laboratory (No. 0009). The oil facility is accredited to ISO/IEC 17025:2017.

### Test Measurements

- Temperature, pressure,  $\Delta p$
- High speed  $\Delta p$ /pressure
- Velocity profiling Pitot traverse system
- Density measurement
- Viscosity measurement
- Meter diagnostic parameters
- Oil flow meter performance evaluation
- Evaluation of temperature / viscosity effects
- Installation effects testing

### Testing Service

- Oil flow meter development testing
- Flow conditioner compliance testing
- Evaluation of  $\Delta p$  through meter / components
- Flow control valve characterisation
- Valve Cv evaluation
- UKAS accredited calibration laboratory (No 0009)

### MeterVue

MeterVue forms the foundation of TÜV SÜD National Engineering Laboratory's comprehensive Meter Calibration Management Services. From a secure repository for calibration data and certificates to the remote witnessing of calibrations as they take place, MeterVue is changing the face of calibration through the use of the internet.

## Oil Flow Test Measurement Facility Specification

Fluids / Flow Rates	Density Range (50-15 °C) kg/m <sup>3</sup>	Viscosity Range (cSt)
Kerosene	777 - 803	1.53 to 3.04
Gas Oil	809 - 833	4.2 - 10.7
Velocite	830 - 852	11 - 39
Siptech	850 - 873	35 - 205
Aztec	8853 - 876	39 - 236
Operation Conditions		
Flow rates	0.002 l/m to 5 l/m (Very Low Flow Facility)	
Flow rates	0.08 to 200 l/s (approx 43 bbl/day to 108,687 bbl/day)	
Line Pressure	0 to 5 bar (72 psi)	
Line temperature	15°C to 50°C (controlled to <1°C)	
Line A	Typically 3-inch to 8-inch + (Main Line) Typically 0.5-inch to 3-inch (Low Flow)	
Horizontal line length	20.88 m (Main Line) 9.54 m (Low Flow)	
Vertical line length	1.33 m floor to centre pipe 1.26 m floor to centre pipe	
Line B	Typically 3-inch to 8-inch + (Main Line) 19.28 m (Main Line) 1.27 m floor to centre pipe Typically 0.5-inch to 3-inch (Low Flow) 9.75 m (Low Flow) 1.27 m floor to centre pipe	
Reference Instrumentation		
Primary gravimetric standard Viscosities < 30 cSt	1.5t, 600kg, 150kg weigh- tanks	0.03%
Primary gravimetric standard Viscosities > 30 cSt	1.5t, 600kg, 150kg weigh- tanks	0.05% (mass) 0.25% (volume)
Secondary standard Viscosities < 30 cSt	1-2.5" PD meter 2 - off 8" PD meters	0.08%
Secondary standard Viscosities > 30 cSt	1-2.5" PD meter 2 - off 8" PD meters	0.25%

### Why Choose TÜV SÜD National Engineering Laboratory?

TÜV SÜD National Engineering Laboratory is a world class provider of technical consulting, research, measurement, and testing services to clients across many industries including oil & gas, water, power & energy, and government.

TÜV SÜD National Engineering Laboratory is the UK's National Measurement Institute responsible for the management of the UK National Standard for Flow Measurement.

### Related Services

TÜV SÜD National Engineering Laboratory provide the following related services:

- Flow meter selection
- Uncertainty analysis
- Auditing
- Allocation
- CFD



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