

CERTIFICATE OF CALIBRATION



Issued by: NWML
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Issued under Section 6 of the Weights and Measures Act 1985

Date of issue: 6 January 2000

Serial Number: 02689

Client: Wragg Bros Ltd
Robert way
Wickford Business Park
Wickford
Essex
SS11 8DQ

On behalf of: Inenco d.o.o.
10000 Zagreb
V. Ruzdjaka
11 Croatia

Acceptance date: 4 January 2000

Department's No: 18160

Equipment: A 100 litres stainless steel delivery vessel (Serial No.0190)

Description: A stainless steel delivery vessel in the form of a vertical cylinder, which connects the top and bottom conical sections. The top conical section which is bolted to the cylinder has three thermometer pockets and also a displacement plunger. The top datum consisting of an overflow weir which has a diameter of 18 mm, and a transparent chamber fitted with a drain and an air vent. The bottom datum is by inlet and outlet ball valves. Welded to the side of the vessel are three stainless steel legs, which have adjustable feet.

Markings: On name plate: On main rim: 18160

100 LITRE
OUT 20 ° C
INENCO d.o.o.
SERIAL NO. 0190
DRAINAGE TIME: 1 MIN 15 SECS
MANU: WRAGG LTD
ESSEX SS11 8DQ
ENGLAND
1999
18160

Calibrated by: *C.B.R.*

Reference: STD9768

Date of Calibration: 6 January 2000

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CERTIFICATE OF CALIBRATION

Issued by: NWML
Metrology and Test Laboratory
Accreditation Number 0205

Issued under Section 6 of the Weights and Measures Act 1985

Date of issue: 6 January 2000

Serial Number: 02689

Client: Wragg Bros Ltd On behalf of: Inenco d.o.o.

Department's No: 18160


Calibration Method: The vessel was levelled by using the spirit levels on the vessel and then primed. Five consecutive quantities of water were delivered into a container allowing 1 minute 15 seconds drainage between opening and closing the delivery valve. The quantities were determined gravimetrically using the Departments mass standards, which have traceability to the national primary standard of mass via the National Physical Laboratory. The results were corrected to 10°C, 15°C and 20°C, the standard deviation of the results was calculated and the value was multiplied by the percentage point of the Student t distribution, for the 95% confidence interval and (n-1) degrees of freedom, the result is shown below under "st". The temperature of the vessel during the tests was within the range 8.75°C to 9.01°C and a cubical coefficient of expansion of 0.0000477/°C was used to make corrections to standard temperature.

Sealing: The following components have been sealed with wire and lead seals stamped with portcullis and year.

- (i) The top datum weir flange
- (ii) The top cone flange
- (iii) The inlet valve
- (iv) The delivery valve
- (v) The displacement plunger

Results:	Mean Volume Delivered	"st"	Estimated Uncertainty of Measurement
Litres at 10°C	99.978 litres	3.6 ml	± 10 ml
Litres at 15°C	100.002 litres	3.6 ml	± 10 ml
Litres at 20°C	100.026 litres	3.6 ml	± 10 ml

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

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