

CERTIFICATE OF CALIBRATION

ISSUED BY H & D FITZGERALD LTD.

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CERTIFICATE NUMBER **10123**



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Approved signatory

H. Fitzgerald

I. Edge

Description	Dodecane	Batch	10123
Supplier	H&D	Grade	99+% purity
Date calibrated	22 - 29 March 2018	Liquid expiry date	30 March 2022

The density of this liquid was determined by hydrostatic weighing, using instruments and weights, the calibrations of which are traceable to national standards. The liquid in the ampoule formed part of the bulk liquid tested in the hydrostatic weighing cell.

A total of **25** density measurements were made at ambient pressure, and the following densities then calculated:-

10.0°C and 1.013 bar	756.141 kg/m ³ ± 0.010 kg/m ³
15.0°C and 1.013 bar	752.519 kg/m ³ ± 0.010 kg/m ³
20.0°C and 1.013 bar	748.895 kg/m ³ ± 0.010 kg/m ³
25.0°C and 1.013 bar	745.269 kg/m ³ ± 0.010 kg/m ³
30.0°C and 1.013 bar	741.638 kg/m ³ ± 0.010 kg/m ³
40.0°C and 1.013 bar	734.359 kg/m ³ ± 0.010 kg/m ³
50.0°C and 1.013 bar	727.049 kg/m ³ ± 0.010 kg/m ³

The density of this liquid can be found to ± **0.010** kg/m³ over the temperature range of **10** to **50**°C using the following equation:-

$$\text{density} = \alpha + \beta t + \gamma t^2 + \delta t^3$$

where

$$\alpha = \mathbf{763.3840}$$

$$\beta = \mathbf{-0.724577}$$

$$\gamma = \mathbf{+0.0000398}$$

$$\delta = \mathbf{-0.00000165}$$

$$t \quad \mathbf{\text{temperature in } ^\circ\text{C ITS-90}}$$

This standard is for the calibration of density measuring equipment.
See guidance notes on the use of density CRMs, and the relevant MSDS.

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

This certificate has been drawn up according to the guidelines given in ILAC-G12:2000.

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