

The parent batch for this sample was manufactured, tested, packaged and stored on our behalf in accordance with the requirements of ISO 17025 and ISO Guide 34 by Paragon Scientific Ltd. The calibration certificate issued by Paragon Scientific Ltd for this product is reproduced below.

CERTIFICATE OF CALIBRATION

ISSUED BY PARAGON SCIENTIFIC LIMITED

Date of Issue: **13-Nov-17** Certificate number: **FL2739**



0649

4589

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Approved Signatory

Name J. Morris

Signature



UKAS accredited calibration laboratory No. 0649 accredited to ISO/IEC 17025
UKAS accredited reference material producer No. 4589 accredited to ISO Guide 34

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ISO 17025 / ISO Guide 34 VISCOSITY REFERENCE STANDARD

Standard type: **RT1000** Lot No: **1170805** Expiry Date: **13-Nov-19**
Part Number: **V12Z30**

Temperature		Viscosity		Density g/mL
°C	°F	mm ² /s (cSt) Kinematic	mPa's (cP) Dynamic	
20.00	68.00	1164	1114	0.9568
25.00	77.00	1058	1007	0.9522

Paragon Scientific Ltd. certifies that the kinematic viscosity measurements have been made in accordance with ASTM D445 using Reference Viscometers certified in accordance with ASTM D446 and ASTM D2162. See also ASTM D445, D446, D2171, ISO 3104, ISO 3105, IP 71 Sections 1 and 2 and IP 222. The viscosity data reported is based on the primary standard of pure water at 20 °C (ITS-90) having a value of 1.0034 mm²/s (cSt) ± 0.17%, as adopted by NIST, ASTM, IP and ISO (ISO 3666). Temperature measurements were made using thermometers specified in ASTM D445 which have a current calibration traceable to the National Physical Laboratory (NPL), National Institute Standards and Technology (NIST) and other recognised national standards laboratories. The calibrations of this product are traceable to NIST.

Uncertainties:	Viscosity range, Kinematic mm ² /s (cSt), Dynamic mPa's (cP)	Expanded Uncertainty
	2 to 8	± 0.40 %
	8 to 80	± 0.41 %
	80 to 400	± 0.42 %
	400 to 800	± 0.43 %
	800 to 8000	± 0.44 %
	8000 to 125 000	± 0.46 %

Uncertainties stated on this certificate do not include the uncertainty for the value of the viscosity of water at 20 °C (ITS-90) having a value of 1.0034 mm²/s (cSt) ± 0.17%.

Density Uncertainties: Expanded Uncertainty ± 0.01 %

The reported expanded uncertainty is based on a combined standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

The evaluation has been carried out in accordance with UKAS requirements.

Notes:

The shelf life of this product is guaranteed until the expiry date, provided the bottle is unopened and stored at ambient temperature (15 to 30 °C). The guarantee is void if the bottle seal is broken. Filtration of product before use is not necessary. No minimum volume is required to guarantee homogeneity.

Units:

Viscosity 1 mPa's = 10⁻³ Pa's = 1 cP = 10⁻² P

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service (UKAS). It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. UKAS is one of the signatories to the Multilateral Agreement of European co-operation for Accreditation (EA) for the mutual recognition of calibration certificates issued by accredited laboratories.

