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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 17034 by Paragon Scientific Ltd. The certificate of analysis issued by Paragon Scientific Ltd for this product is reproduced below.

CERTIFICATE OF ANALYSIS

ISSUED BY PARAGON SCIENTIFIC LIMITED

Date of Issue: **28-Apr-26** Certificate No. **SA5176**

Paragon Scientific Ltd

UKAS REFERENCE MATERIALS 4589

UKAS accredited reference material producer No 4589 accredited to ISO 17034
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Approved Signatory
Name: Mr. P. Whitehurst
Technical Director
Signature:

ISO 17034 VISCOSITY AND DENSITY CERTIFIED REFERENCE MATERIAL

Product Code: **D500** Batch Number: **1252502049** Expiry Date: **27-Apr-29**

Temperature		Viscosity				Density
(°C)	(°F)	Kinematic mm^2/s (cSt)	Dynamic mPa·s (cP)	SUS	SFS	(g/mL)
20.00	68.00	827.9	719.1			0.8686
25.00	77.00	576.4	498.9			0.8655
37.78	100.00	253.4	217.4			0.8579
40.00	104.00	222.8	190.8			0.8565
50.00	122.00	130.2	110.7			0.8506
60.00	140.00	81.26	68.64			0.8447
80.00	176.00	37.17	30.96			0.8328
98.89	210.00	20.71	17.02			0.8216
100.00	212.00	20.09	16.49			0.8210

Paragon Scientific Ltd. certifies that the kinematic viscosity measurements have been made in accordance with ASTM D2162 using long capillary Master Viscometers at all temperatures. 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 mm^2/s (cSt) ± 0.17%, as adopted by NIST, ASTM, IP and ISO (ISO 3666). Density measurements were made in accordance with ASTM D1480. Viscosity and density measurements were made by a single laboratory with ISO 17025 accreditation for the relevant test method. Temperature measurements were made using thermometers specified in ASTM D2162 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 measured temperature is based on the International Temperature Scale of 1990 (ITS 90). SUS and SFS values have been calculated in accordance with ASTM D2161 where stated.

Uncertainties:

Expanded Uncertainty

Viscosity Range	Kinematic Viscosity	Dynamic Viscosity
0.3 to 3	0.08%	0.08%
3 to 7.4	0.08%	0.08%
7.4 to 10	0.10%	0.10%
10 to 30	0.13%	0.13%
30 to 72	0.15%	0.15%
72 to 180	0.17%	0.17%
180 to 520	0.19%	0.19%
520 to 1000	0.21%	0.21%
1000 to 2700	0.23%	0.23%
2700 to 8000	0.25%	0.25%
8000 to 13000	0.27%	0.27%
13000 to 65000	0.29%	0.29%
65000 to 174000	0.30%	0.30%

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 mm^2/s (cSt) ± 0.17%.

Density Uncertainty: Expanded Uncertainty: 0.012 %

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k = 2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

This CRM is intended for the calibration and/or validation of equipment used for the measurement of viscosity and density. The shelf life of this product is guaranteed until the expiry date, provided the bottle is unopened and stored at 5 °C to 30 °C. The guarantee is void if the bottle seal is broken. Filtration of product before use is not necessary. This products homogeneity is guaranteed to be fit for purpose when used with a sample size appropriate for the intended measurement method. Do not return unused product to the bottle. Follow best laboratory practise when using this product. Always keep container sealed when not in use. Follow good hygiene practice.

Units: Kinematic Viscosity: $1\ cSt = 10^{-2}\ St = 10^{-6} m^2/s = 1\ mm^2/s$

Dynamic Viscosity: $1\ mPa{\cdot}s = 10^{-3}\ Pa{\cdot}s = 1\ cP = 10^{-2}\ P$

Dynamic Viscosity = Kinematic Viscosity x Density (at the same temperature)

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service (UKAS). It provides traceability of measurement to recognised national standards, and to units of measurement realised at the National Physical Laboratory (NPL) or other recognised national standards laboratories. 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.