

The parent batch for this sample was manufactured, tested, packaged and stored on our behalf by Paragon Scientific Ltd. The certificate of analysis issued by Paragon Scientific Ltd for this product is reproduced below.



CERTIFICATE OF ANALYSIS

ISO 17034 COLOUR CERTIFIED REFERENCE MATERIAL

Gardner 8

Product Code: **GARD08** Batch Number: **8231101027** Certificate No: **SA4704**
 Issue Date: **18-Feb-2025** Expiry Date: **18-Feb-2027**

Certified Values:

Chromaticity	Value	Uncertainty
x	0.4234	0.0006
y	0.4568	0.0005
Y	73.09	0.4

GARDNER COLOUR 8.4

Expanded Uncertainty: 0.1

Room temperature: 20.0 °C ± 1 °C

Intended Use:

This product is intended for the calibration and/or verification of equipment used for the measurement of colour of liquid samples. This product may also be used for visual based methodology.

Certification:

An Agilent Cary 4000 spectrophotometer was used to measure the spectral transmittance of the liquid batch samples from 360 nm to 830 nm at 1 nm intervals. The measurement beam area was a vertical patch, 1 mm wide and 6 mm high centrally positioned through the liquid which was contained in a 10 mm quartz glass cell. The spectral bandwidth was set at 2 nm. The CIE chromaticity coordinates were calculated in accordance with ASTM E308 for 2° Observer and Illuminant C. Measurements were made by a single laboratory with ISO 17025 accreditation for the test method. The colour values of this liquid colour reference standard fall within the ASTM D1544/D6166 specification range.

Uncertainties:

Uncertainties of the certified values have been determined in accordance with the "Guide to the Expression of Uncertainty in Measurement" (GUM). All uncertainties are reported as expanded uncertainties derived as the combined standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Metrological Traceability:

The accuracy of the instrument is checked periodically using standards calibrated at the National Physical Laboratory. The reference beam was a clear air path. The instrument baseline was carried out with a clear air path in both the reference and sample beam.

Homogeneity & Stability:

This product has been produced according to in-house procedures consistent with ISO 17025 and ISO 17034, and its homogeneity is guaranteed to be fit for purpose when used with a sample size appropriate for the intended measurement method.



Storage & Instructions for handling and use:

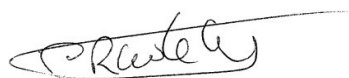
The shelf life of this product is guaranteed until the expiry date, provided the bottle is unopened and stored upright between 18 °C to 28 °C. The guarantee is void if the bottle seal is broken. Always keep container sealed when not in use. Follow good hygiene practice. Mix well before use by inversion or gentle shaking. Store in the dark. Use immediately after decanting. Do not return samples to the bottle after use.

Health & Safety:

Please refer to the Safety Data Sheet (SDS) supplied for this product. If you require a copy of the original SDS issued with this product, email sds-request@lgcstandards.com quoting product code, batch number and expiry date, which can be found on this certificate. It is the responsibility of the user of this material to establish health & safety practices to determine applicability of regulatory limitations prior to use.

Legal Notice:

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Approved Signatory, Mr. P. Whitehurst, Technical Director

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 (NPL) 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.