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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 calibration certificate issued by Paragon Scientific Ltd for this product is reproduced below.

Paragon Scientific Ltd

ilac-MRA UKAS REFERENCE MATERIALS 4589

# CERTIFICATE OF CALIBRATION
# ISO 17025 / ISO 17034 SULFUR CERTIFIED REFERENCE MATERIAL

| | | | | | |
|---|---|---|---|---|---|
| Product Code: | **GOSU-02** | Lot Number: | **1200411017** | Certificate No: | **SA3899** |
| Issue Date: | **08-Jan-2025** | Expiry Date: | **08-Jan-2027** | | |
| Matrix: | **Synthetic Diesel** | Certified Value: | **10ppm / 0.0010 % (w/w) Sulfur** | | |

## Intended Use:

This Certified Reference Material (CRM) is for the purposes of calibration, verification or for use in quality control procedures used for analysing Sulfur content in petroleum products, either by X-ray fluorescence spectrometry (XRF) or other methodologies used in the analysis of Sulfur.

## Uncertainties:

Uncertainties for the calibration of this Standard are: Expanded Uncertainty: **± 1 %** (Relative)

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%.

## Uncertified Values:

Density: 0.7979 g/mL @ 20 °C

The density was measured using a digital densitometer according to ASTM D4052.

## Certification:

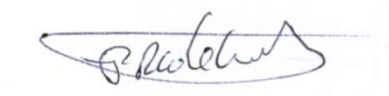
This Standard was prepared from Di-n-butyl Sulfide and Synthetic Diesel, of known purity, by gravimetric methods. The balances used in this process are calibrated on a regular basis with the calibration being traceable to National Institute Standards and Technology (NIST) and other recognised national standards laboratories. In order to confirm the certified value of this CRM a secondary verification was carried out using XRF. This certificate provides traceability of measurement to recognised national standards, and to units of measurement recognised at National Institute Standards and Technology (NIST) and other recognised national standards laboratories.

## Instructions:

Prior to using this CRM it is recommended that the container be mixed, either by shaking or swirling. Ensure that when transferring to further glassware that this glassware is clean and suitable. If dilutions are performed then these dilutions must be performed using calibrated balances when done gravimetrically, or Class A glassware is used if the dilution is done volumetrically. Any dilution must be done using the same matrix as the CRM. In order to prevent contamination of the CRM any pipetting should not be done directly from the CRM's original container and any excess sample should not be returned to the original container.

## Homogeneity and Stability:

The shelf life of this product is guaranteed until the expiry date, provided the bottle is unopened and stored between 5 °C to 30 °C. The guarantee is void if the bottle seal is broken. Always keep container sealed when not in use. This product has been produced according to in-house procedures and its homogeneity is guaranteed to be fit for purpose when used with a sample size appropriate for the intended measurement method.



**Approved Signatory, Mr. P. Whitehurst, Technical Director**



**UKAS ACCREDITED CALIBRATION LABORATORY NO. 0649 ACCREDITED TO ISO/IEC 17025**
**UKAS ACCREDITED REFERENCE MATERIAL PRODUCER NO. 4589 ACCREDITED TO ISO 17034**
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