Reference Material Certificate

ISSUED BY **STANHOPE-SETA Richardson Laboratory**

PRODUCTION DATE **15/10/2024** CERTIFICATE NUMBER **N/A**

Certificate Issued By:

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Approved By: Duncan Black

Signature:

Name of material: AvCount Verification Material

Product code: SA1006-0 Batch number: 2410006002

Description of CRM: Certified reference material (CRM) consisting of a polydisperse suspension of irregular shaped particles in a white mineral oil.

Method of Certification: This material is a secondary working standard with a particle distribution traceable to NIST SRM 2806a & 2806d and is manufactured in accordance with ISO 11171:2022 - Annex F.

Hazards: Refer to SDS 'SA1006-0 AVCOUNT VERIFICATION MATERIAL' prior to handling.

Certified Values:

Calibration		2806a report µm(c)			2806d report µm(c)		
Particle Diameter (µm)		≥ 4	≥ 6	≥ 14	≥ 4	≥ 6	≥ 14
Particles / mL (IP 565 or IP 630 Procedure A)		6864	2784	196	5675	2454	181
Expanded Uncertainty (%)*		1.7	1.3	1.9	1.6	1.3	2.0
Coverage Factor at a 95 % confidence level (k)		2.101	2	2	2.093	2	2
IP 565	Upper Limit [F]	7490	3247	273	6217	2870	253
	Lower Limit [F]	6239	2321	120	5134	2038	110
	Test Uncertainty Ratio (TUR)	6	14	22	7	14	21
IP 630	Upper Limit [F]	8601	3982	278	7128	3510	257
	Lower Limit [F]	5126	1586	115	4221	1398	106
	Test Uncertainty Ratio (TUR)	16	33	23	17	34	22
ASTM D7619	Upper Limit [F]	7967	3296	278	6613	2914	256
	Lower Limit [F]	5762	2272	115	4737	1994	106
	Test Uncertainty Ratio (TUR)	11	15	23	12	15	22

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Instructions for handling and preparation of the CRM:	**1.** CRM must be in the original tightly closed bottle between 17-23 °C for 48 hours prior to use. **2.** The CRM must be conditioned prior to test as detailed below and in accordance with the method of test. **a.** Vigorously shake by hand for 60 seconds. **b.** Ultrasonically disperse contents of bottle for 60 seconds using an ultrasonic bath with a power rating of 3 kW/m^2 . **c.** Mechanically tumble the CRM end over end for 1 min at a rate of one complete turn a second. **d.** Ultrasonically degas the contents of the bottle for 20 seconds using an ultrasonic bath with a power rating of 3 kW/m^2. **3.** Use immediately after preparation. **4.** Using the CRM in a dusty atmosphere can increase particle counts. **5.** Once the container is opened it shall be used immediately and only once. Do not return removed aliquots to the bottle.
Verification Procedure:	**1.** Follow the instructions in the method of test and the AvCount manual. **2.** The particle count for each size band should be between the upper and lower limits shown on this certificate.
Intended use:	Certified reference material to be used for verification of automatic particle counters (APC). It is to be used in accordance with ISO 11171, IP 565, IP 630 and ASTM D7619.
Commutability:	Value is only commutable to the test methods stated in the intended use section.
Level of homogeneity:	Homogeneity samples are selected by systematic sampling in accordance to ISO 11171:2022. It has been demonstrated that this CRM batch is homogenous from inter-bottle testing. Stability is guaranteed during the total shelf life provided its storage conforms to the following statements.
Expiry date:	Certificate is valid for 2 years from date of production. The certification is nullified if the material is damaged, contaminated, otherwise modified, or used in a manner for which it was not intended. If the material is being stored it must be between 15-25 °C and away from direct sunlight.

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

[Þ] The upper and lower limits have been calculated in accordance with the relevant test method based on Reproducibility/√2 + uncertainty.