



CERTIFICATE OF ANALYSIS

VHG Quality Product

Particle Count Calibration Fluid RM

Product #: VHG-PCMTD-CAL-500

Matrix: Hydraulic Fluid

NIST SRM: 2806b

Lot #: 1014808

Intended Use: This solution is intended for use as a reference material (RM) for the determination of particles in lubricating and hydraulic fluid as a verification standard. This solution contains ISO Medium Test Dust (MTD) sourced directly from NIST RM 8631a and shall be used with Automatic Particle Counters (APC) calibrated to ISO 11171 to NIST SRM 2806b.

Reference values: Determined from an APC instrument calibrated to ISO 11171:2016 (E) using NIST SRM 2806b designated as $\mu\text{m}(b)$			
Particle Diameter [$\mu\text{m}(b)$]	Particle Count (# particles /mL)	Acceptable User Variance Max	Acceptable User Variance Min
>4	9584	12000	8000
>5	5733	7000	5000
>6	4016	5000	3000
>7	2692	3400	2000
>8	1951	2500	1400
>9	1416	1800	1000
>10	1055	1350	750
>11	780	1000	575
>12	584	750	450
>13	458	600	300
>14	356	450	275
>15	284	360	80
>16	233	300	40
>17	196	260	35
>18	165	220	25
>19	139	200	20
>20	118	180	15
>21	103	160	12
>22	92	140	10
>23	80	120	9
>24	69	100	7
>25	58	90	6
>26	51	85	5
>27	41	80	4
>28	36	75	4
>29	30	65	3
>30	25	50	3

Reference values: Results from an APC instrument calibrated to ISO 11171:2016 (E) using NIST SRM 2806b and the resultant $\mu\text{m}(b)$ results mathematically converted as per Section 6.8 Formula 4			
Particle Diameter [$\mu\text{m}(c)$]	Particle Count (# particles /mL)	Acceptable User Variance Max	Acceptable User Variance Min
>4	7752	10000	6000
>5	4489	6000	3500
>6	2995	4000	2000
>7	2024	3000	1000
>8	1438	1800	1000
>9	1026	1350	750
>10	745	1000	575
>11	543	750	450
>12	409	600	300
>13	317	450	250
>14	249	350	125
>15	205	360	80
>16	167	300	40
>17	141	260	35
>18	121	220	25
>19	100	200	20
>20	85	180	15
>21	74	160	12
>22	63	140	10
>23	53	120	9
>24	45	100	7
>25	36	90	6
>26	30	85	5
>27	41	80	4
>28	36	75	4
>29	30	65	3
>30	25	50	3





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Certification & Traceability: VHG RMs are manufactured, processed, and/or certified under a quality management system that is registered/accredited to **ISO 9001**, **ISO 17034**, and **ISO/IEC 17025**. This RM was prepared to the indicated concentrations shown above according to ISO 11171:2010 (E) Annex F by gravimetric methods using NIST RM 8631a ISO Medium Test Dust (MTD) in hydraulic fluid. The balances used in the preparation of VHG RMs are calibrated regularly with traceability to NIST, using a calibration provider that is accredited to ISO/IEC 17025 by a mutually recognized accreditation body. The indicated concentrations were determined by VHG based upon gravimetric procedures. Secondary verification of the certified concentrations was performed by VHG per ISO 11500 using automatic particle counters that are calibrated to **ISO 11171** with **NIST SRM 2806b**.

Acceptable User Variance: The acceptable user variance represents typical variation in results when the Instructions for Use are followed.

Instructions for Use: Before use, the analyst shall follow these steps:

1. Vigorously shake (either by hand or commercial/laboratory paint shaker) the closed bottle for at least 1 minute.
2. Disperse the contents of the bottle by sonicating in an ultrasonic bath (minimum intensity 5 W/cm²) for at least 1 minute.
3. Mechanically shake the closed bottle by commercial or laboratory paint shaker for at least 3 minutes.
4. Degas the bottle either by:
 - a. Placing in an ultrasonic bath for ~30 seconds.
 - b. Placing in a vacuum chamber until the air bubbles rise to the surface.
5. Remove bottle from degassing equipment above and gently turn the sample bottle over at least five (5) times taking care not to introduce air bubbles.
6. Immediately, without delay, proceed to analytical testing.

If subsampling, combining, or diluting of RM is required, detailed procedures for sample preparation may be found in ISO 11500, ISO 11171, ASTM D7647, and/or ASTM D7596. Please note, if a volume is removed without proper agitation, the remaining solution will no longer perform according to specification. To achieve the highest accuracy, the analyst should: (1) use only pre-cleaned containers and transferware, (2) not pipette directly from the RM's original container, and (3) never pour used product back into the original container. The solution should be kept tightly capped and stored under normal laboratory conditions. Do not freeze, heat, or immerse the bottle or its contents, and avoid exposure to direct sunlight. Minimize exposure to moisture or high humidity.

Period of Validity: LGC ensures the accuracy of this solution for **24 months** from the certification date shown below, provided the instructions for use are followed. During the period of validity, the purchaser will be notified if this product is recalled due to any significant changes in the stability of the solution.

Chuck Goudreau, Certifying Officer

See Exp. Date on Container
Certification Date

LGC waives all responsibility for any damages resulting from the usage and/or implementation of the products/data described herein.

