

March 11, 2026

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And

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Subject	<i>Commercial Laboratory Services</i> – 4792117568 CLS Testing of 1 Process for Metals and VOCs per NFPA 1850-2026
Project	4792117568
Test Methods	Chapter 13 – Cleaning Decontamination Cleaning Efficacy from NFPA 1850, Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural and Proximity Firefighting and Open-Circuit Self-Contained Breathing Apparatus (SCBA), Edition 2026, Issue Date 09/09/2026

Dear Justin Christensen and Chris Robbins,

Per your request, project 4792117568 was opened to conduct the below test protocol:

Product	Test Method
Cleaning Process as defined below	Chapter 13, Chemical Decontamination Cleaning Efficacy

Preconditioning of 10 launderings was conducted on the Gemini Outer Shell Fabric per parameters as listed in NFPA 1850 Chapter 11 and 13. The ballast pieces and testing program are outlined in Chapter 13 of NFPA 1850.

Testing was conducted using Tersus LCO2 followed by conventional wash with a Circul-Air Continental Gerbau CACGSHD-6 Pro, extractor filled to 50% capacity by dry weight (including surrogates). The water temperature was approximately **120°F**.

Test Steps:	Test Process
(1) LCO2 Cleaning	Cleaning using Tersus LCO2
(2) Water Extractor	12 oz of CLEAN by Circul-Air Corp and 12 oz of CitroSqueeze

A copy of the test data has been included at the end of this report.

UL LLC did not select the samples, determine whether the samples were representative of production samples, witness the production of the test samples, or were we provided with information relative to the formulation or identification of component materials used in the test samples. The test results apply only to the actual samples tested.

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This letter will serve to report that all tests on the subject product have been completed.

Thank you for the opportunity to provide your company with these services. Please do not hesitate to contact us if you should have any questions or comments.

Best Regards,

A handwritten signature in black ink that reads 'Karla S. Litaker'.

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CHEMICAL DECONTAMINATION EFFICACY TEST – SEMIVOLATILE ORGANIC COMPOUNDS

NFPA 1850-2026, SECTION 10.4

Facility Name	Tersus followed by Circular
Cleaning Process	CO2 cleaning followed by wash
THE PROCESS COMPLIES WITH THE REQUIREMENTS OF THE STANDARD [YES/NO]	

Specimen ID	Phenol	2-Nitro phenol	2, 4, 6-Trichlorophenol	Acenaphthene	Diethyl phthalate	Fluorene	Phenanthrene	Anthracene	Pyrene	Di-n-octyl phthalate
Concentration (ppm)										
Travel control-blank	0.50	0.01	0.00	0.26	0.55	0.23	0.47	0.19	0.34	0.95
Coat control-blank	0.66	0.01	0.00	0.27	0.54	0.24	0.49	0.23	0.38	0.99
Pant control-blank	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Coat pocket 2	0.61	0.01	0.00	0.26	0.53	0.24	0.49	0.25	0.38	0.93
Coat pocket 3	0.51	0.01	0.00	0.27	0.53	0.25	0.52	0.26	0.41	0.95
Pant pocket 2	0.36	0.00	0.00	0.26	0.54	0.24	0.49	0.24	0.36	0.90
Pant pocket 3	0.52	0.00	0.00	0.27	0.53	0.25	0.51	0.25	0.38	0.91
Travel control-contaminated	28.76	26.03	30.35	29.08	32.55	30.77	31.13	29.94	32.04	35.34
Lab control-contaminated	29.11	26.02	31.78	29.81	33.76	31.77	32.27	31.17	33.47	36.74
Cleaning Efficiency										
Coat pocket 2	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.96	100.00	100.00
Coat pocket 3	100.00	100.00	100.00	100.00	100.00	99.95	99.91	99.90	99.93	100.00
Pant pocket 2	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.97	100.00	100.00
Pant pocket 3	100.00	100.00	100.00	100.00	100.00	99.98	99.95	99.94	100.00	100.00
Average	100.00	100.00	100.00	100.00	100.00	99.98	99.97	99.94	99.98	100.00
Average total cleaning efficiency (%)	100									
Requirement (%)	≥ 50									

Note: The specimen “Pant control-blank” was lost and therefore no results for this specimen are reported. The calculations for cleaning efficiency of the pant specimens are using the values from the “Coat control-blank” specimen. Since this specimen was in the same wash load as the test specimens, it is considered to be representative and equal to the wash that the “Pant control-blank” would have received.

CHEMICAL DECONTAMINATION EFFICACY TEST – HEAVY METALS (CONT'D)	NFPA 1850-2026, SECTION 13.4
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Facility Name	Tersus followed by Circulair
Cleaning Process	CO2 cleaning followed by wash
THE PROCESS COMPLIES WITH THE REQUIREMENTS OF THE STANDARD [YES/NO]	

Specimen ID	Chromium		Cobalt		Arsenic		Cadmium		Antimony		Lead	
	1	2	1	2	1	2	1	2	1	2	1	2
Concentration (ppm)												
Injection	1	2	1	2	1	2	1	2	1	2	1	2
Travel control-blank	1.99	1.98	0.60	0.60	0.02	0.02	1.78	1.77	1.98	1.97	0.04	0.04
Coat control-blank	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pant control-blank	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Coat pocket 2	5.36	5.36	1.00	1.00	5.21	5.28	5.04	5.07	9.83	9.89	43.36	43.74
Coat pocket 3	5.13	5.10	0.95	0.95	4.84	4.86	4.57	4.57	9.21	9.19	39.97	39.99
Pant pocket 2	4.65	4.64	0.97	0.96	4.45	4.45	4.69	4.69	9.04	9.03	33.24	33.01
Pant pocket 3	8.39	8.40	1.57	1.56	8.62	8.62	8.35	8.33	10.42	10.47	43.79	43.57
Travel control-contaminated	104.38	103.03	102.81	102.02	89.77	89.10	93.80	94.10	95.82	96.06	103.46	104.94
Lab control-contaminated	101.53	100.97	98.57	99.29	86.58	86.19	91.83	92.50	93.23	93.56	100.99	100.89
Cleaning Efficiency												
Coat pocket 2	96.69		99.61		94.15		96.44		91.61		58.23	
Coat pocket 3	96.92		99.66		94.59		96.97		92.31		61.65	
Pant pocket 2	97.39		99.64		95.04		96.84		92.48		68.24	
Pant pocket 3	93.70		99.06		90.38		92.88		90.99		58.11	
Average	96.18		99.49		93.54		95.78		91.85		61.56	
Average total cleaning efficiency (%)									90			
Requirement (%)									≥ 50			

Note: The specimens “Coat control-blank” and “Pant control-blank” were lost and therefore no results for these specimens are reported. The calculations for cleaning efficiency are using the values from the “Travel control-blank” specimen. While the travel control specimen should theoretically be equal to the washed blank specimens, the cleaning efficiency values that use those values may not be representative of the values that would be achieved if the washed blank specimens were used. This is largely due to the fact that heavy metals can be introduced during water washing and other environmental exposures that the “Travel control-blank” did not receive.