

2022 Lunar Simulant Assessment – Geotechnical Review

Since 2020, APL staff have collaborated in assessing numerous lunar regolith simulants provided by six providers:

- The Assessment provides information regarding each simulant provider, details regarding supply chain and quality control, and comparisons to Apollo samples.

	2020, 2021 (<i>geochemical focus</i>)	2022 (<i>geotechnical focus</i>)
Companies	Exolith, Off Planet Research, Colorado School of Mines, Outward Technologies	Exolith, Off Planet Research, Colorado School of Mines, Deltion, USGS/NASA
Techniques	<ul style="list-style-type: none"> - Particle size and shape distribution (sieving, Camsizer) - Chemical composition (SEM, EDS, XRF, XRF) 	<ul style="list-style-type: none"> - Particle size distribution (sieving) - Minimum/maximum density - Specific gravity - Shear strength

- Key conclusions from 2022 Assessment: 1) highland and mare simulants exhibit similar PSD to average Apollo regolith; 2) minimum densities are lower than Apollo samples, maximum densities are similar; 3) simulants plot within range of specific gravity values for returned lunar samples; 4) friction angles match lunar samples, while cohesion values exceeded Apollo samples. **However, most differences vs Apollo sample were not significant.**




Lunar Surface Innovation
 C O N S O R T I U M

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Stockstill-Cahill, K.; Martin, A.; Wagoner, C. (2022) LSIC