



**Zybek Advanced Products** | Z  
*Product Engineering, Research & Development* | 0

## Thermal Processing for Lunar Simulant Components



Zybek Advanced Products is utilizing a proprietary, high-energy density electric-arc plasma for producing multi-ton quantities of lunar simulant components. ZAP provides the glass and agglutinate components for the NASA / USGS NU-LHT series simulants. Included in the lunar simulant component portfolio is:

Glass

Agglutinate

Synthetic Anorthite

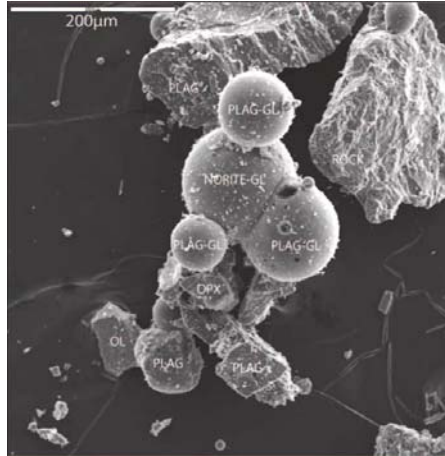
Melt Breccias

Nanophase components

Lunar Building Materials

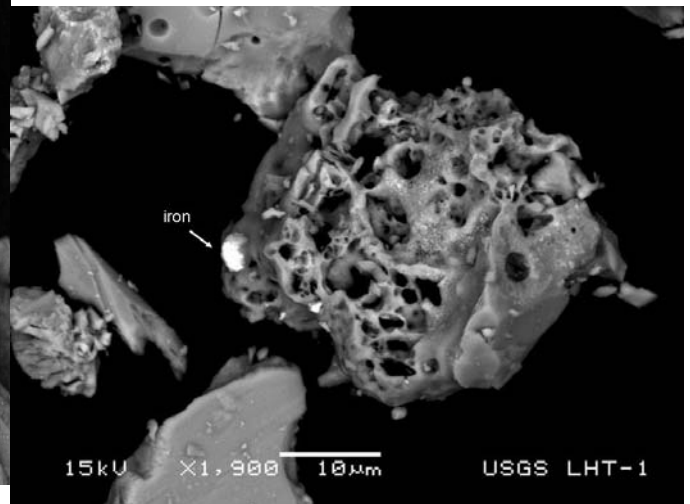
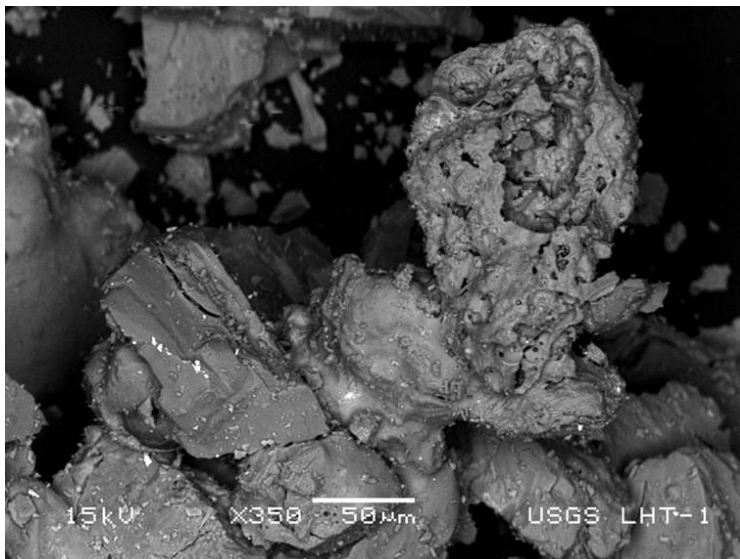
# Glass

With up to 15 ton per month processing capacity, Zybek Advanced Products can produce glass from anorthosite-based and LHT- feed stock materials for lunar simulant applications. Final glass can be in the form of cullet, spheres, or large cross-sections.



# Agglutinate

The agglutinate-fraction of the lunar surface is significant. Many feel the agglutinates are formed by micro meteorites. ZAP's plasma process (patent pending) re-creates the actual agglutinate formation. Energy densities, temperatures and thermal history can be controlled to produce multi-ton quantities of lunar agglutinates. In addition to standard agglutinate, nano-sized iron can be integrated into the agglutinate structure.



# Lunar Building Materials

## *Fiberglass and Bricks*

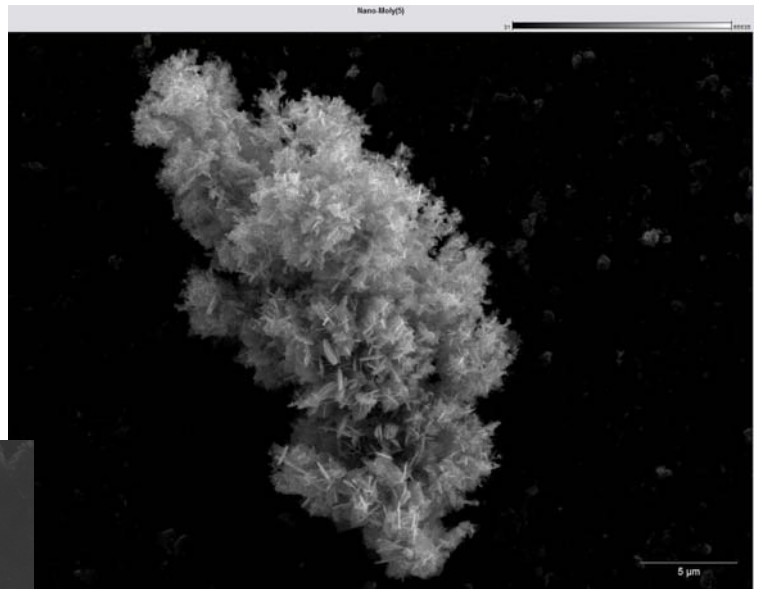
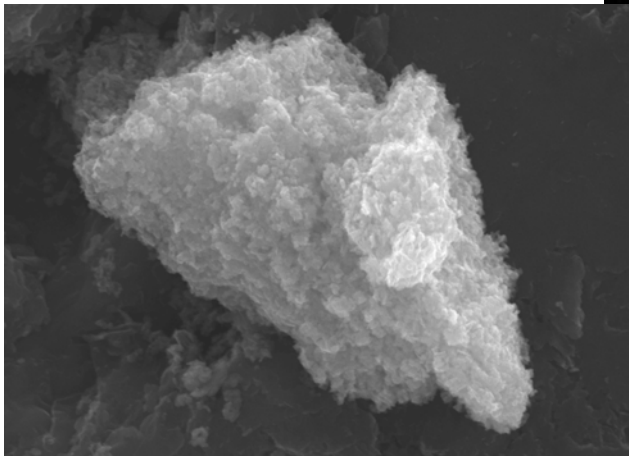
ZAP has an industrial-ready mechanical fiberization process that provides multi-ton quantities of discontinuous glass fiber from LHT starting material.

The re-crystallization process, used in the melt breccia / synthetic material production, can be used to provide bricks fabricated from lunar simulant feed stock.



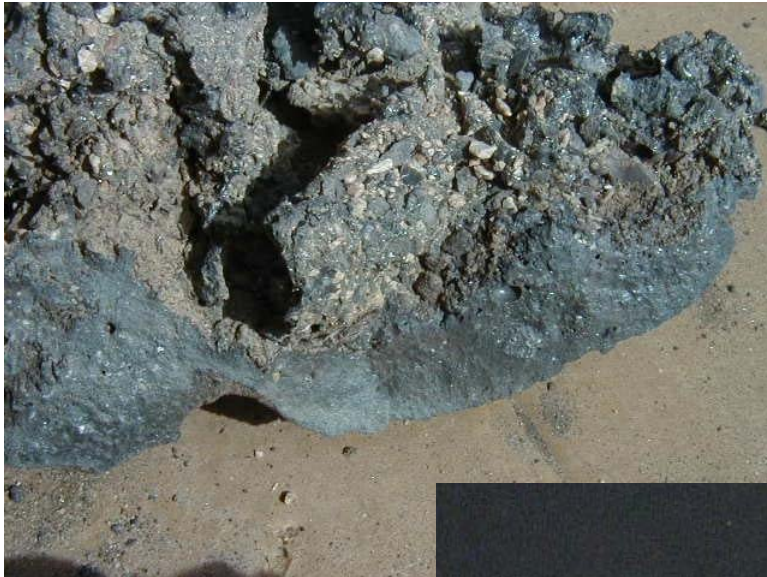
## Nano-size particulates

ZAP's proprietary plasma process has proven effective in delivering nano-size components for the agglutinate and discrete processes. By forcing particulate formation prior to molecular recombination, nano-size materials are created.



## Melt Breccias / Synthetic Minerals

By controlling the material's thermal history, several synthetic and re-crystallized materials can be produced. Examples of this include melt breccias and synthetic Albite : Anorthite. The final form of these materials can be either glass or crystal. Batch and continuous processes are available.



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