Synthetic Epiphytes

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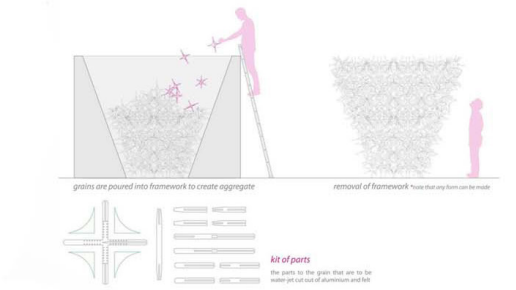
Plants can root themselves into volcanic rocks and grow within microscopic crystalline surfaces without access to soil. Scientists seek to understand this unique, mutualistic relationship between plants and rocks found in extreme environments. SyntheticEPIPHYTES is the result of two research hypotheses. Can we use aggregation as a method of fabrication? Can we digitally fabricate a composite material which will grow within the aggregate system?

Conceived for TEX-FAB, the purpose of the applied research described in this project was to explore aggregation as a strategy for conceptual design and fabrication efficiency. Aggregate form-making results from the collection of grains, rather than the defined connections between them. SyntheticEPIPHYTES develops a system of granulates-- similar to aggregates used in concrete construction—to create structural assemblies and new material performances through collective agglomeration. In this case study, our granular methodology was based upon the cellular structure of basalt.

As a system and a method of making there is significant potential for this research to be applied at multiple scales and various applications. Yet the organic and adaptable nature of aggregation results in a system that is not computationally predictable. Further research through observation of potential assemblies will be needed to understand the behaviors of individual elements. In this case study, the new system becomes the structural substrate for plant growth and emergent ecology. The composite material is a seed-impregnated felt that is sewn into each aggregate, exposing the roots of the plants to water, sunlight, and air. The aggregated structure facilitates a faster growth cycle due to the arid nature of the form.

syntheticepiphytes



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