

Variants of the Rubber-Glass House for Mars

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Abstract

This document presents three variants of the rubber-glass house and compares their material requirements and construction features. The goal is to select an optimal design for sustainable Martian colonies.

1. Two-Story Rubber-Glass House

Floor Plan and Structure

- **Total Area:** 1000 m² (50 m x 20 m) per level, 2000 m² total
- **Height:** 6 m (3 m per level)
- **Roof:** Flat roof

Materials

- **Rubber floor slab and foundation wall:** Cast from silicone rubber on site
- **Frame:** High-strength titanium or Inconel structure
- **Glazing:** Borosilicate glass with insulation layer
- **Roof:** Solar panels for energy generation
- **Airlock:** Titanium/Inconel construction with borosilicate glass

Quantity Calculation

- **Rubber floor slab and foundation wall:** Double the amount of silicone rubber (214 m³)
- **Frame:** Increased demand for titanium/Inconel (approx. 11,000 kg)
- **Borosilicate glass:** 2000 m²
- **Solar panels:** 1000 m²
- **Airlock:** 2 units

2. Three-Story Rubber-Glass House with Basement

Floor Plan and Structure

- **Total Area:** 1000 m² (50 m x 20 m) per level, 3000 m² total
- **Height:** 9 m (3 m per level) plus basement

- **Basement:** Fully rubber-coated, same area as ground floor

Materials

- **Rubber floor slab and foundation wall:** Cast from silicone rubber on site
- **Frame:** High-strength titanium or Inconel structure
- **Glazing:** Borosilicate glass with insulation layer
- **Roof:** Solar panels for energy generation
- **Airlock:** Titanium/Inconel construction with borosilicate glass

Quantity Calculation

- **Rubber floor slab and foundation wall:** Four times the amount of silicone rubber (428 m³)
- **Frame:** Increased demand for titanium/Inconel (approx. 16,500 kg)
- **Borosilicate glass:** 3000 m²
- **Solar panels:** 1000 m²
- **Airlock:** 3 units

3. Two-Story Rubber-Glass House with Pitched Roof

Floor Plan and Structure

- **Total Area:** 1000 m² (50 m x 20 m) per level, 2000 m² total
- **Height:** 6 m (3 m per level) plus pitched roof
- **Roof:** Pitched roof

Materials

- **Rubber floor slab and foundation wall:** Cast from silicone rubber on site
- **Frame:** High-strength titanium or Inconel structure
- **Glazing:** Borosilicate glass with insulation layer
- **Roof:** Solar panels for energy generation, adapted to pitched roof
- **Airlock:** Titanium/Inconel construction with borosilicate glass

Quantity Calculation

- **Rubber floor slab and foundation wall:** Double the amount of silicone rubber (214 m³)
- **Frame:** Increased demand for titanium/Inconel (approx. 11,000 kg)
- **Borosilicate glass:** 2000 m²
- **Solar panels:** 1000 m², adjusted to the roof angle
- **Airlock:** 2 units

Conclusion

Each variant offers specific advantages and challenges in terms of construction, materials, and energy efficiency. The decision for one variant should be based on specific requirements, the availability of resources, and long-term plans for Martian colonization.

These variants take advantage of locally available materials and sustainable building methods to minimize costs and dependence on supplies from Earth.

If you need further details or a PDF version of these variants, please let me know.

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