MILK CHAIR by Rush Drayton

A physical demonstration of regenerative biomaterials in design

Photographer: Johanna Stroud
Design Category: Furniture / Experimental Design / Sustainable Innovation
Contact: rushdrayton.com | @rushdrayton | rushdrayton@gmail.com

Milk, Pumice, Marble Dust, Charcoal, Hessian, Hemp, Steel, Clay, Wood
87 x 55 x 55cm
2025

About Rush Drayton

Rush Drayton is a sculptor and design engineer with a Master's in Innovation Design Engineering (MSc/MA) from Imperial College London and the Royal College of Art. His work explores the role of regenerative materials in post-industrial design, fusing sculpture, ecology, and fabrication.

Can a chair prove that biomaterials can outperform industrial materials?

Sculptor and design engineer Rush Drayton developed *Milk Chair* as a material study, exploring the potential of a casein-based bioplaster he developed from surplus dairy.

Unlike gypsum-based plasters, this casein composite, a derivative of casein glue, bonds naturally to wood, metal, fabric, and clay. It adheres to complex forms while maintaining durability, offering a low-energy, non-toxic, and compostable alternative to industrial composites.

To understand its structural limits, Drayton designed a form that would challenge the material, testing its ability to support large overhangs, sharp points, and skeletal structures while accommodating different viscosities and finishes.

Milk Chair resists the false binary of permanence versus decay, demonstrating that sustainability isn't about preserving materials indefinitely, but about designing for renewal, adaptation, and long-term ecological viability.

Ultimately, *Milk Chair* is a small step toward a future where materials are not just extracted and discarded, but cultivated, evolved, and reimagined.

Why *Milk Chair* Matters

Most biomaterials are dismissed as fragile, short-lived, or impractical. *Milk Chair* challenges that perception, proving that regenerative materials can be:

- Durable in use, degradable by design – Water-resistant and structurally sound indoors, but compostable under natural conditions.

- Adaptable across disciplines – Possible applications for sculpture, furniture, and architectural applications.
- A circular alternative to gypsum and fibreglass – Made from food waste and organic binders, with no synthetic additives.
- An aesthetic and functional material – Surfaces can be textured, polished, or tinted with natural pigments.

Milk Chair is a proof-of-concept, opening the door for biomaterial integration in product and architectural design.

Material Innovation Highlights

- Bioplaster from surplus dairy – A casein-based composite developed through material iteration, with marble dust, pumice, and natural fibres for strength.
- Testing biomaterial versatility – The chair's form demonstrates the adhesion, curing properties, and surface behaviour of the material on different substrates.
- Circular sourcing – Made from surplus dairy and plant-based by-products, replacing high-energy industrial materials.
- Beyond furniture – Potential applications in sculpture, casting, interior surfaces, and bio-based composites.

Links & Visuals

[Google Drive link with high-res image]