HAUSER & WIRTH

How We Move Art

How We Move Art is a new research initiative aimed at rethinking the materials and methods used in the transportation of artwork. One key yet often overlooked area contributing to this impact is the packaging involved in the transportation of artworks. Ultimately, we are developing research-based methods that will reduce the ecological footprint of our processes while still ensuring the safety and integrity of artworks. This is part of Hauser & Wirth's goal to develop and and share meaningful and industry specific responses to the climate crisis.

Led by Cliodhna Murphy, our Global Head of Environmental Sustainability; Poppy Fairfax, Senior Registrar; and Kim Kraczon, a conservator specializing in sustainable practices in the visual art sector—the initiative seeks to identify and implement alternatives to current packaging materials and systems. This case study outlines the challenges associated with existing art industry standard materials and the solutions we have discovered so far. By sharing our findings we want to help others shortcut their own processes and hold constructive conversations with suppliers.

We found that small and modest changes in material selection can have a significant impact when applied strategically.

TRAVEL FRAME COMPARISONS

Based on the materials and options we reviewed; we evaluated the Travel Frame prototypes based on a scoring system, with 5 being highest and 1 being lowest.

Key criteria for effectiveness:

1. **Artwork conservation**
2. **Lightweight design**
3. **Minimize resource depletion and petrochemical content**

The methodology applied does not compare like with like (size and material choice) in all scenarios and therefore offers an overview rather than comprehensive evaluation.
The rationale for this overview is to provide a real-time picture of how we are influencing material choice changes when ordering Travel Frames.

How Artists are Taking Action:

LEARNING FROM NICOLAS PARTY

"At Nicolas Party Studio, we transport the largest 2D artworks to the framer via reusable T-frames as a method to ensure the works' safety before framing but also out of a concern to slightly reduce our waste of cardboard, polythene, and tape. Everytime an artwork is shadow boxed, slip cased, or soft wrapped, we notice a large amount of packing materials that will eventually turn into waste. Reusing T-frames has been noticeably effective for the efficiency of our time in packing artworks as well as the continual costs of other unsustainable packing materials. We wish we could use more reusable or biodegradable art packing materials that offer alternatives to petrol-based plastics but they have yet to be found with regularity in the market place."

—August Krogan-Roley, Nicolas Party studio

Ingredients of the Travel Frame:

ENVIRONMENTAL IMPACT AND THE NEED FOR ALTERNATIVES

The Travel Frame, a standard, cost-effective solution for transporting two-dimensional artworks relatively short distances serves as a focal point for this project. Like many galleries Hauser & Wirth produces Travel Frames, typically made from industry standard materials such as Correx® or corrugated plastic (polypropylene), hardwood plywood (eucalyptus timber), and Plastazote® (polyethylene foam). While these materials are functional and commonly used, they have significant environmental and ethical concerns, particularly around recyclability, sourcing, and end-of-life disposal.

Polypropylene (Correx®)
Made from crude oil and natural gas, it is difficult to recycle and often ends up incinerated, contributing to CO2 emissions and microplastic pollution.

Eucalyptus timber (Hardwood Plywood)
Typically sourced from monocrop eucalyptus plantations, which contribute to biodiversity loss and water depletion.

Polyethylene Foam (Plastazote®)
Derived from fossil fuels and not typically recycled at its end-of-life, releasing harmful microplastics and toxins.

ALTERNATIVE INGREDIENT LIST

As part of our search for more eco-friendly alternatives, we have investigated several materials that could replace or complement the current components of the Travel Frame. These alternatives aim to reduce resource depletion, reduce carbon emissions, improve recyclability, and incorporate more sustainable material sources.

1

Softwood Plywood (instead of Hardwood Plywood)
Softwood plywood, sourced from sustainably managed European plantations (for a UK Travel Frame), offers a lighter and lower-emission alternative to hardwood plywood. Unlike hardwood, which can take decades to mature, softwood grows faster and is more readily replenishable, making it a more sustainable choice for frame construction.

ALTERNATIVE INGREDIENT LIST

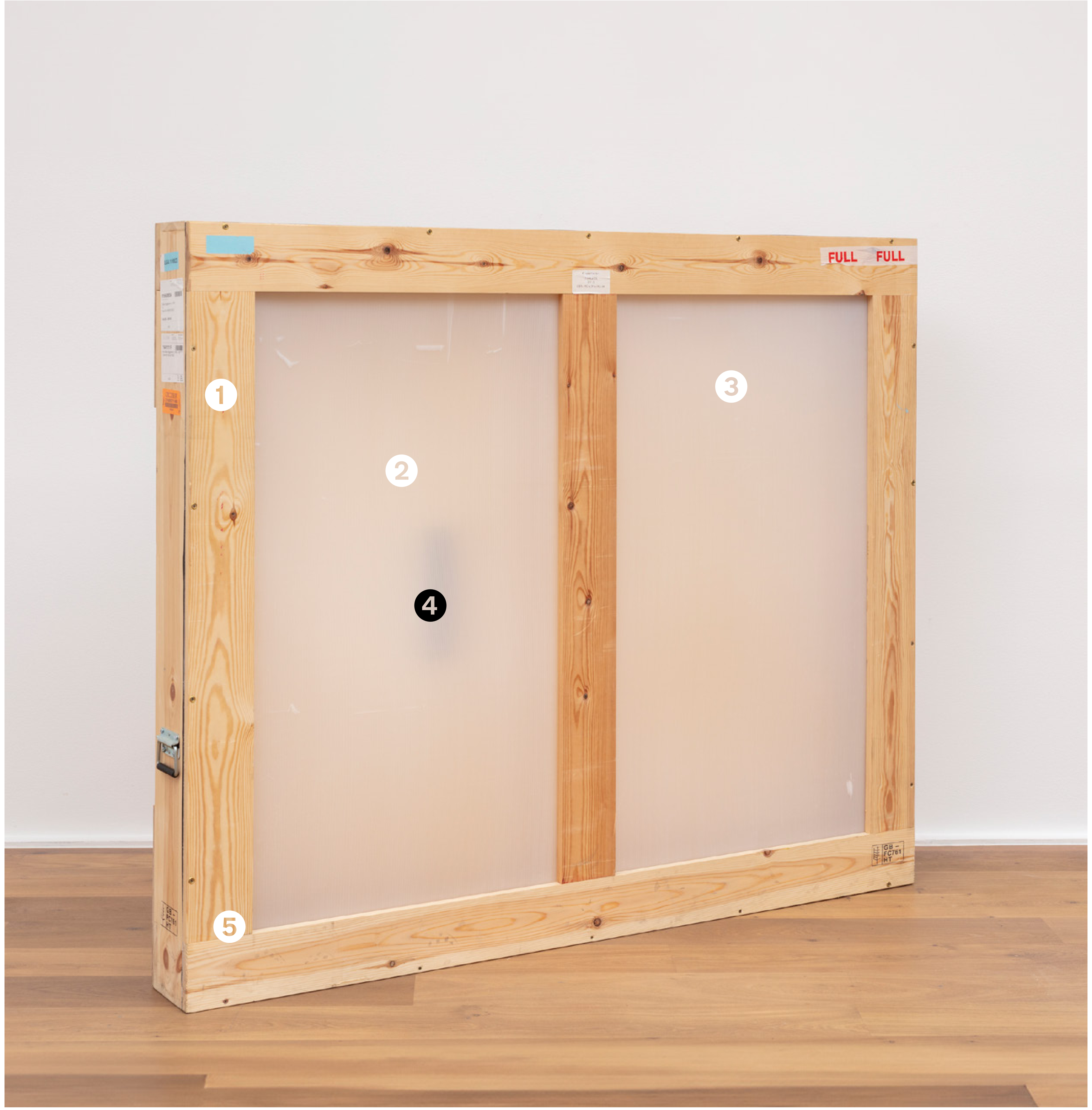
2

Expanded Cork (instead of Plastazote®)
Cork derived from the bark of the cork oak tree, is a renewable, non-toxic, biodegradable material that provides natural cushioning and insulation. While cork is not likely an equivalent to plastic foams in terms of in shock absorption, we are currently testing how we can integrate it into our crating methods. It remains an environmentally responsible option and is a promising substitute for foam-based materials.

ALTERNATIVE INGREDIENT LIST

❸

Honeycomb Cardboard (instead of Plastazote®)
Honeycomb cardboard, made from recycled paper, is lightweight, recyclable, and biodegradable. It offers a sustainable alternative to polyethylene foam, although it has limitations in its shock absorption qualities and moisture resistance. A major benefit is of this material is its recyclability makes it a viable contender for reducing long-term waste.



ALTERNATIVE INGREDIENT LIST

4

Biodegradable Hot Melt Glue (instead of Wood Glue)
TECBOND 214B, a bio-based hot melt adhesive partially derived from renewable sources such as sugarcane, potentially offers a “greener” option compared to conventional wood glue. While the manufacturer’s sustainability claims of biodegradability are as yet not fully proven, it does use less petrochemically-sourced raw materials in its production, reducing its environmental impact.

ALTERNATIVE INGREDIENT LIST

❺

Wheat Starch Glue (instead of Wood Glue)
A fully natural, biodegradable glue made from wheat starch offers an eco-friendly alternative to synthetic adhesives. In addition to biodegradability and composability, it can be reversed with water for removal, making it compatible with circular economy principles. However, its bonding strength is less than that of synthetic adhesives and may require specific application methods.

RETHINKING CRATE CONSTRUCTION

Conventional crate construction often involves the use of steel screws and toxic adhesives, both of which have significant environmental costs in terms of production, use, and disposal. The steel industry is one of the largest contributors to global CO2 emissions. With this in mind, we are exploring ways to reduce reliance on such materials, including alternatives to steel screws and innovative designs that may eliminate the need for screws altogether.

By exploring modular designs and recyclable materials, we aim to not only reduce emissions but also increase the potential for reusability and recyclability. For example, designing crates that can be disassembled easily for shipping, storage, reuse or recycling reduces their environmental impact at the end of their life cycle.

HOW WE CREATED OUR ALTERNATIVE BRIEF

To begin the process, we collaborated with a group of UK-based crate makers, including Constantine, Mtec, and Queen's, to co-develop prototypes. Our brief emphasized the following:

❶ **Curbside recyclability**
Materials must be recyclable in most urban recycling systems.

❷ **Lightweight**
The new Travel Frames must be as lightweight as current designs to ensure no increase in transport emissions.

❸ **Durability**
The frames should endure at least six uses.

❹ **Petrochemical-free**
Where possible, materials should not be derived from fossil fuels.

❺ **Budget**
Prototype cost should be as close to £150 as possible.

Practical Outcomes:

REAL-WORLD INSIGHTS FROM LONDON-BASED CRATE MAKERS

The results of our collaboration with the crate makers were promising. Here are some of the key insights:

1

Mtec Fine Art

Mtec experimented with switching from hardwood plywood to softwood plywood, which reduced the overall carbon footprint to 0.34 kg CO_2e per unit. This material substitution resulted in a lightweight, durable Travel Frame that was cost-effective at £146 per unit. They also tested using aluminium in place of both Correx® and plywood, which, though more recyclable, was costlier at £355 per unit, as well as significantly heavier than Correx®, which contributes to carbon emissions.

Practical Outcomes:

REAL-WORLD INSIGHTS FROM LONDON-BASED CRATE MAKERS

The results of our collaboration with the crate makers were promising. Here are some of the key insights:

2

Queen's

Queen's developed a Travel Frame using expanded cork, double-wall cardboard, and unbleached cotton fabric, making it a potentially regenerative option that replaced synthetic materials. The total cost was £175 per frame, offering a lightweight and compostable option reducing freight emissions and costs.

Practical Outcomes:

REAL-WORLD INSIGHTS FROM LONDON-BASED CRATE MAKERS

The results of our collaboration with the crate makers were promising. Here are some of the key insights:

❸

Constantine

Constantine’s approach was rooted in creating easy-to-adopt solutions for our gallery team, focusing on material choices that would cause minimal disruption while providing a meaningful shift towards more sustainable practices. By prioritizing materials that are easier to repurpose and recycle, Constantine's designs offer practicality. They also suggest replacing foam with cork blocks and using non-formaldehyde plywood. Their design featured reusable screws and recyclable components, costing £290 per frame, but with significant benefits for material reuse and recyclability.

	Current Travel Frame (standard size)	**Queens Prototype** (smaller than standard)	**Constantine Prototype** (smaller than standard)	**Mtec Prototype 1** (smaller than standard)	**Mtec Prototype 2** (smaller than standard)	**Hybrid Travel Frame** (mix of current and alternative materials)
Dimensions	192 × 20 × 162 cm	59 × 19.5 × 59 cm	61.5 × 16.5 × 59 cm	55 × 12 × 45 cm	55 × 20 × 59 cm	250 × 230 × 4 cm
Cost (Based on T/F outer dimensions with are variable therefore weighting not applied)	£310	£175	£250	£146	£155	£916
Artwork conservation	4	3	4	4	4	4
Lightweight	4	5	4	4	2	3
Durable – use up to 6 times	5	3	4	4	4	4
Minimizing resource depletion – deforestation, monocropping, water shortages	2	4	4	3	3	4
Minimizing petrochemical content – leading to CO_2 emissions, microplastics	2	4	3	2	3	4
Recycling potential	2	4	3	3	3	4
Home compostable content	0	3	2	0	1	3
Material reuse potential	1	4	3	2	2	3
Total score	**20**	**30**	**27**	**22**	**22**	**29**

George Rouy, Torso, 2025 © George Rouy. Image orientation turned on side

PROGRESS AND KEY FINDINGS

The journey from traditional packaging to more sustainable alternatives has revealed crucial insights. Although initial efforts focused on replacing petrochemical-based materials, we realized that a complementary approach—integrating materials without disrupting the integrity of the packaging—was most effective. Small changes in material selection can significantly reduce environmental impact.

The adjustments made by our crate-makers have proven pivotal. Their ability to innovate, even with small tweaks, has been the key to laying a strong foundation for long-term sustainability. What surprised us most was how even modest changes in material selection could have a significant impact when applied strategically.

For instance, we are testing these new materials in a real-world scenario for an exhibition traveling from London to Los Angeles.

PROGRESS AND KEY FINDINGS

The key changes include:

Honeycomb cardboard front and back instead of Correx®
Thin cork sheets as seals instead of neoprene
Cork blocks wrapped in Dartek® instead of Plastazote®

Ultimately, progress in sustainability requires collaboration, experimentation, and bravery. By breaking down industry preconceptions about materials like cork, and sharing insights across teams and suppliers, we can foster a collective culture of environmental responsibility.

> *Every small action contributes to a larger movement, and together we can spark transformative change.*

Our research into non-plastic crating materials and methods revealed they are a viable alternative in certain situations rather than a blanket solution for all fine art crating scenarios. We always encourage the implementation of non-traditional materials and methods after careful consideration and on a case-by-case basis.

PROGRESS AND KEY TAKEAWAYS

1 →

2 →

3 →

4

APPENDIX

	Replacement for	Properties	Conservation Considerations	Manufacturing Process	Environmental Impact Categories	Reuse	End of Working Life Management
Softwood Plywood	Hardwood Plywood	• Less dense and lighter than hardwood plywood (lower CO2 in transit) • Fast-growing • Emits less acid than hardwoods, safer for long-term transport of paintings • Generally less expensive • Less durable (dent easily)	Widely used for artwork packing, but may not be suitable for long-term artwork storage due to its reduced durability.	Timber is heat treated, thin wood planks are stripped from logs and glued with grains at right angles to prevent warping. The adhesive (phenol formaldehyde) is produced from the reaction of formaldehyde and phenol.	Toxicity (human/environment): Formaldehyde is a carcinogen, but the amount in plywood is minimal. Resource depletion: Softwood plantations can be sustainably managed.	Plywood can be reused multiple times, but is prone to mould/rot in moist environments.	Not curbside recyclable. Recycled at designated centers. Best to keep in use for as long as possible.
Expanded Cork	Plastazote and Polystyrene	• 100% natural • Non-toxic • Fungi-resistant • Durable • Good thermal properties • Absorbs vibration		Cork granules are ground and expanded under high pressure and temperature to create a structure with larger internal cavities.	Cork bark is renewable; regrows every 9–10 years. Ensure FSC-certified sourcing. Low carbon footprint.	Reusable, biodegradable, and compostable. Can be repurposed for other applications.	Can be composted; biodegradable; recyclable at specialized facilities.
Honeycomb Cardboard	Plastazote and Polystyrene	• Made from recycled paper • Lightweight • Limited shock absorption • Becomes acidic over time • Sensitive to moisture	Can damage sensitive materials (e.g., silver, copper) over time due to acidic emissions; offers some protection during transit.	Made from wood pulp via chemical or mechanical pulping. PVAc adhesive is used to bind layers together.	Toxicity (human/environment): Paper recycling can release pollutants into wastewater. Resource depletion: FSC-certified paper ensures sustainable management.	Reusable unless exposed to moisture or non-reversible adhesives.	Curbside recyclable with paper; biodegradable and compostable.
TECBOND 214B or Biodegradable Hot Melt	Wood Glue (for adhering cork/foam/ honeycomb cardboard)	• Lower petrochemical content than conventional wood glue • Additives to catalyze the degradation of plastic • Origin of raw agricultural materials unknown		Produced by polymerization of vinyl acetate, usually at 65°C for 10 hours.	Toxicity (human/environment): The catalyzed breakdown of "bio-based" EVA may result in microplastics Resource depletion: Potentially, derived from monocrops, such as corn, sugarcane, and cassava.	Cannot be reused once applied.	Contaminates recycling streams when used with wood and paper-based products. Disposal via specialized facilities.
Wheat Starch Glue	Wood Glue (for adhering cork/foam/ honeycomb cardboard)	• 100% natural • Non-toxic • Reversible bond with water • May have a weak bond if not applied properly • Requires additives to deter pests	Generally safe for conservation; bond can be reversed without damage, but excess water may harm some substrates.	Made by dissolving starch in water, often with additives to prevent pests and improve shelf life.	Biodegradable, compostable, and compatible with wood and paper recycling streams if residue is minimal.	Cannot be reused after application, but substrates can be reused if glue is easily removed without damage.	Biodegradable and compostable; compatible with wood and paper recycling if residue is minimal.

TRACING THE SUPPLY CHAIN

Supply chain transparency refers to the ability to track and trace the journey of raw materials and finished products from their origin through to the end consumer. This process sheds light on the sourcing, manufacturing, and distribution stages, providing insights into potential environmental or social risks. For example, knowing where a product's raw materials are sourced and how they are processed can reveal the environmental footprint or labor conditions behind a product.

For many products, certifications like the **Forestry Stewardship Council (FSC)** for sustainably managed natural resources (e.g., timber) or compliance with the **Modern Slavery Act** (which is relevant for UK companies with annual turnovers over £36 million) can offer assurance that certain ethical standards are being met. However, comprehensive supply chain data is not universally accessible to consumers. Even when available, it can often be generalized, leaving consumers with limited visibility into the details of sourcing and manufacturing practices.

In the case of **Travel Frames**, ensuring a sustainable and ethical supply chain required diligent efforts. We contacted distributors and suppliers directly, both by email and phone, to inquire about the origin of raw materials and the locations of manufacturing plants. While some product websites provided general information about their sustainability practices, determining the specific origins of materials like timber, crude oil, or natural gas proved challenging. In fact, tracing the supply chain for products made from fossil-fuel-derived plastics beyond the manufacturing plant's general location was often not possible.

This lack of transparency suggests two potential scenarios: either companies are hesitant to disclose unfavourable information due to potential negative publicity, or they may not possess the data themselves. A few suppliers were unwilling to share specifics, fearing that revealing such details could provide a competitive advantage to others. This reluctance highlights an ongoing challenge in achieving full transparency across supply chains, particularly in sectors where proprietary information is highly guarded.

FUNCTION OF MATERIALS AND PRODUCTS

The primary function of materials used in Travel Frame construction is to protect artworks during transport. This involves safeguarding them against shock, vibration, moisture, and temperature fluctuations. While the selection of materials for such cases should ideally prioritize both performance and sustainability, the realities of product functionality often make it difficult to prioritize one over the other.

For example, **plywood** is commonly used in case construction due to its mechanical strength and resistance to warping, making it ideal for protecting valuable artworks in transit. However, plywood is made using **phenol-formaldehyde resin**, a synthetic substance derived from non-renewable resources (fossil fuels). This resin makes plywood difficult to recycle at the end of its life, presenting a sustainability issue. While replacing plywood with solid wood may mitigate some of these concerns, solid wood is more susceptible to warping under extreme temperature and humidity conditions, potentially reducing the lifespan and reusability of the travel case.

NEGOTIATION & COMPROMISE OF SUSTAINABILITY METRICS

In an ideal world, the materials used in art transport would tick every box on the sustainability checklist. These materials would be locally sourced, derived from renewable or regenerative resources, ethically produced, non-toxic, durable, lightweight to reduce carbon emissions in transport, and recyclable at the end of their life—all while ensuring the protection of artworks during transit. However, such materials are rare, and even when they do exist, they rarely meet every single performance and sustainability criterion.

As such, choosing materials often involves a balancing act. In some cases, the performance qualities of a material must outweigh its environmental or social impact. For example, while plywood's synthetic resin is derived from non-renewable fossil fuels, its mechanical properties, which provide necessary protection for artworks, may make it the best option available for certain cases. This negotiation of sustainability metrics is an inherent part of product development in industries where both functionality and environmental impact must be carefully weighed.

PRODUCTS THAT OFFER INSPIRATION

One innovative example of sustainable design is **EARTHCRATE**, a product constructed from rigid plyboard. At the end of its usable life, EARTHCRATE is curbside recyclable, offering a clear pathway for responsible disposal and reducing its environmental footprint. Additionally, the solution is significantly lighter and more cost-effective than traditional wooden gallery crates, with only **10% of the CO_2 emissions** compared to a standard wooden crate. This represents a notable step forward in terms of both reducing environmental impact and offering a more sustainable alternative for art transport.

HAUSER & WIRTH