

Traceless Materials

Overview	
Country	Germany
Type of organization	Circular Bioeconomy Company
Number of employees	Approximately 57 employees
Type of practice	Best
Level of investment	High
Activity type	Processing waste / Product design from waste material
Key words	Upcycling / Reusing / Waste collection

Summary

www.traceless.eu

Traceless Materials GmbH, founded in 2020 in Hamburg, Germany, is a circular bioeconomy company that has developed a novel biomaterial called traceless®. This material is derived from agricultural residues and serves as a sustainable alternative to conventional plastics and bioplastics.

Traceless® is fully biobased, plastic-free, and home compostable, breaking down under natural conditions within 2 to 9 weeks. The company produces traceless® in granulate form, which can be processed into various products such as films, rigid materials, coatings, and adhesives, using standard plastic processing technologies. This innovation aims to reduce plastic pollution and contribute to a regenerative, climate-friendly economy.

Traceless uses agricultural waste like brewer's spent grains to produce a plastic-free, fully compostable biomaterial. It is certified 100% biobased, home compostable, and can be processed with standard plastic machinery.

The material degrades without leaving harmful residues and reduces greenhouse gas emissions by up to 95% compared to conventional plastics.

Background and origin

Traceless Materials GmbH was founded by Dr. Anne Lamp and Johanna Baare with the mission to address global plastic pollution and contribute to a regenerative, climate-friendly economy.

By transforming agricultural residues into a sustainable material, the company aims to reduce reliance on fossil-based plastics and promote a circular economy. Traceless® materials are designed to integrate seamlessly into nature's biological cycle, leaving no trace behind.

Relevance to the craft sector

Traceless® materials offer significant potential for the craft sector by providing sustainable, plastic-free alternatives that can be used in various applications. Artisans and designers can utilize traceless® granulates to create eco-friendly products, aligning with increasing consumer demand for sustainable and biodegradable materials. The material's compatibility with standard processing technologies makes it accessible for small-scale craft production.

Target groups

- **Manufacturers:** Seeking sustainable alternatives to conventional plastics for various applications.
- **Brand Owners:** Looking to incorporate eco-friendly materials into their product lines.
- **Consumers:** Interested in products made from sustainable, biodegradable materials.
- **Artisans and Designers:** Exploring innovative materials for craft and design projects.



Source: traceless materials

Material focus - type of waste material involved

Traceless focuses on using organic waste materials from the agricultural and food-processing industries. Specifically, the company relies on residues left over from starch production, grain processing, and brewery operations, such as spent grains.

These by-products are considered secondary biomass, meaning they are not grown specifically for material production and do not compete with food resources. By transforming these agricultural leftovers into a new type of plastic-free, compostable material, Traceless creates value from waste that would otherwise be discarded.



Stakeholders involved

- Traceless founders and team,
- EU and German government funders (EIC, BMUV),
- private investors,
- industrial processing partners, certification bodies, and companies adopting the material for sustainable product development.



Source: traceless materials

Professionals involved and their roles

- Engineers and Scientists
- Operations Team
- Quality Assurance
- Marketing and Sales

Connection of the practice with the project-identified needs

Knowledge of Waste Materials

Traceless exhibits a strong scientific and technical understanding of organic waste streams, particularly secondary biomass from agricultural processes. They focus on residues like spent grains from breweries and by-products from starch or grain processing—materials often discarded or underutilized. Instead of traditional plastic feedstocks or even first-generation bioplastics (which may still rely on food crops or chemically modified polymers), Traceless uses natural polymers inherently present in these residues. Their process avoids chemical modification, ensuring the material remains naturally degradable. This demonstrates applied expertise in biopolymer extraction, circular material flows, and environmental impacts of different waste types.

Green Entrepreneurial Skills

The company's trajectory reflects high-level entrepreneurial competence in the green innovation space. The founders successfully translated a research-based concept into a fast-scaling startup. Within just a few years, Traceless secured €36.6 million in funding, including from the European Innovation Council and Germany's BMUV—key indicators of investor confidence and alignment with EU green transition goals. They've also planned the construction of a full-scale production facility, showing long-term strategic planning. Their active involvement in international sustainability events, policy forums, and material innovation groups positions them as thought leaders and changemakers within the bioeconomy and circular plastics sectors.

Creativity and Innovative Solutions

Traceless created a completely plastic-free material that still functions like conventional plastic, offering durability, processability, and flexibility while being fully home-compostable and toxin-free. This required not only scientific creativity but also innovative thinking in how to align material performance with environmental compatibility and existing industry infrastructure. Unlike many green materials that require new machines or come with high functional trade-offs, Traceless materials can be processed using standard plastic manufacturing technologies. This compatibility reduces adoption barriers and increases scalability.



Methodological approach to implement the practice

Process description - step by step instructions for implementing the practice

1. Source agricultural residues (e.g. spent grains, starch waste).
2. Extract natural polymers without chemical modification.
3. Process into granulates using proprietary technology.
4. Convert granulates into products via standard plastic machinery (e.g. molding, coating, extrusion).
5. Distribute to industry partners for use in packaging and other applications.
6. End-of-life products are compostable in natural conditions without leaving microplastics.



Source: traceless materials

Related Resources that have been developed

Traceless has developed certified material samples, lifecycle assessment reports, application prototypes (e.g. packaging, labels, film), and communication resources for industry adoption. They also provide technical data for processing and compostability certification.



Source: traceless materials

End product

The end product of the Traceless process is a plastic-free, fully compostable biomaterial in the form of granulates. These granulates can be processed into items such as rigid packaging (e.g. trays, cutlery), flexible films, coatings, labels, and adhesives using standard plastic manufacturing equipment. The final products are non-toxic, naturally degradable in the environment, and serve as sustainable alternatives to conventional plastics.

Sources of funding for this intervention

- European Innovation Council (EIC) Accelerator – EU-level support for deep-tech startups
- German Federal Ministry for the Environment (BMUV) – national funding for climate and environmental innovation
- Private investors – venture capital and sustainability-focused investment funds

Altogether, they have raised €36.6 million to scale their operations and build a commercial production plant.



Source: *traceless materials*

Innovation, novel methods or technologies used

Traceless Materials GmbH has pioneered an innovative approach to sustainable materials by developing *traceless*[®], a plastic-free, home-compostable biomaterial derived from agricultural residues. Their patent-pending technology extracts natural biopolymers from plant waste, producing granulates that can be processed into various products using standard plastic manufacturing equipment.

This method distinguishes itself from traditional bioplastics by utilizing natural polymers without synthetic modification, ensuring rapid biodegradability within 2 to 9 weeks under natural conditions. Moreover, *traceless*[®] materials are free from harmful additives and solvents, offering a holistic solution that aligns with the cradle-to-cradle principle.

Obstacles and challenges faced

Traceless faced challenges in scaling production, securing regulatory certifications, and ensuring material compatibility with existing industrial processes—all while maintaining full biodegradability and plastic-free composition.

Steps further and plans for the future

Traceless plans to complete its first commercial production plant in Hamburg by 2025, scale up material output, expand partnerships with industry, and continue developing new applications for its plastic-free material across sectors like packaging, fashion, and consumer goods.

Key impacts - environmental, economic & social

Traceless has significant environmental, economic, and social impacts. Environmentally, it reduces plastic pollution, cuts greenhouse gas emissions by up to 95%, and avoids toxic substances, offering a fully compostable alternative that leaves no microplastics. Economically, it supports green industry growth, creates sustainable jobs, and enables cost-efficient production using existing machinery. Socially, it fosters responsible consumption, promotes circular economy values, and increases public awareness of plastic-free, nature-compatible solutions.

Qualities and criteria's to consider the practice effective, efficient, sustainable, transferable

Qualities	
Effectiveness: How well does the practice achieve its goals?	Traceless® effectively addresses plastic pollution by offering a fully compostable, plastic-free alternative to conventional plastics. Its production and disposal processes result in up to 95% reduction in greenhouse gas emissions and 83% savings in fossil energy demand compared to traditional plastics. Additionally, each ton of traceless® produced can save approximately 100,000 liters of water and reduce land demand by 1,060 m ² annually.
Efficiency: Does the practice minimize resources while maximizing outputs?	The production of traceless® is resource-efficient, utilizing agricultural residues and renewable energy sources. This approach not only conserves valuable resources but also ensures that the material can be processed using existing plastic manufacturing equipment, facilitating seamless integration into current production lines.
Sustainability: Does the practice contribute to environmental protection, social equality and long-term viability?	Traceless® materials are designed to be fully compostable under natural conditions, breaking down within 2 to 9 weeks without leaving harmful residues. Their production process avoids the use of toxic chemicals, ensuring safety for both humans and the environment. By leveraging non-food biomass, the company prevents land-use conflicts and supports biodiversity.
Transferability: Are the methods transferable in different contexts?	The patent-pending technology behind traceless® is scalable and adaptable to various contexts. The material's compatibility with standard plastic processing technologies allows for easy adoption across different industries. With the construction of its first large-scale production facility in Hamburg, Traceless Materials aims to demonstrate the feasibility of industrial-scale production, paving the way for broader implementation.

Required Competences for the best practice implementation

Activities-to-competences mapping

Associated competences	
Knowledge	Material science, biopolymer chemistry, circular economy, biomaterial properties, regulations, lifecycle assessment, and industrial processing.
Skills	Process engineering, residue handling, lab testing, machine operation, and digital systems use.
Attitudes	Sustainability, innovation, precision, and safety across sourcing, development, and manufacturing stages.

Training needs required for successful implementation

- Training in biopolymer chemistry and material processing
- Understanding circular economy principles and environmental regulations
- Skills in handling agricultural residues and operating processing equipment
- Use of digital monitoring and control systems
- Lab testing and quality assurance techniques
- Safety protocols and machine maintenance

Lessons learned

Turning agricultural residues into functional, plastic-free materials is achievable with the right technology, but requires strong investment, clear certifications, and close collaboration with industry. Scalability depends on using existing manufacturing infrastructure and maintaining strict sustainability standards.

References / links

- <https://www.linkedin.com/company/traceless-materials>
- <https://www.instagram.com/traceless.eu/>
- <https://www.traceless.eu>



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