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Sustainability at TPP Techno Plastic Products AG

Quality Statement for TPP Products

TPP is ISO 9001 certified and manufactures according to cGMP guidelines. The high quality standard is regularly checked and confirmed by certifications. The ISO certificate can be downloaded from www.tpp.ch.

Product Quality and Hygiene

TPP certifies that all sterile products are manufactured according to strict manufacturing guidelines and product specifications and meet all quality and documentation requirements. All employees follow strict hygiene techniques and COVID 19 regulations.

Manufacturing Process

- TPP manufactures plastic laboratory consumables under clean room conditions to prevent contamination. All products are packed in clean room booths to ensure maximum cleanliness.
- Strict hygiene guidelines and access controls are applied throughout the manufacturing process.
- Constant material and process conditions ensure consistent batch stability.

Sustainability and Recycling at TPP

With the global discussion on the environmental impact of plastics, the question of the sustainability and usefulness of plastic products is often raised. In this statement, we address frequently asked questions and explain our position on recycling and sustainability.

Global trends and context

The discussion about plastic waste and recycling is a global issue that affects our industry. Innovative technologies and approaches are being developed around the world to reduce the environmental impact of plastics. TPP is closely monitoring these trends and is actively engaged in sustainable solutions.

Recycling used TPP products: Feasibility and practicality

TPP products are manufactured under strict hygiene standards and are free of detectable contaminants such as endotoxin, RNA/DNA, RNAse/DNAse and cytotoxic substances. Recycling would not currently guarantee these purity standards.

- Material Composition: The specific plastics of TPP meet the requirements of sensitive applications. Recycling these materials is energy intensive due to their different chemical composition and reduces the environmental benefit.
- Material quality: Repeated melting can degrade the quality and properties of plastics, which can compromise the safety and efficiency of products.
- Environmental and economic factors: Collecting and processing used plastic products is logistically and financially costly. The energy required and the CO_2 impact of transportation could outweigh the environmental benefits of recycling.

Current Developments and Future Prospects

TPP supports the development of innovative recycling processes and purification techniques to make recycled materials usable in cell culture and to improve their material properties. We are exploring promising technologies that could make recycling more efficient and environmentally friendly.

Sustainability at TPP

TPP focuses on consistent quality to ensure efficient use of resources and high standards. We are actively involved in the development of alternatives to conventional plastics, even if materials that meet our requirements are not yet available on the market. Our goal is to make a long-term positive contribution to environmental protection by reducing material consumption, optimizing efficiency and testing new sustainable materials and processes.

- **Quality of Cell Culture Plastics**: The high quality of our products enables reliable experiments without repetition, reducing material consumption and the environmental footprint.
- **Raw Material Sources**: TPP sources raw materials from Europe and manufactures in Switzerland, supporting short transportation routes and local supply chains.
- **Packaging System**: Modular packaging maximizes transport pallet efficiency and reduces packaging material consumption.
- **Sustainable Disposable Pallets**: Our disposable pallets are sourced from certified local sources, minimizing environmental impact.
- **Internal Processes**: TPP continually optimizes its processes to conserve resources, such as switching to LED lighting and locating near public transportation to reduce CO_2 emissions.
- **Sterilization**: Sterilization is performed at a nearby facility that also operates in an environmentally friendly manner to ensure quality and sustainability.
- **Renewable Energy**: Our manufacturing facilities use 80% renewable energy to further reduce our carbon footprint.

Customer Feedback and Continuous Improvement

TPP values customer feedback on our sustainability efforts and uses it to continuously improve our processes. Their perspectives help us refine our strategies and become even more effective environmental stewards.

Excursus: Is laboratory glass a sustainable alternative to plastic in cell culture?

Most important pros and cons (table not exhaustive)

PRO	CONTRA
Chemical stability	
• Chemically inert • Does not react with most chemicals, minimizes interactions with cell culture media	• Coatings on glass surfaces have a lower stability (e.g. collagen)
Risk of Breakage and Weight	
	• Fragile and heavy • Risk of injury / contamination • Handling and transport
Cleaning & Sterilization	
• Repeated cleaning and autoclaving possible	• Extensive cleaning with surfactants and acid baths [1] • Repeated cleaning and autoclaving minimizes the optical properties
Costs	
• One-off acquisition costs	• Higher acquisition and running costs • Sterilization processes, with high workload and resources
Transparency	
• Clear, distortion-free view • Ideal for microscopy and cell observation	• Plastic is similar to glass • Appearance is limited by reuse
Adherence of cells	
	• Impaired adhesion of certain cell types, such as primary cells
Sustainability	
• Reusable	• Borosilicate glass melting point approx. 820°C • Borosilicate glass interferes with the recycling process Special disposal • High water consumption during cleaning and sterilization
Practicality	
	• Complex, sometimes toxic cleaning and sterilization processes • Sterility not 100% guaranteed • Personnel costs for cleaning and sterilization processes • Possible detergent residues impair cell processes

[1] Detailed instructions for cleaning glass in cell culture can be found here: https://www.sigmaaldrich.com/CH/en/technical-documents/protocol/chemistry-and-synthesis/reaction-design-and-optimization/cleaning-glassware

Outlook: Research and Innovation

- Polyethylene (PE) and Polypropylene (PP): Studies have shown that recycled PE and PP materials are suitable for certain biotechnological applications due to their chemical stability and inertness. However, the current focus is on applications such as packaging or accessories and not directly on cell culture processes.
- Bio-based and compostable plastics: Research is also investigating bio-based and compostable plastics as more sustainable alternatives to conventional plastics. [2]
- Standards compliance: Recycled materials must meet strict standards of biocompatibility, sterilizability and chemical purity to be accepted in cell culture.

Summary

- TPP is committed to a high standard of sustainability and quality. We will continue to explore innovative approaches and technologies to minimize environmental impact while meeting the needs of our customers. Our commitment to sustainability is underpinned by continuous improvement and active feedback.

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[2] For further information: https://de.wikipedia.org/wiki/Bio-basierter_Kunststoff