Position

Advancing ESPR-compliance for technical plastic products via EN10204-based Digital Product Passports

A low-barrier, standards-based approach for SME plastic converters and recyclers

1. Introduction: The relevance of EN 10204 for technical plastic products

In the evolving landscape of sustainability and regulatory compliance, the role of standardization and traceability has become increasingly vital. The European Sustainability Reporting Standards (ESRS), derived from the Corporate Sustainability Reporting Directive (CSRD), place growing emphasis on transparency across value chains. For technical plastic products, particularly those integrated into strictly regulated sectors such as automotive, electronics and medical technology, the need for harmonized documentation and verified material traceability is critical.

We at TecPart represent the perspective of small and medium sized (SME) plastic processors and recyclers focusing on technical plastic products delivering to sectors as named before. Our primary concern as regards ESRS and Digital Product Passport (DPP) development for technical plastic products is the lack of reliable and harmonized data structures across the value chain, disproportionate cost and complexity for SMEs, and limited access to structured product information for recycling and recyclate-related reporting.

A low-barrier DPP approach for SME converters and recyclers

Originally developed for metallic materials, the EN 10204 standard defines types of inspection documents that serve to validate conformity and material testing at the point of production. It offers structured, auditable formats such as type 3.1 and 3.2 inspection certificates, which confirm compliance with specified technical requirements based on individual or batch testing.

Although EN 10204 is historically rooted in metallurgy, it has seen growing relevance in other material classes, particularly in the context of high-performance plastics used in technical applications. In the automotive sector, for example, suppliers increasingly adopt EN 10204-based inspection certificates for plastic parts that are safety-relevant, subject to regulatory approval, or require specific performance verification.

TecPart proposes leveraging EN 10204 as a harmonized documentation backbone within the framework of Digital Material Passports (DMPs), with the potential to extend into Digital Product Passports (DPPs). Integrating EN 10204-based documentation would streamline ESRS compliance, facilitate supply chain transparency, and improve data interoperability across sectors.

Importantly, for SMEs, concerns around implementation costs must be addressed. As this paper outlines, while some investment is needed, many of the structures and inspections are already routine in quality assurance processes. By aligning existing documentation with EN 10204 formats and using open digital templates for DMP or DPP integration, costs can be kept manageable. With supportive tools, even SMEs can adopt these standards with minimal disruption.

To support reliable and interoperable infrastructure, especially for SMEs that depend on external IT services, TecPart encourages proportionate certification mechanisms for DPP service providers – provided they ensure data security and continuity without creating new barriers.

In addition, to ensure data protection, legal certainty, and consistent enforcement across the EU single market, TecPart also supports the requirement that DPP service providers — including backup services — be based in the European Economic Area (EEA). This aligns with existing EU data frameworks and provides SMEs with legal clarity and recourse within a harmonized regulatory space.

2. Complementary standards for technical plastics in regulated markets

While EN 10204 offers a foundational structure for inspection documentation, the complexity of plastic products — especially in highly regulated technical product sectors such as automotive, electronics and medical applications — requires additional technical standards to capture relevant performance and compliance data.

Since vertical markets follow different regulations and demand different types of information, the Digital Product Passport (DPP) will need to serve as the harmonizing layer — providing one common data syntax and one process standard. This enables an application-agnostic data set that reduces the complexity of sectoral requirements while ensuring verifiability and traceability – both for downstream users such as recyclers, and upstream reporting obligations

Key normative frameworks for all technical plastic product segments to consider are:

- REACH Regulation (EC 1907/2006): Controls the use of chemical substances, including those embedded in plastics.
- SCIP Database (ECHA): Repository for substances of very high concern (SVHCs) in articles, with product-level metadata and regulatory identifiers.

Specific normative frameworks for automotive, electronics and medical applications that would need to complement EN 10204 include:

2.1 Automotive sector:

- VDA 231-106: Defines requirements for material data sheets for thermoplastic materials.
- IMDS (International Material Data System): A de facto industry standard for material and substance reporting across the automotive supply chain. It includes metadata on component structure, weight, and substance content.
- VDA 5050: An emerging standard for interoperable data exchange between OEMs and suppliers, relevant for future DPP use cases.
- Catena-X: Industry alliance providing standardized data models (e.g., Asset Administration Shell) for product lifecycle and sustainability data across the supply chain.

2.2 Electronics sector:

- RoHS Directive (2011/65/EU): Regulates hazardous substances in electrical and electronic equipment.
- IEC 62474: Material declaration standard for the electronics industry, including metadata on recyclability and substance risks.
- • BOMcheck: Centralized compliance platform aligned with IEC 62474, enabling suppliers to efficiently manage and share RoHS and REACH compliance data across the supply chain.

2.3 Medical technology:

- ISO 10993 Series: Biological evaluation of medical plastics.
- ISO 13485: Quality management systems for medical devices.
- MDR (EU) 2017/745: Regulatory framework for placing medical devices on the EU market.

These standards define critical parameters such as chemical composition, mechanical and thermal performance, recyclability, and biocompatibility. When paired with EN 10204-based documentation, and linked to metadata systems like IMDS they offer a reliable foundation for product and material-level compliance reporting.

3. Sectoral analysis: EN 10204 as a backbone for Digital Product Passports

3.1 Automotive industry: Established practice and future opportunity

The automotive sector has been an early adopter of structured inspection and certification protocols. EN 10204 inspection certificates — particularly type 3.1 — are already widely used for both metallic and non-metallic safety-relevant components, including high-performance thermoplastics used in under-the-hood applications, structural reinforcements, or airbag modules. The integration with systems such as IMDS allows these certificates to feed into lifecycle databases, facilitating downstream analysis of material origin, regulatory compliance, and environmental impact.

This aligns with regulatory developments such as the revised End-of-Life Vehicles (ELV) Regulation and the emerging Environmental Vehicle Passport, which require increased transparency and data traceability across the vehicle lifecycle.

Extending this structure into a Digital Product Passport would require standardizing the data exchange format (e.g., via XML or JSON-LD) and linking it to broader product metadata such as function, repairability, and embedded energy use. Initiatives such as Catena-X provide the needed semantic frameworks to do so.

Digital Product Passports must also support downstream use cases, including repair, reuse, and second-life applications. For recyclers, structured access to relevant product and material data is critical. TecPart supports the integration of such functions, provided access rights and IP concerns are carefully balanced.

3.2 Electronics sector: High potential for harmonization

In the domain of electrical and electronic equipment, particularly under the WEEE directive, technical plastics constitute a major fraction of the product weight. However, documentation and traceability are often limited to substance-level compliance (e.g., RoHS, REACH) without detailed inspection records.

Adopting EN 10204-based inspection protocols for plastic components in WEEE products could significantly improve the granularity and reliability of data used for digital product passports. This would allow stakeholders to assess not only chemical compliance but also performance-related data such as flame retardancy, mechanical stability, or recyclability.

Such an approach aligns with the upcoming Ecodesign for Sustainable Products Regulation (ESPR), which will mandate DPPs across product categories, including electronics. EN 10204 documentation, when digitized and harmonized with data spaces like the European Dataspace for Manufacturing or ECHA's SCIP database, could play a vital role in ensuring regulatory consistency.

From an SME perspective, leveraging existing quality control documentation and aligning it with EN 10204 formats could offer a low-barrier entry point into the DPP ecosystem—particularly when paired with open-source tools, modular templates, and support from industry alliances.

3.3 Medical devices: A cautious but strategic use case

The medical technology sector is governed by stringent regulatory frameworks, and any integration of EN 10204-based systems must respect these boundaries. Nonetheless, inspection certificates are already a requirement for certain plastic parts that are part of Class II or III medical devices.

In such cases, a type 3.1 certificate could confirm conformity with ISO 10993 test results or biocompatibility specifications. Combined with ISO 13485 documentation and UDI (Unique Device Identification) systems, a Digital Product Passport augmented with EN 10204 principles could provide an additional compliance and traceability layer.

The challenge lies in ensuring the interoperability of medical documentation with broader DPP architectures, especially under strict data protection and clinical safety mandates. However, with careful alignment and robust metadata structures, the benefits of transparency, supply chain auditability, and lifecycle data integration are substantial.

4. Conclusion: Strategic standardization for ESRS-ready plastics

The EN 10204 standard, when appropriately adapted, presents a compelling opportunity to unify inspection and compliance documentation across material classes and industry sectors. Its structured approach to quality and conformity reporting is highly compatible with the objectives of Digital Product Passports and the broader ESRS framework.

For technical plastic products — particularly in regulated markets such as automotive, WEEE, and medical technology — EN 10204 offers a practical basis for integrating quality data, regulatory compliance, and sustainability metrics into a single digital ecosystem. When combined with sector-specific standards like IMDS, IEC 62474, or VDA data sheets, the result is a harmonized and future-proofed approach to material and product transparency.

To make this transformation accessible to SMEs, stakeholders must emphasize practical, low-cost implementation paths. These include ready-to-use templates, integration with existing ERP and quality systems, and open-source digital tools that automate data entry and certificate generation. By combining EN 10204 with interoperable metadata standards and product-level frameworks, SMEs can participate in DPP schemes without prohibitive complexity. This includes the certification of DPP service providers, where appropriate, as outlined above.

In addition, cross-sectoral pilot projects, common data models, and policy-level recognition of EN 10204 within ESPR and CSRD frameworks are needed to support market uptake and legal certainty.

By combining robust documentation standards with digital interoperability and low-barrier implementation tools, SME plastic processors and recyclers can actively participate in the DPP landscape — not only to comply with regulation, but to contribute to a circular, transparent, and digitally enabled economy.

About TecPart – Verband Technische Kunststoff-Produkte e.V. (TecPart)

TecPart is the industry association representing manufacturers of technical plastic products in the public sphere, in politics, and in national and European committees. Its members are highly specialized experts in compounding and plastics recycling, additive manufacturing, thermoforming, injection molding, and other plastics processing technologies. They develop, design, and produce technical plastic components as well as the tools required for their manufacture. Customers and end-users include the automotive, electrical, mechanical engineering, and medical technology industries. With more than 310,000 employees in around 3,000 companies and annual sales of approximately €70 billion, plastics processing is among the most powerful industrial sectors in Germany. The roughly 910 manufacturers of durable technical plastic products represented by TecPart employ around 100,000 people and generate annual sales of €19.7 billion.

For more information, visit www.tecpart.de