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Technical Bulletin
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Sustainability in Personal Protective Equipment: An introduction to PCR, LCA, EPDs

In today's world, there is a growing demand to enhance sustainability practices across all aspects of life, including work and the personal safety industry.

Sustainability involves a comprehensive approach that emphasises increasing certain practices while decreasing others to help promote environmental health, social responsibility, and economic viability. It guides us to increase the use of VOC-free (Volatile Organic Compounds) and water-based substances, as well as materials that comply with the Program for the Endorsement of Forest Certification (PEFC), ensuring responsible sourcing and reducing environmental impact. At the same time, it encourages us to decrease the use of chemicals of concern, which can be harmful to human health and the environment, thereby fostering safer and healthier practices. This balanced approach supports a sustainable future. More than this, products should not only meet customer performance requirements, but also ideally offer sustainability benefits, such as reduced waste, energy efficiency, and extended lifetimes.

In the context of Personal Safety, opportunities for improvement include promoting the use of reusable Personal Protective Equipment (PPE), extending the service life of disposable options, developing alternatives, and selecting PPE made from more sustainable materials. However, whether a product is better from an environmental perspective depends on many aspects, including the manufacturing process of the product and the materials it is made from, as well as on the required maintenance.

The evolving landscape and learning curve raise many questions about what the ‘right’ course of action is. A prime example is the debate between using recycled materials versus virgin materials, with ongoing discussions about the sustainability of alternative-derived polymers versus virgin polymers. It's important to recognise that choices, such as using a recycled instead of a virgin material, are not always straightforward as recycled materials can sometimes have a greater environmental impact due to the processing required. Here is where we would see the benefit of a Life Cycle Assessment to help understand the realities better. Ongoing development and education are critical components of this journey and should incorporate sustainability practices wherever applicable.

While there are various approaches to achieving more sustainable solutions in the market, 3M believes that science and data-driven decisions must guide these efforts. Conducting Life Cycle Assessments (LCAs) and using standardised Product Category Rules (PCRs), to create Environmental Product Declarations (EPDs) is one of the essential ways for making informed decisions regarding the full environmental impact of a product. These assessments offer crucial data to evaluate environmental benefits by highlighting improvements across various aspects of product design and production, clearly illustrating how environmental impacts can vary and evolve.

The aim of this bulletin is to provide an introduction that explains why these concepts are important, why they matter, and how they can help inform your PPE and sustainability decisions.

What is a ‘Product Category Rule’ (PCR)?

Also known as a PCR, they could be viewed as the first stage in understanding the environmental impact of a product. PCRs provide a uniform and standardised set of instructions and guidelines for a category of products to be assessed against. Creating a single standard globally to measure products against helps ensure consistency and comparability, whilst contributing to a way to harmonise sustainability claims. PCRs are critical in establishing a framework for standardising sustainability assessments, benefiting customers, manufacturers, product developers, and regulators alike.

3M is proud to be a leader in developing Product Category Rules (PCRs) within the Personal Protective Equipment (PPE) sector, in collaboration with EPD International. This organisation brings together a group of industry experts, including manufacturers, to create PCRs, ensuring a comprehensive and standardized approach. Championing a PCR for respiratory protection devices (RPD) in October 2024, 3M intends to support the introduction of further PPE PCRs to support customers evaluations, including the release of a PCR for hearing protection in October 2025.[1]

[1] Those PCR’s can be consulted on https://www.environdec.com.

What is a ‘Life Cycle Assessment’ (LCA)?

While the PCR can be seen as the recipe to create an LCA and an EPD for a specific product category, the LCA is the study used to thoroughly assess the environmental impacts of a product over its life cycle, and across multiple impact categories.

Life Cycle Assessments (LCAs) are essential tools for evaluating the environmental impact of products throughout their entire life cycle, from raw material extraction to disposal. Conducting LCAs allows for informed decisions about the sustainability of PPE products and processes. These assessments provide comprehensive data on various environmental factors, such as energy consumption, greenhouse gas emissions, water usage, and waste generation. By analysing these factors, LCAs not only help generate the information to create the Environmental Product Declaration, they can help identify areas where advancements can be made to reduce the overall environmental footprint.

In the context of PPE, LCAs are particularly important when considering changes in materials or manufacturing processes. The choice between different types of materials can be better understood through LCAs, which reveal more about the environmental impact associated with each option. This scientific and data-driven approach ensures that the environmental impact of products are better understood.

Overall, LCAs are essential for driving science-based and data-driven decisions. This is fundamental in helping develop products which minimise negative influences and ideally drive towards a positive environmental impact. An LCA also aids in assessing the current impact of a product against a PCR, generating the information to create the Environmental Product declaration.

What is an ‘Environmental Product Declaration?’ (EPD)?

Having created the standardised rules (PCR) to conduct a life cycle assessment of the product, the EPD communicates the LCA results in a standardized and verified document.

EPDs are developed in accordance with “ISO 14025: Environmental product declarations” based on LCAs, using specific PCRs, and for specific categories of products. They are standardized documents that provide third-party verified, objective data about the environmental impact of a product. EPDs offer detailed information on product composition, system boundaries, and impact results, such as CO_2 emissions and water consumption. They are administered by external program operators and made publicly available.

EPDs offer a transparent and consist approach in certain sustainability claims, which can help customers in their product and manufacturer decision making process.

Summary

- The Product Category Rule (PCR) provides a standardised set of instructions and guidelines for a category of products to be assessed against.
- PCRs allow for data comparisons on similar products with reduced risk of making too many significant assumptions.
- Life Cycle Assessments (LCA) are essential tools for evaluating the environmental impact of products throughout their entire life cycle, from raw material extraction to disposal.
- The LCA is specific to the product being evaluated and cannot be used to compare various products from different sources of supply, for example.
- The Environmental Product Declaration (EPD) developed in accordance with ISO 14025, is the standardised document, which provides third-party verified, objective data from the LCA about the environmental impact of a product.
- EPDs are publicly available and can help inform customers of the environmental impact of PPE as part of their product assessment and selection process.
- 3M adheres to a methodical approach and recognizes the important role of PCRs, LCAs, and EPDs in enhancing product sustainability and offering clear, data driven information on the environmental aspects of PPE.
- The future of LCAs and EPDs lies in the development of scalable, harmonised approaches that enhance data quality and streamline the assessment process, to provide better information for customers.

For more information on 3M’s approach to sustainability and our vision, speak to one of our 3M representatives, visit the 3M Sustainability website or read our 3M Global Impact Report 2025.

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