
WEBINAR
DURABILITY IN TEXTILES:
UNDERSTANDING PEFCR,
REFASHION, WRAP, ESPR
& LCA REQUIREMENTS

WELCOME TO THE WEBINAR

Before we begin, here are some housekeeping items:

- All participants will have their lines automatically muted. If you have questions during the webinar, please type them into the chat.
- The webinar recording and presentation file will be shared with you afterwards.

OUR SPEAKERS TODAY

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AGENDA

01 **Importance of Durability and Regulatory Landscape**

02 **Introducing ESPR and Physical Durability Testing Requirements – PEFCR, Refashion & WRAP**

03 **Comparison of PEFCR, Refashion & WRAP**

04 **How LCA supports PEFCR and sustainability claims**

05 **Q & A**

1

IMPORTANCE OF DURABILITY AND REGULATORY LANDSCAPE

WHY “DURABILITY” IS IMPORTANT ?

Voice of customers

- Half of the customers willing to pay higher price to buy items that are made to last for longer and repairable while continuing to look good
- Expecting recognized ways to measure and communicate longevity
- Could be altered for fit or style
- Majority of global consumers say durability is an important attribute for their clothing
- Longevity expectations
  - T-shirts: 3.3 years (2013) => 4.0 years (2021)
  - Jeans: 3.1 years (2013) => 4.1 years (2021)
  - Dresses: 3.8 years (2013) => 4.6 year (2021)

Source: Citizen Insights: Clothing Longevity and Circular Business Models receptivity in the UK, October 2022)

WHY “DURABILITY” IS IMPORTANT ?

Impact of fast fashion

- In EU, textile consumption increased from 17 kg per person in 2019 to 19 kg per person in 2022
- Simple and low cost design
- Rush manufacturing
- Shorten quality assurance check
- Lifespan of clothes declined
- The European Commission is calling for an end to fast fashion by 2030

WHY “DURABILITY” IS IMPORTANT ?

- Fashion and Textile Industry is the 3rd highest emitter of greenhouse gases globally
- Consumes 98 million tonnes of non-renewable resources every year and uses 93 billion cubic metres of water annually
- Global garment production to increase 63% by 2030 which is equivalent to 500 billion shirts
- If not fully utilized before disposal, the amount of waste produced will be out of control
- **Durability** is one of the key parameters to enhance sustainability
- Products that are more **durable** means they have a longer useful life and less probably to be discarded as waste
- Extending the average life of clothing by 9 months could reduce carbon, water and waste footprints by around 20 - 30%

Number of garment produced and sold

Garment utilization

REGULATORY LANDSCAPE

Global trend on sustainability and circular economy

(1) The European Green Deal

- A comprehensive strategy by the European Union aimed at making Europe the first climate-neutral continent by 2050 i.e. achieving net zero greenhouse gas emissions
- One of the building blocks is the circular economy action plan (CEAP)
  - In March 2022, the commission adopted package of measure proposed in the circular economy action plan
  - One of the strategies from the action plan is to make textile more **durable**, repairable, reusable and recyclable, to tackle fast fashion, textile waste and the destruction of unsold textiles, and ensure their production takes place in full respect of social rights
  - By 2030, textile products placed on the EU market are **long-lived** and recyclable, made as much as possible of recycled fibres, free of hazardous substances and produced in respect of social rights and the environment

REGULATORY LANDSCAPE

Global trend on sustainability and circular economy

2) The Ecodesign for Sustainable Products Regulation (ESPR)

- (EU) 2024/1781 entered into force on July 18, 2024 replacing the Ecodesign Directive 2009/125/EC
- Expand its scope to cover almost all categories of physical goods placed on the EU market, including **textiles**
- First working plan for 2025-2030 was adopted by EU commission on April 16, 2025 including "**Textiles, in particular garments** and footwear". Textiles are the first product category to be regulated due to their high potential to extend product lifetimes. The Delegated Act detailing the ecodesign requirements shown in below table is expected in 2027 setting product specific performance requirements. **Durability** is one of them

Durability	Reliability	Reusability	Upgradability
Reparability	Recyclability	Recycled content	Presence of substances of concern
Possibility of remanufacturing	Possibility of recovery of materials	Possibility of maintenance and refurbishment	Resource use or resource efficiency
Energy use or energy efficiency	Water use and efficiency	Environmental impacts, including carbon and environmental footprint	Expected generation of waste materials

REGULATORY LANDSCAPE

Global trend on sustainability and circular economy

3) The Anti-waste and Circular Economy Law in France

- Adopted in 2020, the law aims to eliminate waste and pollution from the design stage and transform the system of production, distribution, and consumption from a linear to a circular economy model
- 5 goals to be achieved
  - Stimulate design for the circular economy
    - Stimulating high-quality design for goods and packaging with an emphasis on **durability**, reusability, design for repairability and remanufacturing, recyclability and composability
  - Manage resources to preserve value
  - Make the economics work
  - Invest in innovation, infrastructure and skills
  - Collaborate for system change

REGULATORY LANDSCAPE

Global trend on sustainability and circular economy

4) The Green Claims Directive

- The EU found that over half of environmental claims are misleading or unfounded. This directive was created to combat "greenwashing" and ensure consumers receive trustworthy, verifiable information
- **Longevity** or **Durability** as a claim, brands can no longer make generic "sustainable" claims without proof. A claim that a product is "long-lasting" or has a "lower environmental impact" due to its durability must be backed by data. The PEFCR Annex V provides the standardized, scientific methodology to generate this data
- The Directive specifically prohibits making unfounded claims about a product's lifespan or repairability. For example, claiming a garment will last for a certain number of wears must be verified through accredited testing
- The Directive empowers national authorities to fine companies up to 4% of their annual turnover for widespread infringements. This makes accurate **durability** claims a significant legal and financial risk
- Action for Brands: Use the PEFCR for apparel and footwear which is the EU's recommended methodology for substantiating environmental claims, including those related to durability

REGULATORY LANDSCAPE

Global trend on sustainability and circular economy

5) Extended Producer Responsibility (EPR)

- In 2025, The European Parliament adopted new rules requiring producers to cover the costs of textile collection, sorting, reuse, and recycling. The new law places responsibility firmly on the producers
- All companies making textiles available in the EU - including those selling online from outside, must cover the costs of collecting, sorting, re-using and recycling their products. Clothing, footwear, fashion accessories and household textiles (e.g. curtains, blankets, bed linen) are included. Member States can also decide to add mattresses
- Each Member State must establish its EPR scheme for producers within 30 months of the directive entering into force. Micro-enterprises will have one extra year
- At buyer level, they are likely to demand more sustainable materials and circular design from their global suppliers as products built for **durability** and recyclability will reduce EPR costs and enhance brand reputation
- Otherwise, rental, resale and repair services can add value while cutting waste may be one of the ways out

2

INTRODUCING ESPR AND PHYSICAL DURABILITY TESTING REQUIREMENTS – PEFCR, REFASHION & WRAP

ESPR

Technical Brief: The ESPR Framework

Unlike the previous Ecodesign Directive which focused on energy-using products (electronics), the Ecodesign for Sustainable Products Regulation (ESPR), which entered into force in 2024, applies to almost all physical goods.

- **Status**: The framework is live.
- **Enforcement Mechanism:** Product-specific 'Delegated Acts'.
- **Priority 1:** Textiles and apparel have been designated as the top-priority sector due to high environmental impact.
- **Global Reach:** The law applies to any 'economic operator' placing products on the EU market, regardless of headquarters location.

Key Dates

July 2024
ESPR formally entered into force. The transition period for foundational transparency requirements began

April 2025
First Working Plan adopted. Textiles officially ranked as the #1 priority for delegated acts.

July 2026
The hard deadline for large enterprises to end the destruction of unsold apparel and footwear.

Early 2027
Anticipated enforcement of product-specific Ecodesign and Digital Product Passport (DPP) rules.

ESPR Delegated Acts – 2026 Status & Timeline

ESPR Delegated Acts: Current Status (2026)

Key Developments:

- **Framework Established:** The Ecodesign for Sustainable Products Regulation (ESPR) (EU) 2024/1781 was published in June 2024.
- **Preparatory Study Phase:** We are currently in the **3rd Milestone** (Dec 2025 – Mar 2026) of the preparatory study, focusing on:
  - Base case environmental/economic analysis.
  - Design options for durability and recyclability.
- **Next Steps (4th Milestone → Final Adoption):**
  - **4th Milestone:** Will define specific policy scenarios and specific data elements for **Digital Product Passport (DPP).**
  - **Delegated Act Adoption:** The final requirements for textiles will be adopted following the conclusion of these studies.

Focus Area: Defining the "Base Case" & Impact Hotspots

Environmental & Economic Analysis (Base Cases)

Scope of Analysis:

- **Representative Products:** The study models impacts based on three core categories:
  - **Knitted Products** (e.g., T-shirts, sweaters).
  - **Denim Products** (e.g., jeans).
  - **Other Woven Products** (e.g., jackets, trousers).
- **Identified Impact Hotspots:**
  - **Raw Materials (LCS1):** Accounts for **60-63%** of total lifecycle environmental impacts, driven by land use and resource consumption.
  - **Manufacturing (LCS2):** The second largest contributor (~20% impact), primarily due to energy use in dyeing and finishing.

Emerging Design Options (The Core of Future Regulation)

Proposed Design Options (DOs) for Delegated Acts

The 4 Key Design Options Under Assessment:

The Preparatory Study is assessing these four technical pillars for the Delegated Acts.

DO1 – Robustness
Focus on physical durability standards (pilling, abrasion, color fastness) to extend active lifespan.

DO2: Recyclability
Design requirements for disassembly and mono-materiality to facilitate high-quality recycling.

DO3: Recycled Content
Mandatory integration of recycled fibers. Example target under review: 20% recycled cotton for denim.

DO4: Footprint
Mandatory disclosure of the manufacturing environmental /carbon footprint via the DPP.

Requirements: Substances of Concern

Mandatory Tracking

The ESPR introduces a requirement to track "Substances of Concern" (SoC) in the Digital Product Passport.

- **Threshold:** Reporting likely triggered at **0.1% weight by weight**.
- **Scope:** Includes REACH SVHCs, CLP hazards, and substances that negatively affect recycling.

Action Required

Map supply chains for restricted substances immediately. The definition of "Concern" is broader than just "Banned" - it includes recycling disruptors.

Innovation Opportunity

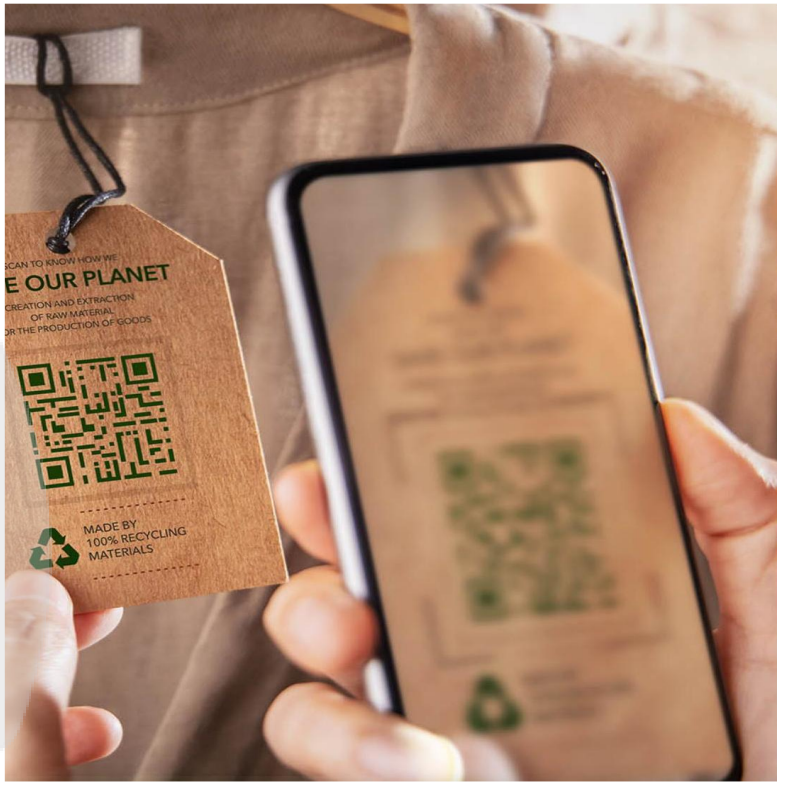
Adopt a "Safe and Sustainable by Design" approach to substitute hazardous chemicals early in the design phase.

The Technical Architecture of a DPP

The Digital Product Passport (DPP) is the technical heart of the ESPR. It moves product information from a static, physical care label to a dynamic, machine-readable digital twin. This is a transition from 'managing labels' to 'managing a distributed data ledger' that covers mandatory fields.

A DPP is more than just a QR code; it is a standardized data infrastructure. According to the latest 2026 guidelines, a compliant DPP must feature three distinct layers:

- The Data Carrier: The physical bridge (QR Code, NFC tag, or RFID) that complies with ISO/IEC 15459:2015.
- The Unique Identifier (UID): A persistent digital link to the specific product model, batch, or individual item.
- The Decentralized Registry: A cloud-based ledger that allows consumers, repairers, and customs authorities to access real-time data on composition and recyclability.



The Three Layers of Mandatory Data

1. Identification & Traceability

The baseline requirements coming in the 2026 delegated act.

- ID Type
- Origin
- Ownership

2. Environmental Performance

The data derived from PEFCR studies.

- Product durability
- Carbon footprint
- Water footprint
- Land use

3. Circularity & End-of-Life

Information for the repair and second-hand market.

- Repair
- Recycle
- Substances of concern

Ban on Destruction of Unsold textiles

The Core Regulation:

- **Prohibition:** The destruction of unsold textile products will be legally prohibited.
- **Effective Date:** The ban enters into force on **19 July 2026**.
- **Scope:** Applies to "unsold textile products" generated at the retailer stage (pre-consumer waste), including:
  - Surplus stock and deadstock.
  - Products returned by consumers (e.g., right of withdrawal).
- **Derogations:** Destruction is only permitted in specific cases, such as for health and safety reasons.
- **SME Exemption:** Micro and small enterprises are currently **exempted** from this prohibition.

PEFCR, REFASHION AND WRAP

OVERVIEW

	Product Environmental Footprint Categories Rules (PEFCR) - EU	Refashion Durability Program – France	Textiles 2030 (WRAP) – UK
Scope & Focus	• Broad focus on the overall environmental impact of products across their entire life cycle.	• Specific focus on the physical durability of textile products, with financial incentives for meeting durability criteria.	• Help brands, manufacturers, and retailers ensure their products remain functional under normal use and washing conditions.
Methodology	• Lab testing and Life Cycle Assessment (LCA) to quantify environmental impacts	• Relies on laboratory tests to assess physical durability based on predefined criteria.	• Define product categories, test methods, and classification criteria for durability assessment.
Incentives	• Provides a standardized method for environmental impact assessment, aiding in regulatory compliance and market differentiation.	• Offers financial bonuses for products that meet durability standards.	• Include a comprehensive set of tests to ensure clothing maintains performance over its lifetime.

PEFCR

PHYSICAL DURABILITY REQUIREMENTS - PEFCR

- In October 2019, the European Commission approved the project to develop **Product Environmental Footprint Categories Rules (PEFCR)** for apparel and footwear
- As part of the development of PEFCR, a PEF study of the **R**epresentative **P**roduct (PEF-RP) shall be carried out on the representative products with the intention of identifying the most relevant impact categories, life cycle stages, processes, elementary flows, and any other major requirements
- There are 13 representative products:

Apparel	**Apparel Accessories**
1. T-shirts	10. Apparel accessories
2. Shirts and blouses	
3. Sweaters and midlayers	**Footwear**
4. Jackets and coats	11. Open-toed shoes
5. Pants and shorts	12. Closed-toed shoes
6. Dresses, skirts and jumpsuits	13. Boots
7. Leggings, stockings, tights and socks	
8. Underwear	
9. Swimwear	

PHYSICAL DURABILITY REQUIREMENTS - PEFCR

- Physical Durability Tables from Annex V of the PEFCR provide 3 levels of testing requirement for those 13 representative products, namely **“Basic Level”, “Moderate Level” and “Aspiration Level“**
- With a few revision in version 1.3, 2.0, 3.0, the final version 3.1 was published on Apr 29, 2025 and The EU Commission gave the green light on May 14, 2025

(i) Classification of sub-categories under the 13 representative products

- Apparel: Woven/Knit - All Uses, Non-Sport, Sport, Tops, Bottoms. Workwear is partially in the scope like Uniforms (e.g. for airline crew, hotel staff, etc.)
- Apparel Accessories
- Footwear: Infant/Children/Adult – Non-Sport, Multipurpose with/without heel, Indoor, Outdoor, Water Sports, With Cleats, Linear, Multidirectional

(ii) Exemption products

- Made up of 80% or more genuine leather and/or fur
- Menstrual underwear

(iii) Out of scope products

- Protective wear (PPE), they are under another regulation

PHYSICAL DURABILITY REQUIREMENTS - PEFCR

Key parameters

- Tests should be performed in the “As received” state either on “Material” or “Finished product” provided that they are from production quality. Tests require product evaluation after care cycles (i.e. Dimensional stability, spirality and appearance) shall be conducted at the product level
- Variation in material composition, construction, fabric weight, dyeing method, fabric treatment and finishes, testing shall be performed individually
- Samples shall be selected based on majority composition of the products. Any individual materials comprising over 5% of the total composition of the product will need to be tested corresponding to the relevant product category
- Example: A non-sport T-shirt, front panel 100% Cotton jersey, back panel 100% polyester twill. Overall content is 94% Cotton 6% Polyester
  - Cotton knitted front panel: Test according to “Knit, non-sport”
  - Polyester woven back panel: Test according to “Woven, all uses”

PHYSICAL DURABILITY REQUIREMENTS - PEFCR

	Machine Wash			Hand Wash			Dryclean		
	Dimensional stability	Spirality	Appearance	Dimensional stability	Spirality	Appearance	Dimensional stability	Spirality	Appearance
Jackets & Coats (Category 4)	5 cycles			5 cycles			3 cycles		5 cycles
Other categories	5 cycles		15 cycles	5 cycles			3 cycles		5 cycles

- Cleaning is according to the care label on the product and following the rationale in the table on the next slide
- More stringent washing method should be selected first i.e. Machine wash over Hand wash
- Dryclean should only be used when it is exclusive in the label i.e. Dryclean only

PHYSICAL DURABILITY REQUIREMENTS - PEFCR

Key parameters

- Apparel – Minimum the darkest colorway shall be tested
- Footwear – Best selling products carry over from previous seasons shall be tested. For new products, colorway with the highest planned production volume shall be tested
- Test results valid for one year
- **Basic, Moderate and Aspirational level** contribute to 5, 10 and 15 test points while below Basic is 0. For example, if the sample fulfil the aspirational level requirement for a test, it will score 15 test points
- Each test is assigned with a “Criticality weighting” in “%”, the higher the % the higher importance of that test
- Test points from the 3 levels and the % from criticality weighting is part of the calculation of the product lifetime (specific duration of service or DoS)

PHYSICAL DURABILITY REQUIREMENTS - PEFCR

Apparel category – T-shirt (Woven, All uses) (partially captured)

Table 1 - Subcategory 1: T-shirts, Segment: Woven, All uses

End of Life Category	Required Normative Test	Criticality, Weighting	Basic Level	Moderate Level	Aspirational Level
Product Deformation	ISO 6330/ISO 5077: Determination of dimensional change after washing and drying (%)	Yes, 10%	4 < x ≤ 6%	2 < x ≤ 4%	x ≤ 2%
Fabric Strength	EN ISO 12947-2: Determination of the abrasion resistance of fabrics by the Martindale method - Part 2: Determination of specimen breakdown (cycles)	2 of 3 needed, 10%	6,000 < x ≤ 15,000	15,000 < x ≤ 25,000	x > 25,000
	ISO 13934-2: Tensile properties of fabrics - Part 2: Determination of maximum force using the grab method (N)	2 of 3 needed, 10%	100 < x ≤ 150	150 < x ≤ 300	x > 300
	ISO 13937-1: Tear properties of fabrics - Part 1: Determination of tear force using ballistic pendulum method (Elmendorf) (N)	2 of 3 needed, 10%	6 < x ≤ 8	8 < x ≤ 12	x ≤ 12
Fabric Aspect Damage	ISO 15487: Method for assessing appearance of apparel and other textile end products after domestic washing and drying - Collar appearance: Curled or blistered aspect	No, 7%	NA	x = 3	x = 5
	ISO 15487: Method for assessing appearance of apparel and other textile end products after domestic washing and drying - Product aspect: Holes or broken yarn	Yes, 10%	Absence of defect (15 pt): no hole and no broken yarn Presence of defect (0 pt): hole or broken yarn		
	ISO 15487: Method for assessing appearance of apparel and other textile end products after domestic washing and drying - Pilling and fuzzing	No, 3%	x = 2/3	3 ≤ x ≤ 4	x ≥ 4/5

End of Life Category	Required Normative Test	Criticality, Weighting	Basic Level	Moderate Level	Aspirational Level
Product Deformation	ISO 6330/ISO 5077: Determination of dimensional change after washing and drying (%)	Yes, 10%	4 < x ≤ 6%	2 < x ≤ 4%	x ≤ 2%

PHYS

Apparel category – T-shirt (Woven, All uses) (Cont'd)

- Calculation of the Intrinsic Durability Product Score (IDPS)

Criticality, Weighting

Test	Test result	Test score	Weighting	Total
Product deformation	moderate	10	10	10 * 10 = 100
Fabric strength test 1	moderate	10	10	10 * 10 = 100
Fabric strength test 2	basic	5	10	5 * 10 = 50
Fabric strength test 3	basic	5	10	5 * 10 = 50
Fabric aspect damage test 1	moderate	10	7	10 * 7 = 70
Fabric aspect damage test 2	basic	5	10	5 * 10 = 50
Fabric aspect damage test 3	moderate	10	3	10 * 3 = 30
Seam aspect damage	aspirational	15	10	15 * 10 = 150
Accessories aspect damage test 1	basic	5	10	5 * 10 = 50
Accessories aspect damage test 2	moderate	10	3	10 * 3 = 30
Colour damage test 1	moderate	10	3	10 * 3 = 30
Colour damage test 2	aspirational	15	10	15 * 10 = 150

IDPS

= Sum of all Weighted Individual Test Scores / Total Product Weighting

= (100+100+50+50+70+50+30+150+50+30+30+150) / (10+10+10+10+7+10+3+10+10+3+3+10)

Test results	Test score
Below basic	0
Basic	5
Moderate	10
Aspirational	15

0 — **8.958** — 15

IDPS (Intrinsic Durability Product Score)

PHYSICAL DURABILITY REQUIREMENTS - PEFCR

Apparel category – T-shirt (Woven, All uses) (Cont'd)

- Converting IDPS to Intrinsic Durability Multiplier (IDM)
  - IDM = 0.67 if IDPS < 2.5
  - IDM = 0.514 + (0.0624 x IDPS) if IDPS ≥ 2.5

Example in previous page IDPS: 8.958
IDM = 1.07
Assume no repairability service offer

- Calculation of Repairability Multiplier (RM)
  - Repair Cost Ratio (RC), average repair cost / product selling price
  - Availability of Spare Parts (SP)
  - Repair Service (RS), availability and fee
  - Right to Repair (RRC), availability information on repair e.g. warranty, map etc.

PHYSICAL DURABILITY REQUIREMENTS - PEFCR

Apparel category – T-shirt (Woven, All uses) (Cont'd)

- Together with the "Default Product Duration of Service" and "Repairability Multiplier", the Product Lifetime (Specific Duration of Service)
- Product Lifetime (Specific Duration of Service) = D x I x R
  - D: Default product duration of service
  - I: Intrinsic Durability Multiplier (IDM)
  - R: Repairability multiplier (RM)

- For example, a T-shirt

	Worst	Example	Best
D: Default product duration of service	45	45	45
Intrinsic Durability Multiplier (IDM)	0.67	1.07	1.45
R: Repairability multiplier (RM)	1	1	1.15
Product Lifetime (number of uses) (Specific Duration of Service)	30	48	75

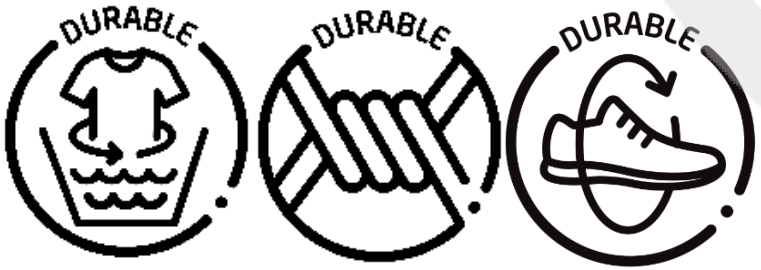
Table 7 - Default product duration of service per product sub-category

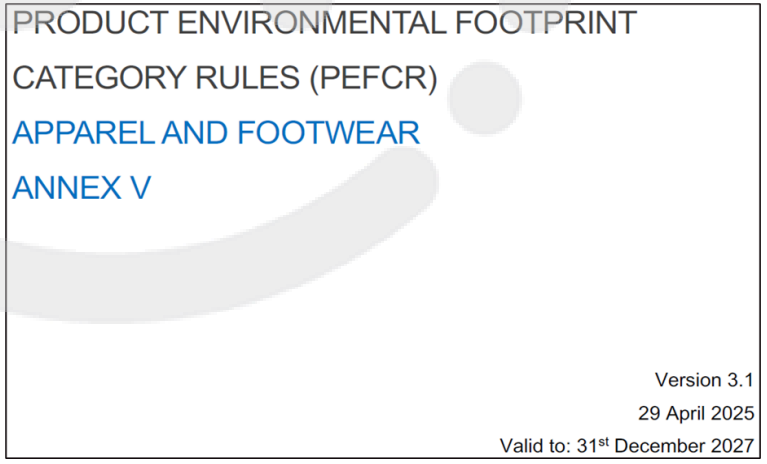
No.	Product sub-category	Product	Number of uses per product duration of service[4]
1	T-shirts	Average	45[5]
2	Shirts and blouses	Average	40
3	Sweaters and midlayers	Average	85
4	Jackets and coats	Average	100
5	Pants and shorts	Average	70
6	Dresses, skirts and jumpsuits	Average	70
7	Leggings, stockings, tights and socks	Average	55
		Leggings/tights	70
		Hosiery	50
		Socks	50
8	Underwear	Average	60
9	Swimwear	Average	30
10	Apparel accessories	Average	100
11	Open-toed shoes	Average	50
12	Closed-toed shoes	Average	100
13	Boots	Average	100

- The number of uses per duration of service includes all kinds of reuses such as consumer to consumer donation, reuse at end of life or reuse of donated unsold consumer products
- A use is defined as a 24-hour period, regardless of how many hours the apparel or footwear product is worn within this 24-hour period

INTERTEK HP (HIGH PERFORMANCE) MARK - DURABILITY

- Intertek HP Mark – Durability Testing Program aligned the product categories, number of cleaning cycles and bundled the testing requirements with PEFCR
- Fulfilling Intertek HP Mark Durability requirement represents the product also meets the Aspirational Level requirement in PEFCR
- For apparel, we expand the scope of testing including other important test items which are not found in the PEFCR especially on colorfastness like washing, water, perspiration, rubbing and light
- These colorfastness performance if not satisfactory are also the main source of client complaint like cross staining from denim jeans to a white t-shirt, color fading after certain period of exposure under sunlight etc.
- We also require the products to fulfil the same requirement for physical performance after repeated cleaning cycles instead of only the as received state in PEFCR



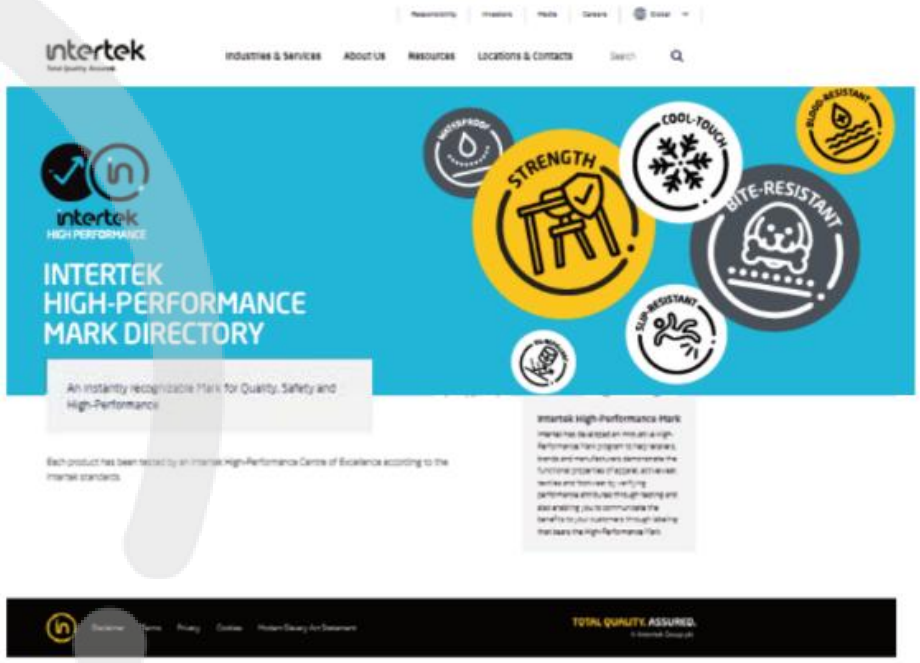


DELIVERABLES OF THE HP MARK PROGRAM

Trade Dressing

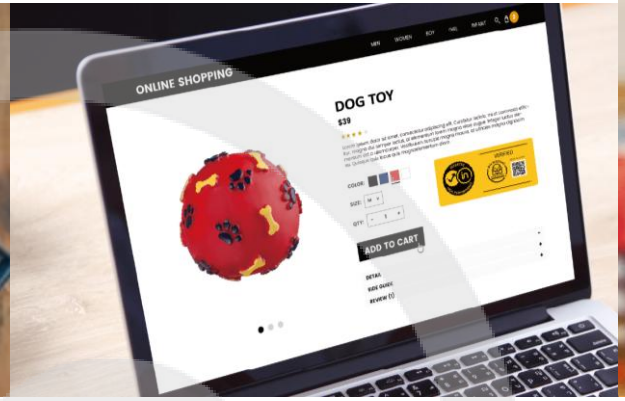
Certificate

HP Mark Directory

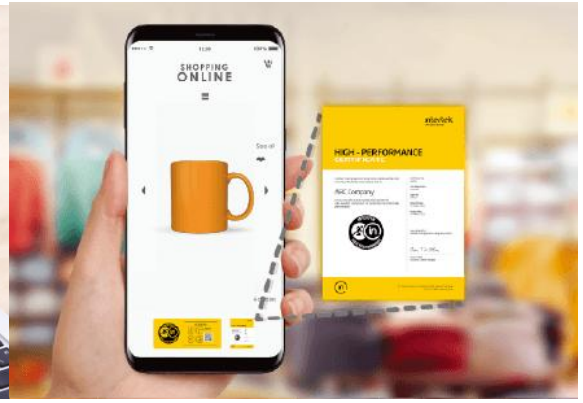


APPLICATIONS OF HP MARK

Product Tag



Website



Mobile Apps

Corporate Video

In-Store & Window Display

Brochure & Lookbook

Other Printed Materials

REFASHION

PHYSICAL DURABILITY REQUIREMENTS – REFASHION

- To encourage and reward the most virtuous eco-design initiatives or penalize the lest virtuous products
- The purpose is to reward products that minimize their environmental impact or penalize those whose recycling represents a danger
- First introduced in 2023, the bonus is paid by Refashion in 2025
- In 2025, the program is updated with new product categories introduced (e.g. infant products) for durability testing and also added an aspect for penalty for recyclability of textiles and footwear. Bonus to be paid by Refashion in 2026
- There are four aspects in the program

Durability	Environmental Certifications	Use of raw recycled materials	Recyclability
Bonus (+$)	Bonus (+$)	Bonus (+$)	Penalty (-$)
- Comply with Physical performance test e.g. dimensional stability, appearance, strength, pilling, abrasion, colorfastness etc.	- Ecocert® Ecological & Recycled Textiles Standard (ERTS) -Level 2 - Oeko-tex® Made in Green - Bluesign® - Fairtrade® Textile - Ecolabel Européen - Demeter® - GOTS - Bioré®	- From post-consumer waste - From open loop recycling of waste - Not from production off-cuts - Not from unsold items	- Presence of Metalloplastic fibers - Presence of Electronic or electrical components

PHYSICAL DURABILITY REQUIREMENTS – REFASHION

Eco-Modulation program - Durability

- The physical performance requirement were designed for below six product categories:
  - Textile – Knit (children, men and women)
  - Textile Knit (baby, 0 – 36 months)
  - Textile – Woven (children, men and women)
  - Textile Woven (baby, 0 – 36 months)
  - Household Linen – Knit and Woven
  - Footwear

- Each of the above product categories were breakdown into sub-categories:

PHYSICAL DURABILITY REQUIREMENTS – REFASHION

Eco-Modulation program - Durability

- Sub-categories:

Textile – Knit (11) (Children, Men and Women)	Textile - Knit (Baby) (8)	Textile – Woven (8) (Children, Men and Women)	Textile - Woven (Baby) (6)	Household Linen (3)	Footwear (5)
-	-	Denim	-	Bed Linen	Men's and Children's Shoes
Jackets, Coats	Jackets, Coats	Jackets, Coats	Jackets, Coats	Table Linen	Women's Shoes
Lingerie, Underwear	Lingerie, Underwear	Lingerie, Underwear	Lingerie, Underwear	Bath Linen	Indoor Shoes (children, men and women)
Nightwear	-	Nightwear	-	-	Layette Baby Shoes (not for walking)
Pantyhose/Tights	-	-	-	-	Baby Shoes
Pullover, Sweater	Pullover, Sweater	-	-	-	-
Skirt, Dress, Jumpsuit	Skirt, Dress, Jumpsuit	Skirt, Dress, Jumpsuit	Skirt, Dress, Jumpsuit	-	-
Socks	Socks	-	-	-	-
-	-	Shirt, Blouse	Shirt, Blouse	-	-
Sweat-shirt	-	-	-	-	-
Swimwear	Swimwear	Swimwear	Swimwear	-	-
Trousers/Pants, Shorts, Legging	Trousers/Pants, Shorts, Legging	Trousers/Pants, Shorts	Trousers/Pants, Shorts, Legging	-	-
T-shirt, Polo, Shirt, Blouse	T-shirt, Polo, Shirt, Blouse	-	-	-	-

PHYSICAL DURABILITY REQUIREMENTS - REFASHION

Eco-Modulation program - Key parameters for Durability

- **Lining is excluded from the program, testing is not required except appearance after cleaning**
- No weighting or scoring system, either Pass or Fail the requirement
- Tests shall be conducted on “Finished products” unless in very special case the size of garment is not sufficient like baby
- Number of washing cycles – Dimensional stability, Appearance and Spirality

	Dimensional stability	Appearance after washing	Spirality
Denim (Textile -Woven) (Children, Men and Women)	3	3	-
Jackets, Coats (Textile – Knit) (Children, Men and Women) and (Baby) Jackets, Coats (Textile – Woven) (Children, Men and Women) and (Baby)	5	5	-
Lingerie, Underwear (Textile – Knit) (Children, Men and Women) Lingerie, Underwear (Textile – Woven) (Children, Men and Women)	3	15	-
Lingerie, Underwear (Textile – Knit) (Baby) Lingerie, Underwear (Textile – Woven) (Baby)	5	15	
Nightwear (Textile – Knit) (Children, Men and Women)	3	10	10
Nightwear (Textile – Woven) (Children, Men and Women)	3	10	-
Pantyhose/Tights (Textile – Knit) (Children, Men and Women)	-	15	-
Pullover, Sweater (Textile – Knit) (Children, Men and Women)	3	3	3
Pullover, Sweater (Textile – Knit) (Baby)	5	15	5

PHYSICAL DURABILITY REQUIREMENTS - REFASHION

Eco-Modulation program - Key parameters for Durability

- Number of washing cycles - Dimensional stability, Appearance and Spirality (Cont'd)

	Dimensional stability	Appearance after washing	Spirality
Skirt, Dress, Jumpsuit (Textile – Knit) (Children, Men and Women) Skirt, Dress, Jumpsuit (Textile – Woven) (Children, Men and Women)	3	3	-
Skirt, Dress, Jumpsuit (Textile – Knit) (Baby) Skirt, Dress, Jumpsuit (Textile – Woven) (Baby)	5	15	-
Socks (Textile – Knit) (Children, Men and Women)	-	3	-
Socks (Baby)	-	15	
Shirt, Blouse (Textile – Woven) (Children, Men and Women)	3	3	-
Shirt, Blouse (Textile – Woven) (Baby)	5	15	-
Sweat-shirt (Textile – Knit) (Children, Men and Women)	5	15	5
Swimwear (Textile – Knit) (Children, Men and Women) Swimwear (Textile – Woven) (Children, Men and Women)	-	-	-
Swimwear (Textile – Knit) (Baby) Swimwear (Textile – Woven) (Baby)	5	15	-

PHYSICAL DURABILITY REQUIREMENTS - REFASHION

Eco-Modulation program - Key parameters for Durability

- Number of washing cycles - Dimensional stability, Appearance and Spirality (Cont'd)

	Dimensional stability	Appearance after washing	Spirality
Trousers/Pants, Shorts, Legging (Textile – Knit) (Children, Men and Women) Trousers/Pants, Shorts, Legging (Textile – Knit) (Baby) Trousers/Pants, Shorts, Legging (Textile – Woven) (Baby)	5	15	-
Trousers/Pants, Shorts (Textile – Woven) (Children, Men and Women)	5	3	-
T-shirt, Polo, Shirt, Blouse (Textile – Knit) (Children, Men and Women)	3	3	3
T-shirt, Polo, Shirt, Blouse (Textile – Knit) (Baby)	5	15	5
Bed Linen Table Linen Bath Linen	3	3	-
Footwear (all)	-	-	-

PHYSICAL DURABILITY REQUIREMENTS - REFASHION

Eco-Modulation program - Key parameters for Durability

- Number of washing cycles – Other performance tests
- The same test is subjected to as received or different number of washing cycles prior to testing according to the product categories, details can be found from the specification:

Product Category → **Pantalon/Pants - Short - Legging**

☐Bébé/Baby ☒Enfant/Child ☒Femme/Woman ☒Homme/Man

☒Maille/Knit ☐Chaine & Trame/Woven

Pantalon, pantacourt, short, legging
Trousers, cropped pants, shorts, leggings

Intitulé Essai	Nbre de lavages avant test / Number of washes before assessing test	Méthode à utiliser / Norm + conditions	Exigence / Requirement	*Test (UK)*
Evaluation de la stabilité dimensionnelle au lavage	5	NF EN ISO 5077	≤ 4%	*Determination of dimensional change after washing and drying*
Aspect après lavage - trou et fil tiré	15	NF EN ISO 15487	Absence de trou / no hole Absence de fil tiré / no pulled yarn	*Appearance after washing and drying - Hole*
Aspect après lavage - boulochage, ébouriffage, moutonnement			Boulochage / Pilling ≥ 4 Ebouriffage / Fuzzing ≥ 4 Moutonnement / Matting ≥ 4	*Appearance after washing and drying - pilling, fuzzing, matting*
Aspect après lavage- dégradation coloris			≥ 4	*Appearance after washing and drying - Color change*
Aspect après lavage - coutures			≥ 3-4	*Appearance after washing - seams*
Aspect après lavage - caractère lisse			≥ 3-4	*Appearance after washing - smooth character*
Aspect après lavage - motif imprimé/broderie			≥ 3-4	*Aspect après lavage - motif imprimé/broderie*
Aspect après lavage - manipulation des accessoires fonctionnels			Accessoires fonctionnels intacts / no change - functional	*Appearance after washing and drying - Functional accesssories*
Evaluation de l'élasticité des étoffes - déformation permanente	0	NF EN ISO 20932-1 Méthode/Method : A 5 cycles + 30 min relaxation	≤ 10%	*Determination of the elasticity of fabrics - permanent deformation*
Résistance à l'abrasion méthode Martindale	5	NF EN ISO 12947-2 9 kPa (1 fil rompu / breakdown of 1 yarn)	> 20 000 sauf bas de survetement, bas de jogging, short de jogging / except tracksuit bottoms, jogging bottoms, jogging shorts : > 35 000	*Determination of the abrasion resistance by Martindale method*
Eclatement de la matière	0	ISO 13938-1 (or 2) (7,3cm²)	> 350 kPa	*Bursting properties of fabrics*
Tests additionnels pour les bas de survetement, bas de jogging, short de jogging **Additional tests for tracksuit bottoms, jogging bottoms, jogging shorts**				
Eraillage des étoffes (masse)	0	ASTM D3939 600 rotations à 60 trs/min	≥ 4	*Test Method for Snagging Resistance of Fabrics*

Number of washing cycles for Dimensional Stability

Number of washing cycles for Appearance

Number of washing cycles prior to Elasticity test, "0" means test in the "As received" state

Number of washing cycles prior to Abrasion test, "5" means wash 5 cycles before perform the test

PHYSICAL DURABILITY REQUIREMENTS - REFASHION

Eco-Modulation program - Key parameters for Durability

- Apparel – Colorway to be tested

Number of colors	Number of colors to be tested	Selection criteria
1 – 3	1	- Darkest
4 - 6	2	- Darkest - Lightest (not white)
7 – 9	3	- Darkest - Intermediate - Lightest (not white)
10 - 12	4	- Darkest - 2 x intermediate (dark + light) - Lightest (not white)
13 - 15	5	- Darkest - 3 x intermediate (2 x dark + light) - Lightest (not white)
16 - 20	6	- Darkest - 4 x intermediate (2 x dark + 2 x light) - Lightest (not white)
> 20	Add 1 color for 5 new colors	- Add to the previous selection 1 x dark then 1 x light , then 1 x dark, etc.

PHYSICAL DURABILITY REQUIREMENTS - REFASHION

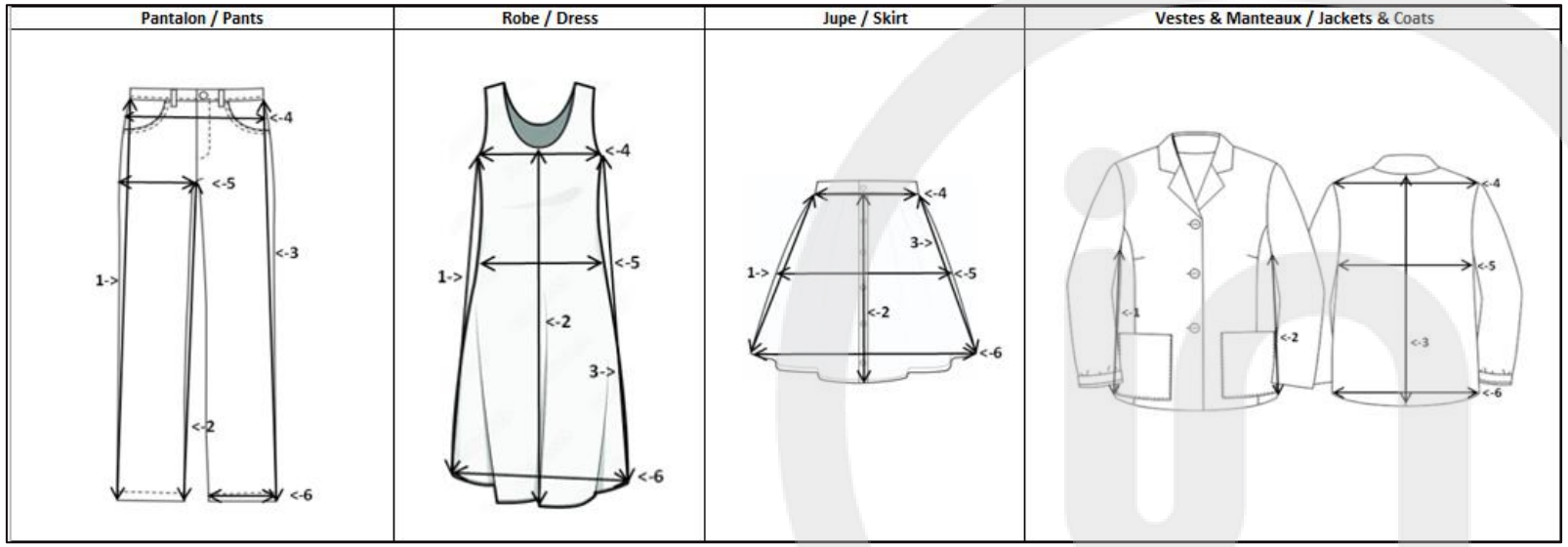
Eco-Modulation program - Key parameters for Durability

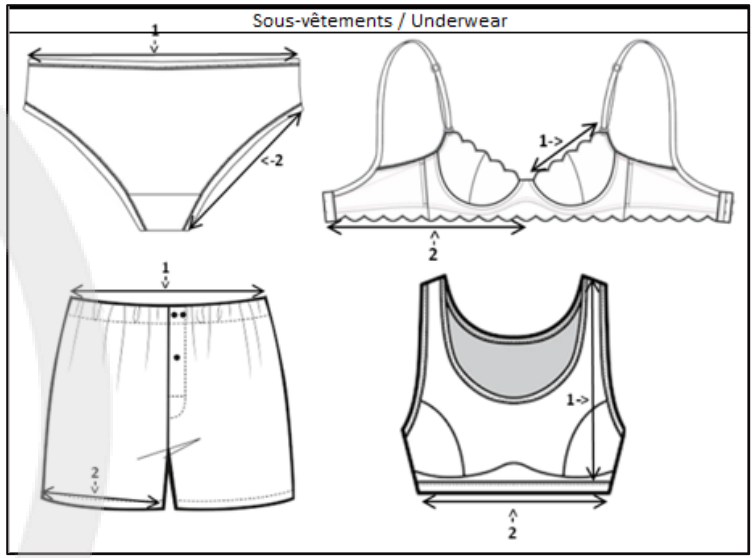
- Footwear – Colorway to be tested
  - All tests should be performed on one colorway except the below scenario:
    - ❑ Outsole abrasion test always on all colorway
    - ❑ Bonding strength test on all colorway if the bonding type and material are different
    - ❑ Baby indoor shoes: Upper abrasion test on 2 colorway
    - ❑ Baby indoor shoes and layette shoes: Upper tearing strength test on 2 colorway

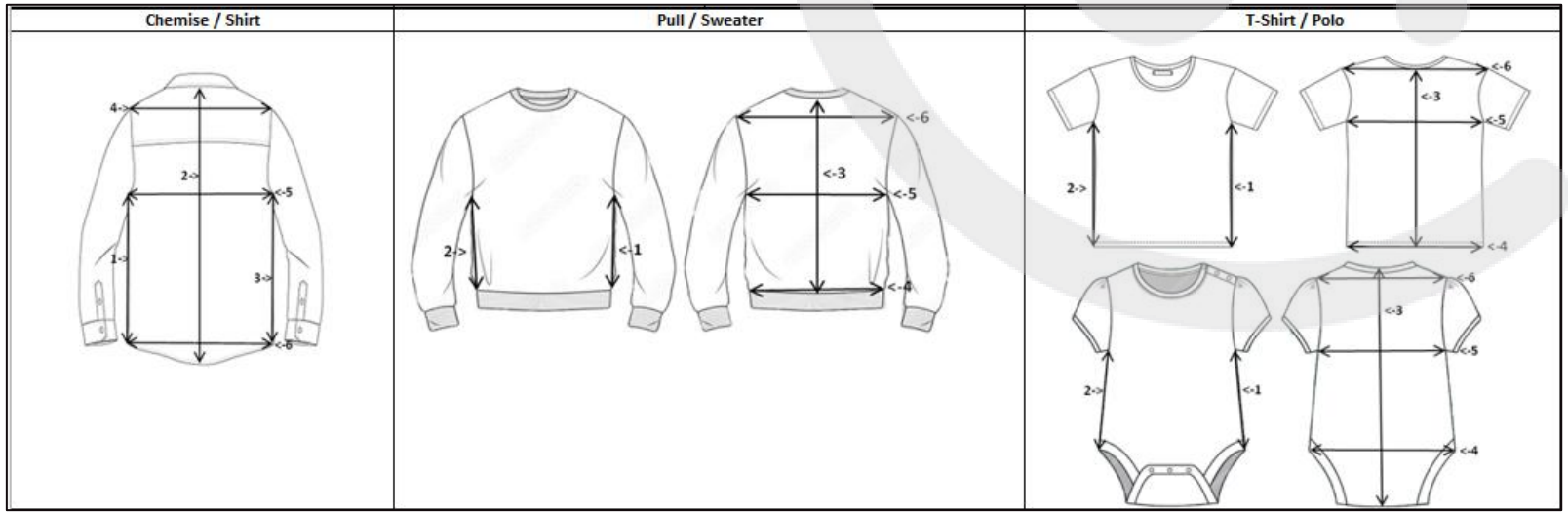
PHYSICAL DURABILITY REQUIREMENTS - REFASHION

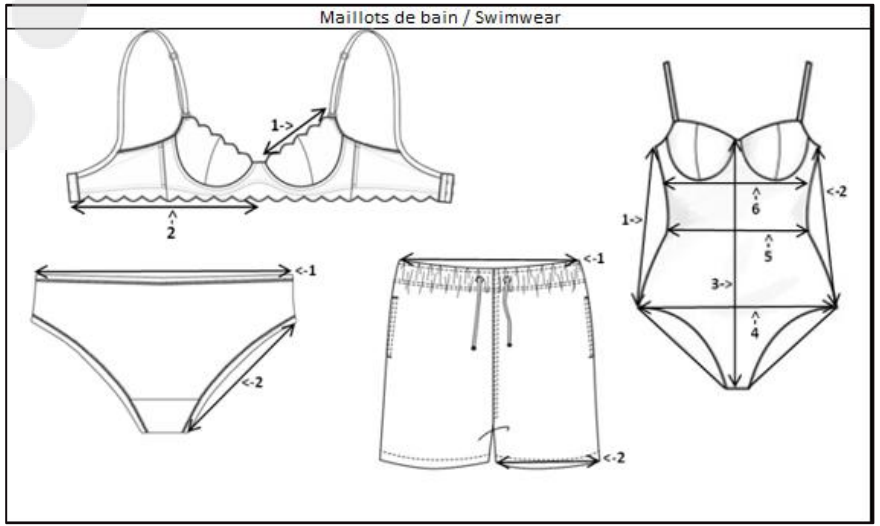
Eco-Modulation program - Key parameters for Durability

- Standardize the measurement points for Apparel as a minimum









PHYSICAL DURABILITY REQUIREMENTS - REFASHION

Eco-Modulation program – Bonus payment for Durability

- All tests must be performed by an ISO/IEC 17025 accredited lab with at least 60% test items within their accreditation scope by “Apparel”, “Household Linen” and “Footwear” individually
- Only if all tests pass (straight pass or retest pass) is eligible for the bonus
- The bonus paid corresponds to the multiplication an amount (specific to each product categories) depending on the volume placed into the market
- Example: 215,000 **Tops**, the bonus will be (100,000*0.7) + (115,000*0.07) = € 78,050

Category	Quantity ≤100,000 items	Quantity >100,000 items
Tops, Bottoms, Bed linen, Table linen, Open footwear, Closed footwear, Indoor and baby footwear	€0.70	€0.07
Intimate products, Outdoor clothing, Bath linen/towels	€1.05	€0.105
Socks & Hosiery	€0.35	€0.035

WRAP

PHYSICAL DURABILITY REQUIREMENTS – TEXTILES 2030 (WRAP UK)

Key goals of textiles 2030

Reducing Carbon & Water Footprint:

- Aiming for a 50% reduction in carbon footprint by 2030, aligning with net-zero ambitions.
- Cutting the water footprint of new products sold by 30%.

Circular Economy Commitments:

- Increasing circular business models (e.g., resale, rental, repair).
- Designing for durability, recyclability, and reduced waste.
- Encouraging investment in fiber-to-fiber recycling infrastructure in the UK.

Collaboration Across the Supply Chain:

- Working with government policies, industry partners, and consumers to drive systemic change.
- Providing data and reporting frameworks to track progress.

PHYSICAL DURABILITY REQUIREMENTS – TEXTILES 2030 (WRAP UK)

Covered categories

The product categories have been selected through industry input as part of the Textiles 2030 durability sprint group, part of WRAP's Design for Circularity Workstream and, the LITAC Durability Research Project and WRAP's clothing longevity protocol.

The current set of guidelines (May 2025. V2) cover the following adult product categories.

- Formal trousers (woven)
- Casual trousers (woven)
- Denim
- Jersey bottoms (including leggings)
- Underwear
- T-shirts
- Shirts
- Pyjama bottoms (woven)
- Pyjama bottoms (knitted)

Children's clothing, those for specific activities requiring additional performance requirements (e.g., sportwear/outdoor), home textiles, or items falling outside of those defined above are not included. Further product categories will be added in the next update.

PHYSICAL DURABILITY REQUIREMENTS – TEXTILES 2030 (WRAP UK)

Testing summary

The durability tests are designed to evaluate a garment's lifespan and are applied based on the product categories.

These tests include:

- A mix of existing industry quality and performance tests.
- New methods developed by LITAC in the Durability Research Project.
- Washing method (**Machine wash at 30°C**) chosen to closely represent domestic washing, based on consumer surveys and industry feedback and includes washing up to **50 cycles**.
- **Tumble drying** is used in testing (even though line drying is more common) to ensure global consistency and replicability across test facilities.

This approach ensures standardized, reliable testing while reflecting real-world usage as much as possible.

PHYSICAL DURABILITY REQUIREMENTS – TEXTILES 2030 (WRAP UK)

Classification summary

Products are tested using the test protocol and classified as **Basic, Moderate, or Aspirational** based on results.

- A product must meet at least the Basic level in all required tests to be classified.
- If a product fails to meet the Basic level, it remains unclassified.
- Overall classification is determined by the lowest-performing test result—all criteria must meet the required level.

Weighting

- No scoring or weighting system is currently used in the classification.
- All tests are treated equally, with no single test given more importance than others.
- This will be re-assessed in future versions of the guidelines.

PHYSICAL DURABILITY REQUIREMENTS – TEXTILES 2030 (WRAP UK)

Critical failures & Visual stability – Not for product classification

A **critical failure** occurs when a garment or material does not withstand reasonable wear and tear during washing and drying.

- Defined as significant damage, collapse, or malfunction that makes the product no longer functional or unacceptable without repair or alteration.
- Examples include component breakage, holes, tears, design flaws, or material defects.

A **visual stability** captured other changes that may not be seen as critical to function, but are not captured in other areas of testing, may cause an end user to no longer use the product.

- Examples include twisting, puckering, roping and changes to the shape.

A visual guide of common failures will be included in a future update.

Testing facilities must record and report critical failures and visual stability using the table provided in the guideline as shown on next slide:

PHYSICAL DURABILITY REQUIREMENTS – TEXTILES 2030 (WRAP UK)

Critical failures & Visual stability Assessment Table – Not for product classification

Critical failure or Visual stability issue	Wash and dry cycle	Type of issue	Photo of issue	Location on garment (as much detail as possible)	Size (mm), length and width	If a component failure – does this prevent the garment being closed/done up when being worn ?	Should this be reported as a critical, major or minor failure ?	If a visual stability issued Rating (1-5)
Critical failure	30 cycles	Zipper malfunction		Front placket	/	Yes	To be determined by WRAP	/
Critical failure	15 cycles	Seam failure and opened		Inseam	30mm	Yes	To be determined by WRAP	/

PHYSICAL DURABILITY REQUIREMENTS – TEXTILES 2030 (WRAP UK)

Requirements summary for each product category, Pre-wash:

Test item	Formal Trousers (woven)	Casual Trousers (woven)	Denim	Jersey Bottoms (including leggings)	Underwear	Shirts	Pyjama Bottoms (woven)	Pyjama Bottoms (knitted	T-shirts
Abrasion BS EN ISO 12947-2	✓	✓	✓			✓	✓		
Pilling BS EN ISO 12945-2 (2000 & 7000 cycles)	✓			✓	✓			✓	✓
Seam strength BS EN ISO 13935-2	✓	✓	✓			✓	✓		
Tensile strength BS EN ISO 13934-2	✓	✓	✓			✓	✓		
Tearing strength BS EN ISO 13937-2	✓	✓	✓			✓	✓		
Bursting strength ISO 13938-1/2				✓	✓			✓	✓
Stretch and recovery BS EN ISO 20932-1				✓	✓				

PHYSICAL DURABILITY REQUIREMENTS – TEXTILES 2030 (WRAP UK)

Requirements summary for each product category, Post-wash:

Test item	Formal Trousers (woven)	Casual Trousers (woven)	Denim	Jersey Bottoms (including leggings)	Underwear	Shirts	Pyjama Bottoms (woven)	Pyjama Bottoms (knitted)	T-shirts
Visual assessment (5, 15, 30 and 50 washes)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dimensional stability (5, 15, 30 and 50 washes)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Spirality BS ISO 16322-3 (5 wash and dry cycles)				✓	✓			✓	✓

3

COMPARISON OF PEFCR, REFASHION & WRAP

COMPARISON AMONG PROGRAMS

	PEFCR	Refashion	WRAP
Scope	(1) Textile Apparel except made up of 80% or more genuine leather and/or fur (2) Footwear (3) Accessories (no testing required with default lifetime modifier) (4) Lining: If comprising over 5% of the total composition of the product, test separately	(1) Textile Apparel (2) Footwear (3) Household Linen (4) Lining: Out of scope	(1) Textile Apparel for Adults (2) Lining
Number of colorway to be tested	(1) Apparel: Darkest (2) Footwear: Best selling products or highest planned production volume	(1) Apparel: Darkest, Intermediate and Lightest (not white) based on number of colorway (2) Footwear: Based on test property and end users (i.e. baby)	(1) Not specified

COMPARISON AMONG PROGRAMS

	PEFCR	Refashion	WRAP
Sampling status and washing conditions	(1) Apparel and Footwear: As received (2) Either “Material” or “Finished Product” (3) Dimensional stability & Spirality: - Machine wash: 5 cycles - Dryclean: 3 cycles (4) Appearance change: - Machine wash: 15 cycles except “Jackets & Coats: 5 cycles” - Dryclean: 5 cycles	(1) Footwear: As received. Apparel and Household Linen: As received or after certain cleaning cycles based on test property and product type (2) “Finished Product” only unless the size is really insufficient like baby wear (3) Dimensional stability & Spirality: - Machine wash: 3 or 5 cycles based on product type - Dryclean: Half of the requested cycles (rounded up) in machine wash (4) Appearance change - Machine wash: 3, 5, 10 or 15 cycles based on product type - Dryclean: Half of the requested cycles (rounded up) in machine wash	(1) As received (2) “Finished Product” only (3) Dimensional stability and Appearance change: - Machine wash: 5, 15, 30 & 50 cycles - Dryclean: Not specified (4) Spirality - Machine wash: 5 cycles - Dryclean: Not specified

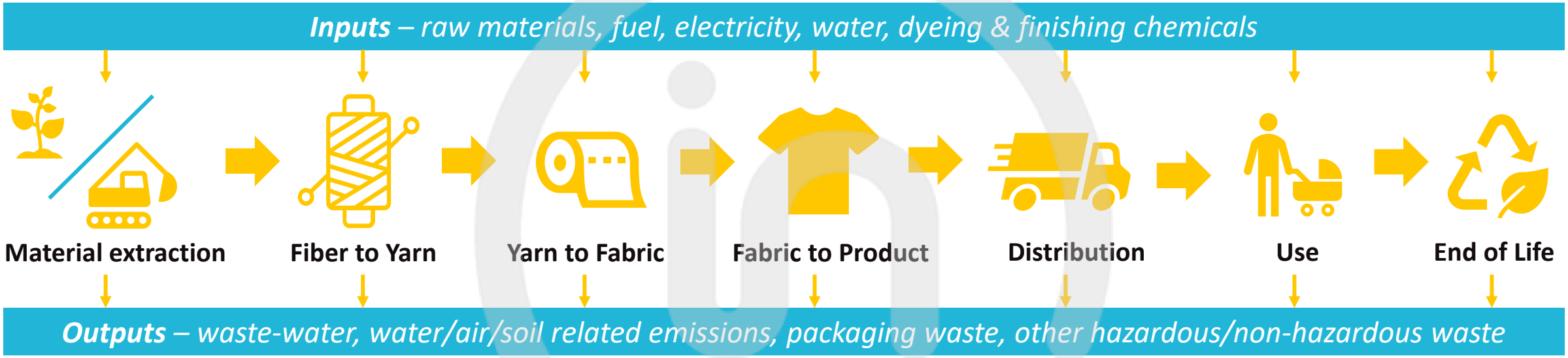
COMPARISON AMONG PROGRAMS

	PEFCR	Refashion	WRAP
Classification mechanism	(1) Test results to determine “Basic”, “Moderate” and “Aspirational” level then to calculate the product lifetime	(1) Bonus pay back according to product category and volume to be placed into market	(1) Test results to determine “Basic”, “Moderate” and “Aspirational” level

UNDERSTANDING LCA & PEFCR REQUIREMENTS

CONCEPT OF LIFE CYCLE ASSESSMENT (LCA)

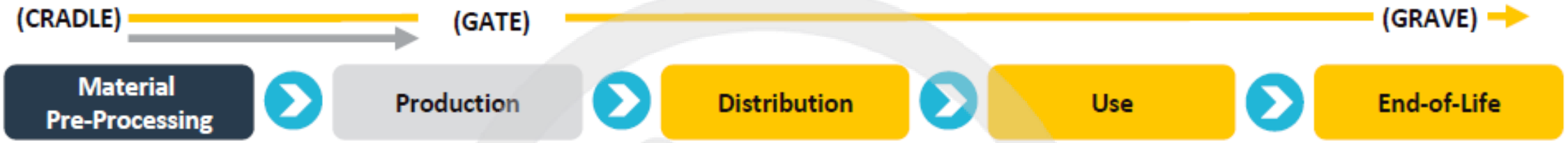
Life Cycle Assessment (LCA): A systematic methodology used to evaluate the environmental impacts associated with all stages of a product's life cycle from raw material extraction, manufacturing, distribution, and use, to end-of-life treatment and disposal. Conducted according to ISO 14040 and ISO 14044 standards.



Main application of LCA are:

- Analysis of the origin of problems related to a particular product,
- Assess and improve environmental performance across the supply chain
- Communicate product sustainability to consumers transparently
- Possibility to choose between a number of products (Stand out in the market with environmentally friendly products)

SYSTEM BOUNDARIES

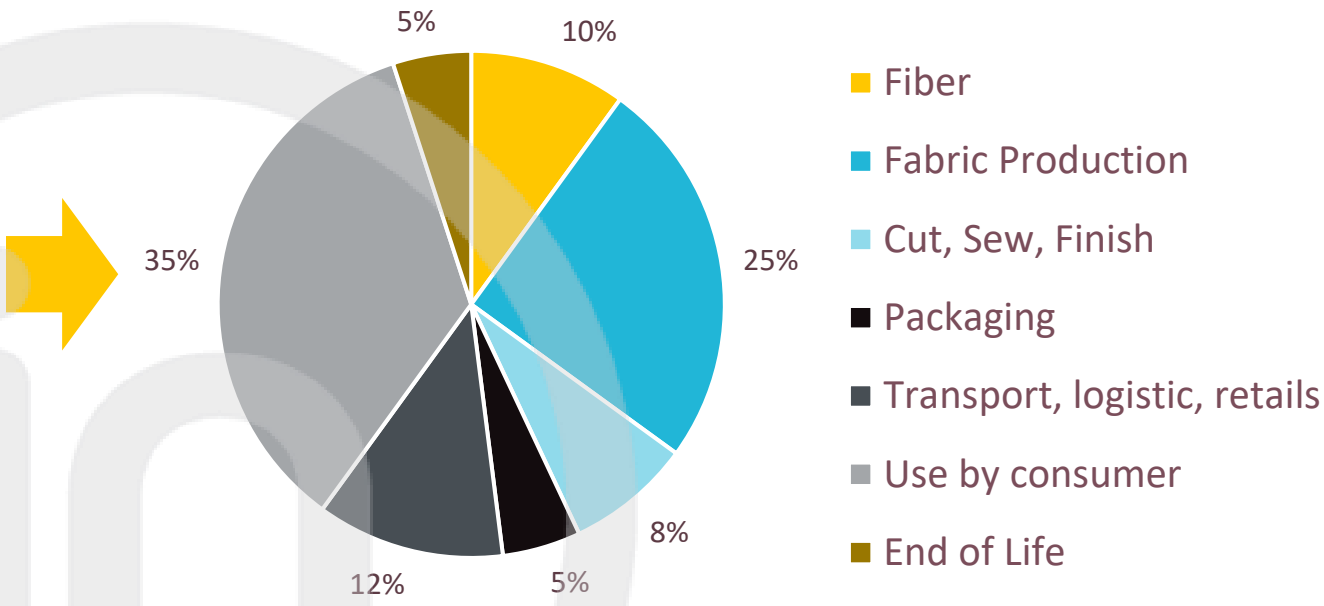


A cradle-to-gate LCA includes only the stages from raw material extraction to the point where the product leaves the production facility (the “gate”). It excludes the use and disposal stages, making it ideal for manufacturers who want to assess the impact of production processes without accounting for how consumers use or dispose of the product.

A cradle-to-grave LCA covers the entire life cycle of a product, from raw material extraction (cradle) through manufacturing, distribution, usage, and final disposal (grave). This type provides a full view of the environmental impacts across all stages, making it valuable for understanding the total impact of a product on the environment, including its end-of-life stage.

Each type of LCA serves different goals; cradle-to-grave offers a complete picture, while cradle-to-gate focuses on production impacts, allowing companies to improve and optimize manufacturing practices. For

LCA EXAMPLE – TEXTILE (GWP IMPACTS)



- Majority of the impacts are in the upstream or downstream supply chain for the product.
- Contributions from use phase are dependent on the geography of use – certain geographies uses more water & energy to wash the clothes.
- The fiber & fabric manufacturing can also vary depending on the geographies (even for same performance) due to change in electricity grid & use of renewable energy share.

PEFCR

What is PEFCR?

It is part of the **European Union's Product Environmental Footprint (PEF) initiative**, which was developed by the European Commission (EC) to create a standardized way of measuring and communicating the environmental performance of products across their life cycle.

Origin & Purpose

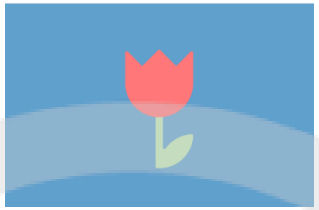
- The European Commission (2013) launched the Single Market for Green Products Initiative, aiming to reduce confusion caused by the many different environmental labels, methods, and standards in Europe.
- To achieve this, the EC introduced PEF (Product Environmental Footprint) and OEF (Organization Environmental Footprint) as standardized methodologies based on Life Cycle Assessment (LCA) principles.
- PEFCRs provide sector- and product-specific guidance on how to apply the general PEF method consistently.

PEFCR = the rulebook that explains how to do an LCA for a specific product group under the EU's standardized PEF framework.

PEFCR PROJECTS IN THE TRANSITION PHASE

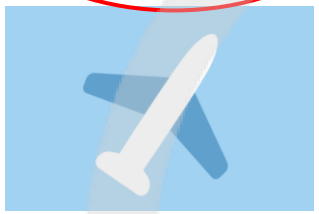
Developed PEFCRs


Apparel and Footwear

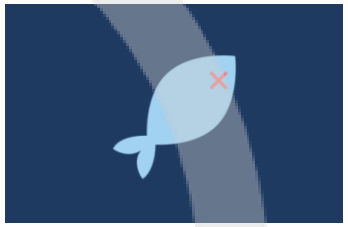

Cut Flowers & Potted Plants


Synthetic Turf

PEFCRs in Development


Aviation, Drones & eVTOLs


Marine fish

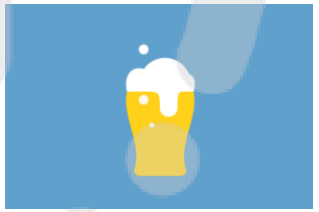

Space


Tourism

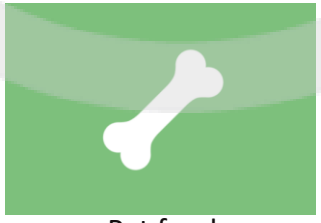
PEFCRs in Revision


Feed for Food-producing Animals


Batteries and Accumulators


Beer

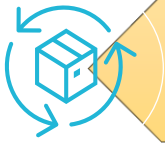

Pasta


Pet food


Dairy Products

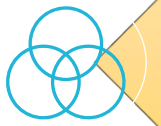
Source: PEF METHOD - Green Forum - European Commission

WHAT IS PEFCR FOR APPAREL AND FOOTWEAR?



A **methodology aligned with he Environmental Footprint (EF)** methods to measure impacts of garments and footwear

Jointly developed by European Commission and industry through a multi-stakeholder process with the expert review



Provides **consistent product comparisons** using equivalent functional parameters.

Covers **producer-controlled activities** such as fabric use, energy, packaging, waste, and emissions.

Includes **upstream and downstream impacts** (e.g., raw material production, packaging recycling) with both background datasets and supplier-specific data.

Requires a **representative product definition** per category, which serves as the EF benchmark.

13 VIRTUAL REPRESENTATIVE PRODUCTS (RPs) COVERED IN PEFCR

Image source: https://pefapparelandfootwear.eu/whats-behind-the-methodology/

BENEFITS OF PEFCR FOR APPAREL AND FOOTWEAR INDUSTRY

- **Saves time, cost, and effort**
  - ✓ No need to reinvent rules, the product-specific guidance is already derived from EF methods
  - ✓ Ready-to-use secondary data reduces data collection burden
  - ✓ Simplifies building life cycle models
- **Enables better decision-making**
  - ✓ Clear comparisons with benchmarks and competitors
  - ✓ Identification of key environmental hotspots across the product group
  - ✓ Enhanced credibility through recognized schemes showcasing environmental performance
  - ✓ Supports reliable green claims for products
  - ✓ Single market for environmental claims

KEY INSIGHTS FROM PEFCR FOR APPAREL AND FOOTWEAR

Scope: Full life cycle (cradle to grave) → raw materials, manufacturing, distribution, use, end-of-life

Functional unit: One product (apparel/footwear) serving intended use

Data sources: EF 3.1 database, industry members, scientific literature, expert assumptions

Major Hotspot :

Life cycle stages – Upstream or Downstream supply chain for the product.

Impact categories (Most relevant 10 out of 16 categories)

Climate change; Particulate matter; Acidification; Terrestrial eutrophication; Marine eutrophication; Freshwater ecotoxicity; Land use; Water use; Resource use, Minerals and metals; and Resource use, fossils

ENVIRONMENTAL FOOTPRINT IMPACT CATEGORIES

EF Impact Category	Impact Indicator	Unit	Characterization Model	Robustness
Climate change, total	Global Warming Potential (GWP100)	kg CO_2-eq	Bern model (IPCC 2021, Forster et al. 2021)	I
Ozone depletion	Ozone Depletion Potential (ODP)	kg CFC-11-eq	EDIP model, WMO 2014 + integrations	I
Human toxicity, cancer	Comparative Toxic Unit for humans (CTUh)	CTUh	USEtox2.1 (Fantke et al. 2017), adapted (Saouter et al. 2018)	III
Human toxicity, non-cancer	Comparative Toxic Unit for humans (CTUh)	CTUh	USEtox2.1 (Fantke et al. 2017), adapted (Saouter et al. 2018)	III
Particulate matter	Impact on human health	Disease incidence	PM model (Fantke et al. 2016, UNEP 2016)	I
Ionising radiation, human health	Human exposure efficiency relative to U235	kBq U235-eq	Human health effect model (Dreicer et al. 1995; Frischknecht et al. 2000)	II
Photochemical ozone formation, human health	Tropospheric ozone concentration increase	kg NMVOC-eq	LOTOS-EUROS model (Van Zelm et al. 2008, ReCiPe 2008)	II
Acidification	Accumulated Exceedance (AE)	mol H^+-eq	Accumulated Exceedance (Seppälä et al. 2006; Posch et al. 2008)	II
Eutrophication, terrestrial	Accumulated Exceedance (AE)	mol N-eq	Accumulated Exceedance (Seppälä et al. 2006; Posch et al. 2008)	II
Eutrophication, freshwater	Fraction of nutrients reaching freshwater end compartment (P)	kg P-eq	EUTREND model (Struijs et al. 2009, ReCiPe)	II
Eutrophication, marine	Fraction of nutrients reaching marine end compartment (N)	kg N-eq	EUTREND model (Struijs et al. 2009, ReCiPe)	II
Ecotoxicity, freshwater	Comparative Toxic Unit for ecosystems (CTUe)	CTUe	USEtox2.1 (Fantke et al. 2017), adapted (Saouter et al. 2018)	III
Land use (occupation & transformation)	Soil quality index	Dimensionless (pt)	LANCA model (De Laurentiis et al. 2019; Horn & Maier 2018)	III
Water use	User deprivation potential (deprivation-weighted consumption)	m^3 world-eq	AWARE model (Boulay et al. 2018; UNEP 2016)	III
Resource use, minerals & metals	Abiotic resource depletion (ADP ultimate reserves)	kg Sb-eq	van Oers et al. 2002, CML 2002 v4.8	III
Resource use, fossils	biotic resource depletion –fossil fuels (ADP-fossil)	MJ	van Oers et al. 2002, CML 2002 v4.8	III

The sub-categories 'Climate change –fossil', 'Climate change – biogenic' and 'Climate change - land use and land use change' shall be reported separately, if they show a contribution of more than 5% each to the total score of climate change.

MOST RELEVANT LIFE CYCLE STAGES PER RP AND IMPACT CATEGORY

Impact Category	RP1	RP2	RP3	RP4	RP5	RP6	RP7	RP8	RP9	RP10	RP11	RP12	RP13
Climate change	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
Ozone depletion	-	-	-	-	-	-	-	-	-	-	-	-	-
Human toxicity, cancer	-	-	-	-	-	-	-	-	-	-	-	-	-
Human toxicity, non-cancer	-	-	-	-	-	-	-	-	-	-	-	-	-
Particulate matter	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
Ionising radiation	-	-	-	-	-	-	-	-	-	-	-	-	-
Photochemical ozone formation	-	-	-	-	-	-	-	-	-	-	-	-	-
Acidification	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2,4	1,2,4	1	1	1	1
Eutrophication, terrestrial	-	-	1	1	-	-	-	-	-	1	1	1	1
Eutrophication, freshwater	-	-	-	-	-	-	-	-	-	-	-	-	-
Eutrophication, marine	1,2	-	1	1	-	1,2		1,2	-	1	1	1	1
Ecotoxicity, freshwater	-	-	1	1	-		1,2	-	-	1	1	1	1
Land use	-	-	1	-	-		-	-	-	-	-	-	-
Water use	1,2	1	1	1	1	1	1,2	1	2,4	1			
Resource use, minerals and metals	1,2	1,2	-	-	1,2	1,2	1,2	1,2,4	1,2	-	1	1	1
Resource use, fossils	1,2	1,2	-	1,2	1,2	1,2	1,2	1,2,4	1,2	-	1,2	1,2	1,2

Note: RP1. T-shirts, RP2. Shirts and blouses, RP 3. Sweaters and midlayers, RP4. Jackets and coats, RP5. Pants and shorts, RP6. Dresses, skirts and jumpsuits, RP7. Leggings, stockings, tights and socks, RP8. Underwear, RP9. Swimwear, RP10. Apparel accessories, RP11. Open-toed shoes, RP12. Closed-toed shoes, RP13. Boots.

1: LCS1. Raw materials extraction and pre-processing, 2: LCS2. Manufacturing, 3: LCS3. Distribution, 4: LCS4. Use, 5: LCS5. End of life.

TYPES OF DATA USED IN LCA

Primary data

Directly measured or collected data from one or multiple facilities (site-specific data) that are representative of the activities of the company.

👍 **Advantages :**

- High accuracy & representativeness.
- Consistency
- Traceability
- Control

👎 **Disadvantages:**

- Time & resource intensive
- Can be selective in nature
- Limited availability

Secondary data

Data that is not directly collected, measured, or estimated by the company, but sourced from a third-party LCI database or other sources. Secondary data includes industry average data, literature studies, and may contain proxy data, or other generic data.

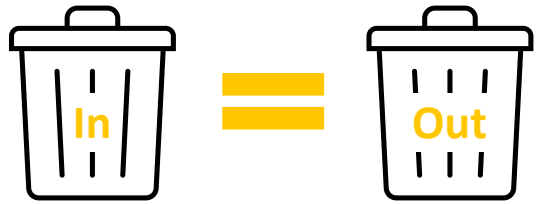
👍 **Advantages :**

- Easy to use, cost effective
- Provides good overview
- Can be used to fill data gaps

👎 **Disadvantages:**

- Lack of specificity
- Data quality concerns
- May not be the most updated data

CHALLENGES WITH USE OF SECONDARY DATA



- Any LCA study as good as good the data being used (Garbage in – Garbage out).
- Having an accurate and credible LCA results translates to the amount of efforts needed.
- Average data are used in absence of primary data. Average data refers to the use of datasets from established LCA databases. *Some studies only use and rely on average data from databases, which isn't specific to the product under consideration.*
- Reason → It's fast and easy to use than collecting primary data from suppliers.

How credible are your sustainability claims if your results aren't true to your product's reality?

- Due to holistic system boundary of LCA, it's not possible to collect all primary data in supply chain.
- It's recommended to have primary data collected for the processes directly owned or controlled by an organization.
- It's also a good practice to disclose the share of primary data along with the LCA results.

4. DATA QUALITY REQUIREMENTS AND RATING IN PEFCR

4.1 Data needs matrix

The DNM helps determine which data should be used in the PEF model based on how much influence the company has over each process. There are three situations:

Situation 1: The process is directly run by the company applying the PEFCR.

Situation 2: The process is not run by the company, but the company has access to specific information about it.

Situation 3: The process is not run by the company, and the company does not have access to specific information.

		Most relevant process	Other process
Situation 1: process run by the company using the PEFCR	Option 1	Provide company-specific data (as requested in the PEFCR) and create a company-specific dataset, in aggregated form (DQR≤1.5)[24] Calculate the DQR values (for each criterion + total)	
	Option 2		Use default secondary dataset in PEFCR, in aggregated form (DQR≤3.0) Use the default DQR values
Situation 2: process not run by the company using the PEFCR but with access to company-specific information	Option 1	Provide company-specific data (as requested in the PEFCR) and create a company-specific dataset, in aggregated form (DQR≤1.5) Calculate the DQR values (for each criterion + total)	
	Option 2	Use company-specific activity data for transport (distance), and substitute the sub-processes used for electricity mix and transport with supply-chain specific EF compliant datasets (DQR≤3.0)* Re-evaluate the DQR criteria within the product specific context	
	Option 3		Use company-specific activity data for transport (distance), and substitute the sub-processes used for electricity mix and transport with supply-chain specific EF compliant datasets (DQR≤4.0)* Use the default DQR values.
Situation 3: process not run by the company using the PEFCR and without access to company- specific information	Option 1	Use default secondary data set in aggregated form (DQR≤3.0) Re-evaluate the DQR criteria within the product specific context	
	Option 2		Use default secondary data set in aggregated form (DQR≤4.0) Use the default DQR values

PEFCR will provide additional guidance on these criteria.

OVERALL DATA QUALITY LEVEL OF DATASETS

Overall Data Quality Rating (DQR)	Overall Data Quality Level
DQR ≤ 1.5	Excellent quality
1.5 < DQR ≤ 2.0	Very good quality
2.0 < DQR ≤ 3.0	Good quality
3.0 < DQR ≤ 4.0	Fair quality
DQR > 4.0	Poor quality

10. CASE STUDY- DECATHLON'S ENVIRONMENTAL-ASSESSMENT APPROACH

Overview: What Decathlon does

- Decathlon performs a **full life-cycle assessment (LCA)** for its products from raw-material extraction, manufacturing, packaging, transport, usage, to end-of-life.
- They rely on the Product Environmental Footprint (PEF) method (promoted by the European Commission) as the scientific framework to model and measure environmental impacts.
- For each product, they compute: (a) a **PEF score** capturing 16 different environmental-impact indicators (e.g. climate, water, pollution) and (b) the **carbon footprint** (i.e. emissions expressed in kg CO_2-equivalent).

DECATHLON Sustainability

Link to the case study: The environmental assessment of our products

THE PROCESS:

Scientific Framework: Choosing LCA as methodology, anchored in PEF standards.

Product Data Collection: Gathering data on product composition, materials, packaging, manufacturing processes, etc.

Life-Cycle Modelling: Simulating all phases: raw material, manufacture, packaging, transport, usage (e.g. washing/energy), and end-of-life (recycling, landfill, incineration).

Result Collection: Producing scores (PEF, carbon footprint) that quantify the impact across different environmental dimensions

Exploitation of Results: Supports eco-design and material improvements, helping designers target high-impact areas, providing transparent product impact labelling for customers, and contributing to company-level carbon-reduction planning.

HOW INTERTEK HELPED

- **Validated Decathlon's new LCA dataset methodology** to ensure alignment with the Product Environmental Footprint (PEF) method.
- **Reviewed Decathlon's eco-design communication process** to ensure compliance with the EU Green Claims Directive and French Climate & Resilience Law.
- **Conducted documentation audits and interviews** with key teams to verify accuracy, transparency, and robustness of the methodology.
- **Identified improvement opportunities** to strengthen methodology credibility and future reporting.
- **Enhanced confidence in environmental claims**, that enabled Decathlon to communicate verified sustainability performance to customers.

HAVE FURTHER QUESTIONS?

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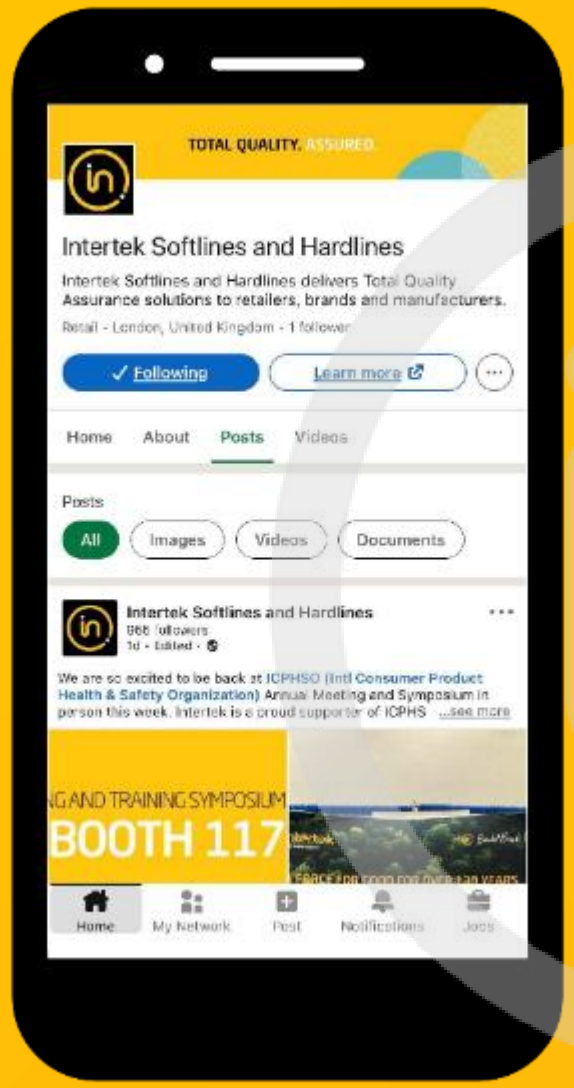
SCAN AND FOLLOW



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