DRAFT PRODUCT ENVIRONMENTAL FOOTPRINT CATEGORY RULES (PEFCR)

APPAREL AND FOOTWEAR

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Non-voting members: CEC (European Footwear Confederation), CNMI (Camera Nazionale della Moda Italiana), COTANCE, EURATEX, FESI and the International Fur Federation

Observers: European Commission EF Team, European Environmental Bureau (EEB)

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FIRST PEFCR INFORMATION	
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Leading organization	Sustainable Apparel Coalition
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How to read this document

This document includes different types of information:

- **Notes addressed to the reader** are presented in orange boxes, as shown below:

Note	This document is based on the template provided by in Annex B: PEF Report Template of the PEF method (2019) which shall be applied for all types of PEFCRs.

- **Sections of the template** for the PEFCR per the PEF method are copied directly and:
  - Indicated in grey and with square brackets ([ ]) for instructions;
  - Indicated in *italics* for PEFCR content.

  Instructions will be replaced at a later date (or kept in some cases with the grey and brackets removed) as the PEFCR is completed.

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Acronyms and abbreviations

[List in this section all the acronyms used in the PEFCR. Those already included in the latest version of the PEF method or the Annex A shall be copied in their original form. The acronyms shall be provided in alphabetical order.]

µm	micrometre
AWARE	Available WAter REmaining
BOM	bill of materials
BSI	British Standards Institution
CEC	European Footwear Confederation
CELC	European Confederation of Flax and Hemp
CFs	characterization factors
CFF	Circular Footprint Formula
CNMI	Camera Nazionale della Moda Italiana
CMWG	Cattle Model Working Group
CO_2	carbon dioxide
CPA	Classification of Products by Activity
CTUe	comparative toxic units for ecosystems
CTUh	comparative toxic units for human health
D2C	direct to consumer
DC	distribution centre
DNM	data needs matrix
DQR	data quality rating
EC/DG-ENV	European Commission/Directorate-General for the Environment
EEB	European Environmental Bureau
EF	Environmental Footprint
EFTA	European Free Trade Association
EVA	ethylene vinyl acetate
ELCD	European reference Life Cycle Database
EOL	end of life
FAO	Food and Agriculture Organization of the United Nations
FESI	Federation of the European Sporting Goods Industry
FHCM	Fédération de la Haute Couture et de la Mode
FU	functional unit
g	gram
GHGs	greenhouse gases
GeR	geographical representativeness
GeR_{SD}	geographical representativeness evaluated at the level of the secondary dataset
Higg PM	Higg Product Module
IFF	International Fur Federation
ILCD	International reference Life Cycle Data system
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
IWTO	International Wool Textile Organisation
JRC	Joint Research Centre

kBq U^{235} eq	kilobecquerel uranium-235 equivalent
kcal	kilocalorie
kg	kilogram
kg CFC-11 eq	kilogram of trichlorofluoromethane or freon-11 equivalent
kg CO_2-eq	kilogram of carbon dioxide equivalent
kg N eq	kilogram of nitrogen equivalent
kg NMVOC eq	kilogram of non-methane volatile organic compounds equivalent
kg P eq	kilogram of phosphorus equivalent
kg Sb eq	kilogram of antimony equivalent
km	kilometre
kWh	kilowatt-hour
LCA	Life Cycle Assessment
LCI	Life Cycle Inventory
LCIA	Life Cycle Inventory Assessment
LCS	Life Cycle Stage
LHVs	lower heating values
LUC	land use change
m^3	cubic metre
ME	metabolizable energy
MJ	*Megajoule*
mol H^+	mole of hydrogen ion
mol N eq	mole of nitrogen equivalent
ODP	ozone depletion potential
P	precision/uncertainty
P_{AD}	precision evaluated at the level of the activity data
PE	polyethylene
PEF	Product Environmental Footprint
PEFCRs	Product Environmental Footprint Category Rules
PET	polyethylene terephthalate
PM	particulate matter
Pt	point for dimensionless values
PTFE	Polytetrafluoroethylene
RP	representative product
SAC	Sustainable Apparel Coalition
SMGP	Single Market for Green Products
t	tonne
TAB	Technical Advisory Board
TeR	technological representativeness
TeR_{SD}	technological representativeness evaluated at the level of the secondary dataset
TiR	time representativeness
TiR_{AD}	time representativeness evaluated at the level of the activity data
TiR_{SD}	time representativeness evaluated at the level of the secondary dataset
tkm	tonne kilometre
TS	Technical Secretariat
UUID	Universally Unique Identifier

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Definitions

[List in this section all the definitions that are relevant for the PEFCR. Those already included in the latest version of the PEF method or the Annex A shall be copied in their original form. The definitions shall be provided in alphabetical order.]

This glossary defines key terms used in this document, based on "Suggestions for updating the Product Environmental Footprint (PEF) method" (Zampori et al., 2019) and is herein referred to as the PEF method. For further clarifications, please refer to the PEF method.

Activity data	This term refers to information which is associated with processes while modelling Life Cycle Inventories (LCI). The aggregated LCI results of the process chains that represent the activities of a process are each multiplied by the corresponding activity data[1] and then combined to derive the environmental footprint associated with that process. Examples of activity data include quantity of kilowatt-hours of electricity used, quantity of fuel used, output of a process (e.g. waste), number of hours equipment is operated, distance travelled, floor area of a building, etc. Synonym of "non-elementary flow.
Acidification	EF impact category that addresses impacts due to acidifying substances in the environment. Emissions of NO_x, NH_3 and SO_x lead to releases of hydrogen ions (H^+) when the gases are mineralised. The protons contribute to the acidification of soils and water when they are released in areas where the buffering capacity is low, resulting in forest decline and lake acidification.
Aggregated dataset	Complete or partial life cycle of a product system that next to the elementary flows (and possibly not relevant amounts of waste flows and radioactive wastes) lists in the input/output list exclusively the product(s) of the process as reference flow(s), but no other goods or services. Aggregated datasets are also called "LCI results" datasets. The aggregated dataset may have been aggregated horizontally and/or vertically.
Allocation	An approach to solving multi-functionality problems. It refers to "partitioning the input or output flows of a process or a product system between the product system under study and one or more other product systems" (ISO 14040:2006).
Application specific	It refers to the generic aspect of the specific application in which a material is used. For example, the average recycling rate of PET in bottles.
Background processes	Refers to those processes in the product life cycle for which no direct access to information is possible. For example, most of the upstream life-cycle processes and generally all processes further downstream will be considered part of the background processes.
Benchmark	A standard or point of reference against which any comparison may be made. In the context of PEF, the term 'benchmark' refers to the average environmental performance of the representative product sold in the EU market.
Characterisation	Calculation of the magnitude of the contribution of each classified input/output to their respective EF impact categories, and aggregation of contributions within each category. This requires a linear multiplication of the inventory data with characterisation factors for each substance and EF impact category of concern. For

	example, with respect to the EF impact category "climate change", CO_2 is chosen as the reference substance and kg CO_2-equivalents as the reference unit.
Climate change	All inputs or outputs that result in greenhouse gas emissions. The consequences include increased average global temperatures and sudden regional climatic changes. Climate change is an impact affecting the environment on a global scale.
Company-specific data	It refers to directly measured or collected data from one or multiple facilities (site-specific data) that are representative for the activities of the company. It is synonymous to "primary data". To determine the level of representativeness a sampling procedure may be applied.
Comparative assertion	An environmental claim regarding the superiority or equivalence of one product versus a competing product that performs the same function (including the benchmark of the product category) (adapted from ISO 14044:2006).
Comparison	A comparison, not including a comparative assertion, (graphic or otherwise) of two or more products based on the results of a PEF study and supporting PEFCRs.
Cradle to grave	A product's life cycle that includes raw material extraction, processing, distribution, storage, use, and disposal or recycling stages. All relevant inputs and outputs are considered for all of the stages of the life cycle.
Critical review	Process intended to ensure consistency between a PEFCR and the principles and requirements of the PEF method.
Data Quality Rating	Semi-quantitative assessment of the quality criteria of a dataset based on Technological representativeness, Geographical representativeness, Time-related representativeness, and Precision. The data quality shall be considered as the quality of the dataset as documented.
Disaggregation	The process that breaks down an aggregated dataset into smaller unit process datasets (horizontal or vertical). The disaggregation may help making data more specific. The process of disaggregation should never compromise or threat to compromise the quality and consistency of the original aggregated dataset.
Downstream	Occurring along a product supply chain after the point of referral.
Ecotoxicity, freshwater	Environmental footprint impact category that addresses the toxic impacts on an ecosystem, which damage individual species and change the structure and function of the ecosystem. Ecotoxicity is a result of a variety of different toxicological mechanisms caused by the release of substances with a direct effect on the health of the ecosystem.
Electricity tracking	Electricity tracking is the process of assigning electricity generation attributes to electricity consumption.
Elementary flows	In the life cycle inventory, elementary flows include "material or energy entering the system being studied that has been drawn from the environment without previous human transformation, or material or energy leaving the system being studied that is released into the environment without subsequent human transformation" (ISO 14040, 3.12). Elementary flows include, for example, resources taken from nature or emissions into air, water, soil that are directly linked to the characterisation factors of the EF impact categories.

Eutrophication	Nutrients (mainly nitrogen and phosphorus) from sewage outfalls and fertilised farmland accelerate the growth of algae and other vegetation in water. The degradation of organic material consumes oxygen resulting in oxygen deficiency and, in some cases, fish death. Eutrophication translates the quantity of substances emitted into a common measure expressed as the oxygen required for the degradation of dead biomass. Three EF impact categories are used to assess the impacts due to eutrophication: Eutrophication, terrestrial; Eutrophication, freshwater; Eutrophication, marine.
Foreground processes	Refer to those processes in the product life cycle for which direct access to information is available. For example, the producer's site and other processes operated by the producer or its contractors (e.g. goods transport, head-office services, etc.) belong to the foreground processes.
Functional unit	The functional unit defines the qualitative and quantitative aspects of the function(s) and/or service(s) provided by the product being evaluated. The functional unit definition answers the questions "what?", "how much?", "how well?", and "for how long?".
Global warming potential	Capacity of a greenhouse gas to influence radiative forcing, expressed in terms of a reference substance (for example, CO_2-equivalent units) and specified time horizon **(**e.g. GWP 20, GWP 100, GWP 500, for 20, 100, and 500 years respectively)**.** It relates to the capacity to influence changes in the global average surface-air temperature and subsequent change in various climate parameters and their effects, such as storm frequency and intensity, rainfall intensity and frequency of flooding, etc.
Human toxicity – cancer	EF impact category that accounts for adverse health effects on human beings caused by the intake of toxic substances through inhalation of air, food/water ingestion, penetration through the skin insofar as they are related to cancer.
Human toxicity – non cancer	EF impact category that accounts for the adverse health effects on human beings caused by the intake of toxic substances through inhalation of air, food/water ingestion, penetration through the skin insofar as they are related to non-cancer effects that are not caused by particulate matter/respiratory inorganics or ionising radiation.
Input flows	Product, material or energy flow that enters a unit process. Products and materials include raw materials, intermediate products and co-products (ISO 14040:2006).
Ionising radiations, human health	EF impact category that accounts for the adverse health effects on human health caused by radioactive releases.
Land use	EF impact category related to use (occupation) and conversion (transformation) of land area by activities such as agriculture, forestry, roads, housing, mining, etc. Land occupation considers the effects of the land use, the amount of area involved and the duration of its occupation (changes in quality multiplied by area and duration). Land transformation considers the extent of changes in land properties and the area affected (changes in quality multiplied by the area).
Life cycle	Consecutive and interlinked stages of a product system, from raw material acquisition or generation from natural resources to final disposal (ISO 14040:2006).
Life cycle approach	Takes into consideration the spectrum of resource flows and environmental interventions associated with a product from a supply-chain perspective, including all stages from raw material acquisition through processing, distribution, use, and end of life processes, and all relevant related environmental impacts (instead of focusing on a single issue).

Life cycle assessment	Compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle (ISO 14040:2006).
Life cycle inventory dataset	A document or file with life cycle information of a specified product or other reference (e.g., site, process), covering descriptive metadata and quantitative life cycle inventory. A LCI dataset could be a unit process dataset, partially aggregated or an aggregated dataset.
Normalisation	After the characterisation step, normalisation is the step in which the life cycle impact assessment results are multiplied by normalisation factors that represent the overall inventory of a reference unit (e.g. a whole country or an average citizen). Normalised life cycle impact assessment results express the relative shares of the impacts of the analysed system in terms of the total contributions to each impact category per reference unit. When displaying the normalised life cycle impact assessment results of the different impact topics next to each other, it becomes evident which impact categories are affected most and least by the analysed system. Normalised life cycle impact assessment results reflect only the contribution of the analysed system to the total impact potential, not the severity/relevance of the respective total impact. Normalised results are dimensionless, but not additive.
Output flows	Product, material or energy flow that leaves a unit process. Products and materials include raw materials, intermediate products, co-products and releases (ISO 14040:2006).
Ozone depletion	EF impact category that accounts for the degradation of stratospheric ozone due to emissions of ozone-depleting substances, for example long-lived chlorine and bromine containing gases (e.g. CFCs, HCFCs, Halons).
Partially disaggregated dataset	A dataset with a LCI that contains elementary flows and activity data, and that only in combination with its complementing underlying datasets yield a complete aggregated LCI data set.
Particulate matter	EF impact category that accounts for the adverse health effects on human health caused by emissions of Particulate Matter (PM) and its precursors (NO_x, SO_x, NH_3).
PEF profile	The quantified results of a PEF study. It includes the quantification of the impacts for the various impact categories and the additional environmental information considered necessary to report.
PEF study	Term used to identify the totality of actions needed to calculate the PEF results. It includes the modelling, the data collection, and the analysis of the results. It excludes the PEF report and the verification of the PEF study and report.
Photochemical ozone formation	EF impact category that accounts for the formation of ozone at the ground level of the troposphere caused by photochemical oxidation of volatile organic compounds (VOCs) and carbon monoxide (CO) in the presence of nitrogen oxides (NO_x) and sunlight. High concentrations of ground-level tropospheric ozone damage vegetation, human respiratory tracts and manmade materials through reaction with organic materials.
Primary data or site-specific data	This term refers to data from specific processes within the supply chain of the user of the PEF method or user of the PEFCR. Such data may take the form of activity data, or foreground elementary flows (life cycle inventory). Primary data are site-specific, company-specific (if multiple sites for the same product) or supply chain specific. Primary data may be obtained through meter readings, purchase records, utility bills, engineering models, direct monitoring, material/product balances, stoichiometry, or other methods for obtaining data from specific processes in the value chain of the user of the PEF method or user of the PEFCR. In this method, primary data is synonym of "company-specific data" or "supply-chain specific data".

Reference flow	Measure of the outputs from processes in a given product system required to fulfil the function expressed by the functional unit (based on ISO 14040:2006).
Representative product (model)	The RP may be a real or a virtual (non-existing) product. The virtual product should be calculated based on average European market sales-weighted characteristics of all existing technologies/materials covered by the product category or sub-category. Other weighting sets may be used, if justified, for example weighted average based on mass (ton of material) or weighted average based on product units (pieces).
Resource use, fossil	EF impact category that addresses the use of non-renewable fossil natural resources (e.g. natural gas, coal, oil).
Resource use, minerals and metals	EF impact category that addresses the use of non-renewable abiotic natural resources (minerals and metals).
Secondary data	It refers to data not from a specific process within the supply-chain of the company performing a PEF study. This refers to 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 (e.g., from published production data, government statistics, and industry associations), literature studies, engineering studies and patents, and may also be based on financial data, and contain proxy data, and other generic data. Primary data that go through a horizontal aggregation step are considered as secondary data.
Sensitivity analysis	Systematic procedures for estimating the effects of the choices made regarding methods and data on the results of a PEF study (based on ISO 14040: 2006).
Sub-processes	Those processes used to represent the activities of the level 1 processes (=building blocks). Sub-processes may be presented in their (partially) aggregated form.
System boundary	Definition of aspects included or excluded from the study. For example, for a “cradle-to-grave” EF analysis, the system boundary includes all activities from the extraction of raw materials through the processing, distribution, storage, use, and disposal or recycling stages.
Unit process	Smallest element considered in the LCI for which input and output data are quantified (based on ISO 14040:2006).
Upstream	Occurring along the supply chain of purchased goods/ services prior to entering the system boundary.
Water use	It represents the relative available water remaining per area in a watershed, after the demand of humans and aquatic ecosystems has been met. It assesses the potential of water deprivation, to either humans or ecosystems, building on the assumption that the less water remaining available per area, the more likely another user will be deprived (see also http://www.wulca-waterlca.org/aware.html).
Weighting	Weighting is a step that supports the interpretation and communication of the results of the analysis. PEF results are multiplied by a set of weighting factors, which reflect the perceived relative importance of the impact categories considered. Weighted EF results may be directly compared across impact categories, and also summed across impact categories to obtain a single overall score.

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1. Introduction

The Product Environmental Footprint (PEF) method provides detailed and comprehensive technical rules on how to conduct PEF studies that are more reproducible, consistent, robust, verifiable and comparable. Results of PEF studies are the basis for the provision of EF information and they may be used in a diverse number of potential fields of applications, including in-house management and participation in voluntary or mandatory programmes.

For all requirements not specified in this PEFCR the user of the PEFCR shall refer to the documents this PEFCR is in conformance with (see Section 2.7).

The compliance with the present PEFCR is optional for PEF in-house applications, whilst it is mandatory whenever the results of a PEF study or any of its content is intended to be communicated.

Terminology: shall, should and may

This PEFCR uses precise terminology to indicate the requirements, the recommendations and options that could be chosen when a PEF study is conducted.

- *The term "shall" is used to indicate what is required in order for a PEF study to be in conformance with this PEFCR.*
- *The term "should" is used to indicate a recommendation rather than a requirement. Any deviation from a "should" requirement has to be justified when developing the PEF study and made transparent.*
- *The term "may" is used to indicate an option that is permissible. Whenever options are available, the PEF study shall include adequate argumentation to justify the chosen option.*

2. General information about the PEFCR

2.1. Technical Secretariat

[The list of the organizations in the Technical Secretariat (TS) at the time of approval of the final PEFCR shall be provided. For each one, the type of organization shall be reported (industry, academia, NGO, consultant, etc.), as well as the starting date of participation. The TS may decide to include also the names of the members of the persons involved for each organization]

Table 1 PEF Apparel and Footwear TS members

No.	Name of the organization	Type of organisation	Main contact(s)	Member status
1	SAC	Industry association	Baptiste Carriere-Pradal Joël Mertens	Secretariat lead Voting
2	ADEME	Government agency	Erwan Autret	Voting
3	C&A	Industry	Galina Parmenter	Voting
4	CELC	Industry association	Marie Demagdt	Voting
5	Cotton Incorporated	Industry association	Michele Wallace	Voting
6	Décathlon	Industry	Raffaele Duby Quentin Badonnel	Voting
7	FHCM	Industry association	Léonore Garnier	Voting
8	H&M	Industry	Anna Eklof Asp	Voting
9	Inditex	Industry	Natalia Capelan Teijido Germán García Ibáñez	Voting
10	IWTO	Industry association	Jeanette Cook	Voting
11	Lacoste	Industry	Steve Duhamel Frédéric LeCoq Raynald Anquet	Voting
12	Nike Inc	Industry	Adam Brundage Marjorie Gass	Voting
13	Refashion	Industry association	Hélène Daret Adèle Routhiau Maud Hardy	Voting
14	Sympatex	Industry	Rüdiger Fox	Voting
15	VF Corporation	Industry	Jordan Chamberlain	Voting
16	W.L. Gore & Associates	Industry	Benjamin Bowers Marie Mawe	Voting
17	CEC	Industry association	Carmen Arias	Non-voting
18	CNMI	Industry association	Chiara Luisi	Non-voting
19	COTANCE	Industry association	Gustavo Gonzalez-Quijano	Non-voting

No.	Name of the organization	Type of organisation	Main contact(s)	Member status
20	EURATEX	Industry association	Mauro Scalia	Non-voting
21	FESI	Industry association	Luca Boniolo	Non-voting
22	IFF	Industry association	Adam Gono	Non-voting
23	European Commission EF Team	Government	Lionel Thellier	Observer
24	European Environmental Bureau (EEB)	NGO	Jean-Pierre Schweitzer	Observer
25	Quantis	Consultant	Angela Adams Emilie Carasso	Technical expert

2.2. Consultations and stakeholders

[For each public consultation the following information shall be provided:

- Opening and closing date of the public consultation
- Number of comments received
- Names of organizations that have provided comments
- Link to the online platform]

The first public consultation is currently planned for four weeks from 7 July 2021 to 24 September 2021, on the PEFCR for apparel and footwear stakeholder workspace.

Note	Consultation information to be completed at a later date.

2.3. Review panel and review requirements of the PEFCR

[This section shall include the names and affiliations of the members of the review panel. The member that is chairing the review panel shall be identified.]

Note	Review information to be completed at a later date.

Table 2 PEFCR review panel

Name of the member	Affiliation	Role
Ugo Pretato	Studio Fieschi	Chair
Laurent Maeder	Maeder Conseils	Industry expert
Sonia Valdivia	World Resources Forum	NGO representative

The reviewers have verified that the following requirements are fulfilled:

- *The PEFCR has been developed in accordance with the requirements provided in the PEF method and Annex A of the PEF method;*
- *The PEFCR supports the creation of credible, relevant and consistent PEF profiles;*
- *The PEFCR scope and the representative products are adequately defined;*
- *The functional unit, allocation and calculation rules are adequate for the product category under consideration;*
- *Datasets used in the PEF-RPs and the supporting studies are relevant, representative, reliable, and in compliance with data quality requirements;*
- *The selected additional environmental and technical information are appropriate for the product category under consideration and the selection is done in accordance with the requirements stated in the PEF method,*
- *The model of the RP and corresponding benchmark (if applicable) represent correctly the product category or sub-category;*
- *The RP model, disaggregated in line with the PEFCR and aggregated in ILCD format, are EF compliant following the rules available at: http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml ;*

- *The RP model in its corresponding excel version is compliant with the rules outlined in Section A.2.3 of Annex A;*
- *The Data Needs Matrix is correctly implemented;*
- *The classes of performance, if identified, are appropriate for the product category.*

[The TS may add additional review criteria as appropriate]

The public review reports are provided in Annex 3 of this PEFCR.

[The review panel shall produce: i) a public review report for each PEF-RP, ii) a public review report for the final PEFCR].

2.4. Review statement

Note	Review statement to be completed at a later date.

This PEFCR was developed in compliance with the PEF Method adopted by the Commission on [indicate the date of approval of the latest version available].

The representative product(s) correctly describe the average product(s) sold in Europe for the product category/sub-category in scope of this PEFCR.

PEF studies carried out in compliance with this PEFCR would reasonably lead to reproducible results and the information included therein may be used to make comparisons and comparative assertions under the prescribed conditions (see chapter on limitations). [the last part of this statement shall be deleted in case the PEFCR is for intermediate product(s)].

[The review statement shall be completed by the reviewer.]

2.5. Geographic validity

This PEFCR is valid for products in scope sold or consumed in the European Union + the UK + EFTA.

Each PEF study shall identify its geographical validity listing all the countries where the product object of the PEF study is consumed/sold with the relative market share. In case the information on the market for the specific product object of the study is not available, Europe + UK +EFTA shall be considered as the default market, with an equal market share for each country.

2.6. Language

The PEFCR is written in English. The original in English supersedes translated versions in case of conflicts.

2.7. Conformance to other documents

This PEFCR has been prepared in conformance with the following documents (in prevailing order):

- *Product Environmental Footprint (PEF) method*
- *....*

[The PEFCR shall list additional documents, if any, with which the PEFCR is in conformance with.]

Note	Conformance to other documents additional to the PEF method to be completed at a later date as required.

3. PEFCR scope

[This section shall i) include a description of the scope of the PEFCR, ii) list and describe the sub-categories included in the PEFCR (if any), describe the product(s) in scope and the technical performance]

The product category for this PEFCR is apparel and footwear, which is defined as follows:

- **Provide an apparel or footwear product to meet the consumer's specific needs, as defined per sub-category**

The full life cycle (cradle to cradle) for apparel and footwear sold in the EU market is within the scope of this PEFCR. Additionally, this PEFCR could also be used to assess partial life cycle impacts of products included in this category.

Thirteen different sub-categories are included in this PEFCR as described in Table 4.

3.1. Product classification

The CPA codes for the products included in this PEFCR are provided in

Table 3 below.

[Based on the product category/sub-category, provide the corresponding Classification of Products by Activity (CPA) (based on the latest CPA list version available). Where multiple production routes for similar products are defined using alternative CPAs, the PEFCR shall accommodate all such CPAs. Identify the sub-categories not covered by the CPA, if any.]

Table 3 CPA/NACE codes per product sub-category

Product sub-category	CPA/NACE code
1. T-shirts	14.14.30 T-shirts, singlets and other vests, knitted or crocheted
2. Shirts and blouses	14.14.11 Men's or boys' shirts, knitted or crocheted
	14.14.13 Women's or girls' blouses, shirts and shirt- blouses, knitted or crocheted
	14.14.21 Men's or boys' shirts, of textile fabric not knitted or crocheted
	14.14.23 Women's or girls' blouses, shirts and shirt- blouses, of textile fabric not knitted or crocheted

Product sub-category	CPA/NACE code
3. Sweaters and midlayers	14.39.10 Jerseys, pullovers, cardigans, waistcoats and similar articles, knitted or crocheted
4. Jackets and coats	14.12.11 Men's ensembles, jackets and blazers, industrial and occupational
	14.12.21 Women' s ensembles, jackets and blazers, industrial and occupational
	14.13.11 Men's or boys' overcoats, car coats, capes, cloaks, anoraks, windcheaters, wind-jackets and similar articles, knitted or crocheted
	14.13.12 Men's or boys' suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches and shorts, knitted or crocheted
	14.13.13 Women's or girls' overcoats, car coats, capes, cloaks, anoraks, windcheaters, wind-jackets and similar articles, knitted or crocheted
	14.13.14 Women's or girls' suits, ensembles, jackets, blazers, dresses, skirts, divided skirts, trousers, bib and brace overalls, breeches and shorts, knitted or crocheted
	14.13.21 Men's or boys' overcoats, raincoats, car coats, capes, cloaks, anoraks, wind-cheaters, wind- jackets and similar articles of textile fabrics, not knitted or crocheted
	14.13.23 Men's or boys' jackets and blazers, of textile fabrics, not knitted or crocheted
	14.13.31 Women's or girls' overcoats, car coats, capes, cloaks, anoraks, wind-cheaters, wind-jackets and similar articles of textile fabrics, not knitted or crocheted
	14.13.33 Women's or girls' jackets and blazers of textile fabrics, not knitted or crocheted
5. Pants and shorts	14.13.12 Men's or boys' suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches and shorts, knitted or crocheted
	14.12.12 Men's trousers, bib and brace overalls, breeches and shorts, industrial and occupational
	14.13.14 Women's or girls' suits, ensembles, jackets, blazers, dresses, skirts, divided skirts, trousers, bib and brace overalls, breeches and shorts, knitted or crocheted
	14.13.24 Men's or boys' trousers, bib and brace overalls, breeches and shorts of textile fabrics, not knitted or crocheted
	14.13.35 Women's or girls' trousers, bib and brace overalls, breeches and shorts of textile fabrics, not knitted or crocheted
6. Dresses, skirts and jumpsuits	14.13.14 Women's or girls' suits, ensembles, jackets, blazers, dresses, skirts, divided skirts, trousers, bib and brace overalls, breeches and shorts, knitted or crocheted
	14.13.34 Women's or girls' dresses, skirts and divided skirts of textile fabrics, not knitted or crocheted
	14.14.12 Men's or boys' underpants, briefs, nightshirts, pyjamas, bathrobes, dressing gowns and similar articles, knitted or crocheted
	14.14.14 Women's or girls' slips, petticoats, briefs, panties, nightdresses, pyjamas, dressing gowns, negligees, bathrobes and similar articles, knitted or crocheted

Product sub-category	CPA/NACE code
	14.14.22 Men's or boys' singlets and other vests, underpants, briefs, nightshirts, pyjamas, bathrobes, dressing gowns, of textile fabric not knitted or crocheted
	14.14.24 Women's and girls' singlets and other vests, slips, petticoats, briefs, panties, nightdresses, pyjamas, negligees, bathrobes, dressing gowns and similar articles, of textile fabric not knitted or crocheted
7. Leggings, stockings, tights and socks	14.31.10 Panty hose, tights, stockings, socks and other hosiery, knitted or crocheted
8. Underwear	14.14.12 Men's or boys' underpants, briefs, nightshirts, pyjamas, bathrobes, dressing gowns and similar articles, knitted or crocheted
	14.14.22 Men's or boys' singlets and other vests, underpants, briefs, nightshirts, pyjamas, bathrobes, dressing gowns, of textile fabric not knitted or crocheted
9. Swimwear	14.19.12 Tracksuits, ski suits, swimwear and other garments, knitted or crocheted
	14.19.22 Tracksuits, ski suits and swimwear; other garments of textile fabric, not knitted or crocheted
10. Apparel accessories	14.19.41 Hat forms, hat bodies and hoods of felt; plateaux and manchons of felt; hat shapes, plaited or made by assembling strips of any material
	14.19.42 Hats and other headgear, of felt, or plaited or made by assembling strips of any material, or knitted or crocheted or made up from lace or other textile fabric in the piece; hairnets
	14.19.23 Handkerchiefs, shawls, scarves, veils, ties, cravats, gloves and other made-up clothing accessories; parts of garments or of clothing accessories, of textile fabric, not knitted or crocheted, n.e.c.
	22.29.10 Apparel and clothing accessories (including gloves), of plastics
	14.19.19 Other made-up clothing accessories and parts of garments or of clothing accessories, knitted or crocheted
	14.19.31 Clothing accessories of leather or of composition leather, expect sports gloves
	14.19.13 Gloves, mittens and mitts, knitted or crocheted
11. Open-toed shoes	15.20.12 Footwear with outer soles and uppers of rubber or plastics, other than waterproof or sports footwear
	15.20.14 Footwear with uppers of textile materials, other than sports footwear
	15.20.23 Footwear with uppers of leather, other than sports footwear, footwear incorporating a protective metal toe-cap and miscellaneous special footwear
12. Closed-toed shoes	15.20.12 Footwear with outer soles and uppers of rubber or plastics, other than waterproof or sports footwear
	15.20.14 Footwear with uppers of textile materials, other than sports footwear
	15.20.23 Footwear with uppers of leather, other than sports footwear, footwear incorporating a protective metal toe-cap and miscellaneous special footwear

Product sub-category	CPA/NACE code
	15.20.40 Parts of footwear of leather; removable insoles, heel cushions and similar articles; gaiters, leggings and similar articles, and parts thereof
13. Boots	15.20.11 Waterproof footwear, with outer soles and uppers of rubber or plastics, other than footwear incorporating a protective metal toe-cap
	15.20.13 Footwear with uppers of leather, other than sports footwear, footwear incorporating a protective metal toe-cap and miscellaneous special footwear
	15.20.21 Tennis shoes, basketball shoes, gym shoes, training shoes and the like
	15.20.29 Other sports footwear, except snow-ski footwear and skating boots
	15.20.31 Footwear incorporating a protective metal toe-cap
	15.20.40 Parts of footwear of leather; removable insoles, heel cushions and similar articles; gaiters, leggings and similar articles, and parts thereof

3.2. Representative products

[The PEFCR shall include a description of the representative product(s) and how it has been derived. The TS shall provide in an Annex to the PEFCR information about all the steps taken to define the "model" of the RP(s) and report the information gathered].

The PEF study of the representative products (PEF-RP) is available upon request to the TS coordinator that has the responsibility of distributing it with an adequate disclaimer about its limitations.

The product category includes apparel and footwear products sold in Europe.

This PEFCR covers 13 virtual representative products per the products sub-categories defined in Table 4 below. ANNEX IV – Designing the representative product model describes the steps taken to define the RP model.

Table 4 Product sub-categories and descriptions

No.	Sub-category/ representative product	Typical products included	Description
1	T-shirts	Singlets, t-shirts, polo shirts, other short-sleeved shirts	Garment to cover the upper body to the elbow
2	Shirts and blouses	Long-sleeved shirts, blouses, tunics, base layers	Garment to cover the upper body including the entire arm

No.	Sub-category/ representative product	Typical products included	Description
3	Sweaters and midlayers	Pullovers, cardigans, hoodies, jerseys, sweatshirts, knitted and wool sweaters, vests	Garment to keep the upper body warm and covered
4	Jackets and coats	Blazers, suit jackets, overcoats, other light jackets, rain jackets, outdoor winter jackets, parkas, down jackets, fur jackets, outdoor vests, leather jackets	Garment to put on top of a shirt or sweater or to protect from the elements
5	Pants and shorts	Casual pants, outdoor pants, dress pants, jeans, sports pants, capri pants, shorts	Garment to cover the lower body, may protect from the elements
6	Dresses, skirts and jumpsuits	Short- and long-sleeved, strapless, wrap, long and short, one-piece suits	One-piece garment that covers both the upper and lower body, or the lower body only, other than pants and shorts.
7	Leggings, stockings, tights and socks	Opaque and sheer tights, pantyhose, fishnets, ankle socks, knee socks, low-cut socks	Tight garment to cover the legs and/or feet
8	Underwear	Boxers, briefs, panties, bras, body-shaping suits	Garment worn under clothes, often next to the skin of the upper or lower body
9	Swimsuits	Bikinis, bathing suits, racing-style swimwear, board shorts	Garment worn for water-based or sun-based activities
10	Apparel accessories	**Hats:** Caps, flat caps, woollen hats/beanies, fedoras, panamas, bowlers, newsboys, berets	Garment to cover the head for warmth or as a fashion item
		Scarves and ties: Warm and light scarves, buffs, neckerchiefs, headscarves, shawls, bowties	Garment worn around the neck for warmth or as a fashion item
		Belts: Dress belts, casual belts, buckle belts, tie-up belts, suspenders	Flexible band or strap worn around the waist or over the shoulders used to secure or to hold up clothing such as pants
		Gloves and mittens: fingerless gloves, fashion gloves, outdoor sports gloves, mittens	Articles of clothing that protect hands and wrists from the elements or as a fashion item. Used in pairs.
11	Open-toed shoes	Flip-flops, casual /fashion sandals, sports sandals, slippers	Open-toed shoes that can be worn for sports, leisure or fashion, providing protection from the ground. Used in pairs.
12	Closed-toed shoes	Slippers, tennis shoes, moccasins, espadrilles, sneakers, cleats, athletic shoes, dress shoes, protective toecap – toed shoes	Closed-toed shoes that can be worn for sports, leisure, fashion or work, providing protection from the ground. They may protect against water, the elements and/or heavy objects. Used in pairs.
13	Boots	Polymer boots, winter boots, hiking boots, dress boots, protective toecap - toed boots	Boots that cover the ankle that can be worn for sports, leisure, fashion, or work, providing protection from the ground. They may protect against water, the elements, heavy objects and/or ankle injuries. Used in pairs.

3.3. Functional unit and reference flow

[The PEFCR shall describe (i) how each aspect of the functional unit affects the environmental footprint of the product, (ii) how to include this effect in the EF calculations and (iii) how an appropriate reference flow shall be calculated. In case calculation parameters are needed, the PEFCR shall provide default values or shall request these parameters in the list of mandatory company-specific information. A calculation example shall be provided].

The functional unit (FU) is to provide an apparel or footwear product to meet the consumer's specific needs, as defined per sub-category.

Table 5 below defines the key aspects used to define the FU.

Table 5 Key aspects to determine the unit of analysis

Aspect	Aspect detail	Description
What?	Function provided	To provide an apparel or footwear product to meet the consumer's needs, as defined per sub-category in Table 4.
How much?	Magnitude of the function	One apparel product, one pair of socks or one pair of footwear as defined by a bill of materials.
How well?	Expected level of quality	Wear in good condition with appropriate use for the given product, as defined per sub-category in Section 3.3.3.1.
How long?	Duration of the product provided	One day of wear which includes aspects such as duration of service, or lifetime, care cycles per lifetime and quality, as defined per sub-category.

A day of wear is defined as a 24-hour period, regardless how many hours the apparel or footwear product is worn within this 24-hour period. A day of wear is also equivalent to one use, with no requirement to wash the apparel product between uses.

Both the "how well" and "how long" aspects reflect the intrinsic quality of the product. With an extended lifetime, the impact of the use stage will be higher (e.g. more washes), however the impact of the production stage will be lower per day of wear. Products that fail to meet baseline quality requirements will have a higher overall impact. See Section 3.3.3.1. for more information.

The average product lifetime per sub-category is defined in Section 3.3.2.

The reference flow is the amount of product needed to fulfil the defined function and shall be measured in the fraction of the life cycle of the specific apparel or footwear product studied. *All quantitative input and output data collected in the study shall be calculated in relation to this reference flow.*

Note	As indicated in the PEF method (Zampori et al., 2019), *If the product lifetime is extended into a product with original product specifications (providing the same function) these processes shall be included in the FU and reference flow. […]The user of the PEF method shall describe how reuse or refurbishment is included in the calculations of the reference flow and the full life cycle model, taking into account the "how long" of the FU.*

3.3.1. Guidance on sizing

When calculating a product environmental footprint, companies and users shall base the calculations on the product prototype size, and indicate the size that has been chosen. A prototype size is defined as the median size of brand's own specific sizing chart. The following medium sizes shall be used for apparel, based on TS expertise:

- Infants: (0 to 2): size 1 year (68)
- Children (2 to 8): size 6 years (104)
- Children (8 to 14): size 10 years (140)
- Women: size 38
- Men: size 50
- Mixed: size 40

For footwear, the following medium sizes shall be used:

- Infants: size 21
- Children: size 32
- Women: size 37
- Men: size 42

3.3.2. Product lifetime

3.3.2.1. Introduction

In these PEFCRs, the focus is on:

i) the intrinsic quality of the product and its materials, as measured with standardized tests; and

ii) the possibility of repairing or refurbishing.

Note	In the present draft, only the methodology to address aspect i) is described. The criteria and multipliers for ii) will be updated at a later stage.

For the lifetime, the concept of the "duration of service" from the Higg Product Module (PM) methodology is used where the duration of service is defined as *"the lifetime of the product with appropriate use for its intended function".* According to this definition, the standard duration of service is independent from the number of users. Quality tests and thresholds as well as possible further requirements are used to define the Duration of Service Factor (DoS Factor), or lifetime multiplier, if certain quality requirements have been met. The standard duration of service as given in Section 3.3.2.2 can therefore be multiplied by a DoS factor depending on certain criteria described in Section 3.3.3.

3.3.2.2. Standard duration of service

Table 6 below lists the number of wears per product sub-category based on the Higg PM. The values are based partly on the Laitala 2018 study as well as information from Cotton Incorporated (Daystar et al., 2019) and IWTO (Klepp, 2020) for the lifespan in years, multiplied with information on uses per year based on Laitala et al., (2018) and expert judgement. The presented default lifetime shall only be modified by the multipliers presented in Section 3.3.3.

421 Table 6 Default product duration of service per product sub-category

No.	Product sub-category	Product	Number of wears per product duration of service
1	T-shirts	Average	45[1]
2	Shirts and blouses	Average	40[1]
3	Sweaters and midlayers	Average	85[1]
4	Jackets and coats	Average	100
5	Pants and shorts	Average	70[1]
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

422

423 A use is equivalent to one day of wear. The numbers included above are independent from
424 the number of users.

Note	This table has been simplified to reflect the uncertainty of the data. It may be updated at a later stage should more data be provided.

425 ### 3.3.3. Calculation of the duration of service

426 For the determination of the duration of service, the default duration of service combined
427 with the corresponding duration of service factors (supported with evidence) shall be used.

428 #### 3.3.3.1. Requirements regarding intrinsic quality

429 The intrinsic quality of the product and of its materials and parts can have a direct impact on
430 the lifetime of the product. The PEFCRs follow a similar method to the one developed for the
431 Higg PM which combines several tests into one factor by which the standard lifetime is
432 multiplied.

[1] Calculated based on the percentages of the fibre types in the RP.

Performance tests are defined per representative product category. Depending on the performance of the product, and using a weighting system, a score is determined as a multiplier with which the standard lifetime of the product can be adjusted. The number of tests for each product have been limited to those associated with the most common product failure modes.

The specific requirements for the different types of products are defined in Table 41 through Table 64 which can be found in ANNEX V – Detailed requirements regarding intrinsic quality.

Suitable proof for meeting requirements can either be development-based where suitable production tolerances have been agreed upon with the manufacturers, or be production-based. The production tolerances should be in line with the requirements in the corresponding tables in Annex V. In-house laboratory testing is allowed if proficiency can be demonstrated for the required tests, meaning the in-house laboratory is in compliance with international certification schemes such as ISO 17025 or equivalent.

The intrinsic quality multiplier shall be calculated using the levels achieved in the tests by the product and the materials that compose it. The percent of total possible points achieved translates to an intrinsic quality multiplier to the product's lifetime (number of days of wear in the functional unit).

- The intrinsic quality multiplier shall only be applied to products for which the tables in Annex IV apply.
- For other products, the multiplier shall be equal to 1.
- If no test is performed, the number of points allocated is 0. .

The intrinsic quality multipliers to be used based on the percentage of possible points achieved are summarized in Table 7, based on TS expertise.

Note	A refinement of the requirements for a factor of 1 or more might be needed, e.g. in the case where a quality program is in place which does not include all the pre-qualification tests.

Table 7 Intrinsic quality multipliers

Percent of possible points achieved	Intrinsic quality multiplier
0 points / no tests performed	0.67
1 to 3 points	0.84
4 to 7 points	1
8 to 11 points	1.17
12 points or more	1.45

The number of points reached shall be rounded to the next inferior whole number.

Two examples of the calculation with the intrinsic quality multiplier for a shirt are provided in Table 8 and Table 9 below.

Table 8 Example of impact for a shirt on climate change, intrinsic quality multiplier = 1

Indicator	Climate change results
Supply chain impacts and end of life stage	14 kg CO_2-eq
Use stage	+ 40 total uses*1 / 2 uses per wash * 0.04 kg CO_2eq
Total (per lifetime)	*=14.8 kg CO_2eq*
Total (per day of wear)	*14.8 kg CO_2eq / (40 total uses *1 for the intrinsic quality multiplier)* *= 0.37 kg CO_2eq*

Table 9 Example of impact for a shirt on climate change, intrinsic quality multiplier = 1.45

Item	Climate change results
Supply chain impacts and end of life stage	14 kg CO_2eq
Use stage	+ 40 total uses*1.45 / 2 uses per wash * 0.04 kg CO_2eq
Total (per lifetime)	*=15.16 kg* CO_2eq
Total (per day of wear)	*15.16 kg CO_2eq / (40 total uses * 1.45 for the intrinsic quality multiplier)* *= 0.26 kg CO_2eq*

3.3.3.2. Repair/refurbish

A further aspect influencing the lifetime of the product is the possibility to repair or refurbish the products as part of the design, as well as the availability of guides or repair services.

The value for the repairability multiplier is set to 1 pending an update of the PEFCRs at a later stage.

Note	Repairability is currently being explored by the Technical Secretariat. This section will be updated at a later date.

3.4. System boundaries

[This section shall include a system diagram clearly indicating the processes and life cycle stages that are included in the product category/sub-category. A short description of the processes and life cycle stages shall be provided. The diagram shall include an indication of the processes for which company-specific data are required and the processes excluded from the system boundary.]

The following life cycle stages and processes shall be included in the system boundary*:* the entire life cycle (from cradle to cradle) of apparel and footwear products including the raw material production (including packaging), manufacturing, distribution, use and end-of-life life cycle stages. The system boundaries are shown in Figure 1 for apparel and Figure 2 for footwear. The main processes for each life cycle stage are also indicated below.

Note	Requirements for company-specific data will be added at a later stage.

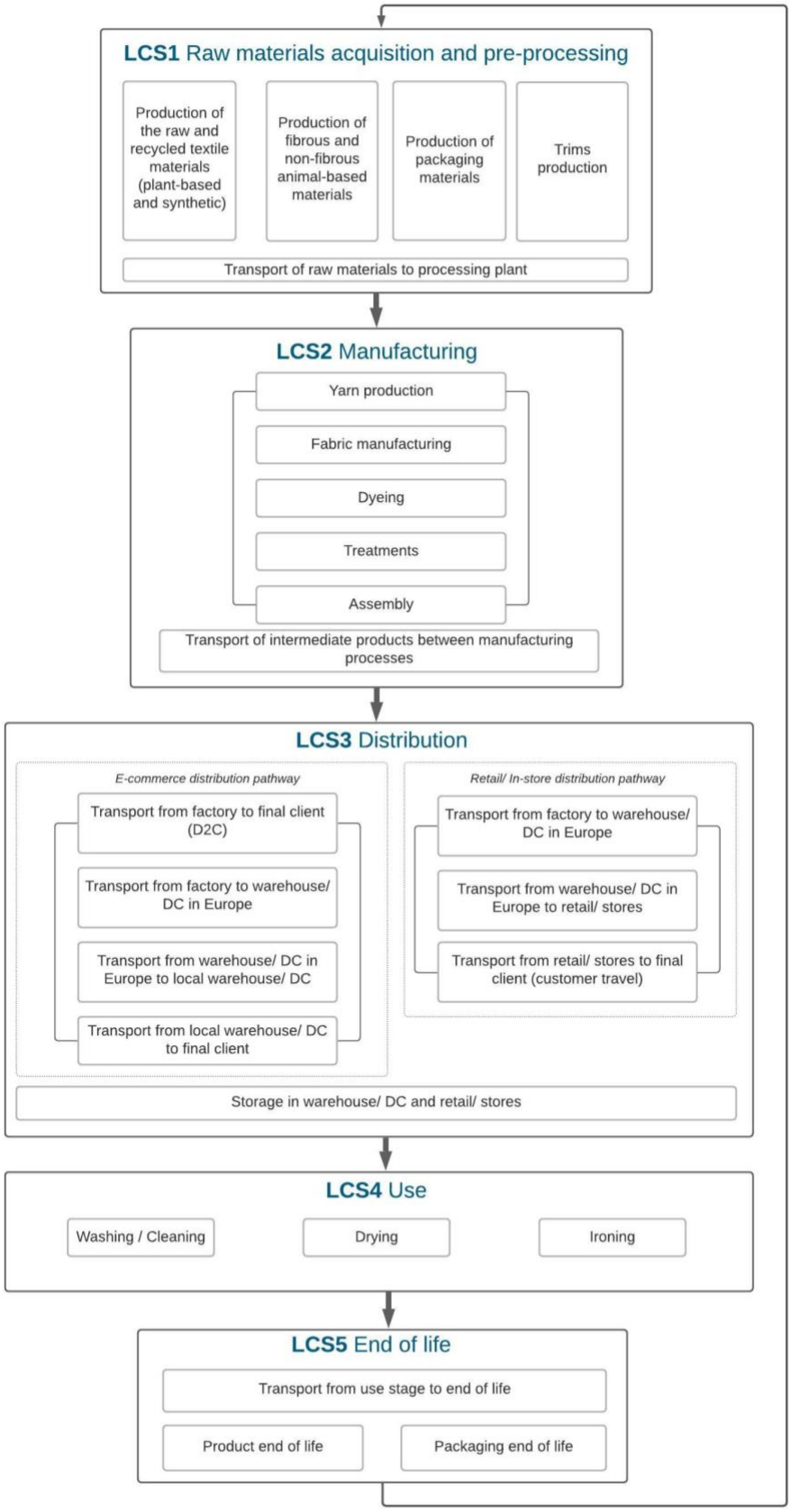


Figure 1 System boundary diagram for apparel

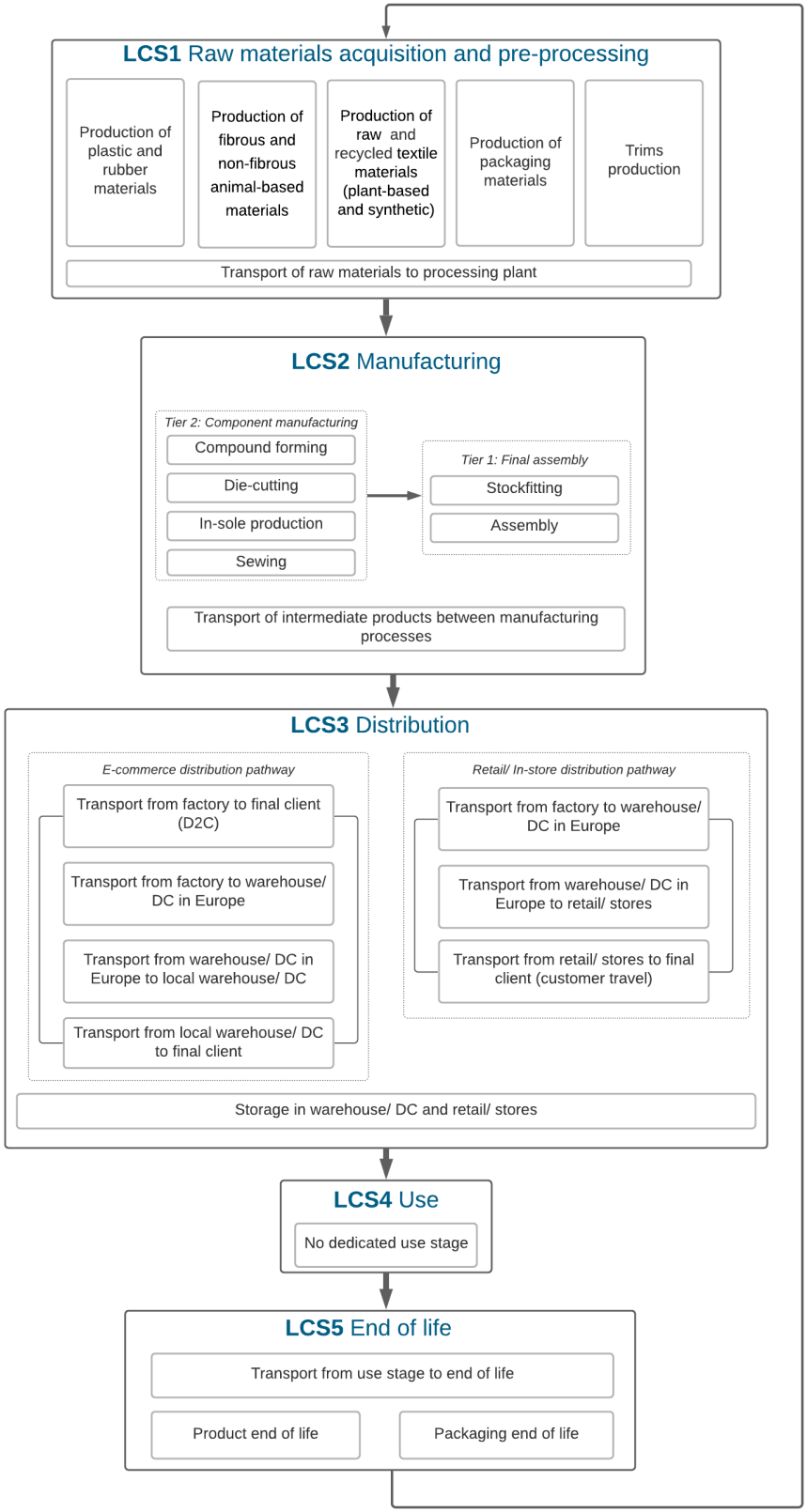


Figure 2 System boundary diagram for footwear

491 Table 10 Processes included per life cycle stage

Life cycle stage	Short description of the processes included
LCS1 Raw materials acquisition and pre-processing	• Production or extraction of raw textile materials, fibrous and non-fibrous animal-based materials (including leather materials, tanning and finishing), packaging materials and trims, including the production of filament yarn • Additionally for footwear, production of plastic and rubber materials • Raw material transport to manufacturing plant
LCS2 Manufacturing	Apparel: • Production of yarn through spinning (production of yarn from staple fibres) • Production of knitted fabric (e.g. knitting circular, knitting flat) • Production of woven fabric • Dyeing: Bleaching and dyeing processes • Treatments: Includes both wet and dry treatments • Assembly (includes sewing) • Transport of intermediate products between manufacturing processes Footwear: • Compound forming • Die-cutting • In-sole production • Sewing • Stockfitting • Assembly • Transport of intermediate products between manufacturing processes
LCS3 Distribution	E-commerce: • Transport from factory to the final client (direct to consumer) • Transport from the factory to warehouse/ distribution centre located in Europe • Transport from a warehouse/ distribution centre located in Europe to a local warehouse/ distribution centre • Transport from local warehouse/ distribution centre to final client • Distribution losses Retail/ in-store: • Transport from the factory to warehouse/ distribution centre located in Europe • Transport from warehouse/ distribution centre located in Europe to retail/ stores • Transport from retail/ stores to final client (consumer travel) • Distribution losses
LCS4 Use	Apparel • Washing / cleaning • Drying • Ironing
LCS5 End of life	• Transportation, from user to collection point • Transportation, from collection point to sorting point • Transportation, from sorting point to recycling • Transportation, from user to disposal • Recycling, incineration (with and without energy recovery) and landfilling

492 *According to this PEFCR, the following processes may be excluded based on the cut-off rule:*
493 [include the list of processes that shall be excluded based on the cut off rule]*. No additional*
494 *cut-off is allowed. OR According to this PEFCR, no cut-off is applicable.*

Note	Processes to be excluded will be completed at a later stage.

Each PEF study done in accordance with this PEFCR shall provide in the PEF study a diagram indicating the activities falling in situation 1, 2 or 3 of the data needs matrix.

3.5. List of EF impact categories

Each PEF study carried out in compliance with this PEFCR shall calculate the PEF-profile including all EF impact categories listed in the Table below. [The TS shall indicate in the table if the sub-categories for climate change shall be calculated separately. In case one or both sub- categories are not reported on, the TS shall include a footnote explaining the reasons, e.g.: "The sub-indicators 'Climate change – biogenic' and 'Climate change - land use and land transformation' shall not be reported separately because their contribution to the total climate change impact, based on the benchmark results, is less than 5% each."]

Note	The information on the climate change sub-categories will be completed following the PEF-RP study.

Table 11 Impact categories for the PEF profile

EF impact category	Impact indicator	Unit	Characterization model
Climate change	Radiative forcing as Global Warming Potential (GWP100)	kg CO_2-eq	Baseline model of 100 years of the Intergovernmental Panel on Climate Change (IPCC) (based on IPCC 2013)
- Climate change – fossil			
- Climate change-biogenic			
- Climate change – land use and land use change			
Ozone depletion	Ozone Depletion Potential (ODP)	kg CFC-11-eq	Steady-state ODPs as in (WMO 2014 + integrations)
Human toxicity, cancer	Comparative Toxic Unit for humans (CTUh)	CTUh	USEtox model 2.1 (Fankte et al, 2017)
Human toxicity, non-cancer	Comparative Toxic Unit for humans (CTUh)	CTUh	USEtox model 2.1 (Fankte et al, 2017)
Particulate matter	Impact on human health	disease incidence	PM method recommended by UNEP (UNEP, 2016)
Ionising radiation, human health	Human exposure efficiency relative to U235	kBq U^{235} -eq	Human health effect model as developed by Dreicer et al., 1995 (Frischknecht et al, 2000)

EF impact category	Impact indicator	Unit	Characterization model
Photochemical ozone formation, human health	Tropospheric ozone concentration increase	kg NMVOC -eq	LOTOS-EUROS model (Van Zelm et al, 2008) as implemented in ReCiPe 2008
Acidification	Accumulated Exceedance (AE)	mol H^+ -eq	Accumulated Exceedance (Seppälä et al. 2006, Posch et al, 2008)
Eutrophication, terrestrial	Accumulated Exceedance (AE)	mol N -eq	Accumulated Exceedance (Seppälä et al., 2006, Posch et al, 2008)
Eutrophication, freshwater	Fraction of nutrients reaching freshwater end compartment (P)	kg P -eq	EUTREND model (Struijs et al, 2009) as implemented in ReCiPe
Eutrophication, marine	Fraction of nutrients reaching marine end compartment (N)	kg N -eq	EUTREND model (Struijs et al, 2009) as implemented in ReCiPe
Ecotoxicity, freshwater	Comparative Toxic Unit for ecosystems (CTUe)	CTUe	USEtox model 2.1 (Fankte et al, 2017)
Land use	• Soil quality index (dimensionless) • Biotic production (kg biotic production) • Erosion resistance (kg soil) • Mechanical filtration (m^3 water) • Groundwater replenishment (m^3 groundwater)	Dimensionless (pt)	Soil quality index based on LANCA (Beck et al. 2010 and Bos et al. 2016)
Water use	User deprivation potential (deprivation- weighted consumption)	m^3 world -eq	Available WAter REmaining (AWARE) as recommended by UNEP, 2016
Resource use[2], minerals and metals	Abiotic resource depletion (ADP ultimate reserves)	kg Sb -eq	CML 2002 (Guinée et al., 2002) and (van Oers et al., 2002).
Resource use, fossils	biotic resource depletion – fossil fuels (ADP-fossil)	MJ	CML 2002 (Guinée et al., 2002) and (van Oers et al., 2002)

The full list of normalisation factors and weighting factors are available in ANNEX I - List of EF normalisation and weighting factors. *The full list of characterization factors is available at this link* http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml. [The TS shall specify the EF reference package that shall be used.]

[2] *The results of this impact category shall be interpreted with caution, because the results of ADP after normalization may be overestimated. The European Commission intends to develop a new method moving from depletion to dissipation model to better quantify the potential for conservation of resources.*

3.6. Additional technical information

[The TS shall list the additional technical information to be reported]:

- ...

Note	Additional technical information to be completed at a later stage if relevant.

3.7. Additional environmental information

[Specify which additional environmental information shall/should be reported (provide units). Avoid if possible the use of should. Reference all methods used to report additional information.]

Practitioners should report additional environmental information as described in the PEF method (2019). Additional environmental information should include the following (non-exhaustive list):

- Information regarding the company's work with social/environmental responsibility, such as a link to a Corporate Social Responsibility (CSR) report, which initiatives you have joined (e.g. reporting to CDP), but also data about specific environmental characteristics of the product may be added; and
- Sustainability programs for apparel and footwear or materials/energy/packaging, etc., including the percentage that follows each program. (e.g., percentage of cardboard that is from a certified source or percentage of textiles from certified labels (e.g. OEKO-TEX® MADE IN GREEN or ZDHC's MRSL compliance).
- Results of a plastic leakage assessment if one has been conducted, see for example a plastic leakage study of an outdoor jacket here.
- Biodiversity is relevant for each product sub-category in scope of the PEFCR based on expert judgement of the TS. To assess and report impacts on biodiversity, an organic certification system for natural fibres may be used as a proxy. The PEFCR applicant

shall report whether any of the materials are certified as organic and report the total mass percentage of the product that is certified organic.

Note	Additional environmental information to be completed at a later stage if relevant.

3.8. Limitations

[This section shall include the list of limitations a PEF study will have, even if carried out in accordance with this PEFCR.]

The following limitations should be noted when conducting PEF studies with these PEFCRs:

- Microplastic leakage is often associated with the use and end of life stages of apparel and footwear products. Microplastics are not yet covered by the PEF methodology because the impact assessment methods do not yet exist. A plastic leakage assessment can be done to quantify plastic leakage in a first step. More information on conducting a plastic leakage assessment is included in Section 3.7.
- Because the PEF methodology is product- and not user- centric, these PEFCRs do not allow for differentiation between the impact of a new or secondhand item.
- The duration of service of items is included in these PEFCRs, but the methodology to measure the duration of service is highly debated and may be refined in the future. Non-physical durability attributes such as design (use of adjustable design features such as adjustable waist, enabling detaching and replacing parts such as pockets), or making the garment fit for different purposes, which may have an impact on how long a single user will use a product, were not included in these PEFCRs.
- Deadstock is not included in the PEFCRs at this stage, however the TS is investigating how to include it in a future version.
- The toxicity aspects are measured with the LCIA method USEtox, which includes – human toxicity (cancer and non-cancer effects) and freshwater ecotoxicity, but no marine water or terrestrial ecotoxicity for the moment. This method therefore does

not cover the full impacts of chemicals on humans and ecosystems, which are covered by chemical legislation and other methodologies.

These PEFCRs have a time validity of X years. Updates may be conducted earlier should any key limitation need to be resolved, key technologies change (e.g. recycling), or should better data be made available to inform the default product duration of service per product sub-category (see Table 6).

Note	Time validity of the PEFCRs to be completed for the final version of the PEFCRs.

3.8.1. Comparisons and comparative assertions

[This section shall include the conditions under which a comparison or comparative assertion may be made.]

Note	Conditions under which a comparison or comparative assertion may be made to be completed at a later stage.

3.8.2. Data gaps and proxies

[This section shall include:

- The list of data gaps on the company-specific data to be collected that most frequently are encountered by companies in the specific sectors and how these data gaps may be solved in the context of the PEF study;
- The list of processes excluded from the PEFCR due to missing datasets that shall not be filled in by the user of the PEFCR;
- The list of processes for which the user of the PEFCR shall apply ILCD-EL compliant proxies.

The TS may decide to indicate in the LCI excel file (see Section 5) for which processes no datasets are available and therefore are considered data gaps and for which processes proxies shall be used.]

Note	Data gaps, excluded processes and proxies to be completed following the delivery of the EF3.0 database, or before the supporting studies at the latest for proxies, and updated as required.

Consumer behaviour can be taken into account through surveys. In the future, digital product passports will become more widely used and thus more primary data will be made available to increase the robustness of key parameters such as the number of wears before a care cycle. In the meantime, the standard duration of service as described in Section 3.3.3 shall be used.

4. Most relevant impact categories, life cycle stages, processes and elementary flows

4.1. Most relevant EF impact categories

The most relevant impact categories per product sub- category *are the following:*

Table 12 Most relevant impact categories per RP

Impact category	RP1	RP2	RP3	RP4	RP5	RP6	RP7	RP8	RP9	RP10	RP11	RP12	RP13
Climate change	**22%**	**24%**	**29%**	**28%**	**24%**	**24%**	**25%**	**23%**	**29%**	**21%**	**32%**	**28%**	**30%**
Ozone depletion	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Human toxicity, cancer	1%	1%	0%	0%	1%	1%	1%	1%	0%	1%	2%	1%	2%
Human toxicity, non-cancer	2%	2%	2%	2%	1%	2%	2%	2%	2%	3%	1%	2%	1%
Particulate matter	**6%**	**7%**	**4%**	**6%**	**7%**	**7%**	**7%**	**6%**	**8%**	**7%**	**11%**	**9%**	**10%**
Ionising radiation	1%	1%	0%	0%	1%	1%	1%	1%	1%	0%	1%	0%	1%
Photochemical ozone formation	3%	3%	2%	3%	3%	3%	3%	3%	3%	2%	4%	3%	4%
Acidification	**6%**	**6%**	**4%**	**5%**	**6%**	**6%**	**6%**	**6%**	**6%**	**6%**	**9%**	**8%**	**9%**
Eutrophication, terrestrial	2%	2%	2%	2%	2%	2%	2%	2%	2%	4%	**4%**	**4%**	**5%**
Eutrophication, freshwater	**6%**	**5%**	2%	3%	6%	**5%**	**5%**	**7%**	4%	3%	4%	3%	4%
Eutrophication, marine	3%	3%	4%	3%	3%	3%	3%	3%	2%	**6%**	3%	3%	3%
Ecotoxicity, freshwater	**10%**	**9%**	4%	5%	**9%**	**9%**	**9%**	**10%**	**11%**	**5%**	**8%**	**7%**	**9%**
Land use	1%	1%	**32%**	**19%**	1%	4%	4%	1%	0%	**25%**	1%	**9%**	1%
Water use	**20%**	**16%**	**6%**	**5%**	**15%**	**16%**	**10%**	**18%**	3%	**6%**	1%	3%	1%
Resource use, minerals and metals	4%	5%	2%	**6%**	**6%**	**5%**	**5%**	3%	**9%**	4%	2%	**5%**	**5%**
Resource use, fossils	**14%**	**14%**	**6%**	**11%**	**15%**	**14%**	**16%**	**15%**	**19%**	**9%**	**16%**	**14%**	**15%**
Total most relevant contribution (%)	**83%**	**82%**	**82%**	**80%**	**81%**	**84%**	**83%**	**85%**	**81%**	**84%**	**81%**	**83%**	**83%**

4.2. Most relevant life cycle stages

The most relevant life cycle stages for per product sub-category are the following:

Table 13 Most relevant life cycle stage per impact categories per RP

Impact category	RP1	RP2	RP3	RP4	RP5	RP6	RP7	RP8	RP9	RP10	RP11	RP12	RP13
Climate change	1,2,4	1,2	1,2	1,2	1,2	1,2	1,2	2,4	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	1,2,4	1,2	1,2	1,2	1,2	1,2	1,2	1,2,4	1,2	1,2	1,2	1,2	1,2
Eutrophication, terrestrial	--	--	--	--	--	--	--	--	--	--	1,2	1,2	1,2
Eutrophication, freshwater	1,2,4	1,2	--	--	--	1,2	2,4	1,2,4	--	--	--	--	--
Eutrophication, marine	--	--	--	--	--	--	--	--	--	1	--	--	--
Ecotoxicity, freshwater	1,2,4	1,2	--	--	1,2,4	1,2	1,2,4	1,2,4	2,4	1,2	1,2	1,2	1,2
Land use	--	--	1	1	--	--	--	--	--	1	--	1	--
Water use	1	1	1	1,2	1	1	1	1	--	1	--	--	--
Resource use, minerals and metals	--	--	--	1,2	1,2	1,2	1,2	--	1,2	--	--	1	1
Resource use, fossils	2,4	1,2	1,2	1,2	1,2,4	1,2	1,2	2,4	1,2	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. Swimsuits, RP10. Apparel accessories, RP11. Open-toed shoes, RP12. Closed-toed shoes, RP13. Boots. LC1. Raw materials extraction and pre-processing, LCS2. Manufacturing, LCS3. Distribution, LCS4. Use, LCS5. End of life.

4.3. Most relevant processes

The most impacting processes for the product category in scope of this PEFCR are the following

[this table shall be filled in based on the final results of the PEF studies of the representative product(s). Provide one table per sub-category, if appropriate.]

Table 14 Most impacting processes per product sub-category

Process per life cycle stage (LCS)	RP1	RP2	RP3	RP4	RP5	RP6	RP7	RP8	RP9	RP10	RP11	RP12	RP13
LCS1: Raw material acquisition and pre-processing													
Cashmere	--	--	X	X	--	--	--	--	--	--	--	--	--
Cotton	X	X	X	X	X	X	X	X	--	X	--	--	--
Leather	--	--	--	--	--	--	--	--	--	X	X	X	X
Linen	--	X	--	--	X	--	--	--	--	--	--	--	--
Synthetics (others)	--	--	--	--	--	--	X	--	X	--	--	--	--
Polyamide	--	--	--	--	--	--	X	--	X	--	--	--	--
Polyester	--	--	--	X	--	X	X	--	X	--	--	X	X
PTFE	--	--	--	X	--	--	--	--	--	--	--	--	--
Silk	--	--	--	--	--	--	--	--	--	X	--	--	--
Steel	--	--	--	--	--	--	--	--	--	--	--	--	X
Viscose	--	X	--	--	--	X	X	--	--	--	--	--	--
Wool	--	--	X	X	--	--	X	--	--	X	--	X	--
LCS2													
Spinning	X	X	X	--	X	X	X	X	--	--	--	--	--
Knitting	--	--	X	--	--	--	--	--	--	--	--	--	--
Weaving	--	X	--	X	X	X	--	X	X	X	--	--	--
Sole making	--	--	--	--	--	--	--	--	--	--	X	--	--
Die-cutting and sewing	--	--	--	--	--	--	--	--	--	--	X	X	X
Bleaching and dyeing	X	X	X	X	X	X	X	X	X	--	--	--	--
Finishing	X	X	X	X	X	X	X	X	X	X	--	--	--
Assembly	X	X	X	X	X	X	X	X	X	X	X	X	X
LCS4													
Washing	X	X	--	--	X	X	X	X	X	--	--	--	--
Drying	X	--	--	--	X	--	X	X	--	--	--	--	--

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. Swimsuits, RP10. Apparel accessories, RP11. Open-toed shoes, RP12. Closed-toed shoes, RP13. Boots.

4.4. Most relevant elementary flows

The most relevant direct elementary flows for the product category in scope of this PEFCR are the following [the list shall be provided based on the final results of the PEF studies of the representative product(s). Provide one list per sub-category, if appropriate.]

Note	To be completed following the last PEF-RP study as an annex to the PEFCRs.

5. Life cycle inventory

All newly created datasets shall be EF compliant.

5.1. List of mandatory company-specific data

[The TS shall here list the processes to be modelled with mandatory company-specific data (i.e. activity data and direct elementary flows).]

Note	Processes to be modelled with mandatory company-specific data to be updated following the availability of the EF 3.0 database. The list below has been provided for companies to prepare for the supporting studies, and is a worst-case scenario. It is likely that the amount of mandatory company-specific data will be reduced.

The following company-specific data shall be collected by companies using these PEFCRs, with a data quality rating (DQR) ≤1.5, as detailed in Section 5.3.1:

- LCS1 – Raw materials: material type and quantity per bill of material including trims, material provenance, packaging material types and quantity including recycled content
- LCS2 – Manufacturing: processes and technologies used (possible to change energy type and amount if data are available), loss rates
- LCS3 – Distribution: specific transport modes and distances, loss rates
- LCS4 – Use stage: care instructions as per the care label
- LCS5 – End of life: market sales per country
- General: final product weight, optional information to assess the intrinsic product quality (standardized quality test results needed to determine the multiplier; otherwise a multiplier of 1 is used)

Process A

[Provide a short description of process "a". List all the activity data and direct elementary flows that shall be collected and the default datasets of the sub-processes linked to the activity data within process "a". Use the table below to introduce minimum one example in the PEFCR. In case not all processes are introduced here, the full list of all processes shall be included in an excel file.]

Note	The table below is provided as an example for the TS to see what data tables will eventually look like.

Table 15 Data collection requirements for mandatory process A (dummy example)

Requirements	Data type	Example
For data collection purposes	Activity data to be collected	Quantity of tap water
	Specific requirements (e.g. frequency, measurement standard, etc.)	Company-specific primary data on the percentage by weight required per FU that are no older than 2 years old
For modelling purposes	Unit of measure	L/FU
	Default dataset to be used	De-ionised water production| technology mix| production mix, at plant| 100% active substance {RER} [LCI result]
	Dataset source (i.e. node)	http://ecoinvent.lca-data.com/
	UUID	8040e11a-715f-4cd9-823c-a57124a553b2
	TiR (average)	1
	TeR	2
	GeR	1
	P	2
	DQR	2

Where TeR is technological representativeness, GeR is geographical representativeness, TiR is time representativeness, and P is precision, UUID Universally Unique Identifier, and DQR data quality rating.

[List all the emissions and resources that shall be modelled with company-specific information (most relevant foreground elementary flows) within process "a".]

Note	Company specific data to be collected will be provided as an Excel file in an appendix. See Table 15 as an example.

*See excel file named "[*Name PEFCR_version number*] - Life cycle inventory" for the list of all company-specific data to be collected.*

5.2. List of processes expected to be run by the company

[The processes listed in this chapter shall be additional to the ones listed as mandatory company-specific data. No repetition of processes or data are allowed. In case there are no further processes expected to be run by the company, please state "There are no further processes expected to be run by the company in addition to those listed as mandatory company-specific data."]

The following processes are expected to be run by the user of the PEFCR:

- *Process X*
- *Process Y*

Note	Processes expected to be run by the company to be completed following the delivery of the EF3.0 database, or before the supporting studies at the latest, and updated as required.

Process X:

[Provide a short description of process "x". List all the activity data and direct elementary flows that shall be collected and the datasets of the sub-processes linked to the activity data within process "x". Use the table below to introduce minimum one example in the PEFCR. In case not all processes are introduced here, the full list of all processes shall be include in an excel file.]

Note	Data collection requirements and direct elementary flow collection requirements for mandatory processes will be provided as an Excel file in an appendix. See Table 15 as an example.

*See excel file named "[*Name PEFCR_version number*] - Life cycle inventory" for the list of all processes expected to be in situation 1.*

5.3. Data quality requirements

The data quality of each dataset and the total PEF study shall be calculated and reported. The calculation of the DQR shall be based on the following formula with four criteria:

$$\mathit{DQR} = \frac{TeR+GeR+TiR+P}{4} \quad \textit{[Equation 1]}$$

Where TeR is technological representativeness, GeR is geographical representativeness, TiR is time representativeness, and P is precision. The representativeness (technological, geographical and time-related) characterises to what degree the processes and products selected are depicting the system analysed, while the precision indicates the way the data are derived and related level of uncertainty.

The next chapters provide tables with the criteria to be used for the semi-quantitative assessment of each criterion.

[The PEFCR may specify more stringent data quality requirements and specify additional criteria for the assessment of data quality. The PEFCR shall report the formulas to be used for assessing the DQR of i) company-specific data (equation 20 of the PEF method), ii) secondary datasets (equation 19 of the PEF method, iii) PEF study (equation 20 of the PEF method).]

5.3.1. Company-specific datasets

The DQR shall be calculated at the level-1 disaggregation, before any aggregation of sub-processes or elementary flows is performed. The DQR of company-specific datasets shall be calculated as following:

1. *Select the most relevant activity data and direct elementary flows: most relevant activity data are the ones linked to sub-processes (i.e. secondary datasets) that account for at least 80% of the total environmental impact of the company-specific dataset, listing them from the most contributing to the least contributing one. Most relevant*

direct elementary flows are defined as those direct elementary flows contributing cumulatively at least with 80% to the total impact of the direct elementary flows.

2. *Calculate the DQR criteria TeR, TiR, GeR and P for each most relevant activity data and each most relevant direct elementary flow. The values of each criterion shall be assigned based on* Table 16*.*

    a. *Each most relevant direct elementary flow consists of the amount and elementary flow naming (e.g. 40 g carbon dioxide). For each most relevant elementary flow, the user of the PEFCR shall evaluate the 4 DQR criteria named* $Te_{R\text{-}EF}$*,* $Ti_{R\text{-}EF}$*,* $G_{R\text{-}EF}$*,* P_{EF}*. For example, the user of the PEFCR shall evaluate the timing of the flow measured, for which technology the flow was measured and in which geographical area.*
    b. *For each most relevant activity data, the 4 DQR criteria shall be evaluated (named* $Ti_{R\text{-}AD}$*,* P_{AD}*,* $G_{r\text{-}AD}$*,* $T_{er\text{-}AD}$*) by the user of the PEFCR.*
    c. *Considering that the data for the mandatory processes shall be company-specific, the score of P cannot be higher than 3, while the score for TiR, TeR, and GeR cannot be higher than 2 (The DQR score shall be ≤1.5).*

3. *Calculate the environmental contribution of each most relevant activity data (through linking to the appropriate sub-process) and direct elementary flow to the total sum of the environmental impact of all most-relevant activity data and direct elementary flows, in % (weighted, using all EF impact categories). For example, the newly developed dataset has only two most relevant activity data, contributing in total to 80% of the total environmental impact of the dataset:*
    - *Activity data 1 carries 30% of the total dataset environmental impact. The contribution of this process to the total of 80% is 37.5% (the latter is the weight to be used).*
    - *Activity data 2 carries 50% of the total dataset environmental impact. The contribution of this process to the total of 80% is 62.5% (the latter is the weight to be used).*

4. *Calculate the T_eR, T_iR, G_eR and P criteria of the newly developed dataset as the weighted average of each criteria of the most relevant activity data and direct elementary flows. The weight is the relative contribution (in %) of each most relevant activity data and direct elementary flow calculated in step 3.*

The user of the PEFCR shall calculate the total DQR of the newly developed dataset using Equation 2, where, $\overline{TiR}, \overline{TeR}, \overline{GeR}, \bar{P}$ are the weighted average calculated as specified in point (4).

$$DQR = \frac{\overline{TiR}+\overline{TeR}+\overline{GeR}+\bar{P}}{4} \quad \text{[Equation 2]}$$

Table 16 DQR assessment criteria for datasets with company-specific information*

Rating	PEF and PAD	T_iR-EF and $_{TiR}$-AD	T_eR-EF and T_eR- AD	GeR-EF and GeR-AD
1	Measured/calculated and externally verified	The data refers to the most recent annual administration period with respect to the EF report publication date	The elementary flows and the activity data exactly the technology of the newly developed dataset	The activity data and elementary flows reflects the exact geography where the process modelled in the newly created dataset takes place
2	Measured/calculated and internally verified, plausibility checked by reviewer	The data refers to maximum 2 annual administration periods with respect to the EF report publication date	The elementary flows and the activity data are a proxy of the technology of the newly developed dataset	The activity data and elementary flows) partly reflects the geography where the process modelled in the newly created dataset takes place
3	Measured/calculated /literature and plausibility not checked by reviewer OR Qualified estimate based on calculations plausibility checked by reviewer	The data refers to maximum three annual administration periods with respect to the EF report publication date	Not applicable	Not applicable
4-5	Not applicable	Not applicable	Not applicable	Not applicable

PEF: Precision for elementary flows; PAD: Precision for activity data; TiR-EF: Time Representativeness for elementary flows; TiR-AD: Time representativeness for activity data; TeR-EF: Technology representativeness for elementary flows; TeR-AD: Technology representativeness for activity data; GeR-EF: Geographical representativeness for elementary flows; GeR-AD: Geographical representativeness for activity data.

* Note that the reference years for criterion TiR may be adapted by the TS; more than one table may be included in the PEFCR

5.4. Data needs matrix

All processes required to model the product and outside the list of mandatory company-specific data (listed in Section 5.1) shall be evaluated using the Data Needs Matrix (see Table 17*). The user of the PEFCR shall apply the DNM to evaluate which data are needed and shall be used within the modelling of its PEF, depending on the level of influence the user of the PEFCR (company) has on the specific process. The following three cases are found in the DNM and are explained below:*

1. ***Situation 1****: the process is run by the company applying the PEFCR;*
2. ***Situation 2****: the process is not run by the company applying the PEFCR but the company has access to (company-)specific information;*
3. ***Situation 3****: the process is not run by the company applying the PEFCR and this company does not have access to (company-)specific information.*

Table 17 Data Needs Matrix (DNM)

		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)[3] 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)*	

[3] Company-specific datasets shall be made available to the EC

		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	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

**Disaggregated datasets shall be used.*

The options described in the DNM are not listed in order of preference.

5.4.1. Processes in situation 1

For each process in situation 1 there are two possible options:

- *The process is in the list of most relevant processes as specified in the PEFCR or is not in the list of most relevant process, but still the company wants to provide company-specific data (option 1);*
- *The process is not in the list of most relevant processes and the company prefers to use a secondary dataset (option 2).*

Situation 1/Option 1

For all processes run by the company and where the user of the PEFCR applies company-specific data. The DQR of the newly developed dataset shall be evaluated as described in Section B.5.3.1.

Situation 1/Option 2

For the non-most relevant processes only, if the user of the PEFCR decides to model the process without collecting company-specific data, then the user shall use the secondary dataset listed in the PEFCR together with its default DQR values listed here.

If the default dataset to be used for the process is not listed in the PEFCR, the user of the PEFCR shall take the DQR values from the metadata of the original dataset.

5.4.2. Processes in situation 2

When a process is not run by the user of the PEFCR, but there is access to company-specific data, then there are three possible options:

- *The user of the PEFCR has access to extensive supplier-specific information and wants to create a new EF compliant dataset (Option 1);*
- *The company has some supplier-specific information and want to make some minimum changes (Option 2);*
- *The process is not in the list of most relevant processes and the company wants to make some minimum changes (option 3).*

Situation 2/Option 1

For all processes not run by the company and where the user of the PEFCR applies company-specific data, the DQR of the newly developed dataset shall be evaluated as described in Section 5.3.1.

Situation 2/Option 2

The user of the PEFCR shall use company-specific activity data for transport and shall substitute the sub-processes used for electricity mix and transport with supply-chain specific PEF compliant datasets, starting from the default secondary dataset provided in the PEFCR.

Please note that the PEFCR lists all dataset names together with the UUID of their aggregated dataset. For this situation, the disaggregated version of the dataset is required.

The user of the PEFCR shall make the DQR context-specific by re-evaluating TeR and TiR using the table(s) B.11. The criteria GeR shall be lowered by 30%[4] *and the criteria P shall keep the original value.*

Situation 2/Option 3

The user of the PEFCR shall apply company-specific activity data for transport and shall substitute the sub-processes used for electricity mix and transport with supply-chain specific PEF compliant datasets, starting from the default secondary dataset provided in the PEFCR.

Please note that the PEFCR lists all dataset names together with the UUID of their aggregated dataset. For this situation, the disaggregated version of the dataset is required.

In this case, the user of the PEFCR shall use the default DQR values. If the default dataset to be used for the process is not listed in the PEFCR, the user of the PEFCR shall take the DQR values from the original dataset.

Table 18 DQR criteria assessment for secondary datasets

	TiR	*TeR*	*GeR*
1	The EF report publication date happens within the time validity of the dataset	The technology used in the EF study is exactly the same as the one in scope of the dataset	The process modelled in the EF study takes place in the country the dataset is valid for
2	The EF report publication date happens not later than 2 years beyond the time validity of the dataset	The technologies used in the EF study is included in the mix of technologies in scope of the dataset	The process modelled in the EF study takes place in the geographical region (e.g. Europe) the dataset is valid for
3	The EF report publication date happens not later than 4 years beyond the time validity of the dataset	The technologies used in the EF study are only partly included in the scope of the dataset	The process modelled in the EF study takes place in one of the geographical regions the dataset is valid for

[4] *In situation 2, option 2 it is proposed to lower the parameter GeR by 30% in order to incentivise the use of company-specific information and reward the efforts of the company in increasing the geographic representativeness of a secondary dataset through the substitution of the electricity mixes and of the distance and means of transportation.*

	TiR	*TeR*	*GeR*
4	The EF report publication date happens not later than 6 years beyond the time validity of the dataset	The technologies used in the EF study are similar to those included in the scope of the dataset	The process modelled in the EF study takes place in a country that is not included in the geographical region(s) the dataset is valid for, but sufficient similarities are estimated based on expert judgement.
5	The EF report publication date happens later than 6 years after the time validity of the dataset	The technologies used in the EF study are different from those included in the scope of the dataset	The process modelled in the EF study takes place in a different country than the one the dataset is valid for

[More than one table may be included in the PEFCR and entered in the section on life cycle stages]

5.4.3. Processes in situation 3

If a process is not run by the company using the PEFCR and the company does not have access to company-specific data, there are two possible options:

- *It is in the list of most relevant processes (situation 3, option 1);*
- *It is not in the list of most relevant processes (situation 3, option 2).*

Situation 3/Option 1

In this case, the user of the PEFCR shall make the DQR values of the dataset used context-specific by re-evaluating TeR, TiR and GeR, using the table(s) provided. The criteria P shall keep the original value.

Situation 3/Option 2

For the non-most relevant processes, the user of the PEFCR shall apply the corresponding secondary dataset listed in the PEFCR together with its DQR values.

If the default dataset to be used for the process is not listed in the PEFCR, the user of the PEFCR shall take the DQR values from the original dataset.

5.5. Which datasets to use?

This PEFCR lists the secondary datasets to be applied by the user of the PEFCR. Whenever a dataset needed to calculate the PEF profile is not among those listed in this PEFCR, then the user shall choose between the following options (in hierarchical order):

- *Use an EF compliant dataset available on one of the nodes of the Life Cycle Data Network http://eplca.jrc.ec.europa.eu/LCDN/;*
- *Use an EF compliant dataset available in a free or commercial source;*
- *Use another EF compliant dataset considered to be a good proxy. In such case this information shall be included in the "limitations" section of the PEF report.*
- *Use an ILCD entry level (EL) compliant dataset. These datasets shall be included in the "limitations" section of the PEF report. A maximum of 10% of the total environmental impact may be derived from ILCD-EL compliant datasets (calculated cumulatively from lowest to largest contribution to the total EF profile).*
- *If no EF compliant or ILCD-EL compliant proxy is available, it shall be excluded from the PEF study. This shall be clearly stated in the PEF report as a data gap and validated by the PEF study and PEF report verifiers.*

5.6. How to calculate the average DQR of the study

To calculate the average DQR of the PEF study, the user of the PEFCR shall calculate separately the TeR, TiR, GeR and P for the PEF study as the weighted average of all most relevant processes, based on their relative environmental contribution to the total single overall score. The calculation rules explained in Section 4.6.5.8 of the PEF method shall be used.

5.7. Allocation rules

[The PEFCR shall define which allocation rules shall be applied by the user of the PEFCR and how the modelling/ calculations shall be made.] The allocations rules that shall be followed are indicated in Table 19.

Table 19 Allocation rules

Process	Allocation rule	Modelling instructions	Allocation factor
Distribution: all transport processes related to the distribution of the final product to the final client	Mass allocation	The distribution impacts (trucks, vans, etc.) are based on the distance travelled and the mass of the product being transported (tonne-kilometre (tkm)).	-
Distribution: consumer travel	Volume allocation	The impacts from consumer travel (allocation of the car impact) shall be based on volume.	The allocation factor shall be calculated as the volume of the product divided by the maximum volume ($0.2m^3$ for a passenger car).
Distribution: intermediate storage at warehouse/ distribution centre and retail/ stores	The allocation shall be based on the space (in m^3) and time (in weeks) occupied by the representative product.	The total storage capacity of a warehouse or retail store shall be known, as well as the product-specific volume and the average storage time.	The allocation factor is calculated as the ratio between the product volume*time and storage capacity volume*time. To adjust for additional space the product takes in the storage facility, a storage volume factor of 4 is used for ambient storage, thus the product volume shall be multiplied by 4.
Use: washing	Mass allocation	The mass fraction of the load is used.	-
End of life	Market share allocation	The allocation is assumed to be 100% European end-of-life treatment.	-

5.8. Electricity modelling

The following electricity mix shall be used in hierarchical order:

Supplier-specific electricity product shall be used if for a country there is a 100% tracking system in place, or if:

available, and

the set of minimum criteria to ensure the contractual instruments are reliable is met.

The supplier-specific total electricity mix shall be used if:

available, and

the set of minimum criteria to ensure the contractual instruments are reliable is met.

The 'country-specific residual grid mix, consumption mix' shall be used. Country-specific means the country in which the life cycle stage or activity occurs. This may be an EU country or non-EU country. The residual grid mix prevents double counting with the use of supplier-specific electricity mixes in (a) and (b).

As a last option, the average EU residual grid mix, consumption mix (EU-27 + UK +EFTA), or region representative residual grid mix, consumption mix, shall be used.

Note: for the use stage, the consumption grid mix shall be used.

The environmental integrity of the use of supplier-specific electricity mix depends on ensuring that contractual instruments (for tracking) ***reliably and uniquely convey claims to consumers****. Without this, the PEF lacks the accuracy and consistency necessary to drive product/ corporate electricity procurement decisions and accurate consumer (buyer of electricity) claims. Therefore, a set of* ***minimum criteria*** *that relate to the integrity of the contractual instruments as reliable conveyers of environmental footprint information has been identified. They represent the minimum features necessary to use supplier-specific mix within PEF studies.*

<u>Set of minimum criteria to ensure contractual instruments from suppliers</u>

A supplier-specific electricity product/ mix may only be used if the user of the PEF method ensures that the contractual instrument meets the criteria specified below. If contractual instruments do not meet the criteria, then country-specific residual electricity consumption-mix shall be used in the modelling.

The list of criteria below is based on the criteria of the GHG Protocol Scope 2 Guidance – An amendment to the GHG Protocol Corporate Standard – Mary Sotos – World Resource Institute.

A contractual instrument used for electricity modelling shall:

Criterion 1 – Convey attributes

- *Convey the energy type mix associated with the unit of electricity produced.*
- *The energy type mix shall be calculated based on delivered electricity, incorporating certificates sourced and retired (obtained or acquired or withdrawn) on behalf of its customers. Electricity from facilities for which the attributes have been sold off (via contracts or certificates) shall be characterized as having the environmental attributes of the country residual consumption mix where the facility is located.*

Criterion 2 – Be a unique claim

- *Be the only instruments that carry the environmental attribute claim associated with that quantity of electricity generated.*
- *Be tracked and redeemed, retired, or cancelled by or on behalf of the company (e.g. by an audit of contracts, third party certification, or may be handled automatically through other disclosure registries, systems, or mechanisms).*

Criterion 3 – Be as close as possible to the period to which the contractual instrument is applied

[The TS may provide more information following the PEF method]

<u>Modelling 'country-specific residual grid mix, consumption mix':</u>

Datasets for residual grid mix, consumption mix, per energy type, per country and per voltage are made available by data providers.

If no suitable dataset is available, the following approach should be used:

Determine the country consumption mix (e.g. X% of MWh produced with hydro energy, Y% of MWh produced with coal power plant) and combine them with LCI datasets per energy type and country/region (e.g. LCI dataset for the production of 1MWh hydro energy in Switzerland):

- *Activity data related to non-EU country consumption mix per detailed energy type shall be determined based on:*
- *Domestic production mix per production technologies;*
- *Import quantity and from which neighbouring countries;*
- *Transmission losses;*
- *Distribution losses;*
- *Type of fuel supply (share of resources used, by import and / or domestic supply).*

These data may be found in the publications of the International Energy Agency (IEA (www.iea.org).

- *Available LCI datasets per fuel technologies. The LCI datasets available are generally specific to a country or a region in terms of:*
- *fuel supply (share of resources used, by import and/ or domestic supply);*
- *energy carrier properties (e.g. element and energy contents);*
- *technology standards of power plants regarding efficiency, firing technology, flue-gas desulphurisation, NOx removal and de-dusting.*

Allocation rules:

[The PEFCR shall define which physical relationship shall be used by PEF studies: (i) to subdivide the electricity consumption among multiple products for each process (e.g. mass, number of pieces, volume...) and (ii) to reflect the ratios of production/ratios of sales between EU countries/regions when a product is produced in different locations or sold in different countries. Where such data are not available, the average EU mix (EU-27 + UK +EFTA), or region representative mix, shall be used. The following template shall be used:]

Table 20 Allocation rules for electricity

Process	Physical relationship	Modelling instructions
Manufacturing	Mass	The electricity mix (i.e., national consumption) used shall be a production-weighted average when data from multiple sites are used.
distribution	Volume	The electricity mix (i.e., national consumption) used shall be a volume-weighted average when data from multiple sites are used.
Use	Market share allocation	The allocation is assumed to be 100% European electricity mix.

If the consumed electricity comes from more than one electricity mix, each mix source shall be used in terms of its proportion in the total kWh consumed. For example, if a fraction of this total kWh consumed is coming from a specific supplier a supplier-specific electricity mix shall be used for this part. See below for on-site electricity use.

A specific electricity type may be allocated to one specific product in the following conditions:

g) If the production (and related electricity consumption) of a product occurs in a separate site (building), the energy type physical related to this separated site may be used.

h) If the production (and related electricity consumption) of a product occurs in a shared space with specific energy metering or purchase records or electricity bills, the product-specific information (measure, record, bill) may be used.

i) If all the products produced in the specific plant are supplied with a publicly available PEF study, the company wanting to make the claim shall make all PEF studies available. The allocation rule applied shall be described in the PEF study, consistently applied in all PEF studies connected to the site and verified. An example is the 100% allocation of a greener electricity mix to a specific product.

<u>On-site electricity generation:</u>

If on-site electricity production is equal to the site own consumption, two situations apply:

No contractual instruments have been sold to a third party: the own electricity mix (combined with LCI datasets) shall be modelled.

Contractual instruments have been sold to a third party: the 'country-specific residual grid mix, consumption mix' (combined with LCI datasets) shall be used.

If electricity is produced in excess of the amount consumed on-site within the defined system boundary and is sold to, for example, the electricity grid, this system may be seen as a multifunctional situation. The system will provide two functions (e.g. product + electricity) and the following rules shall be followed:

If possible, apply subdivision. Subdivision applies both to separate electricity productions or to a common electricity production where you may allocate based on electricity amounts the upstream and direct emissions to your own consumption and to the share you sell out of your company (e.g. if a company has a windmill on its production site and exports 30% of the produced electricity, emissions related to 70% of produced electricity should be accounted in the PEF study).

If not possible, direct substitution shall be used. The country-specific residual consumption electricity mix shall be used as substitution[5]*.*

Subdivision is considered as not possible when upstream impacts or direct emissions are closely related to the product itself.

5.9. Climate change modelling

The impact category 'climate change' shall be modelled considering three sub-categories:

1. ***Climate change – fossil:*** *This sub-category includes emissions from peat and calcination/carbonation of limestone. The emission flows ending with '(fossil)' (e.g. 'carbon dioxide (fossil)' and 'methane (fossil)') shall be used, if available.*
2. ***Climate change – biogenic****: This sub-category covers carbon emissions to air (CO2, CO and CH4) originating from the oxidation and/or reduction of biomass by means of its*

[5] *For some countries, this option is a best case rather than a worst case.*

transformation or degradation (e.g. combustion, digestion, composting, landfilling) and CO2 uptake from the atmosphere through photosynthesis during biomass growth – i.e. corresponding to the carbon content of products, biofuels or aboveground plant residues, such as litter and dead wood. Carbon exchanges from native forests[6] shall be modelled under sub-category 3 (incl. connected soil emissions, derived products, residues). The emission flows ending with '(biogenic)' shall be used.

A simplified modelling approach shall be used when modelling foreground emissions.

Only the emission 'methane (biogenic)' is modelled, while no further biogenic emissions and uptakes from atmosphere are included. If methane emissions can be both fossil or biogenic, the release of biogenic methane shall be modelled first and then the remaining fossil methane.

3. ***Climate change – land use and land use change**: This sub-category accounts for carbon uptakes and emissions (CO2, CO and CH4) originating from carbon stock changes caused by land use change and land use. This sub-category includes biogenic carbon exchanges from deforestation, road construction or other soil activities (including soil carbon emissions). For native forests, all related CO2 emissions are included and modelled under this sub-category (including connected soil emissions, products derived from native forest[7] and residues), while their CO2 uptake is excluded. The emission flows ending with '(land use change)' shall be used.*

For land use change, all carbon emissions and removals shall be modelled following the modelling guidelines of PAS 2050:2011 (BSI, 2011) and the supplementary document PAS2050-1:2012 (BSI, 2012) for horticultural products. PAS 2050:2011 (BSI, 2011): "Large emissions of GHGs can result as a consequence of land use change. Removals as a direct result of land use change (and not as a result of long- term management practices) do not usually occur, although it is recognized that this could happen in specific circumstances. Examples of direct land use change are the conversion of land used for growing crops to industrial use or

[6] Native forests – represents native or long-term, non-degraded forests. Definition adapted from table 8 in Annex V C(2010)3751 to Directive 2009/28/EC.

[7] Following the instantaneous oxidation approach in IPCC 2013 (Chapter 2). 210

conversion from forestland to cropland. All forms of land use change that result in emissions or removals are to be included. Indirect land use change refers to such conversions of land use as a consequence of changes in land use elsewhere. While GHG emissions also arise from indirect land use change, the methods and data requirements for calculating these emissions are not fully developed. Therefore, the assessment of emissions arising from indirect land use change is not included.

The GHG emissions and removals arising from direct land use change shall be assessed for any input to the life cycle of a product originating from that land and shall be included in the assessment of GHG emissions. The emissions arising from the product shall be assessed on the basis of the default land use change values provided in PAS 2050:2011 Annex C, unless better data are available. For countries and land use changes not included in this annex, the emissions arising from the product shall be assessed using the included GHG emissions and removals occurring as a result of direct land use change in accordance with the relevant sections of the IPCC (2006). The assessment of the impact of land use change shall include all direct land use change occurring not more than 20 years, or a single harvest period, prior to undertaking the assessment (whichever is the longer). The total GHG emissions and removals arising from direct land use change over the period shall be included in the quantification of GHG emissions of products arising from this land on the basis of equal allocation to each year of the period[8].

1. *Where it can be demonstrated that the land use change occurred more than 20 years prior to the assessment being carried out, no emissions from land use change should be included in the assessment.*
2. *Where the timing of land use change cannot be demonstrated to be more than 20 years, or a single harvest period, prior to making the assessment (whichever is the longer), it shall be assumed that the land use change occurred on 1 January of either:*

    - *the earliest year in which it can be demonstrated that the land use change had occurred; or*

[8] In case of variability of production over the years, a mass allocation should be applied.

- *on 1 January of the year in which the assessment of GHG emissions and removals is being carried out.*

The following hierarchy shall apply when determining the GHG emissions and removals arising from land use change occurring not more than 20 years or a single harvest period, prior to making the assessment (whichever is the longest):

1. *where the country of production is known and the previous land use is known, the GHG emissions and removals arising from land use change shall be those resulting from the change in land use from the previous land use to the current land use in that country (additional guidelines on the calculations can be found in PAS 2050- 1:2012);*

2. *where the country of production is known, but the former land use is not known, the GHG emissions arising from land use change shall be the estimate of average emissions from the land use change for that crop in that country (additional guidelines on the calculations can be found in PAS 2050-1:2012);*
3. *where neither the country of production nor the former land use is known, the GHG emissions arising from land use change shall be the weighted average of the average land use change emissions of that commodity in the countries in which it is grown.*

Knowledge of the prior land use can be demonstrated using a number of sources of information, such as satellite imagery and land survey data. Where records are not available, local knowledge of prior land use can be used. Countries in which a crop is grown can be determined from import statistics, and a cut-off threshold of not less than 90% of the weight of imports may be applied. Data sources, location and timing of land use change associated with inputs to products shall be reported." [end of quote from PAS 2050:2011]

Soil carbon storage shall not be modelled, calculated and reported as additional environmental information.

The sum of the three sub-categories shall be reported.

[If climate change is selected as a relevant impact category, the PEFCR shall (i) always request to report the total climate change as the sum of the three sub-indicators, and (ii) for the sub-indicators 'Climate change – fossil', 'Climate change – biogenic' and 'Climate change - land use and land use change', request separate reporting for those contributing more than 5% each to the total score.]

[Choose the right statement]

The sub-category 'Climate change-biogenic' shall be reported separately.

[OR]

The sub-category 'Climate change-biogenic' shall not be reported separately.

Note	Climate change modelling option to be selected at a later stage.

The sub-category 'Climate change-land use and land transformation' shall not be reported separately.

5.10. Modelling of end of life and recycled content

The end of life of products used during the manufacturing, distribution, retail, the use stage or after use shall be included in the overall modelling of the life cycle of the product. Overall, this should be modelled and reported at the life cycle stage where the waste occurs. This section provides rules on how to model the end of life of products as well as the recycled content.

The Circular Footprint Formula (CFF) is used to model the end of life of products as well as the recycled content and is a combination of "material + energy + disposal", i.e.:

Material $(1 - R_1)E_V + R_1 \times \left(AE_{recycled} + (1 - A)E_V \times \frac{Q_{Sin}}{Q_p}\right) + (1 - A)R_2 \times \left(E_{recyclingEoL} - E_V^* \times \frac{Q_{Sout}}{Q_P}\right)$

Energy $(1 - B)R_3 \times (E_{ER} - LHV \times X_{ER,heat} \times E_{SE,heat} - LHV \times X_{ER,elec} \times E_{SE,elec})$

Disposal $(1 - R_2 - R_3) \times E_D$

With the following parameters

***A**: allocation factor of burdens and credits between supplier and user of recycled materials.*

***B**: allocation factor of energy recovery processes. It applies both to burdens and credits. It shall be set to zero for all PEF studies.*

***Qs_{in}**: quality of the ingoing secondary material, i.e. the quality of the recycled material at the point of substitution.*

***Qs_{out}**: quality of the outgoing secondary material, i.e. the quality of the recyclable material at the point of substitution.*

***Q_p**: quality of the primary material, i.e. quality of the virgin material.*

***R_1**: it is the proportion of material in the input to the production that has been recycled from a previous system.*

***R_2**: it is the proportion of the material in the product that will be recycled (or reused) in a subsequent system. R2 shall therefore take into account the inefficiencies in the collection and recycling (or reuse) processes. R2 shall be measured at the output of the recycling plant.*

***R_3**: it is the proportion of the material in the product that is used for energy recovery at EoL.*

***$E_{recycled}$ (E_{rec}):** specific emissions and resources consumed (per functional unit) arising from the recycling process of the recycled (reused) material, including collection, sorting and transportation process.*

***$E_{recyclingEoL}$ (E_{recEoL})**: specific emissions and resources consumed (per functional unit) arising from the recycling process at EoL, including collection, sorting and transportation process.*

***E_v**: specific emissions and resources consumed (per functional unit) arising from the acquisition and pre-processing of virgin material.*

***E_{*v}**: specific emissions and resources consumed (per functional unit) arising from the acquisition and pre-processing of virgin material assumed to be substituted by recyclable materials.*

***E_{ER}**: specific emissions and resources consumed (per functional unit) arising from the energy recovery process (e.g. incineration with energy recovery, landfill with energy recovery, etc.).*

***$E_{SE,heat}$ and $E_{SE,elec}$**: specific emissions and resources consumed (per functional unit) that would have arisen from the specific substituted energy source, heat and electricity respectively.*

***E_D**: specific emissions and resources consumed (per functional unit) arising from disposal of waste material at the EoL of the analysed product, without energy recovery.*

***$X_{ER,heat}$ and $X_{ER,elec}$**: the efficiency of the energy recovery process for both heat and electricity.*

***LHV**: lower heating value of the material in the product that is used for energy recovery.*

[Within the respective chapters, the following parameters shall be provided in the PEFCR:

- All A values to be used shall be listed in the PEFCR, together with a reference to the PEF method and Annex C. In case specific A values cannot be determined by the PEFCR, the PEFCR shall prescribe the following procedure for its users:
    - Check in Annex C the availability of an application-specific A value which fits the PEFCR,
    - If an application-specific A value is not available, the material-specific A value in Annex C shall be used,
    - If a material-specific A value is not available, the A value shall be set equal to 0.5.
- All quality ratios (Qsin, Qsout/Qp) to be used.
- Default R1 values for all default material datasets (in case no company-specific values are available), together with a reference to the PEF method and Annex C. They shall be set to 0% when no application-specific data are available.

- Default R2 values to be used in case no company-specific values are available, together with a reference to the PEF method and Annex C. https://eplca.jrc.ec.europa.eu/permalink/Annex_C_V2.1_May2020.xlsx
- All datasets to be used for Erec, ErecEoL, Ev, E*v, EER, ESE,heat and ESE,elec, ED]

[Default values for all parameters shall be listed in a table in the section of the appropriate life cycle stage.]

The CFF relies on several parameters which account for: physical characteristics of products sent to recycling (e.g. the material quality after recycling and the heating value of the material); impacts of processes (impact of energy production, recycling and substituted virgin material production); and the market reality for a recycled product.

For apparel and footwear products, the **A** factor is set at 0.8 by the PEF method. To model recycled materials coming from another value chain (e.g. plastic PET bottles as input for textile fibre production) or leaving the system for another value chain (e.g. textile composted for use in the agriculture), the **A** factor should also be selected according to Annex C of the PEF method (e.g. A is 0.5 for plastics and PET bottles, 0.5 for compost).

The **B** factor is currently defined as 0 by the PEF method, i.e. 100% of generated, externally used energy is credited to the provider of incinerated material and included as an impact for the user of the recovered energy (i.e. both waste-to-energy burdens and avoided primary production benefits).

The parameters of the CFF are to be defined for each raw material / disposed material and reported and justified in the product footprint report.

In the case of recycling, the $\mathbf{R_2}$, $\mathbf{E_{rec}}$, $\mathbf{E_{recEoL}}$, $\mathbf{E_v}$ and $\mathbf{E^*_v}$ shall be defined for every recycling process.

- The $\mathbf{R_1}$ factor shall be defined as the share of recycled material in each raw material.
- The rate of recycling, $\mathbf{R_2}$, defined for each recycling scenario applicable, shall account for the quantity of recycled material effectively produced by the recycling process (accounting for processing loss rates).

- The rate of material sent to energy recuperation, $\mathbf{R_3}$, shall correspond to the rate of product sent to incineration with energy recovery[9] (including the share of product sent to incineration as municipal waste and the share of product collected as used clothing and footwear articles, sorted as non-recyclable and sent to incineration).
- The share of product landfilled or disposed of without energy recovery, equal to $1 - \mathbf{R_2} - \mathbf{R_3}$, equates to considering by default that the losses of the recycling process[10] are landfilled or disposed of, without energy recovery. If the recycling losses are known to be disposed of otherwise, the end-of-life may be modelled accordingly.
- The quality factor ratios for each substitution, $\frac{\mathbf{Q_{s_{in}}}}{\mathbf{Q_p}}$ and $\frac{\mathbf{Q_{s_{out}}}}{\mathbf{Q_p}}$, should account for the difference in quality in comparison to the virgin material. In particular, in the case of mechanical recycling, the fibres have a lesser quality than the virgin fibres they would substitute. The nature and unit of the parameter chosen to measure material quality is not defined by the PEF method. Substitution rates or economic values are used for this parameter.
- $\mathbf{E_{rec}}$ and $\mathbf{E_{recEoL}}$ shall be defined as the impacts of the collection, sorting, pre-processing, processing and transportation of materials involved in treating materials sent to recycling until their use as recycled materials.
- $\mathbf{E_v}$ and $\mathbf{E^*_v}$ correspond to the impacts of substituted or consumed virgin materials, with the same scope as the factors for recycled materials.
- $\mathbf{X_{ER,heat}}$ and $\mathbf{X_{ER,elec}}$, $\mathbf{E_{SE,heat}}$, $\mathbf{E_{SE,elec}}$ and $\mathbf{E_D}$ shall be defined according to the practices and electricity mixes in the applicable geographical zone where the product is disposed of.

The following part of the Circular Footprint Formula is used to model the recycled content:

$$(1 - R_1)E_v + R_1(AE_{recycled} + (1 - A)E_v \frac{Q_{sin}}{Q_p})$$

[9] The CFF includes the recuperation of energy from landfills in the R_3 term. Since the recuperation of methane emitted from apparel or footwear products in landfill is not known, it is not included in the PEFCRs.

[10] This refers to the material losses occurring in the transformation of the recyclable product into recycled material.

The R1 values applied shall be supply-chain specific or R1=0 should be used as default*, in relation with the DNM. Material-specific values based on supply market statistics are not accepted as a proxy and therefore shall not be used. The applied R1 values shall be subject to PEF study verification.*

When using supply-chain specific R1 values other than 0, traceability throughout the supply chain is necessary. The following guidelines shall be followed when using supply-chain specific R1 values:

- *The supplier information (through e.g. statement of conformity or delivery note) shall be maintained during all stages of production and delivery at the converter;*
- *Once the material is delivered to the converter for production of the end products, the converter shall handle information through their regular administrative procedures;*
- *The converter for production of the end products claiming recycled content shall demonstrate through its management system the [%] of recycled input material into the respective end product(s).*
- *The latter demonstration shall be transferred upon request to the user of the end product. In case a PEF profile is calculated and reported, this shall be stated as additional technical information of the PEF profile.*
- *Company-owned traceability systems may be applied as long as they cover the general guidelines outlined above.*

The R_1 values for recycled apparel and footwear products in Table 21 are taken from a study on the European market on the potential for recycled fashion from the Confederation of British Industry (2020). The R_1 values for recycled plastic bottles in synthetic fibres comes from the report “Material Change Insights 2019” (Textile Exchange, 2020).

Table 21 Definition of the CFF parameters for the raw materials

Fibre type	Scope for E_v	Flow of recycled material	Origin of recycled material	A	R_1	Q_{Sin}/Q_p	E_{rec}
Synthetic	Production of virgin polyester fibres	Recycled polyester fibres	PET recyclate	0.5	0%	1	Impacts of sorting and recycling PET recyclate into polyester fibres
			PET bottles			0.7[11]	Impacts of sorting and recycling PET bottles into polyester fibres
Recycled materials from textiles	Production of cellulosic virgin fibres	Recycled fibres	Textile product	0.8	0%	0.5[12]	Impacts of collection, sorting, shredding of used textiles
	Production of synthetic virgin fibres	Recycled fibres	Textile product	0.8	0%	1	Impacts of collection, sorting, shredding of used textiles
Footwear	Production of virgin rubber	Recycled rubber	Footwear	0.5[13]	0%	to be defined	Impacts of collection, sorting, recycling of used footwear

According to the PEF Method (Zampori et al., 2019), the Q_{Sout}/Q_p and Q_{Sin}/Q_p ratios are capped at 1. The ratios are relevant if the substituted primary material and the recycled material are similar materials. In cases where the recycled material substitutes a different material, the quality ratio is set as 1 and the difference in the quantity of material used shall be accounted in the E^*_v parameter. The E^*_v parameter shall be scoped for the quantity of virgin material needed to fulfil the same function as the quantity of recycled material.

The parameters for the raw materials in the CFF are defined in Table 21.

[11] (Arena et al. 2003) in (Shen et al. 2011)

[12] Expert opinion extrapolated from case studies

[13] In accordance with Annex C

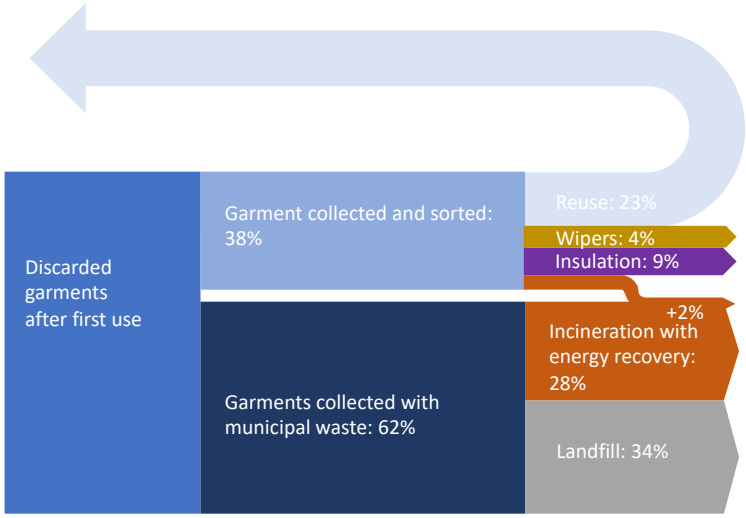
1191 Table 22 Guidelines for defining the quality ratio in the CFF

Situation	Typical cases	CFF application
Quality loss compensated by **increased material quantity**	Cardboard, textile production (increased spinning losses because of shorter fibres)	Q_{sout}/Q_p based on mass ratio, considering the quality is the inverse of the mass needed.[14]
Quality loss **limits** the maximum incorporation	Recycled yarn used in clothing, footwear materials and components (e.g. insocks, insoles, outsoles and composites)	Q_{sout}/Q_p = 1 as long as the quantity of recycled material is below the maximum incorporation threshold. If the incorporation of recycled material induces more losses, refer to previous case.
Quality loss forces application with **lower quality requirement /** transfer to **another application field**	Footwear and other plastic products recycled into a plastic public bench (instead of a wooden bench)	Q_{sout}/Q_p is set as 1 Functional Unit of E^*_v : amount of wood substituted by 1 kg of PET
	Textile and footwear materials and components recycled into insulation materials	Q_{sout}/Q_p is set as 1 Substitute conventional insulation material Functional unit of E*v : amount of material for identical thermal insulation
	PET bottle recycled into a fleece jacket (instead of wool or polyester) to synthetic fibre	Consider substitution to closest material, e.g. polyester Q_{sout}/Q_p is set as 1
	Compost and methanisation	Apply A = 0.5 for compost (and composted digestate) E_{*v} x Q_{sout}/Q_p is set as 0 due to lack of primary data and for the sake of simplicity
Recycled materials **unlikely to replace virgin material**	Textile garments recycling into wipers	Q_{sout}/Q_p is defined as a quotient of the economic values of the recycled material over the virgin material, it is considered that the price difference accounts for the difference in usage practices

1192

1193 Figure 3 details the general post-consumer scenario rates. These scenarios and the
1194 corresponding R_2 and R_3 values presented in Figure 3 and Table 23 are from the Synthesis of
1195 the Environmental Assessment of the Value Chain of Used Textiles (RDC Environment and
1196 EcoTLC, 2019), with the added assumption that materials recycled as insulation replace
1197 mineral wool.

[14] For example, 100 g of primary material is substituted by 150 g of secondary material → Q_{sout}/Q_p =100/150 = 0.667



Status in CFF Formula	Rate of End-Of-Life scenario (excluding reuse)
R2_Wipers	5%
R2_Insulation	12%
R3	39%
1 – R2 – R3	44%

Figure 3 Scenarios for post-consumer apparel and definition of R_2 and R_3 parameters for the CFF

For footwear, as detailed in Figure 4, it is difficult to find statistics on recycling[15], which is thus assumed to be negligible. A 12% collection rate and a 10% reuse rate[16] are used, the European rate of landfill / incineration with energy recovery is applied to the 88% of footwear disposed with municipal waste.

Status in CFF Formula	Rate of End-Of-Life scenario (excluding reuse)
R2	0%
R3	46%
1 – R2 – R3	54%

Figure 4 Scenarios for post-consumer footwear and definition of R_2 and R_3 parameters for the CFF

The percentages shown Figure 3 and Figure 4 are scaled to 100% excluding the reuse share.

The general parameters for end-of-life in the CFF are defined in Table 23.

[15] Better Shoe Foundation, http://www.bettershoes.org/home/post-consumer-life, last accessed 2021/01/12

[16] EcoTLC (Refashion), 2019, Roads to innovation, https://refashion.fr/pro/sites/default/files/fichiers/Chemins-Innovation2019_EN_BD.pdf) (accessed 2021/17/02)

1208 Table 23 Definition of the CFF parameters for the end-of-life for apparel

Recycling pathway	Scope for E^*_v	A	R_2 for pathway	Q_{Sout}/Q_p	E_{rec}	R_3
Mechanical recycling						
Wipers	Production of wipers from virgin cotton	0.8	5%	0.3[17],	Collection, sorting of clothes and production of wipers from used clothes	
Insulation	Production of virgin mineral wool	0.8	12%	1[18]	Collection, sorting of clothes and production of insulation from used clothes	
Apparel	Virgin fibres (which is replaced)	0.8	0%	0.5[19]	Collection, sorting of clothes, production of recycled fibres through mechanical recycling	*39%*
			Total:	***17%***		
Chemical recycling						
Apparel and other applications	Virgin synthetic fibres	0.8	0%	1[20]	Collection, sorting of clothes, production of recycled fibres through chemical recycling	
	Virgin manmade cellulosics	0.8	0%	0.5[21]		
			Total:	***0%***		

1209

1210 Recyclability disruptors and corresponding R_2 values for specific pathways are shown in Table

1211 24.

1212 Table 24 Recyclability disruptors and corresponding R_2 values for specific pathways

Product type	Main disruptors	R_2
Apparel	Products laminated with different materials	0 for all pathways
	Less than 80% cotton	0 for wiper pathway
	Products with more than 5% elastane	0 for insulation pathway
	Products with metallic fibres	

[17] Based on prices from MSC Industrial Direct, this ratio goes from 0.2 for jean-based rags, to 0.5 for good state white t-shirt-based rags, with mixed reclaimed wipers having a ratio of 0.3. Considering most garments are reused in the European context, the value recommended is 0.3.

[18] Mineral wool has a lower insulation quality. As per the PEF Method 2019 (p. 69), the quality ratio is set to 1

[19] Expert opinion extrapolated from case studies. This includes the loss of short fibres in the process.

[20] Chemically recycled synthetic fibres are assumed to have the same characteristics as virgin fibres.

[21] Expert opinion extrapolated from case studies. This includes the loss of short fibres in the process.

Product type	Main disruptors	R_2
	Products with electrical and electronic equipment	0 for all pathways
	Materials without viable recycling technology	0 for all pathways
Footwear	Products with electrical and electronic equipment	0 for all pathways
	Products with fixed composites (glued)	0 for all pathways

[Industry systems may be applied as long as they cover the general guidelines outlined above. In that case, the text above may be replaced by those industry specific rules. If not, they shall be supplemented with the general guidelines above.]

The PEF method (Section 4.4.8.9) provides additional information on the recycling output rate (R_2 value).

"The product design and composition will determine if the material in the specific product is actually suitable for recycling. Therefore, before selecting the appropriate R_2 value, an evaluation of the recyclability of the material shall be made and the PEF study shall include a statement on the recyclability of the materials/ products:
The statement on recyclability shall be provided together with an evaluation for recyclability that includes evidence for the following three criteria (as described by ISO 14021:2016, Section 7.7.4 'Evaluation methodology'):

1. *The collection, sorting and delivery systems to transfer the materials from the source to the recycling facility are conveniently available to a reasonable proportion of the purchasers, potential purchasers and users of the product;*
2. *The recycling facilities are available to accommodate the collected materials;*
3. *Evidence is available that the product for which recyclability is claimed is being collected and recycled. For PET bottles the EPBP guidelines should be used (https://www.epbp.org/design-guidelines), while for generic plastics the recyclability by design should be used (www.recoup.org).*

If one criterion is not fulfilled, or the sector-specific recyclability guidelines indicate limited recyclability, an R_2 value of 0% shall be applied. Point 1 and 3 may be proven by recycling statistics (country specific) derived from industry associations or national bodies. Approximation to evidence at point 3 may be provided by applying for example the design for

recyclability evaluation outlined in EN 13430 Material recycling (Annexes A and B) or other sector-specific recyclability guidelines if available.

Default application-specific R_2 values are available in Annex C. The following procedure shall be followed to select the R_2 value to be used in a PEF study:

- *Company-specific values shall be used when available and following the evaluation of recyclability.*
- *If no company-specific values are available and the criteria for the evaluation of recyclability are fulfilled (see above), application-specific R_2 values shall be used selecting the appropriate value available in Annex C:*
    - *If an R_2 value is not available for a specific country, then the European average shall be used;*
    - *If an R_2 value is not available for a specific application, the R_2 values of the material shall be used (e.g. materials' average);*
    - *In case no R_2 values are available, R_2 shall be set equal to 0 or new statistics may be generated in order to assign an R_2 value in the specific situation.*

The applied R_2 values shall be subject to the PEF study verification.

Background information to calculate the R_2 values for packaging materials is available in Annex C."

For both garments and footwear, the user may use case-specific data to model end-of-life scenarios such as composting, mechanical or chemical recycling.

6. Life cycle stages

Note	All the appendices mentioned in Section 6 will be provided at a later stage.

6.1. Raw materials acquisition and pre-processing

[The PEFCR shall list all technical requirements and assumptions to be applied by the user of the PEFCR. Furthermore, it shall list all processes taking place in this life cycle stage (according to the model of the RP), following the table provided below (transport in separate table). The table may be adapted by the TS as appropriate (e.g. by including relevant parameters of the Circular Footprint Formula).]

Note	Raw material acquisition and pre-processing processes will be provided as an Excel file in an appendix. See Table 15 as an example.

The user of the PEFCR shall report the DQR values (for each criterion + total) for all the datasets used.

The raw materials acquisition and pre-processing life cycle stage includes the processes starting with the extraction of the resources through the gate of the product's production facility (processing and manufacturing plant). The raw materials acquisition and the pre-processing stage are considered to be most relevant for all product sub-categories and thus shall be included for all PEF studies (Zampori et al., 2019).

This life cycle stage usually includes the extraction and processing of fibres. The following production, pre-processing and transport processes are included in the raw materials datasets provided in the EF 3.0 compliant database:

- Mining, extraction, and refining of resources (e.g. including raw oil);
- Pre-processing of all material inputs to the studied product, including recycled materials;
- Agricultural and forestry activities;

- Transportation within and between extraction and pre-processing facilities, and to the production facility (manufacturing plant); and
- Packaging production.

6.1.1. Raw materials production

For apparel products, the following processes shall be considered:

- Production of raw textile materials (plant-based and synthetic);
- Production of fibrous and non-fibrous animal-based materials;
- Trim production;
- Packaging materials production and processing; and
- Transportation between the extraction and pre-processing facilities and to the production facility (manufacturing plant).

For the footwear products the following processes shall be considered:

- Production of raw textile materials (plant-based and synthetic);
- Production of fibrous and non-fibrous animal-based materials;
- Plastic, rubber and synthetic material production;
- Trim production;
- Packaging materials production and processing; and
- Transportation between the extraction and pre-processing facilities and to the production facility (manufacturing plant).

In the case of availability of detailed data, regionalized data per country shall be used. In the case of an origin from multiple sources, the weighted average of the different sources shall be used to properly represent the variability. When published data representative of national averages for other EU countries are available, these may also be used, providing they comply with the PEF requirements. For background EF-compliant datasets, it will be clearly indicated if LUC emissions are included or not. For non-compliant datasets from another database or that were created for the specific PEF, LUC must be modelled as described in the “Suggestions for updating the Product Environmental Footprint (PEF) method” (Zampori et al., 2019).

6.1.2. Raw material circularity

Circularity for the raw material aspects is addressed in the following two cases:

- The apparel or footwear products utilise recycled materials, which can be of textile or non-textile origin; or
- The apparel or footwear product is recycled after a previous use; this includes recycling apparel and footwear into raw materials for other production schemes, such as chemicals or recycling into other rubber, plastic, composites, among other materials.

In these two cases, the credits and impacts associated to these flows are modelled and allocated to the raw material using the Circular Footprint Formula (CFF), presented in detail in Section 5.10. Additional details regarding the CFF are described in Section 4.4.8.1 of the PEF method (Zampori et al., 2019).

6.1.3. Packaging production

Different types of packaging need to be produced to ensure safe shipping and storage of apparel and footwear products. The differentiation between primary, secondary and tertiary packaging is defined as follows:

- **Primary packaging**: Material that immediately covers the product. For example, primary packaging can consist of plastic film or bag, paper wrapping. The hangtag is also considered to be primary packaging.
- **Secondary packaging**: Packaging or containment of a primary package. Packaging for multiple products and their labels are also considered to be secondary packaging.
- **Tertiary packaging**: Packaging conceived so as to facilitate handling and transport of a number of sales units or grouped packaging in order to prevent physical handling and transport damage.

The default raw materials inputs for packaging (primary, secondary and tertiary) to be used for all apparel and footwear sub-categories if no primary data are available are given in Table 25 below.

Table 25 Default packaging materials inputs per kg of garment

Sub-category	Packaging type	Raw material	Amount	Unit
Apparel	Primary	Polybag	0.02	kg
	Secondary/tertiary	Corrugated cardboard	0.06	kg
Footwear	Primary	Corrugated cardboard	0.20	kg
	Secondary/tertiary	Corrugated cardboard	0.06	kg

If packaging contains several apparel or footwear products (e.g. one corrugated cardboard box contains 30 t-shirts), the total packaging weight should be divided by the number of products enclosed.

The recycling of packaging is accounted for in Section 6.1.4 below.

Tertiary packaging includes pallets and additional cardboard box packaging, and is considered not to be relevant.

6.1.4. Packaging circularity

If the product's packaging contains recycled materials or is sent to recycling or energy recovery at its end-of-life, the burdens and credits associated with incorporating recycled materials and to the end-of-life scenarios shall be allocated using the CFF, presented in Section 5.10. Section 5.10 is drafted for apparel and footwear products and also applies to packaging materials, referring to Annex C of the PEF method for default parameter choices for each material, with the possibility to use primary data for R_1 and R_2.

In the case of reusable packaging, the expected number of reuses of the packaging shall be used to allocate the packaging's production and end-of-life to the apparel or footwear product's life cycle. Guidance on evaluating the number of reuses of the packaging is given in the PEF method in section 4.4.9.3.

6.1.5. Raw materials and packaging distribution

[For the different ingredients transported from supplier to factory, the user of the PEFCR needs data on (i) transport mode, (ii) distance per transport mode, (iii) utilisation ratios for truck transport and (iv) empty return modelling for truck transport. The PEFCR shall provide

default data for these or request these data in the list of mandatory company-specific information. The default values provided in the PEF method shall be applied unless PEFCR-specific data are available.]

Note	Raw materials and packaging distribution processes will be provided as an Excel file in an appendix. See Table 15 as an example.

The distribution of raw materials used for apparel and footwear products from a supplier to the manufacturing plant are also included under the raw materials life cycle stage. It also includes the transportation of semi-finished and intermediate products between manufacturing stages.

There are four possible scenarios for product transport:

i) In case the exact location of the supplier is known as well as the transport mode (e.g. the specific type of truck, ship and train or plane), you shall use the specific data available.

ii) In case the exact location of the supplier is known as well as the transport mode, but the specific type of truck, ship, train or plane is not known, you shall use the specific data available and the default values (including utilisation ratio) for the transport mode given in Table 26.

iii) In case the only specific information available is whether or not the supplier is located in the same continent as the processing plant, you shall use the default values provided in Table 26 related to the specific supply chain location and transport modes (provenance ratios).

iv) In case no information on the supply chain location is available, the transport shall be modelled as if the supplier is located outside the continent of the processing plant. This shall be done using the default values in Table 26 and the given provenance ratios from the supplier to tier 1, and to each manufacturing step for each transport mode.

For each material transported the following data are required (Zampori et al., 2019):

- Mass transported;
- Transport mode;
- Distance per transport mode;
- Utilisation ratio for truck transport;
- Empty return modelling for truck transport (if not already included in the utilisation rate, for details see Section 6.3.4).

The impact of the transport shall be calculated per tonne kilometre (tkm), which is equivalent to the transport of 1 tonne (t) of product over 1 kilometre (km). The distance and transportation mode for each material coming to the manufacturing plant shall be based on specific data, and weight-limited transport be taken into account for all materials transported. In the case of a data gap, the default values given in Table 26 shall be used (adapted from Zampori et al., 2019; Eurostat, 2015a). Note that in the case of multi-sourcing for the same item, the allocation of resources and emissions should be done by mass allocation.

Table 26 Default transport scenarios and parameters for product transport

Supply chain location	Distance (km)	Utilisation ratio	Provenance (% of total transport)	Transportation mode
Supplier located in the same continent as the processing plant	1'000	64%	40%	Truck (>32t, EURO 4)
	1'000	n/a		Train (average freight train)
	800	n/a		Ship (barge)
Supplier located outside the continent of the processing plant (ship)	1'000	64%	55%	Truck (>32t, EURO 4)
	18'000	n/a		Ship (transoceanic container)
Supplier located outside the continent of the processing plant (plane)	1'000	64%	5%	Truck (>32t, EURO 4)
	10'000	n/a		Air freight (cargo plane)

[Packaging shall be modelled as part of the raw material acquisition stage of the life cycle.]

[PEFCRs that include reusable packaging from third party operated pools shall provide default reuse rates. PEFCRs with company-owned packaging pools shall specify that the reuse rate

shall be calculated using supply-chain-specific data only. The two different modelling approaches as presented in the PEF method shall be used and copied in the PEFCR. The PEFCR shall include the following: "The raw material consumption of reusable packaging shall be calculated by dividing the actual weight of the packaging by the reuse rate."]

[PEFCRs that include reusable packaging shall include the following: "The reuse rate affects the quantity of transport needed per FU. The transport impact shall be calculated by dividing the one-way trip impact by the number of times this packaging is reused."]

The distance and transportation mode for each packaging material coming to the manufacturing plant shall be considered.
It is assumed that all packaging comes from the same continent as the manufacturing plant.
The transport types listed for each unique supply chain type are additive.

Packaging transport is assumed to be weight-limited for all packaging types. Default parameters (Zampori et al., 2019) for packaging transport are provided in Table 27 below.

Table 27 Default transport parameters for packaging materials

Supply chain	Distance (km)	Utilisation ratio	Provenance (% of total transport)	Transportation mode
Supplier located within the continent of the manufacturing plant	230	64%	100%	Truck (>32t, EURO 4)
	280	n/a		Train (average freight train)
	360	n/a		Ship (barge)

6.2. Manufacturing

[The PEFCR shall list all technical requirements and assumptions to applied by the user of the PEFCR. Furthermore, it shall list all processes taking place in this life cycle stage, according to the table provided below. The table may be adapted by the TS as appropriate (e.g. by including relevant parameters of the Circular Footprint Formula).]

[PEFCRs that include reusable packaging shall account for the additional energy and resource used for cleaning, repairing or refilling.]

[Default loss rates per type of product and how these shall be included in the reference flow shall be described.]

Primary data shall be used to model the energy and water inputs during the manufacturing stage when the process is run by the company using the PEFCRs. The electricity mix (i.e. national consumption) used shall be a production-weighted average when data from multiple sites are used.

Details on how to address multi-functionality of the manufacturing processes are provided in Section 5.7.

The production waste shall be included in all modelling steps up to the output of the manufacturing stage (from cradle to manufacturing gate). Manufacturing wastes shall be divided into the following categories: materials that are recycled; materials that are discarded in a regular disposal facility; hazardous waste; and wastewater.

Default loss rates are given in Table 28.

Note	Manufacturing processes will be provided as an Excel file in an appendix. See Table 15 as an example.

The user of the PEFCR shall report the DQR values (for each criterion + total) for all the datasets used.

6.2.1. Manufacturing processes

The manufacturing life cycle stage includes the impacts from production of the final apparel and footwear products. Considerations for the manufacturing life cycle stage are different between apparel and footwear products and thus include different manufacturing processes, which are described separately below.

Apparel manufacturing (including apparel accessories) includes the following processes per tier:

- Processing of raw materials. This includes spinning fibres into yarn as well as processing non-fibrous products (for example leather) into other intermediate products (tier 3).
- Material production, such as knitting and weaving textiles, preparation, dyeing as well as finishing of fabric (tier 2).
- Final component consolidation created upstream and the final assembly of the product. Processes included are: assembly (sewing), garment wet processing/washing, dry treatment processes (e.g. laser), and the packaging for sale (tier 1).

Footwear manufacturing includes the following processes:

- The component manufacturing step, which includes the making of the different components which are used for the final product assembly. All the individual parts of the shoe (bottom, mid and upper parts) are produced during this step, and it includes processes such as: compound forming (sole production), in-sole production, die-cutting and sewing.
- The consolidation of the components created upstream, and the final assembly of the product. Processes included are: stockfitting, assembly and the packaging for sale.

Footwear manufacturing can be very complex and variable, with different manufacturing pathways found within the same type of shoe and brand. The processes above have been selected due to their applicability for most types of footwear products and manufacturing pathways, covering the most environmentally intensive processes.

6.2.2. Manufacturing losses

Apparel losses

For textile materials, the input and output amounts should be calculated based on the bill of materials or, if not available, on the weight of the final product's textile content and residual losses (wastes) along the production and value chain. The weight of the textile is given as the weight of the final products minus the weight of all non-removable accessories such as buttons, zippers and care labels.

The following hypothesis shall be considered:

- The amount of input material for process n is equal to the amount of output material for process n-1 (T-shirt PEFCR, 2019).

Therefore, the amount of output material (textile weight in the final product) and the textile waste/losses for each pre-processing and manufacturing process can be used to back-calculate the amount of input raw materials.

The following equation shall be used to determine the amount of input material, depending on textile waste given as either a percentage or by quantity.

$$Amount\ of\ input\ material_n = \frac{Amount\ of\ output\ material_n}{1 - Textile\ waste_n}$$

Equation 3

Where the input and output are measured in kg and the textile waste is measured as a percentage.

For example, the average final product weight of RP1 is given as 168.3 g (textile weight only). Assuming that assembly produces 20% textile waste in case of apparel products, the input material for assembly can be calculated accordingly to Equation 3 above to be 210.4 g (=168.3 / (1-20%)) for apparel. The overall losses in the material manufacturing processes (Sandin 2019, WALDB) and the finishing of garment from fabric is presented in Table 28.

Table 28 Losses and waste along the garment manufacturing value chain

Manufacturing step	Losses
Spinning	5%
Knitting, flat	0.06%
Weaving	1%
Dyeing	0.15%
Finishing	0.4%
Garment assembly (cutting, sewing)	20%

Footwear losses

Losses during footwear manufacturing can occur along the whole manufacturing pathway. Depending on the type of shoe and processes applied, the losses between each step can vary significantly. For example:

- The cut and link process, which describes the manufacturing of the upper part of the shoe, has a loss rate of 20% with no by-products with an economic value;
- The compound forming process (e.g. sole, in-sole production) has a 10% loss rate;
- Assembly usually has no additional losses.

Note	Additional footwear modelling assumptions, such as default loss rates, will be added in the second draft PEFCRs which will be completed after the supporting studies.

6.3. Distribution stage

The transport of the final product from factory to final client (including consumer transport) shall be modelled within this life cycle stage. The final client is defined as the individual purchaser of the apparel or footwear product.

In case supply-chain-specific information is available for one or several transport parameters, they may be applied following the Data Needs Matrix.

[A default transport scenario shall be provided by the TS in the PEFCR. In case no PEFCR-specific transport scenario is available, the transport scenario provided in the PEF method shall be used as a basis together with (i) a number of PEFCR-specific ratios, (ii) PEFCR-specific utilisation ratios for truck transport, and (iii) PEFCR-specific allocation factor for consumer transport. For reusable products, the return transport from retail/DC to factory shall be added in the transport scenario. For cooled or frozen products, the default truck/van transport processes should be changed. The PEFCR shall list all processes taking place in scenario

(according to the model of the RP) using the table below. The table may be adapted by the TS as appropriate]

Note	Distribution processes will be provided as an Excel file in an appendix. See Table 15 as an example.

The user of the PEFCR shall report the DQR values (for each criterion + total) for all the datasets used.

The waste of products during distribution and retail shall be included in the modelling. [Default loss rates per type of product and how these shall be included in the reference flow shall be described. The PEFCR shall follow the PEF method Annex F in case no PEFCR-specific information is available.]

When considering the distribution of apparel and footwear, direct to consumer (D2C) should be taken into account as it usually involves a high share of international supply chains for apparel and footwear products sold in Europe, which has a direct influence on the impacts.

6.3.1. Transport processes

The distribution life cycle stage includes the impacts related to the transport of final apparel and footwear products after assembly to the final client, including the impacts related to intermediate storage and distribution losses. The final client is further defined as a private individual. Considerations for the distribution stage are similar for all representative products because the transport mode and distances are not necessarily product-specific. The distribution stage impacts depend mainly on supply chain specifics (e.g. local, intracontinental and international supply chains), corresponding transport modes (and utilisation ratios) and distances covered, as well as product weights and volumes. The following transport processes (adapted from Zampori et al., 2019) are considered for apparel and footwear, with the number in brackets matching with Figure 5 below:

- From factory to the final client (D2C) [1];
- From factory to warehouse/ distribution centre (DC) located in Europe [2];

- From a warehouse/ distribution centre located in Europe to a local warehouse/ distribution centre [3a];
- From local warehouse/ distribution centre to final client [3b];
- From warehouse/ distribution centre located in Europe to retail/ stores[4a]; and
- From retail/ stores to the final client (consumer travel) [4b].

For the distribution life cycle stage, two scenarios as shown in Figure 5 shall be considered for the two main distribution models:

- E-commerce scenario (including D2C sales)
- Retail/in-store scenario

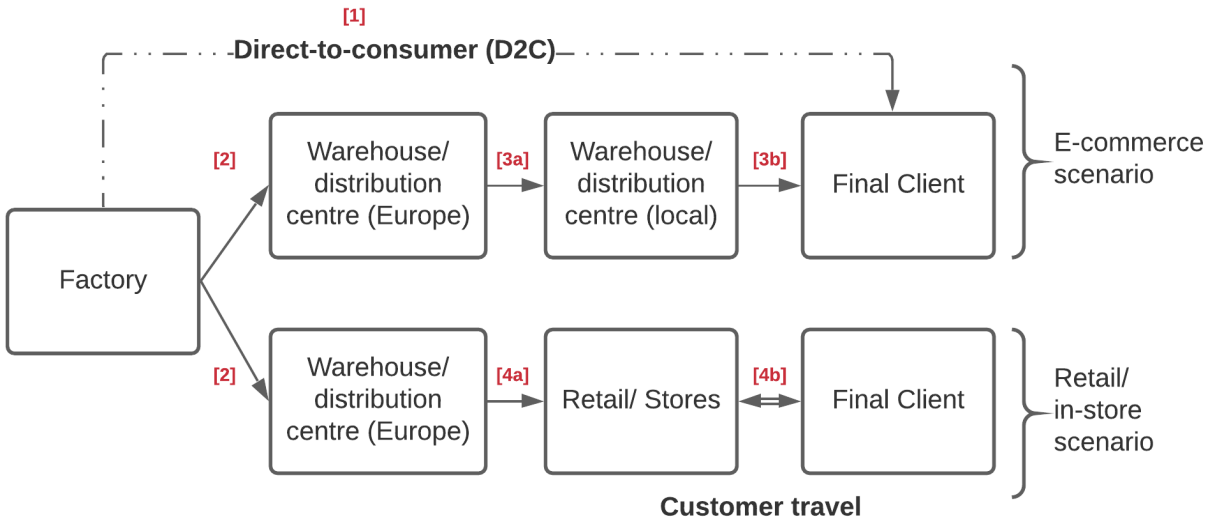


Figure 5 Transport processes and scenarios

The numbers in brackets in Figure 5 refer to the transport processes described in Table 29 further below. For each of these transport processes, the default values per functional unit concerning supply chains, distances covered, utilisation ratios, provenances and transport modes are given, which shall be used when no supply chain specific data are available. Nevertheless, specific data shall be used whenever available.

The distribution impacts are based on the distance travelled and the mass of the product being transported (tkm). The mass of the real load divided by the mass of the payload gives the utilisation ratio. The default utilisation ratio is given as 64% for a truck. The number of empty

returns (i.e. the ratio of the distance travelled to collect the next load after unloading the product to the distance travelled to transport the product) is included and already taken into account, therefore the utilisation ratio shall not be modelled separately.

Note that whenever supply chain specific data are available (e.g. the country of origin is known), the specific distances for ship and plane transport should be determined by using the following calculators:

- https://www.searates.com/services/distances-time/
- https://co2.myclimate.org/en/flight_calculators/new/

If internal tools are available to calculate transportation distances, i.e. using origin and destination codes enabling bulk assessments, these can be used as well if equally or more accurate than the calculators listed above.

The following values shall be determined by the user of the PEF method and specific values shall be used whenever available:

- Ratio between products sold through retail, distribution centre and directly to the final client; and
- For the factory to the final client: ratio between local, intracontinental and international supply chains.

1582 Table 29 Default transport parameters per product

1583

No.	Transport process	Default per functional unit				
		Supply chain	Distance (km)	Utilisation ratio	Provenance (% of total transport)	Transport mode
1	Factory to final client (direct-to-consumer)	Local	1’200	64%	5%	Truck (>32t, EURO 4)
		Intracontinental	3’500	64%	15%	Truck (>32t, EURO 4)
		International (ship)	1’000	64%	0%	Truck (>32t, EURO 4)
			18’000	n/a		Ship (transoceanic container)
		International (plane)	1’000	64%	80%	Truck (>32t, EURO 4)
			10’000	n/a		Cargo plane
2	Factory to warehouse/ DC located in Europe	Local	1’200	64%	5%	Truck (>32t, EURO 4)
		Intracontinental (barge)	2’500	64%	3%	Truck (>32t, EURO 4)
			800	n/a		Ship (barge)
		Intracontinental (train)	800	64%	14%	Truck (>32t, EURO 4)
			2’500	n/a		Train (average freight train)
		International (ship)	1’000	64%	66%*	Truck (>32t, EURO 4)
			18’000	n/a		Ship (transoceanic container)
		International (plane)	1’000	64%	10%*	Truck (>32t, EURO 4)
			10’000	n/a		Cargo plane
		International (train)	1’000	64%	2%	Truck (>32t, EURO 4)
			10’000	n/a		Train (average freight train)
3a	From warehouse/ DC located in Europe to local warehouse/ DC	Intracontinental (plane)	500	64%	100%	Truck (>32t, EURO 4)
			3’500	n/a		Cargo plane
3b	From local warehouse/ DC to final client	Local	250 (round trip)	20%/ *50%***	100%	Van (lorry <7.5t, EURO 3
4a	From warehouse/ DC located in Europe to retail/ stores	Local	1’200	64%	100%	Truck (>32t, EURO 4)
4b	From retail/ stores to final client (consumer travel)	Local	5 5 -	See below 20%/ *50%*** -	62% 5% 33%	Passenger car (average) Van (lorry <7.5t, EURO 3) No impact modelled (public transport)

* calculated with values based on McKinsey (2020b)

**utilisation ratio for a van (lorry <1.2t, EURO 3)

6.3.2. Distribution models

For the transport of the final product, the weight transported is defined as the sum of the product's weight plus all removable accessories such as price tags, cardboard brand tags etc. in addition to the packaging.

The e-commerce scenario includes the transport of the final product from outside or inside Europe (factory) to a warehouse or distribution centre (located in Europe and/ or local), the storage at the warehouse or distribution centre, and further transportation from the warehouse or distribution centre to the final client. As a growing part of online sales, D2C-sales are considered in the e-commerce scenario as well. The impacts generated by the digital infrastructure used for online shopping shall be taken into account. For each product ordered, 30 Wh of electricity (European grid mix) are needed based on expert judgement.

In the retail/ in-store sales scenario, the product is first transported from the factory to a warehouse or distribution centre (located in Europe), then from the warehouse or distribution centre to a retail/ store, and finally transported to the final clients' home involving consumer travel (see Figure 5).

The impacts from consumer travel (allocation of the car impact) shall be based on volume. For an average car, the maximum volume that can be transported is 0.2 m^3, which equals 1/3 of a 0.6 m^3 trunk, whereas for products bigger than 0.2 m^3 the full car transport impact shall be included. Considering products that are sold through shopping malls, the volume of the product (including all packaging) shall be used to allocate the transport burdens, and the allocation factor shall be calculated as the volume of the product divided by the maximum volume of 0.2 m^3.

The default value for the volume is specified below.

Table 30 Default representative product volumes

No.	Sub-category	Default product volume (m^3)
1	T-shirts	0.0018
2	Shirts and blouses	0.006
3	Sweaters and midlayers	0.0102
4	Jackets and coats	0.015
5	Pants and shorts	0.004
6	Dresses, skirts and jumpsuits	0.007

No.	Sub-category	Default product volume (m^3)
7	Leggings, stockings, tights and socks	0.0006
8	Underwear	0.0006
9	Swimsuits	0.0006
10	Apparel accessories	0.0012
11	Open-toed shoes	0.0048
12	Closed-toed shoes	0.018
13	Boots	0.024

1609

1610 The default values for the transport process from retail/ stores to the final client in Table 29
1611 are given as roundtrip distances. LCA datasets for consumer travel are per kilometre.

1612 ### 6.3.3. Storage at warehouse/ DC and retail/ store

1613 The impacts generated by the storage of the final products in warehouses or retail
1614 locations/stores are related to energy for heating and lighting, and waste associated with lost
1615 products and packaging. Concerning the storage in warehouses and retail, no energy and
1616 waste differentiation are needed between apparel and footwear product sub-categories as
1617 usually a variety of products are stored and sold in the same warehouse or retail setting
1618 (ambient storage). This gives consistency of the energy inputs per unit sold within the chosen
1619 reference flow. The default data (from Zampori et al., 2019) in Table 31 shall be used, referring
1620 to electricity consumption (kWh/ m2*year), unless specific data are available.

1621 Table 31 Default storage capacity and energy consumption for warehouse/DC and retail/stores

	Storage capacity (ambient)	Storage time	Default storage capacity	Energy consumption (ambient)
Warehouse/ distribution centre	48'000 m^3	7 weeks (based on OEFCRs retail, 2018 and data received)	3'120'000 m^{3*}weeks/ year	30 kWh/ m^2*year 360 MJ natural gas/ m^2*year
Retail/ stores	2'000 m^3		104'000 m^3*weeks/ year	150 kWh/ m^2*year

1622

1623 The emissions and resource used at storage systems shall be allocated to the product stored,
1624 and the allocation be based on the space (in m^3) and time (in weeks) occupied by the
1625 representative product. Therefore the total storage capacity of a warehouse or retail store
1626 shall be known, and the product-specific volume (see Table 30) and corresponding storage
1627 time are needed to calculate the allocation factor (given as the ratio between the product

volume*time and storage capacity volume*time). The volumes were provided by ADEME and Balzac. Additionally, a storage volume factor of 4 is used for ambient storage to account for the additional space the product takes in the storage facility, meaning the product volume will be multiplied by 4.

6.3.4. Product returns and deadstock

Returns shall be taken into account for both scenarios by multiplying the distances by the percentage of the returns. The following default values shall be used:

- E-commerce scenario 40%
- Retail/ in-store sales scenario 10%

For example, in the e-commerce scenario, the last transport step (scenario 3b in Table 29) would be multiplied with the default percentage of returns via e-commerce (40%).

Additionally, the percentage of product returns has an influence on the distance travelled by the consumer and needs to be taken into account.

Deadstock is defined as the unsold stock of a product. Deadstock shall not be considered at product level, but it should instead be captured in a company's Organisational Environmental Footprint (OEF) or corporate footprint. For companies actively trying to reduce deadstock, information on deadstock reduction efforts can be added to Section 3.6.

Note	The Technical Secretariat is currently investigating how to add deadstock at product level.

6.3.5. Distribution losses and waste

Specific data shall be used if available. The losses are modelled based on the total quantity of product that leaves the factory compared to the quantity that arrives in sellable condition at the point of sale.

A default loss rate of 1% shall be used for the distribution stage if no specific data are available.

6.4. Use stage

[The PEFCR shall provide a clear description of the use stage and list all processes taking place therein (according to the model of the RP) according to the table provided below. The table may be adapted by the TS as appropriate.]

Note	Use stage processes will be provided as an Excel file in an appendix. See Table 15 as an example.

The user of the PEFCR shall report the DQR values (for each criterion + total) for all the datasets used.

[In this section the PEFCR shall also list all technical requirements and assumptions that the user of the PEFCR shall apply. The PEFCR shall state if a delta approach is used for certain processes. In case the delta approach is used, the PEFCR shall state the minimum consumption (reference) to be used when calculating the additional consumption allocated to the product.]

The use stage for apparel considers impacts related to the following steps for most of the sub-categories:

- Washing and cleaning
- Drying
- Ironing and steaming

These processes of the apparel use stage are product dependent and follow care instructions. Further details on material-specific requirements for the use stage per each representative product are described below.

The vast majority of Europeans (70%) follow the label's care instructions (GINETEX, 2019). Thus, both consumer data and care labels should be considered to model the use stage impacts.

For the use stage the consumption grid mix shall be used. The electricity mix shall reflect the ratios of sales between EU countries/ regions. To determine the ratio a physical unit shall be used (e.g. kg of product). Where such data are not available, the average EU consumption mix (EU27+UK + EFTA), or region-representative consumption mix, shall be used.

6.4.1. Washing / cleaning

For apparel products, the care label typically provides washing instructions and thus, these instructions are commonly used for individual products. While the care label shows the maximum temperature a product can withstand, this does not necessarily mean that the product is washed at that temperature and may in fact be washed at a lower temperature.

Specific garment use instructions shall be adopted following the relevant PEFCRs in case of leather and fur products (Leather PEFCRs, 2020). In general, leather articles will not be washed, dried, ironed or steamed.

Washing types and temperatures

For each representative product, key data for the washing types and typical washing temperatures provided in Table 32 below per product sub-category (Laitala, 2018a, Cotton Incorporated, 2020) shall be used.

Table 32 Washing types and specific instructions

No.	Product sub-category	Product details	Temp. (°C)	% Hand-washing	% Machine washing	% Dry cleaning
1	T-shirts	**Average**	**40°C**	**6%**	**89%**	**5%**
		Cotton and blends	40°C	8%	90%	2%
		Wool and blends	30°C	18%	57%	25%
		Synthetics	40°C	9%	88%	3%
		Regen. cellulose	Use average	22%	73%	5%
2	Shirts and blouses	**Average**	**40°C**	**8%**	**81%**	**11%**
3	Sweaters and midlayers	**Average**	**30°C**	**22%**	**64%**	**14%**
4	Jackets and coats	**Average**	**40°C**	**20%**	**60%**	**20%**
		Cotton and blends	Use average	13%	63%	25%
		Wool and blends	30°C	23%	24%	64%
		Synthetics	Use average	13%	61%	26%
		Regen. cellulose	Use average	16%	65%	18%
5	Pants and shorts	**Average**	**40°C**	**6%**	**75%**	**19%**
		Cotton and blends	Use average	13%	63%	25%
		Wool and blends	30°C	23%	24%	64%

No.	Product sub-category	Product details	Temp. (°C)	% Hand-washing	% Machine washing	% Dry cleaning
		Synthetics	Use average	13%	61%	26%
		Regen. cellulose	Use average	16%	65%	18%
6	Dresses, skirts and jumpsuits	**Average**	**40°C**	**17%**	**69%**	**14%**
7	Leggings, stockings, tights and socks	**Average**	**60°C**	**10%**	**85%**	**5%**
		Cotton and blends	Use average	16%	83%	1%
		Wool and blends	30°C	25%	66%	10%
		Synthetics	Use average	24%	75%	1%
		Regen. cellulose	Use average	47%	50%	2%
8	Underwear	**Average**	**60°C**	**12%**	**86%**	**2%**
9	Swimwear	**Average**	**30°C**	**100%**	**0%**	**0%**
10	Apparel accessories	**Average**	**30°C**	**29%**	**47%**	**24%**
		Hat	30°C	29%	56%	14%
		Scarves	30°C	28%	33%	39%
		Gloves	30°C	28%	59%	13%
		Belts	n/a	n/a	n/a	n/a

This table doesn't apply to leather products.

The average load in Europe is considered to be 3.3 kg (Laitala, 2018a). This will be confirmed when the EF 3.0 datasets are available.

The washing datasets from the EF-compliant database are built on average washing programs and shall be used.

<u>Washing frequency</u>

The frequency of washing shall be determined from the garment type for a specific product if available as reflected in Table 33. Key data on the washing frequency from the Higg PM for a standard consumer, based on data from Laitala (2020), Sandin (2019), and Daystar (2019) are provided below.

Table 33 Product uses prior to washing

No.	Sub-category	Average uses prior to washing
1	T-shirts	1
2	Shirts and blouses	2
3	Sweaters and midwear	5
4	Jackets and coats	20

No.	Sub-category	Average uses prior to washing
5	Pants and shorts	3
6	Dresses, skirts and jumpsuits	3
7	Leggings, stockings, tights and socks	2
8	Underwear	1
9	Swimsuits	1
10	Apparel accessories	20

This table doesn't apply to leather products.

A use is equivalent to a day of wear. The average number of days of use before wash for these types of garments are as follows:

- Sportswear (garments primarily worn for sports activities both indoor and outdoor): 1.5 (Laitala, 2018b) with the exception of RP1, RP8 and RP9, where it remains 1 use prior to washing.
- Delicate (dry clean only) items: 5 (FHCM, 2019) with the exception of RP8.

These changes are not relevant for apparel accessories for which the number of uses prior to washing remains 20.

Note	The average number of uses before washing for wool and blends containing 20% of wool or more will be defined at a later stage.

6.4.2. Footwear cleaning

While washing footwear in a washing machine is discouraged by footwear brands, it is assumed that consumers wash their shoes once during the lifetime of the pair of shoes (SAC and thinkstep, 2016), using a dedicated delicate cycle. The impact of this step being negligible, washing of footwear shall not be included. Similarly, polishing of leather footwear shall not be included due to its negligible impact.

6.4.3. Drying

Drying possibilities for garments are based on product and fabric type as well as on the specific country or season in some cases. The tumble dryer rates used for the RPs are shown in Table 34 (Laitala, 2018a, 2020; Gore, 2016).

Note	Further details on drying habits per product type/fibre type will be added at a later date if data are available.

If the care label indicates that tumble drying is possible, a study from ADEME indicates that 32.2% of the products are then tumble-dried (ADEME, 2016).

The frequency of drying shall be determined based on the garment type for a specific product as indicated in Table 34 (Laitala, 2020).

Table 34 Data for drying per product sub-category

No.	Sub-category	Air drying	Tumble drying
1	T-shirts	70%	30%
2	Shirts and blouses	88%	12%
3	Sweaters and midwear	70%	30%
4	Jackets and coats	75%	25%
5	Pants and shorts	70%	30%
6	Dresses, skirts and jumpsuits	88%	12%
7	Leggings, stockings, tights and socks	88%	12%
8	Underwear	65%	35%
9	Swimsuits	88%	12%
10	Apparel accessories	88%	12%

This table doesn't apply to leather products.

6.4.4. Ironing / steaming

Product materials and care instructions shall be considered in the ironing of garments as presented in Table 35 (Laitala, 2018a; Daystar, 2019; Sandin, 2019). Values provided in the table below are representative of ironing per cleaning cycle, therefore ironing is assumed after each wash when relevant. A steaming dataset can be used if relevant, using the same default rates and time spent per garment.

Table 35 Data for ironing and steaming

No.	Sub-category	% of garments ironed or steamed per use	Time spent per garment (min)
1	T-shirts	40%	2.6
2	Shirts and blouses	70%	2.6
3	Sweaters and midwear	0%	n/a
4	Jackets and coats	5%	4
5	Pants and shorts	63%	4.3
6	Dresses, skirts and jumpsuits	18%	4.5

No.	Sub-category	% of garments ironed or steamed per use	Time spent per garment (min)
7	Leggings, stockings, tights and socks	5%	3.4
8	Underwear	1%	1
9	Swimsuits	0%	n/a
10	Apparel accessories	25%	2.0

This table doesn't apply to leather products.

6.4.5. Extended lifetime and circularity

According to Section 4.4.9 of the PEF method (2019), if a product is re-used with the same specifications (same function), this re-use shall be considered as an extension of the use stage of the product. The aspects related to this lifetime extension are discussed in Section 3.3.2.

According to the PEF method:

The following processes are excluded from the use stage:

*(d) **If a product is reused** (see also Section 4.4.9.2), the processes needed to collect the product and make it ready for the new use cycle are excluded (e.g. the impacts from collection and cleaning reusable bottles). These processes are included in the EoL stage if the product is reused into a product with different specifications (see Section 4.4.9 for further details). If the product lifetime is extended into a product with original product specifications (providing the same function) these processes shall be included in the FU and reference flow.*

6.5. End of life

The end of life stage begins when the product in scope and its packaging is discarded by the user and ends when the product is returned to nature as a waste product or enters another product's life cycle (i.e. as a recycled input). In general, it includes the waste of the product in scope, such as the food waste, and primary packaging.

Other waste (different from the product in scope) generated during the manufacturing, distribution, retail, use stage or after use shall be included in the life cycle of the product and modelled at the life cycle stage where it occurs.

[The PEFCR shall list all technical requirements and assumptions that the user of the PEFCR shall apply. Furthermore, it shall list all processes taking place in this life cycle stage (according to the model of the RP) according to the table provided below. The table may be adapted by the TS as appropriate (e.g. by including relevant parameters of the Circular Footprint Formula). Please note that the transport from collection place to EoL treatment may be included in the landfill, incineration and recycling datasets: the TS shall check if it is included in the default datasets provided. However, there might be some cases, where additional default transport data are needed and thus shall be included here. The PEF method provides default values to be used in case no better data are available.]

Note	End of life processes will be provided as an Excel file in an appendix. See Table 15 as an example.

The user of the PEFCR shall report the DQR values (for each criterion + total) for all the datasets used.

The end of life shall be modelled using the Circular Footprint Formula and rules provided in chapter 'End of life modelling' of this PEFCR and in the PEF method, together with the default parameters listed in Table 21 *to* Table 24*.*

Before selecting the appropriate R2 value, the user of the PEFCR shall carry out an evaluation for recyclability of the material. The PEF study shall include a statement on the recyclability of the materials/ products. The statement on recyclability shall be provided together with an evaluation for recyclability that includes evidence for the following three criteria (as described by ISO 14021:1999, Section 7.7.4 'Evaluation methodology'):

1. *The collection, sorting and delivery systems to transfer the materials from the source to the recycling facility are conveniently available to a reasonable proportion of the purchasers, potential purchasers and users of the product;*
2. *The recycling facilities are available to accommodate the collected materials;*
3. *Evidence is available that the product for which recyclability is claimed is being collected and recycled.*

Point 1 and 3 can be proven by recycling statistics (country specific) derived from industry associations or national bodies. Approximation to evidence at point 3 can be provided by applying for example the design for recyclability evaluation outlined in EN 13430 Material recycling (Annexes A and B) or other sector-specific recyclability guidelines if available.

Following the evaluation for recyclability, the appropriate R2 values (supply-chain specific or default) shall be used. If one criterion is not fulfilled or the sector-specific recyclability guidelines indicate limited recyclability, an R2 value of 0% shall be applied.

Company-specific R2 values (measured at the output of the recycling plant) shall be used, if available. If no company-specific values are available and the criteria for the evaluation of recyclability are fulfilled (see below), application-specific R2 values shall be used as listed in Table 23 and Table 24 above*.*

- *If an R2 value is not available for a specific country, the European average shall be used.*
- *If an R2 value is not available for a specific application, the R2 values of the material shall be used (e.g. materials average).*
- *In case no R2 values are available, R2 shall be set equal to 0 or new statistics may be generated in order to assign an R2 value in the specific situation.*

The applied R2 values shall be subject to the PEF study verification.

[The PEFCR shall list in a table all the parameters to be used by the user to implement the CFF, distinguishing between those that have a fixed value (to be provided in the same Table; from the PEF method or PEFCR-specific) and those that are PEF study-specific (e.g. R2, etc.). Furthermore, the PEFCR shall include additional modelling rules derived from the PEF method, if applicable. Within this table, the B value shall be equal to 0 as default.]

[PEFCRs that include reusable packaging shall include the following: "The reuse rate determines the quantity of packaging material (per product sold) to be treated at the end of life. The amount of packaging treated at the end of life shall be calculated by dividing the actual weight of the packaging by the number of times this packaging was reused."]

The end of life of an apparel and footwear product is defined as the point when the product is no longer used for its initial purpose. According to the PEF Method (2019), the reuse of garments or footwear shall be modelled as an extension of the duration of the product's lifetime (see Section 3.3.2).

At the end of life, apparel and footwear products are either directly disposed of through municipal waste collection or they are collected at shops or street collection bins prior to being sorted.

In the case of specific collection schemes, the following fates are identified:

- Reuse by another user to fulfil the product's initial purpose – which is not considered as an end-of-life scenario (see above);
- Recycling to produce rags or insulation materials from used garments or to produce granulates from used footwear;
- Recycling via chemical or mechanical recycling to recover fibres or other raw materials (e.g. rubber or plastic).

In case of disposal through municipal waste collection, two scenarios may occur:

- Landfill
- Incineration

Default rates for these end-of-life scenarios are presented in Table 21 and Table 23 and shall be used in case no specific data are available. Although collection for composting via municipal waste collection occurs at negligible rates, this does not exclude composting as a possible end-of-life scenario.

The modelling of the end-of-life scenario should include the transportation, collection and sorting when applicable, and follow the CFF formula, presented in Section 5.10.

6.5.1. End of life circularity

Depending on the end-of-life scenario of the apparel or footwear product, it may be necessary to allocate the following burdens or credits to the product:

- Burdens and credits from incineration (including energy recovery when applicable);
- Burdens and credits from landfill;
- Burdens and credits from recycling, including substitution of recycled material to virgin material.

The modelling of each end-of-life scenario shall include the transportation, collection, sorting, pre-processing and processing of products when applicable. The associated burdens and credits shall be allocated using the CFF, presented in Section 5.10. These burdens and credits depend on the type of material or fabric, as well as the incineration technology.

6.5.2. Design for recycling

A product conceived with enhanced recyclability may claim a higher recycling output rate to be included in the CFF if it can be proven that this product is indeed sent for recycling in significantly higher proportions[22]. The higher recycling rate must be sourced and referenced[23].

The main disrupting factors for recyclability, preventing recyclability in certain pathways, are presented in Table 36. For these disruptors, R_2 is 0, so as to reflect the fact that these characteristics of the apparel or footwear product will prevent its use in specific recycling pathways (see Table 24).

Table 36 Main disruptors of recyclability

Product type	Main disruptors	Impacted pathways
Apparel	Products laminated with different materials	All pathways
	Less than 80% cotton	Wipers
	Products with more than 5% elastane	Insulation material
	Products with metallic fibres	Insulation material
	Products with electrical and electronic equipment	All pathways
Footwear	Products with electrical and electronic equipment	All pathways
	Products with fix composites (glued)	All pathways
	Products laminated with different materials	All pathways

Indicatively, facilitators of recyclability are indicated in Table 37.

Table 37 Main facilitators of recyclability

Product type	Main facilitators
Apparel	Mono-material products (at least 98% monomaterial)
	Products without hard points (zips, rivets, metal parts, etc.)
	Disassembling ease
Footwear	Mono-material products (at least 98% monomaterial)
	Easily separable shoes between upper and sole

[22] R_2 values are calculated based on the output of recycled material from the recycling process over the total volume of material sent to the end-of-life (including recycling process waste). This value is based on statistics. The higher the R_2, the higher the credits and the burdens from recycling.

[23] According to the PEF method, "The statement on recyclability shall be provided together with an evaluation for recyclability that includes evidence for the following three criteria (as described by ISO 14021:2016, Section 7.7.4 'Evaluation methodology')". More details are provided in the PEF method in Section 4.4.8.9 Recycling output rate (R2).

7. PEF results

7.1. Benchmark values

[Here the TS shall report the results of the benchmark for each representative product. The results shall be provided characterised, normalised, and weighted (as absolute values), each in a different table, according to the template provided below. Results shall also be provided as a single overall score, based on the weighting factors provided in Section 5.2.2 of the PEF method.]

Note	Detailed tables for the 13 representative products can be found in the PEF-RP study. Tables will be provided in this section after the last update of the PEF-RP study.

7.2. PEF profile

The user of the PEFCR shall calculate the PEF profile of its product in compliance with all requirements included in this PEFCR. The following information shall be included in the PEF report:

- *full life cycle inventory;*
- *characterised results in absolute values, for all impact categories (as a table);*
- *normalised results in absolute values, for all impact categories (as a table);*
- *weighted result in absolute values, for all impact categories (as a table);*
- *the aggregated single overall score in absolute values.*

Together with the PEF report, the user of the PEFCR shall develop an aggregated EF compliant dataset of its product in scope. This dataset shall be made available to the European Commission. The disaggregated version may remain confidential.

7.3. Classes of performance

[The identification of classes of performance is not obligatory. Each TS is free to define a method to identify the classes of performance, in case they deem it appropriate and relevant. In case classes of performance are identified, they shall be described and provided in this section. Please refer to 0 for further guidance.]

Note	To be completed at a later stage if required.

8. Verification

The verification of an EF study/ report carried out in compliance with this PEFCR shall be done according to all the general requirements included in Section 8 of the PEF method, including Annex A and the requirements listed below.

The verifier(s) shall verify that the PEF study is conducted in compliance with this PEFCR.

In case policies implementing the PEF method define specific requirements regarding verification and validation of PEF studies, reports and communication vehicles, the requirements in said policies shall prevail.

The verifier(s) shall validate the accuracy and reliability of the quantitative information used in the calculation of the study. As this can be highly resource intensive, the following requirements shall be followed:

- *The verifier shall check if the correct version of all impact assessment methods was used. For each of the most relevant impact categories, at least 50% of the characterisation factors (for each of the most relevant EF impact categories) shall be verified, while all normalisation and weighting factors of all impact categories shall be verified. In particular, the verifier shall check that the characterisation factors correspond to those included in the EF impact assessment method the study declares compliance with118;*
- *The cut-off applied (if any) fulfils the requirements of this PEFCR and the PEF method;*
- *All the newly created datasets shall be checked on their EF compliance (for the meaning of EF compliant datasets refer http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml). All their underlying data (elementary flows, activity data and sub processes) shall be validated;*
- *The aggregated EF compliant dataset of the product in scope (meaning, the EF study) is made available to the European Commission.*
- *For at least 70% of the most relevant processes (by number) in situation 2 option 2 of the DNM, 70% of the underlying data shall be validated. The 70% of data shall include all energy and transport sub-processes for processes in situation 2 option 2;*
- *For at least 60% of the most relevant processes (by number) in situation 3 of the DNM, 60% of the underlying data shall be validated;*

- *For at least 50% of the other processes (by number) in situation 1, 2 and 3 of the DNM, 50% of the underlying data shall be validated.*

In particular, verifier(s) shall verify if the DQR of the process satisfies the minimum DQR as specified in the DNM for the selected processes.

These data checks shall include, but should not be limited to, the activity data used, the selection of secondary sub-processes, the selection of the direct elementary flows and the CFF parameters. For example, if there are 5 processes and each one of them includes 5 activity data, 5 secondary datasets and 10 CFF parameters, then the verifier(s) has to check at least 4 out of 5 processes (70%) and, for each process, (s)he shall check at least 4 activity data (70% of the total amount of activity data), 4 secondary datasets (70% of the total amount of secondary datasets), and 7 CFF parameters (70% of the total amount of CFF parameters), i.e. the 70% of each of data that could be subject to a check.

The verification of the PEF report shall be carried out by randomly checking enough information to provide reasonable assurance that the PEF report fulfils all the conditions listed in Section 8 of the PEF method, including Annex A.

[The PEFCR may specify additional requirements for the verification that should be added to the minimum requirements stated in this document].

Note	To be completed at a later stage.

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[List the references used in the PEFCR.]

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ANNEX I - List of EF normalisation and weighting factors

Global normalisation factors are applied within the EF. The normalisation factors as the global impact per person are used in the EF calculations.

[The TS shall provide the list of normalisation and weighting factors that the user of the PEFCR shall apply. Normalisation and weighting factors are available at: http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml]

ANNEX II – PEF study template

[The PEFCR shall provide as an annex a checklist listing all the items that shall be included in PEF studies, using the PEF study template available as Annex E of the PEF method. The items already included are mandatory for every PEFCR. In addition, each TS may decide to add additional points to the template.]

ANNEX III – Review reports of the PEFCR AND PEF-RP(s)

[Insert here the critical review panel reports of the PEFCR and PEF-RP(s), including all findings of the review process and the actions taken from TS to answer the comments of the reviewers.]

ANNEX IV – Designing the representative product model

[The TS may decide to add other Annexes that are considered important].

[The PEFCR shall include a description of the representative product(s) and how it has been derived. The TS shall provide in an Annex to the PEFCR information about all the steps taken to define the "model" of the RP(s) and report the information gathered].

Given the large number of products considered, significant reflection within the TS was required to determine the product sub-categories. The following high-level principles for decision making were used:

1. How similar are the product functions?
    - For example, no one would choose a sneaker instead of a hat.
2. Which products could provide the same function but may be selected over another for a specific reason?
    - One would choose to wear leggings to go running and not dress pants.
    - To go to the office, one could choose to wear jeans or dress pants.
3. Can each product fit only within one sub-category?
    - If we had sub-categories for fashion and boots, where would a tall leather dress boot fit?
4. How many products are included in one sub-category?
    - If one sub-category accounts for a significant market share, sub-division may be justified.
5. Would the hotspots be similar for products within the sub-category?
    - The aim would be to avoid having one product at one end of the scale within a sub-category.
    - However, this could lead to splitting the categories by use (e.g., casual, fashion, sports), size or material which increases the workload exponentially.

After this exercise and discussions, the apparel and footwear PEFCR were classified into 13 product sub-categories, defined as products that can fulfil equivalent functions and applications as defined by the PEF method.

Products included in each sub-category and a description of each RP is included in Table 4. For the definition of RP BOMs, each sub-category is divided into two to five products matching the categorization of market data available from EURATEX for the identification of product representativeness on the European market as described below.

Bill of materials (BOM)

For each sub-category, key products were identified based on market shares of apparel and footwear products sold in Europe (EURATEX data).

The market splits used within this study are representative of apparel and footwear products produced in and imported to Europe, minus products that were exported from Europe, and were calculated based on product volumes. The main product groups identified per sub-category based on the market shares data from EURATEX are shown in Table 38 below.

Table 38 Market sales share of top products per sub-category

No.	Sub-category/ representative product	Products included	Market shares
1	T-shirts	T-shirts	99.6%
		Collared short-sleeved shirts	0.4%
2	Shirts and blouses	Long-sleeved shirts	75.8%
		Blouses	24.2%
3	Sweaters and midlayers	Jerseys and pullovers	50.9%
		Sweatshirts	17.1%
		Cardigans	22.3%
		Waistcoats	9.7%
4	Jackets and coats	Blazers/suit jackets	31.4%
		Rain jackets	11.0%
		Overcoats	7.3%
		Outdoor winter jackets	38.0%
		Light short jackets	12.3%
5	Pants and shorts	Pants	80.6%
		Shorts	19.4%
6	Dresses, skirts and jumpsuits	Dresses	60.0%
		One-piece suits	14.1%
		Skirts	14.4%
		Robes	11.4%
7	Leggings, stockings, tights and socks	Pantyhose and tights	28.8%
		Hosiery	49.1%
		Socks	22.1%
8	Underwear	Underwear	81.2%
		Bras	18.1%
		Body-shaping suits	0.8%
9	Swimsuits	Women’s swimwear	76.6%

No.	Sub-category/ representative product	Products included	Market shares
		Men's swimwear	23.4%
10	Apparel accessories	Hats	42.2%
		Scarves and ties	2.1%
		Belts	9.9%
		Gloves and mittens	45.9%
11	Open-toed shoes	Casual /fashion sandals	57.0%
		Flip-flops	15.0%
		Open-toed slippers	19.8%
		Athletic sandals	8.2%
12	Closed-toed shoes	Casual /fashion shoes	70.0%
		Slippers	23.5%
		Protective shoes	1.0%
		Athletic shoes	5.5%
13	Boots	Casual /fashion boots	51.4%
		Protective boots	16.4%
		Polymer boots	14.0%
		Athletic boots	18.2%

Totals per RP may not reach 100% due to rounding.

The shares of each material in the average final product weight (g/product for apparel and g/pair for footwear) per functional unit are given in Table 39 for apparel (representative products 1-10) and Table 40 for the footwear product sub-categories (representative products 11-13).

Primary data at product level were collected from TS members for each product sub-category. TS members provided raw material inputs for key products based on either highest volume products or average product data per product sold in Europe. Data collected from TS members were weighted based on their representativeness of an average product sold in the European market using market sales data provided by EURATEX, as well as the average fibre data from the TE Market Report on preferred fibre and materials (2020a).

Note	The animal origin of leather material inputs will be clarified at a later stage.

2096 Table 39 Bill of materials for the apparel representative products with the share (%) of each material based on the average product weight[24]

List of materials	RP1 T-shirts	RP2 Shirts & blouses	RP3 Sweaters & midlayers	RP4 Jackets & coats	RP5 Pants & shorts	RP6 Dresses, skirts and jumpsuits	RP7 Leggings, stockings, tights and socks	RP8 Underwear	RP9 Swimwear	RP10 Apparel accessories
Average weight [g/product]	**170**	**250**	**500**	**950**	**450**	**300**	**130**	**80**	**120**	**110**
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Acrylic	-	-	5%	11%	-	-	7%	-	-	16%
Cashmere and camel hair	-	-	4%	0.9%	-	-	-	-	-	-
Cotton[25]	70%	55%	34%	15%	47%	54%	22%	70.5%	-	15%
Duck down	-	-	-	0.9%	-	-	-	-	-	-
Elastane	-	-	-	-	4%	-	9%	7%	9%	-
Fur	-	-	-	0.3%	-	-	-	-	-	-
Leather	-	-	-	0.9%	1%	-	-	-	-	7%
Linen	-	5%	-	-	4%	-	-	-	-	-
Polyamide	-	-	2%	15%	7%	4%	27%	10%	51%	4%
Polyamide recycled	-	-	-	-	-	-	4%	2%	-	-
Polyester and other synthetics[26]	21.3%	23.2%	21.7%	35.6%	30.9%	24.5%	18.8%	5.1%	37.6%	30.3%
Polyester recycled	2%	3%	4%	4%	3%	2%	2%	-	2%	-
PTFE	-	-	-	1.8%	-	-	-	-	-	-
Silk	-	-	-	-	-	-	-	-	-	1%
Viscose/ Modal/ Lyocell[27]	6%	13%	5%	4%	2%	13%	8%	5%	-	-
Wool	-	-	24%	9%	-	2%	2%	-	-	26%
Trims[28]	0.7%	0.8%	0.3%	1.6%	1.1%	0.5%	0.2%	0.4%	0.4%	0.7%

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[24] Totals per RP may not reach 100% due to rounding.
[25] Although data from the past years indicate an increased share of organic cotton on the European market (Textile Exchange, 2020b), the actual share of organic cotton in 2019 was 0.93% globally. Because of this very low share, organic cotton is included here in the cotton category.
[26] Other synthetics include aramid, copolyester, elastodiene, elastolefin, EVA, polyethylene, rubber synthetic.
[27] Because of the very similar production processes of viscose and Modal as well as the overall low share of Lyocell, these materials are grouped in the same category.
[28] The assumed material composition of trims is an equal share of PES, PET and metal.

2098 Table 40 Bill of materials for the footwear representative products with the share (%) of each material based on the
2099 average product weight[29]

List of materials	RP11 Open-toed shoes	RP12 Closed-toed shoes	RP13 Boots
Average weight [g/pair]	**350**	**900**	**1100**
Total	**100%**	**100%**	**100%**
Wood-based non-woven	-	-	2%
Cork	5%	-	-
Cotton [30]	-	3%	-
EVA	28%	7%	-
Leather	17%	11%	21%
Metal	-	-	2%
Polyamide	-	3%	3%
Polyester and other synthetics[31]	3%	26%	13%
Polyester recycled	-	3%	2%
Polyurethane	8%	6%	10%
PVC	6%	6%	14%
Rubber natural	13%	8%	5%
Rubber synthetic	19%	16%	11%
Thermoplastic polyurethane	-	3%	14%
Viscose/ Modal[32]	-	2%	-
Wool	-	4%	-
Trims[33]	1%	2%	3%

2100

2101 The average final product weights presented in Table 39 and Table 40 correspond to the weight
2102 of the final product after raw materials acquisition and pre-processing, manufacturing and
2103 assembly. The sum of all raw material inputs needed per representative product are higher than
2104 the final product weight due to losses along the production and value chain. The input amount
2105 per functional unit is therefore calculated data and the quantities are determined according to
2106 residual losses during the production processes (See Section 6.2.2 for details).

[29] Totals per RP may not reach 100% due to rounding.
[30] Although data from the past years indicate an increased share of organic cotton on the European market (Textile Exchange, 2020b), the actual share of organic cotton in 2019 was 0.93% globally. Because of this very low share, organic cotton is included here in the cotton category.
[31] Other synthetics include aramid, copolyester, elastodiene, elastolefin, polyethylene.
[32] Because of the very similar production processes of viscose and modal these materials are grouped in the same category.
[33] The assumed material composition of trims is an equal share of PES, PET and metal.

ANNEX V – Detailed requirements regarding intrinsic quality

The specific requirements regarding intrinsic quality for the different types of products are defined in the following tables (Table 42 to Table 64). In all cases where wash tests are used, care instructions for washing and drying shall be followed. Tumble drying shall be performed each cycle of 10 washes if used.

If a product claims to have an intentionally added performance attribute (such as water repellency, stain release, wrinkle resistance, odour management, wicking, etc), this forms part of the intrinsic quality since the performance is a key attribute of the product's quality claims. When a product has a performance attribute claim, the existing tests are reduced in weight to include additional requirements to measure the performance claim. Any performance claim which cannot be quantified receives 0 points (does not qualify for basic level). If a product has multiple performance claims, the total weighting for performance claims is split evenly between all claims.

For products made of several types of fabrics (more than 3 materials), the tests shall be conducted on 80% of the materials by weight. The garment integrity tests shall be conducted as described below.

2126 Table 41 Intentionally added functional property claims

Performance Claim	Test Standard	5 points (basic) 10x Wash	10 points (moderate) 30x Wash	15 points (aspirational) 60x Wash
Smoothness	ISO 5077 & 6330 (washing) or ISO 3175-2 & 3175-1 (dryclean) according to care label	Grade ≥4 after 5x cleaning cycles	Grade ≥4 after 10x cleaning cycles	Grade ≥3 - 4 after 15x cleaning cycles
Cold (thermal resistance)	ISO11092 RCT	Change claimed value ($K.m^2/W$)<10%	Change claimed value ($K.m^2/W$)<10%	Change claimed value ($K.m^2/W$)<10%
Water repellency	Bundesmann ISO 9865 OR	Rating of 4.5 or higher at 10 min	Rating between 2.5 included and 4.5 not included at 10 min	Rating below 2.5 not included at 10 min
	ISO 4920	≥ Grade 4 (laundered specimen)		
Soil or stain Release	AATCC 130, Washing Procedure selection to match care label	≥ Grade 4 (laundered specimen)		
Wrinkle resistance	ISO 9867	≥ Grade 4 (laundered specimen)		
Wicking	AATCC 197 (Option B, 30 minutes)	Measure performance “as received” (initial value). After wash, must achieve the HIGHER of 80% of initial value or 150 mm.		
Odor manage-ment	ISO 20743, Absorption Method	1-log reduction (90% reduction) in bacteria after 24-hour contact time compared to an untreated, unlaundered sample.		
Breathabili-ty (post-laundering)	*JIS L1099 ** ISO 11092	U-Urban wear, A-Active wear, M-Mountaineering wear Option 1* B1 & B2: U: ≥8000 & 5000, A: ≥12000 & 8000, M: ≥20000 & 10000. Option 2**, Ret: U: 13-20, A:6-13, M: ≤6		
Stretch and recovery	EN 14704-1	≥85% recovery after 30 min - Fabrics containing <5% elastane ≥90% recovery after 30 min - Fabrics containing ≥5% elastane		
Other	Relevant ISO standard	Measure performance “as received” (initial value). After wash, must keep 80% of initial value.		

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Table 42 Duration of service requirements for RP 1 (T-shirts)

Duration of Service Test and Rating		**% Weighting per test**	**Endurance Factors and Requirements**		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Performance (perf.) Test (materials)		**50%**			
Pilling Resistance	ISO 12945-1 (Pilling box method) with assessment by ISO Pilling Grade replicas	13% OR 10% if perf. claim	Smooth surface ≥Grade 3 Products with raised surface ≥ 2-3 5'400 cycles (90min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 7'200 cycles (120 min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 10'800 cycles (180 min)
Density/Weight	EN 12127 / ISO 3801	-	Report only for bursting strength testing		
Fabric Bursting	ISO 13938-2 OR ASTM D3786	13% OR 10% if perf. claim	≤ 180gsm ≥ 251 kPa >180gsm ≥ 320 kPa	≤ 180gsm ≥ 279 kPa >180gsm ≥ 360 kPa	≤ 180gsm ≥ 310 kPa >180gsm ≥ 400 kPa
Fabric Colourfastness	ISO 105 X12 OR AATCC 8 (to crocking) wet rub	8% OR 5% if perf. claim	Grade ≥3 using ISO / AATCC greyscale for colour change	Grade ≥3-4 using ISO / AATCC greyscale for colour change	Grade ≥4 using ISO / AATCC greyscale for colour change
	ISO 105 E04 OR AATCC 15 (to perspiration)	8% OR 5% if perf. claim	Shade change ≥Grade 3	Shade change ≥Grade 3-4	Shade change ≥Grade 4
	ISO 105-B02, X hours of light exposure OR AATCC 16, Op3, 20 AFU (to light)	8% OR 5% if perf. claim	Blue Reference ≥Grade 4 48 hours of light exposure	Blue Reference ≥Grade 4 96 hours of light exposure	Blue Reference ≥Grade 4 144 hours of light exposure
Performance Claim	ISO 6330 4N wash/dry conditions based on care instructions. If tumble dry, use 10 wash / 1 dry, plus evaluation standard as per "Performance Claim" table	0% OR 15% if perf. claim	See "Performance Claim" table for requirement by claim type		
Garment Integrity Test (whole garment after aging) ISO 6330 (washing) or ISO 3175 (dryclean) according to care label.		**50%**	Cleaning cycles* x15 OR x10 if >50% animal fibres	Cleaning cycles* x30 OR x15 if >50% animal fibres	Cleaning cycles* x60 OR x25 if >50% animal fibres
Dimensional Stability Shrinkage & Skew/Twist/Torque	ISO 6330 care label cycles (If tumble dry then 10x wash/1 Dry) or ISO 3175 (dryclean) ISO 5077 & ISO 16322 Spirality	20%	Skewness ≤ 5% Shrinkage width ±5% if knitted Shrinkage width ±3% if woven		

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Appearance	Visual Exam (Comprehensive) ISO 15487	30%	ISO Pilling grade replica ≥3 No component failure (e.g. buttons or zippers) ISO Greyscale Colour change Grade ≥4 No broken seams		

*Cleaning cycles based on a combination of accelerated aging and frequency of washing.

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Table 43 Duration of service requirements for RP 2 (Shirts and blouses) – Woven

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Performance (Perf.) Test (materials)		**50%**			
Pilling Resistance	ISO 12945-1 (Pilling box method) with assessment by ISO Pilling Grade replicas	Woven : 8% OR 5% if perf. claim	Smooth surface ≥Grade 3 Products with raised surface ≥ 2-3 5'400 cycles (90min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 7'200 cycles (120 min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 10'800 cycles (180 min)
Density/Weight	EN 12127 / ISO 3801	-	Report only for bursting strength testing.		
Fabric Colourfastness	ISO 105 X12 OR AATCC 8 (to crocking) wet rub	Woven : 7% OR 5% if perf. claim	Grade ≥3 using ISO / AATCC greyscale for colour change	Grade ≥3-4 using ISO / AATCC greyscale for colour change	Grade ≥4 using ISO / AATCC greyscale for colour change
	ISO 105 E04 OR AATCC 15 (to perspiration)	Woven : 7% OR 5% if perf. claim	Shade change ≥Grade 3	Shade change ≥Grade 3-4	Shade change ≥Grade 4
	ISO 105-B02, X hours of light exposure OR AATCC 16, Op3, 20 AFU (to light)	Woven : 7% OR 5%	Blue Reference ≥Grade 4 48 hours of light exposure	Blue Reference ≥Grade 4 96 hours of light exposure	Blue Reference ≥Grade 4 144 hours of light exposure
Seam slippage (Wovens only)	ISO 13936-2	Woven : 7% OR 5% if perf. claim	<220gsm ≤6mm @ 60N ≥220gsm ≤6mm @ 120N	<220gsm ≤4mm @ 60N ≥220gsm ≤4mm @ 120N	<220gsm ≤2mm @ 60N ≥220gsm ≤2mm @ 120N
Fabric Tear Strength (Wovens only)	ISO 13937-1	Woven : 7% OR 5% if perf. claim	<70gsm:≥ 8N 70 - 120 gsm:≥ 10N 121 - 200 gsm:≥12N >200gsm:≥ 16N	<70gsm: ≥ 9N 70 - 120 gsm: ≥ 11N 121 - 200 gsm:≥13N >200gsm:≥ 17N	<70gsm: ≥ 10N 70 - 120 gsm: ≥ 12N 121 - 200 gsm:≥14N >200gsm: ≥ 18N
Fabric Tensile Strength (Wovens only)	ISO 13934-1 (Values in brackets represent animal fibre products)	Woven : 7% OR 5% if perf. claim	<150 gsm: Warp ≥ 220N , (100N) Weft ≥110N (70N) 151 - 200gsm: Warp ≥290N (125N) Weft≥ 130N (80N)	<150 gsm: Warp ≥ 270N , (125N) Weft ≥160N (85N) 151 - 200gsm: Warp ≥330N (150N) Weft≥ 180N (100N)	<150 gsm: Warp ≥ 310N (145N) Weft ≥200N (100N) 151 - 200gsm: Warp ≥380N (170N) Weft≥ 220N (115N)

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
			201 -300 gsm: Warp ≥360N, (150N) Weft ≥180N (100N) 301 - 400gsm: Warp =>400N, (200N) Weft 220N (150N) >400gsm: Warp ≥ 490N, (250N) Weft 290N (190N)	201 -300 gsm: Warp ≥400N, (200N) Weft ≥220N (125N) 301 - 440gsm: Warp =>400N, (250N) Weft 270N (200N) >400gsm: Warp ≥ 530N, (300N) Weft 330N (220N)	201 -300 gsm: Warp ≥440N, (230N) Weft ≥270N (175N) 301 - 440gsm: Warp =>490N, (290N) Weft 310N (230N) >400gsm: Warp ≥ 580N, (380N) Weft 380N (250N)
Performance Claim	ISO 6330 4N wash/dry conditions based on care instructions. If tumble dry, use 10 wash / 1 dry, plus evaluation standard as per "Performance Claim" table	0% OR 15% if perf. claim	See "Performance Claim" table for requirement by claim type		
Garment Integrity Test (whole garment after aging) ISO 6330 (washing) or ISO 3175 (dryclean) according to care label		**50%**	**Cleaning cycles ** x15**	**Cleaning cycles ** X30**	**Cleaning cycles ** X60**
Dimensional Stability Shrinkage & Skew/Twist/Torque	ISO 6330 care label cycles (If tumble dry then 10x wash/1 Dry) or ISO 3175 (dryclean) ISO 5077 & ISO 16322 Spirality	20%	Skewness ≤ 5% Shrinkage width ±5% if knitted Shrinkage width ±3% if woven		
Appearance	Visual Exam (Comprehensive) ISO 15487	30%	ISO Pilling grade replica ≥3 No component failure (e.g. buttons or zippers) ISO Greyscale Colour change Grade ≥4 No broken seams		

*Cleaning cycles based on a combination of accelerated aging and frequency of washing.

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2134

2135 Table 44 Duration of service requirements for RP 2 (Shirts and blouses) – Knitted

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Performance (Perf.) Test (materials)		**50%**			
Pilling Resistance	ISO 12945-1 (Pilling box method) with assessment by ISO Pilling Grade replicas	Knitted : 13% OR 10% if perf. claim	Smooth surface ≥Grade 3 Products with raised surface ≥ 2-3 5'400 cycles (90min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 7'200 cycles (120 min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 10'800 cycles (180 min)
Density/Weight	EN 12127 / ISO 3801	-	Report only for bursting strength testing.		
Fabric Bursting (knitted only)	ISO 13938-2 OR ASTM D3786	Knitted : 13% OR 10% if perf. claim	≤ 180gsm ≥ 251 kPa >180gsm ≥ 320 kPa	≤ 180gsm ≥ 279 kPa >180gsm ≥ 360 kPa	≤ 180gsm ≥ 310 kPa >180gsm ≥ 400 kPa
Fabric Colourfastness	ISO 105 X12 OR AATCC 8 (to crocking) wet rub	Knitted : 8% OR 5% if perf. claim	Grade ≥3 using ISO / AATCC greyscale for colour change	Grade ≥3-4 using ISO / AATCC greyscale for colour change	Grade ≥4 using ISO / AATCC greyscale for colour change
	ISO 105 E04 OR AATCC 15 (to perspiration)	Knitted : 8% OR 5% if perf. claim	Shade change ≥Grade 3	Shade change ≥Grade 3-4	Shade change ≥Grade 4
	ISO 105-B02, X hours of light exposure OR AATCC 16, Op3, 20 AFU (to light)	Knitted : 8% OR 5% if perf. claim	Blue Reference ≥Grade 4 48 hours of light exposure	Blue Reference ≥Grade 4 96 hours of light exposure	Blue Reference ≥Grade 4 144 hours of light exposure
Performance Claim	• ISO 6330 4N wash/dry conditions based on care instructions. If tumble dry, use 10 wash / 1 dry, plus evaluation standard as per "Performance Claim" table	0% OR 15% if perf. claim	See "Performance Claim" table for requirement by claim type		
Garment Integrity Test (whole garment after aging) ISO 6330 (washing) or ISO 3175 (dryclean) according to care label		**50%**	**Cleaning cycles ** x15**	**Cleaning cycles ** X30**	**Cleaning cycles ** X60**
Dimensional Stability Shrinkage & Skew/Twist/Torque	ISO 6330 care label cycles (If tumble dry then 10x wash/1 Dry) or ISO 3175 (dryclean) ISO 5077 & ISO 16322 Spirality	20%	Skewness ≤ 5% Shrinkage width ±5% if knitted Shrinkage width ±3% if woven		

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Appearance	Visual Exam (Comprehensive) ISO 15487	30%	ISO Pilling grade replica ≥3 No component failure (e.g. buttons or zippers) ISO Greyscale Colour change Grade ≥4 No broken seams		

2136 *Cleaning cycles based on a combination of accelerated aging and frequency of washing.

2137

Table 45 Duration of service requirements for RP 3 (Sweaters and midlayers)

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Performance (perf.) Test (materials)		**50%**			
Pilling Resistance	ISO 12945-1 (Pilling box method) with assessment by ISO Pilling Grade replicas	13% OR 10% if perf. claim	Smooth surface ≥Grade 3 Products with raised surface ≥ 2-3 5'400 cycles (90min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 7'200 cycles (120 min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 10'800 cycles (180 min)
Density/Weight	EN 12127 / ISO 3801		Report only for bursting strength testing.		
Fabric Bursting	ISO 13938-2 OR ASTM D3786	13% OR 10% if perf. claim	≤ 180gsm ≥ 251 kPa >180gsm ≥ 320 kPa	≤ 180gsm ≥ 279 kPa >180gsm ≥ 360 kPa	≤ 180gsm ≥ 310 kPa >180gsm ≥ 400 kPa
Fabric Colourfastness	ISO 105 X12 OR AATCC 8 (to crocking) wet rub	8% OR 5% if perf. claim	Grade ≥3 using ISO / AATCC greyscale for colour change	Grade ≥3-4 using ISO / AATCC greyscale for colour change	Grade ≥4 using ISO / AATCC greyscale for colour change
	ISO 105 E04 OR AATCC 15 (to perspiration)	8% OR 5% if perf. claim	Shade change ≥Grade 3	Shade change ≥Grade 3-4	Shade change ≥Grade 4
	ISO 105-B02, X hours of light exposure OR AATCC 16, Op3, 20 AFU (to light)	8% OR 5% if perf. claim	Blue Reference ≥Grade 4 48 hours of light exposure	Blue Reference ≥Grade 4 96 hours of light exposure	Blue Reference ≥Grade 4 144 hours of light exposure
Performance Claim	ISO 6330 4N wash/dry conditions based on care instructions. If tumble dry, use 10 wash / 1 dry, plus evaluation standard as per "Performance Claim" table	0% OR 15% if perf. claim	See "Performance Claim" table for requirement by claim type		
Garment Integrity Test (whole garment after aging ISO 6330 (washing) or ISO 3175 (dryclean) according to care label		**50%**	**Cleaning cycles ** x15**	**Cleaning cycles ** X20**	**Cleaning cycles ** X30**
Dimensional Stability Shrinkage & Skew/Twist/Torque	ISO 6330 care label cycles (If tumble dry then 10x wash/1 Dry) or ISO 3175 (dryclean) ISO 5077 & ISO 16322 Spirality	20%	Skewness ≤ 5% Shrinkage width ±5% if knitted Shrinkage width ±3% if woven		

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	Test Standard		5 points (basic)	10 points (moderate)	15 points (aspirational)
Appearance	Visual Exam (Comprehensive) ISO 15487	30%	ISO Pilling grade replica ≥3 No component failure (e.g. buttons or zippers) ISO Greyscale Colour change Grade ≥4 No broken seams		

2138 * Cleaning cycles based on a combination of accelerated aging and frequency of washing.

2139 Table 46 Duration of service requirements for RP 4 (Jackets and coats) - Woven

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Performance (perf.) Test (materials)		**50%**			
Pilling Resistance	ISO 12945-1 (Pilling box method) with assessment by ISO Pilling Grade replicas	Woven:7% OR 5% if perf. claim	Smooth surface ≥Grade 3 Products with raised surface ≥ 2-3 5'400 cycles (90min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 7'200 cycles (120 min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 10'800 cycles (180 min)
Martindale Abrasion Resistance (Wovens only)	ISO 12947-2	Woven:7% OR 5% if perf. claim	≤245 gsm :after the rupture of 2 yarns after 7'500 cycles 245 - 339 gsm : after the rupture of 2 yarns after 15'000 cycles >339 gsm : after the rupture of 2 yarns after 25'000 cycles	≤245 gsm :No rupture after 10'000 cycles 245 - 339 gsm :No rupture after 20 000 cycles >339 gsm :No rupture after 30'000 cycles	≤245 gsm :No rupture after 12'500 cycles 245 - 339 gsm :No rupture after 25 000 cycles >339 gsm :No rupture after 35'000 cycles
Density/Weight	EN 12127 / ISO 3801	-	Report only for bursting strength testing.		
Fabric Tear Strength (Wovens only)	ISO 13937-1	Woven:6% OR 5% if perf. claim	<70gsm:≥ 8N 70 - 120 gsm:≥ 10N 121 - 200 gsm:≥12N >200gsm:≥ 16N	<70gsm: ≥ 9N 70 - 120 gsm: ≥ 11N 121 - 200 gsm:≥13N >200gsm:≥ 17N	<70gsm: ≥ 10N 70 - 120 gsm: ≥ 12N 121 - 200 gsm:≥14N >200gsm: ≥ 18N

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Fabric Tensile Strength (Wovens only)	ISO 13934-1 (Values in brackets represent animal fibre products)	Woven:6% OR 4% if perf. claim	<150 gsm: Warp ≥ 220N , (100N) Weft ≥110N (70N) 151 - 200gsm: Warp ≥290N (125N) Weft≥ 130N (80N) 201 -300 gsm: Warp ≥360N, (150N) Weft ≥180N (100N) 301 - 400gsm: Warp =>400N, (200N) Weft 220N (150N) >400gsm: Warp ≥ 490N, (250N) Weft 290N (190N)	<150 gsm: Warp ≥ 270N , (125N) Weft ≥160N (85N) 151 - 200gsm: Warp ≥330N (150N) Weft≥ 180N (100N) 201 -300 gsm: Warp ≥400N, (200N) Weft ≥220N (125N) 301 - 440gsm: Warp =>400N, (250N) Weft 270N (200N) >400gsm: Warp ≥ 530N, (300N) Weft 330N (220N)	<150 gsm: Warp ≥ 310N (145N) Weft ≥200N (100N) 151 - 200gsm: Warp ≥380N (170N) Weft≥ 220N (115N) 201 -300 gsm: Warp ≥440N, (230N) Weft ≥270N (175N) 301 - 440gsm: Warp =>490N, (290N) Weft 310N (230N) >400gsm: Warp ≥ 580N, (380N) Weft 380N (250N)
Fabric Colourfastness	ISO 105 X12 OR AATCC 8 (to crocking) wet rub	Woven:6% OR 4% if perf. claim	Grade ≥3 using ISO / AATCC greyscale for colour change	Grade ≥3-4 using ISO / AATCC greyscale for colour change	Grade ≥4 using ISO / AATCC greyscale for colour change
	ISO 105 E04 OR AATCC 15 (to perspiration)	Woven:6% OR 4% if perf. claim	Shade change ≥Grade 3	Shade change ≥Grade 3-4	Shade change ≥Grade 4
	ISO 105-B02, X hours of light exposure OR AATCC 16, Op3, 20 AFU (to light)	Woven:6% OR 4% if perf. claim	Blue Reference ≥Grade 4 48 hours of light exposure	Blue Reference ≥Grade 4 96 hours of light exposure	Blue Reference ≥Grade 4 144 hours of light exposure
Seam slippage (Wovens only)	ISO 13936-2	Woven:6% OR 4% if perf. claim	<220gsm ≤6mm @ 60N ≥220gsm ≤6mm @ 120N	<220gsm ≤4mm @ 60N ≥220gsm ≤4mm @ 120N	<220gsm ≤2mm @ 60N ≥220gsm ≤2mm @ 120N
Performance Claim	ISO 6330 4N wash/dry conditions based on care instructions. If tumble dry, use 10 wash / 1 dry, plus evaluation standard as per “Performance Claim” table	0% OR 15% if perf. claim	See “Performance Claim” table for requirement by claim type		

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Garment integrity assessment on whole garment after appropriate cleaning cycles ** ISO 6330 (washing) or ISO 3175 (dryclean) according to care label		**50 %**	**Cleaning cycles* 5x OR 10x waterproof jackets**	**Cleaning cycles* 10x OR 30x waterproof jackets**	**Cleaning cycles* 15x OR 60x waterproof jackets**
Garment Dimensional Stability Shrinkage & Skew/ Twist /Torque	ISO 5077 & ISO 16322 Spirality	20% OR 10% If WP claim	Skewness ≤ 5% Shrinkage width ±5% if knitted Shrinkage width ±3% if woven		
Product waterproofness (if claimed)	ISO 811	0% OR 10% if WP claim	≥2.6m & <20% ncludes assessment of seams (no leaking at any seam, curve, or cross point)		
Fabric water repellence (if Claimed)	ISO 4920	0% OR 10% if WP claim	≥ 4		≥3-4
Appearance	Visual Examination ISO 15487	30% OR 20% if WP claim	No coating degradation or delamination of any membranes ISO Pilling grade replica ≥3-4 No component failure (e.g. buttons or zippers) ISO Greyscale Colour change Grade ≥4 No broken seams		

*Cleaning cycles based on a combination of accelerated aging and frequency of washing.

2141

Table 47 Duration of service requirements for RP 4 (Jackets and coats) - Knitted

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Performance (perf.) Test (materials)		**50%**			
Pilling Resistance	ISO 12945-1 (Pilling box method) with assessment by ISO Pilling Grade replicas	Knitted:13% OR 10% if perf. claim	Smooth surface ≥Grade 3 Products with raised surface ≥ 2-3 5'400 cycles (90min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 7'200 cycles (120 min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 10'800 cycles (180 min)
Density/Weight	EN 12127 / ISO 3801		Report only for bursting strength testing.		
Bursting Strength (Knitted only)	ISO 13938-2 OR ASTM D3786	Knitted:13% OR 10% if perf. claim	≤ 180gsm ≥ 251 kPa >180gsm ≥ 320 kPa	≤ 180gsm ≥ 279 kPa >180gsm ≥ 360 kPa	≤ 180gsm ≥ 310 kPa >180gsm ≥ 400 kPa
Fabric Colourfastness	ISO 105 X12 OR AATCC 8 (to crocking) wet rub	Knitted:8% OR 5% if perf. claim	Grade ≥3 using ISO / AATCC greyscale for colour change	Grade ≥3-4 using ISO / AATCC greyscale for colour change	Grade ≥4 using ISO / AATCC greyscale for colour change
	ISO 105 E04 OR AATCC 15 (to perspiration)	Knitted:8% OR 5% if perf. claim	Shade change ≥Grade 3	Shade change ≥Grade 3-4	Shade change ≥Grade 4
	ISO 105-B02, X hours of light exposure OR AATCC 16, Op3, 20 AFU (to light)	Knitted:8% OR 5% if perf. claim	Blue Reference ≥Grade 4 48 hours of light exposure	Blue Reference ≥Grade 4 96 hours of light exposure	Blue Reference ≥Grade 4 144 hours of light exposure
Performance Claim	ISO 6330 4N wash/dry conditions based on care instructions. If tumble dry, use 10 wash / 1 dry, plus evaluation standard as per "Performance Claim" table	0% OR 15% if perf. claim	See "Performance Claim" table for requirement by claim type		

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Garment integrity assessment on whole garment after appropriate cleaning cycles ** ISO 6330 (washing) or ISO 3175 (dryclean) according to care label		**50 %**	**Cleaning cycles* 5x 10x waterproof jackets**	**Cleaning cycles* 10x 30x waterproof jackets**	**Cleaning cycles* 15x 60x waterproof jackets**
Garment Dimensional Stability Shrinkage & Skew/Twist/Torque	ISO 5077 & ISO 16322 Spirality	20% OR 10% If WP claim	Skewness ≤ 5% Shrinkage width ±5% if knitted Shrinkage width ±3% if woven		
Product waterproofness (if claimed)	ISO 811	0% OR 10% if WP claim	≥2.6m & <20% Includes assessment of seams (no leaking at any seam, curve, or cross point)		
Fabric water repellence (if Claimed)	ISO 4920	0% OR 10% if WP claim	≥ 4		≥3-4
Appearance	Visual Examination ISO 15487	30% OR 20% if WP claim	No coating degradation or delamination of any membranes ISO Pilling grade replica ≥3-4 No component failure (e.g. buttons or zippers) ISO Greyscale Colour change Grade ≥4 No broken seams		

*Cleaning cycles based on a combination of accelerated aging and frequency of washing.

2144 Table 48 Duration of service requirements for RP 4 (Jackets and coats) - Leather

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Performance Test (materials)		**50%**			
Tear strength (leather)	ISO 3376 (leather items)	Leather items: x%	> xN		
Tensile strength (leather)	ISO 3377-2 (leather)	Leather items: x%			
Colourfastness (leather)	ISO 105-D01 to dry cleaning	Leather items: x%	Change in colour: 4		
	ISO 11640 to dry rubbing	Leather items: x%	After 50 rubs: 3		
	ISO 11640 to wet rubbing	Leather items: x%	After 10 rubs: 2-3		

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Note	The thresholds for leather items will be defined at a later stage for RP 4 (Jackets and coats), RP5 (Pants and shorts), RP 6 (Dresses, skirts and jumpsuits), RP 7 (Leggings, stockings, tights and socks), RP 8 (Underwear), and RP10 (Accessories).

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Table 49 Duration of service requirements for RP 5 (Pants and shorts) - Woven

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	Test Standard		5 points (basic)	10 points (moderate)	15 points (aspirational)
Performance (perf.) Test (materials)		**50%**			
Pilling Resistance	ISO 12945-1 (Pilling box method) with assessment by ISO Pilling Grade replicas	Woven:7% OR 5% if perf. claim	Smooth surface ≥Grade 3 Products with raised surface ≥ 2-3 5'400 cycles (90min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 7'200 cycles (120 min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 10'800 cycles (180 min)
Martindale Abrasion Resistance (Wovens only)	ISO 12947-2	Woven:7% OR 5% if perf. claim	≤245 gsm :after the rupture of 2 yarns after 7'500 cycles 245 - 339 gsm : after the rupture of 2 yarns after 15'000 cycles >339 gsm : after the rupture of 2 yarns after 25'000 cycles	≤245 gsm : No rupture after 10'000 cycles 245 - 339 gsm : No rupture after 20'000 cycles >339 gsm : No rupture after 30'000 cycles	≤245 gsm : No rupture after 12'500 cycles 245 - 339 gsm : No rupture after 25'000 cycles >339 gsm : No rupture after 35'000 cycles
Seam slippage (Wovens only)	ISO 13936-2	Woven:6% OR 5% if perf. claim	<220gsm ≤6mm @ 60N ≥220gsm ≤6mm @ 120N	<220gsm ≤4mm @ 60N ≥220gsm ≤4mm @ 120N	<220gsm ≤2mm @ 60N ≥220gsm ≤2mm @ 120N
Density/Weight	EN 12127 / ISO 3801		Report only for bursting strength testing.		
Fabric Tear Strength (Wovens only)	ISO 13937-1 (Values in brackets represent animal fibre products)	Woven:6% OR 4% if perf. claim	<70gsm:≥ 8N 70 - 120 gsm:≥ 10N 121 - 200 gsm:≥12N >200gsm:≥ 16N	<70gsm: ≥ 9N 70 - 120 gsm: ≥ 11N 121 - 200 gsm:≥13N >200gsm:≥ 17N	<70gsm: ≥ 10N 70 - 120 gsm: ≥ 12N 121 - 200 gsm:≥14N >200gsm: ≥ 18N

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	Test Standard		5 points (basic)	10 points (moderate)	15 points (aspirational)
Fabric Tensile Strength (Wovens only)	ISO 13934-1 (Values in brackets represent animal fibre products)	Woven:6% OR 4% if perf. claim	<150 gsm: Warp ≥ 220N , (100N) Weft ≥110N (70N) 151 - 200gsm: Warp ≥290N (125N) Weft≥ 130N (80N) 201 -300 gsm: Warp ≥360N, (150N) Weft ≥180N (100N) 301 - 400gsm: Warp =>400N, (200N) Weft 220N (150N) >400gsm: Warp ≥ 490N, (250N) Weft 290N (190N)	<150 gsm: Warp ≥ 270N , (125N) Weft ≥160N (85N) 151 - 200gsm: Warp ≥330N (150N) Weft≥ 180N (100N) 201 -300 gsm: Warp ≥400N, (200N) Weft ≥220N (125N) 301 - 440gsm: Warp =>400N, (250N) Weft 270N (200N) >400gsm: Warp ≥ 530N, (300N) Weft 330N (220N)	<150 gsm: Warp ≥ 310N (145N) Weft ≥200N (100N) 151 - 200gsm: Warp ≥380N (170N) Weft≥ 220N (115N) 201 -300 gsm: Warp ≥440N, (230N) Weft ≥270N (175N) 301 - 440gsm: Warp =>490N, (290N) Weft 310N (230N) >400gsm: Warp ≥ 580N, (380N) Weft 380N (250N)
Fabric Colourfastness	ISO 105 X12 OR AATCC 8 (to crocking) wet rub	Woven:6% OR 4% if perf. claim	Grade ≥3 using ISO / AATCC greyscale for colour change	Grade ≥3-4 using ISO / AATCC greyscale for colour change	Grade ≥4 using ISO / AATCC greyscale for colour change
	ISO 105 E04 OR AATCC 15 (to perspiration)	Woven:6% OR 4% if perf. claim	Shade change ≥Grade 3	Shade change ≥Grade 3-4	Shade change ≥Grade 4
	ISO 105-B02, X hours of light exposure OR AATCC 16, Op3, 20 AFU (to light)	Woven:6% OR 4% if perf. claim	Blue Reference ≥Grade 4 48 hours of light exposure	Blue Reference ≥Grade 4 96 hours of light exposure	Blue Reference ≥Grade 4 144 hours of light exposure

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	Test Standard		5 points (basic)	10 points (moderate)	15 points (aspirational)
Performance Claim	ISO 6330 4N wash/dry conditions based on care instructions. If tumble dry, use 10 wash / 1 dry, plus evaluation standard as per "Performance Claim" table	0% OR 15% if perf. claim	See "Performance Claim" table for requirement by claim type		
Garment integrity assessment on whole garment after appropriate cleaning cycles ISO 6330 (washing) or ISO 3175 (dryclean) according to care label.		**50%**	**Cleaning cycles* x15**	**Cleaning cycle* x30**	**Cleaning cycles* x60**
Garment Dimensional Stability Shrinkage & Skew/Twist/Torque	ISO 5077 & ISO 16322 Spirality	20% OR 10% If WP claim	Skewness ≤ 5%		
			Shrinkage width ±5% if knitted Shrinkage width ±3% if woven		
Product waterproofness (if claimed)	ISO 811	0% OR 10% if WP claim	≥2.6m & <20% Includes assessment of seams (no leaking at any seam, curve, or cross point)		
Fabric water repellence (if Claimed)	ISO 4920	0% OR 10% if WP claim	≥ 4		≥3-4
Appearance	Visual Examination ISO 15487	30% OR 20% if WP claim	No coating degradation or delamination of any membranes ISO Pilling grade replica ≥3-4 No component failure (eg buttons or zippers) ISO Greyscale Colour change Grade ≥4 No broken seams		

* Cleaning cycles based on a combination of accelerated aging and frequency of washing.

2150

Table 50 Duration of service requirements for RP 5 (Pants and shorts) – Knitted

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Performance (perf.) Test (materials)		**50%**			
Pilling Resistance	ISO 12945-1 (Pilling box method) with assessment by ISO Pilling Grade replicas	Knitted:13% OR 10% if perf. claim	Smooth surface ≥Grade 3 Products with raised surface ≥ 2-3 5'400 cycles (90min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 7'200 cycles (120 min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 10'800 cycles (180 min)
Density/Weight	EN 12127 / ISO 3801		Report only for bursting strength testing.		
Bursting Strength (Knitted fabrics only	ISO 13938-2 OR ASTM D3786	Knitted:13% OR 10% if perf. claim	≤ 180gsm ≥ 251 kPa >180gsm ≥ 320 kPa	≤ 180gsm ≥ 279 kPa >180gsm ≥ 360 kPa	≤ 180gsm ≥ 310 kPa >180gsm ≥ 400 kPa
Fabric Colourfastness	ISO 105 X12 OR AATCC 8 (to crocking) wet rub	Knitted:8% OR 5% if perf. claim	Grade ≥3 using ISO / AATCC greyscale for colour change	Grade ≥3-4 using ISO / AATCC greyscale for colour change	Grade ≥4 using ISO / AATCC greyscale for colour change
	ISO 105 E04 OR AATCC 15 (to perspiration)	Knitted:8% OR 5% if perf. claim	Shade change ≥Grade 3	Shade change ≥Grade 3-4	Shade change ≥Grade 4
	ISO 105-B02, X hours of light exposure OR AATCC 16, Op3, 20 AFU (to light)	Knitted:8% OR 5% if perf. claim	Blue Reference ≥Grade 4 48 hours of light exposure	Blue Reference ≥Grade 4 96 hours of light exposure	Blue Reference ≥Grade 4 144 hours of light exposure
Performance Claim	ISO 6330 4N wash/dry conditions based on care instructions. If tumble dry, use 10 wash / 1 dry, plus evaluation standard as per "Performance Claim" table	0% OR 15% if perf. claim	See "Performance Claim" table for requirement by claim type		
Garment integrity assessment on whole garment after appropriate cleaning cycles ISO 6330 (washing) or ISO 3175 (dryclean) according to care label.		**50%**	**Cleaning cycles* x15**	**Cleaning cycle* x30**	**Cleaning cycles* x60**
Garment		20% OR	Skewness ≤ 5%		

Dimensional Stability Shrinkage & Skew/Twist/Torque	ISO 5077 & ISO 16322 Spirality	10% If WP claim	Shrinkage width ±5% if knitted Shrinkage width ±3% if woven	
Product waterproofness (if claimed)	ISO 811	0% OR 10% if WP claim	≥2.6m & <20% Includes assessment of seams (no leaking at any seam, curve, or cross point)	
Fabric water repellence (if Claimed)	ISO 4920	0% OR 10% if WP claim	≥ 4	≥3-4
Appearance	Visual Examination ISO 15487	30% OR 20% if WP claim	No coating degradation or delamination of any membranes ISO Pilling grade replica ≥3-4 No component failure (e.g. buttons or zippers) ISO Greyscale Colour change Grade ≥4 No broken seams	

2151

2152 * Cleaning cycles based on a combination of accelerated aging and frequency of washing.

2153 Table 51 Duration of service requirements for RP 6 (Dresses, skirts and jumpsuits) - Woven

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	Test Standard		5 points (basic)	10 points (moderate)	15 points (aspirational)
Performance (perf.) Test (materials)		50%			
Pilling Resistance	ISO 12945-1 (Pilling box method) with assessment by ISO Pilling Grade replicas	Woven:7% OR 5% if perf. claim	Smooth surface ≥Grade 3 Products with raised surface ≥ 2-3 5'400 cycles (90min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 7'200 cycles (120 min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 10'800 cycles (180 min)
Martindale Abrasion Resistance (Wovens only)	ISO 12947-2	Woven:7% OR 5% if perf. claim	≤245 gsm :after the rupture of 2 yarns after 7'500 cycles 245 - 339 gsm : after the rupture of 2 yarns after 15'000 cycles >339 gsm : after the rupture of 2 yarns after 25'000 cycles	245 gsm : No rupture after 10'000 cycles 245 - 339 gsm : No rupture after 20'000 cycles >339 gsm : No rupture after 30'000 cycles	≤245 gsm : No rupture after 12'500 cycles 245 - 339 gsm : No rupture after 25'000 cycles >339 gsm : No rupture after 35'000 cycles
Seam slippage (Wovens only)	ISO 13936-2	Woven:6% OR 5% if perf. claim	<220gsm ≤6mm @ 60N ≥220gsm ≤6mm @ 120N	<220gsm ≤4mm @ 60N ≥220gsm ≤4mm @ 120N	<220gsm ≤2mm @ 60N ≥220gsm ≤2mm @ 120N
Density/Weight	EN 12127 / ISO 3801		Report only for bursting strength testing.		
Fabric Tear Strength (Wovens only)	ISO 13937-1 (Values in brackets represent animal fibre products)	Woven:6% OR 4% if perf. claim	<70gsm:≥ 8N 70 - 120 gsm:≥ 10N 121 - 200 gsm:≥12N >200gsm:≥ 16N	<70gsm: ≥ 9N 70 - 120 gsm: ≥ 11N 121 - 200 gsm:≥13N >200gsm:≥ 17N	<70gsm: ≥ 10N 70 - 120 gsm: ≥ 12N 121 - 200 gsm:≥14N >200gsm: ≥ 18N

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	Test Standard		5 points (basic)	10 points (moderate)	15 points (aspirational)
Fabric Tensile Strength (Wovens only)	ISO 13934-1 (Values in brackets represent animal fibre products)	Woven:6% OR 4% if perf. claim	<150 gsm: Warp ≥ 220N , (100N) Weft ≥110N (70N) 151 - 200gsm: Warp ≥290N (125N) Weft≥ 130N (80N) 201 -300 gsm: Warp ≥360N, (150N) Weft ≥180N (100N) 301 - 400gsm: Warp =>400N, (200N) Weft 220N (150N) >400gsm: Warp ≥ 490N, (250N) Weft 290N (190N)	<150 gsm: Warp ≥ 270N , (125N) Weft ≥160N (85N) 151 - 200gsm: Warp ≥330N (150N) Weft≥ 180N (100N) 201 -300 gsm: Warp ≥400N, (200N) Weft ≥220N (125N) 301 - 440gsm: Warp =>400N, (250N) Weft 270N (200N) >400gsm: Warp ≥ 530N, (300N) Weft 330N (220N)	<150 gsm: Warp ≥ 310N (145N) Weft ≥200N (100N) 151 - 200gsm: Warp ≥380N (170N) Weft≥ 220N (115N) 201 -300 gsm: Warp ≥440N, (230N) Weft ≥270N (175N) 301 - 440gsm: Warp =>490N, (290N) Weft 310N (230N) >400gsm: Warp ≥ 580N, (380N) Weft 380N (250N)
Fabric Colourfastness	ISO 105 X12 OR AATCC 8 (to crocking) wet rub	Woven:6% OR 4% if perf. claim	Grade ≥3 using ISO / AATCC greyscale for colour change	Grade ≥3-4 using ISO / AATCC greyscale for colour change	Grade ≥4 using ISO / AATCC greyscale for colour change
	ISO 105 E04 OR AATCC 15 (to perspiration)	Woven:6% OR 4% if perf. claim	Shade change ≥Grade 3	Shade change ≥Grade 3-4	Shade change ≥Grade 4
	ISO 105-B02, X hours of light exposure OR AATCC 16, Op3, 20 AFU (to light)	Woven:6% OR 4% if perf. claim	Blue Reference ≥Grade 4 48 hours of light exposure	Blue Reference ≥Grade 4 96 hours of light exposure	Blue Reference ≥Grade 4 144 hours of light exposure
Performance Claim	ISO 6330 4N wash/dry conditions based on care instructions. If tumble dry, use 10 wash / 1 dry, plus evaluation standard as per "Performance Claim" table	0% OR 15% if perf. claim	See "Performance Claim" table for requirement by claim type		

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Garment integrity assessment on whole garment after appropriate cleaning cycles * ISO 6330 (washing) or ISO 3175 (dryclean) according to care label		**50%**	**Cleaning cycles* x15**	**Cleaning cycle* x30**	**Cleaning cycles* x60**
Garment Dimensional Stability Shrinkage & Skew/Twist/Torque	ISO 5077 & ISO 16322 Spirality	20%	Skewness ≤ 5%		
			Shrinkage width ±5% if knitted Shrinkage width ±3% if woven		
Appearance	Visual Examination ISO 15487	30%	ISO Pilling grade replica ≥3-4 No component failure (e.g. buttons or zippers) ISO Greyscale Colour change Grade ≥4 No broken seams		

2154 *Cleaning cycles based on a combination of accelerated aging and frequency of washing.

2155 Table 52 Duration of service requirements for RP 6 (Dresses, skirts and jumpsuits) - Knitted

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Performance (perf.) Test (materials)		**50%**			
Pilling Resistance	ISO 12945-1 (Pilling box method) with assessment by ISO Pilling Grade replicas	Knitted:13% OR 10% if perf. claim	Smooth surface ≥Grade 3 Products with raised surface ≥ 2-3 5'400 cycles (90min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 7'200 cycles (120 min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 10'800 cycles (180 min)
Density/Weight	EN 12127 / ISO 3801		Report only for bursting strength testing.		
Bursting Strength (Knitted fabrics only	ISO 13938-2 OR ASTM D3786	Knitted:13% OR 10% if perf. claim	≤ 180gsm ≥ 251 kPa >180gsm ≥ 320 kPa	≤ 180gsm ≥ 279 kPa >180gsm ≥ 360 kPa	≤ 180gsm ≥ 310 kPa >180gsm ≥ 400 kPa
Fabric Colourfastness	ISO 105 X12 OR AATCC 8 (to crocking) wet rub	Knitted:8% OR 5% if perf. claim	Grade ≥3 using ISO / AATCC greyscale for colour change	Grade ≥3-4 using ISO / AATCC greyscale for colour change	Grade ≥4 using ISO / AATCC greyscale for colour change
	ISO 105 E04 OR AATCC 15 (to perspiration)	Knitted:8% OR 5% if perf. claim	Shade change ≥Grade 3	Shade change ≥Grade 3-4	Shade change ≥Grade 4
	ISO 105-B02, X hours of light exposure OR AATCC 16, Op3, 20 AFU (to light)	Knitted:8% OR 5% if perf. claim	Blue Reference ≥Grade 4 48 hours of light exposure	Blue Reference ≥Grade 4 96 hours of light exposure	Blue Reference ≥Grade 4 144 hours of light exposure
Performance Claim	ISO 6330 4N wash/dry conditions based on care instructions. If tumble dry, use 10 wash / 1 dry, plus evaluation standard as per "Performance Claim" table	0% OR 15% if perf. claim	See "Performance Claim" table for requirement by claim type		
Garment integrity assessment on whole garment after appropriate cleaning cycles * ISO 6330 (washing) or ISO 3175 (dryclean) according to care label		**50%**	**Cleaning cycles* x15**	**Cleaning cycle* x30**	**Cleaning cycles* x60**
Garment Dimensional		20%	Skewness ≤ 5%		

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	Test Standard		5 points (basic)	10 points (moderate)	15 points (aspirational)
Stability Shrinkage & Skew/Twist/Torque	ISO 5077 & ISO 16322 Spirality		Shrinkage width ±5% if knitted Shrinkage width ±3% if woven		
Appearance	Visual Examination ISO 15487	30%	ISO Pilling grade replica ≥3-4 No component failure (e.g. buttons or zippers) ISO Greyscale Colour change Grade ≥4 No broken seams		

2156 *Cleaning cycles based on a combination of accelerated aging and frequency of washing.

2157 Table 53 Duration of service requirements for RP 7 (Leggings, stockings, tights and socks) - Woven

Duration of Service Test and Rating		% Weightingper test	Endurance Factors and Requirements		
Test Item	Test Standard		5 points (basic)	10 points (moderate)	15 points (aspirational)
Performance (perf.) Test (materials)		50%			
Pilling Resistance	ISO 12945-1 (Pilling box method) with assessment by ISO Pilling Grade replicas	Woven:7% OR 5% if perf. claim	Smooth surface ≥Grade 3 Products with raised surface ≥ 2-3 5'400 cycles (90min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 7'200 cycles (120 min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 10'800 cycles (180 min)
Martindale Abrasion Resistance (Wovens only)	ISO 12947-2	Woven:7% OR 5% if perf. claim	≤245 gsm :after the rupture of 2 yarns after 7'500 cycles 245 - 339 gsm : after the rupture of 2 yarns after 15'000 cycles >339 gsm : after the rupture of 2 yarns after 25'000 cycles	245 gsm : No rupture after 10'000 cycles 245 - 339 gsm : No rupture after 20'000 cycles >339 gsm : No rupture after 30'000 cycles	≤245 gsm : No rupture after 12'500 cycles 245 - 339 gsm : No rupture after 25'000 cycles >339 gsm : No rupture after 35'000 cycles
Seam slippage (Wovens only)	ISO 13936-2	Woven:6% OR 5% if perf. claim	<220gsm ≤6mm @ 60N ≥220gsm ≤6mm @ 120N	<220gsm ≤4mm @ 60N ≥220gsm ≤4mm @ 120N	<220gsm ≤2mm @ 60N ≥220gsm ≤2mm @ 120N
Density/Weight	EN 12127 / ISO 3801		Report only for bursting strength testing.		
Fabric Tear Strength (Woven fabrics only)	ISO 13937-1 (Values in brackets represent animal fibre products)	Woven:6% OR 4% if perf. claim	<70gsm:≥ 8N 70 - 120 gsm:≥ 10N 121 - 200 gsm:≥12N >200gsm:≥ 16N	<70gsm: ≥ 9N 70 - 120 gsm: ≥ 11N 121 - 200 gsm:≥13N >200gsm:≥ 17N	<70gsm: ≥ 10N 70 - 120 gsm: ≥ 12N 121 - 200 gsm:≥14N >200gsm: ≥ 18N

Duration of Service Test and Rating		% Weightingper test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Fabric Tensile Strength (Wovens only)	ISO 13934-1 (Values in brackets represent animal fibre products)	Woven:6% OR 4% if perf. claim	<150 gsm: Warp ≥ 220N , (100N) Weft ≥110N (70N) 151 - 200gsm: Warp ≥290N (125N) Weft≥ 130N (80N) 201 -300 gsm: Warp ≥360N, (150N) Weft ≥180N (100N) 301 - 400gsm: Warp =>400N, (200N) Weft 220N (150N) >400gsm: Warp ≥ 490N, (250N) Weft 290N (190N)	<150 gsm: Warp ≥ 270N , (125N) Weft ≥160N (85N) 151 - 200gsm: Warp ≥330N (150N) Weft≥ 180N (100N) 201 -300 gsm: Warp ≥400N, (200N) Weft ≥220N (125N) 301 - 440gsm: Warp =>400N, (250N) Weft 270N (200N) >400gsm: Warp ≥ 530N, (300N) Weft 330N (220N)	<150 gsm: Warp ≥ 310N (145N) Weft ≥200N (100N) 151 - 200gsm: Warp ≥380N (170N) Weft≥ 220N (115N) 201 -300 gsm: Warp ≥440N, (230N) Weft ≥270N (175N) 301 - 440gsm: Warp =>490N, (290N) Weft 310N (230N) >400gsm: Warp ≥ 580N, (380N) Weft 380N (250N)
Fabric Colourfastness	ISO 105 X12 OR AATCC 8 (to crocking) wet rub	Woven:6% OR 4% if perf. claim	Grade ≥3 using ISO / AATCC greyscale for colour change	Grade ≥3-4 using ISO / AATCC greyscale for colour change	Grade ≥4 using ISO / AATCC greyscale for colour change
	ISO 105 E04 OR AATCC 15 (to perspiration)	Woven:6% OR 4% if perf. claim	Shade change ≥Grade 3	Shade change ≥Grade 3-4	Shade change ≥Grade 4
	ISO 105-B02, X hours of light exposure OR AATCC 16, Op3, 20 AFU (to light)	Woven:6% OR 4% if perf. claim	Blue Reference ≥Grade 4 48 hours of light exposure	Blue Reference ≥Grade 4 96 hours of light exposure	Blue Reference ≥Grade 4 144 hours of light exposure

Duration of Service Test and Rating		% Weightingper test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Performance Claim	ISO 6330 4N wash/dry conditions based on care instructions. If tumble dry, use 10 wash / 1 dry, plus evaluation standard as per "Performance Claim" table	0% OR 15% if perf. claim	See "Performance Claim" table for requirement by claim type		
Garment integrity assessment on whole garment after appropriate cleaning cycles *. ISO 6330 (washing) or ISO 3175 (dryclean) according to care label**.**		**50%**	**Cleaning cycles* x15**	**Cleaning cycle* x20**	**Cleaning cycles* x30**
Garment Dimensional Stability Shrinkage & Skew/Twist/Torque	ISO 5077 & ISO 16322 Spirality	20%	Skewness ≤ 5%		
			Shrinkage width ±5% if knitted Shrinkage width ±3% if woven		
Appearance	Visual Examination ISO 15487	30%	ISO Pilling grade replica ≥3-4 No component failure (eg buttons or zippers) ISO Greyscale Colour change Grade ≥4 No broken seams		

2158 * Cleaning cycles based on a combination of accelerated aging and frequency of washing.

2159 Table 54 Duration of service requirements for RP 7 (Leggings, stockings, tights and socks) - Knitted

Duration of Service Test and Rating		% Weightingper test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Performance (perf.) Test (materials)		**50%**			
Pilling Resistance	ISO 12945-1 (Pilling box method) with assessment by ISO Pilling Grade replicas	Knitted:13% OR 10% if perf. claim	Smooth surface ≥Grade 3 Products with raised surface ≥ 2-3 5'400 cycles (90min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 7'200 cycles (120 min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 10'800 cycles (180 min)
Density/Weight	EN 12127 / ISO 3801		Report only for bursting strength testing.		
Bursting Strength (Knitted fabrics only	ISO 13938-2 OR ASTM D3786	Knitted:13% OR 10% if perf. claim	≤ 180gsm ≥ 251 kPa >180gsm ≥ 320 kPa	≤ 180gsm ≥ 279 kPa >180gsm ≥ 360 kPa	≤ 180gsm ≥ 310 kPa >180gsm ≥ 400 kPa
Fabric Colourfastness	ISO 105 X12 OR AATCC 8 (to crocking) wet rub	Knitted:8% OR 5% if perf. claim	Grade ≥3 using ISO / AATCC greyscale for colour change	Grade ≥3-4 using ISO / AATCC greyscale for colour change	Grade ≥4 using ISO / AATCC greyscale for colour change
	ISO 105 E04 OR AATCC 15 (to perspiration)	Knitted:8% OR 5% if perf. claim	Shade change ≥Grade 3	Shade change ≥Grade 3-4	Shade change ≥Grade 4
	ISO 105-B02, X hours of light exposure OR AATCC 16, Op3, 20 AFU (to light)	Knitted:8% OR 5% if perf. claim	Blue Reference ≥Grade 4 48 hours of light exposure	Blue Reference ≥Grade 4 96 hours of light exposure	Blue Reference ≥Grade 4 144 hours of light exposure
Performance Claim	ISO 6330 4N wash/dry conditions based on care instructions. If tumble dry, use 10 wash / 1 dry, plus evaluation standard as per "Performance Claim" table	0% OR 15% if perf. claim	See "Performance Claim" table for requirement by claim type		
Garment integrity assessment on whole garment after appropriate cleaning cycles *. ISO 6330 (washing) or ISO 3175 (dryclean) according to care label.		**50%**	**Cleaning cycles* x15**	**Cleaning cycle* x20**	**Cleaning cycles* x30**
Garment Dimensional		20%	Skewness ≤ 5%		

Duration of Service Test and Rating		% Weightingper test	Endurance Factors and Requirements		
Test Item	Test Standard		5 points (basic)	10 points (moderate)	15 points (aspirational)
Stability Shrinkage & Skew/Twist/Torque	ISO 5077 & ISO 16322 Spirality		Shrinkage width ±5% if knitted Shrinkage width ±3% if woven		
Appearance	Visual Examination ISO 15487	30%	ISO Pilling grade replica ≥3-4 No component failure (eg buttons or zippers) ISO Greyscale Colour change Grade ≥4 No broken seams		

2160 * Cleaning cycles based on a combination of accelerated aging and frequency of washing.

2161

Table 55 Duration of service requirements for RP 8 (Underwear) - Woven

Duration of Service Test and Rating		% Weightingper test	Endurance Factors and Requirements		
Test Item	Test Standard		5 points (basic)	10 points (moderate)	15 points (aspirational)
Performance (perf.) Test (materials)		50%			
Pilling Resistance	ISO 12945-1 (Pilling box method) with assessment by ISO Pilling Grade replicas	Woven:8% OR 5% if perf. claim	Smooth surface ≥Grade 3 Products with raised surface ≥ 2-3 5'400 cycles (90min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 7'200 cycles (120 min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 10'800 cycles (180 min)
Martindale Abrasion Resistance (Wovens only)	ISO 12947-2	Woven:7% OR 5% if perf. claim	≤245 gsm :after the rupture of 2 yarns after 7'500 cycles 245 - 339 gsm : after the rupture of 2 yarns after 15'000 cycles >339 gsm : after the rupture of 2 yarns after 25'000 cycles	245 gsm : No rupture after 10'000 cycles 245 - 339 gsm : No rupture after 20'000 cycles >339 gsm : No rupture after 30'000 cycles	≤245 gsm : No rupture after 12'500 cycles 245 - 339 gsm : No rupture after 25'000 cycles >339 gsm : No rupture after 35'000 cycles
Seam slippage (Wovens only)	ISO 13936-2	Woven:7% OR 5% if perf. claim	<220gsm ≤6mm @ 60N ≥220gsm ≤6mm @ 120N	<220gsm ≤4mm @ 60N ≥220gsm ≤4mm @ 120N	<220gsm ≤2mm @ 60N ≥220gsm ≤2mm @ 120N
Density/Weight	EN 12127 / ISO 3801		Report only for bursting strength testing.		
Fabric Tear Strength (Woven fabrics only)	ISO 13937-1 (Values in brackets represent animal fibre products)	Woven:7% OR 5% if perf. claim	<70gsm:≥ 8N 70 - 120 gsm:≥ 10N 121 - 200 gsm:≥12N >200gsm:≥ 16N	<70gsm: ≥ 9N 70 - 120 gsm: ≥ 11N 121 - 200 gsm:≥13N >200gsm:≥ 17N	<70gsm: ≥ 10N 70 - 120 gsm: ≥ 12N 121 - 200 gsm:≥14N >200gsm: ≥ 18N

Duration of Service Test and Rating		% Weightingper test	Endurance Factors and Requirements		
Test Item	Test Standard		5 points (basic)	10 points (moderate)	15 points (aspirational)
Fabric Tensile Strength (Wovens only)	ISO 13934-1 (Values in brackets represent animal fibre products)	Woven:7% OR 5% if perf. claim	<150 gsm: Warp ≥ 220N , (100N) Weft ≥110N (70N) 151 - 200gsm: Warp ≥290N (125N) Weft≥ 130N (80N) 201 -300 gsm: Warp ≥360N, (150N) Weft ≥180N (100N) 301 - 400gsm: Warp =>400N, (200N) Weft 220N (150N) >400gsm: Warp ≥ 490N, (250N) Weft 290N (190N)	<150 gsm: Warp ≥ 270N , (125N) Weft ≥160N (85N) 151 - 200gsm: Warp ≥330N (150N) Weft≥ 180N (100N) 201 -300 gsm: Warp ≥400N, (200N) Weft ≥220N (125N) 301 - 440gsm: Warp =>400N, (250N) Weft 270N (200N) >400gsm: Warp ≥ 530N, (300N) Weft 330N (220N)	<150 gsm: Warp ≥ 310N (145N) Weft ≥200N (100N) 151 - 200gsm: Warp ≥380N (170N) Weft≥ 220N (115N) 201 -300 gsm: Warp ≥440N, (230N) Weft ≥270N (175N) 301 - 440gsm: Warp =>490N, (290N) Weft 310N (230N) >400gsm: Warp ≥ 580N, (380N) Weft 380N (250N)
Fabric Colourfastness	ISO 105 X12 OR AATCC 8 (to crocking) wet rub	Woven:7% OR 5% if perf. claim	Grade ≥3 using ISO / AATCC greyscale for colour change	Grade ≥3-4 using ISO / AATCC greyscale for colour change	Grade ≥4 using ISO / AATCC greyscale for colour change
	ISO 105 E04 OR AATCC 15 (to perspiration)	Woven:7% OR 5% if perf. claim	Shade change ≥Grade 3	Shade change ≥Grade 3-4	Shade change ≥Grade 4
Performance Claim	ISO 6330 4N wash/dry conditions based on care instructions. If tumble dry, use 10 wash / 1 dry, plus evaluation standard as per “Performance Claim” table	0% OR 15% if perf. claim	See “Performance Claim” table for requirement by claim type		

Duration of Service Test and Rating		% Weightingper test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Garment integrity assessment on whole garment after appropriate cleaning cycles *. ISO 6330 (washing) or ISO 3175 (dryclean) according to care label**.**		**50%**	**Cleaning cycles* x15**	**Cleaning cycle* x20**	**Cleaning cycles* x30**
Garment Dimensional Stability Shrinkage & Skew/Twist/Torque	ISO 5077 & ISO 16322 Spirality	20%	Skewness ≤ 5%		
			Shrinkage width ±5% if knitted Shrinkage width ±3% if woven		
Appearance	Visual Examination ISO 15487	30%	ISO Pilling grade replica ≥3-4 No component failure (eg buttons or zippers) ISO Greyscale Colour change Grade ≥4 No broken seams		

2162 * Cleaning cycles based on a combination of accelerated aging and frequency of washing.

2163

Table 56 Duration of service requirements for RP 8 (Underwear) - Knitted

Duration of Service Test and Rating		% Weightingper test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Performance (perf.) Test (materials)		**50%**			
Pilling Resistance	ISO 12945-1 (Pilling box method) with assessment by ISO Pilling Grade replicas	Knitted:15% OR 11% if perf. claim	Smooth surface ≥Grade 3 Products with raised surface ≥ 2-3 5'400 cycles (90min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 7'200 cycles (120 min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 10'800 cycles (180 min)
Density/Weight	EN 12127 / ISO 3801		Report only for bursting strength testing.		
Bursting Strength (Knitted fabrics only	ISO 13938-2 OR ASTM D3786	Knitted:15% OR 10% if perf. claim	≤ 180gsm ≥ 251 kPa >180gsm ≥ 320 kPa	≤ 180gsm ≥ 279 kPa >180gsm ≥ 360 kPa	≤ 180gsm ≥ 310 kPa >180gsm ≥ 400 kPa
Fabric Colourfastness	ISO 105 X12 OR AATCC 8 (to crocking) wet rub	Knitted:10% OR 7% if perf. claim	Grade ≥3 using ISO / AATCC greyscale for colour change	Grade ≥3-4 using ISO / AATCC greyscale for colour change	Grade ≥4 using ISO / AATCC greyscale for colour change
	ISO 105 E04 OR AATCC 15 (to perspiration)	Knitted:10% OR 7% if perf. claim	Shade change ≥Grade 3	Shade change ≥Grade 3-4	Shade change ≥Grade 4
Performance Claim	ISO 6330 4N wash/dry conditions based on care instructions. If tumble dry, use 10 wash / 1 dry, plus evaluation standard as per "Performance Claim" table	0% OR 15% if perf. claim	See "Performance Claim" table for requirement by claim type		
Garment integrity assessment on whole garment after appropriate cleaning cycles *. ISO 6330 (washing) or ISO 3175 (dryclean) according to care label.		**50%**	**Cleaning cycles* x15**	**Cleaning cycle* x20**	**Cleaning cycles* x30**
Garment Dimensional Stability Shrinkage & Skew/Twist/Torque	ISO 5077 & ISO 16322 Spirality	20%	Skewness ≤ 5% Shrinkage width ±5% if knitted Shrinkage width ±3% if woven		

Duration of Service Test and Rating		% Weightingper test	Endurance Factors and Requirements		
Test Item	Test Standard		5 points (basic)	10 points (moderate)	15 points (aspirational)
Appearance	Visual Examination ISO 15487	30%	ISO Pilling grade replica ≥3-4 No component failure (eg buttons or zippers) ISO Greyscale Colour change Grade ≥4 No broken seams		

2164 * Cleaning cycles based on a combination of accelerated aging and frequency of washing.

2165 Table 57 Duration of service requirements for RP 9 (Swimwear) - Woven

Note	This table is a repetition of the requirements for RP5 with additional requirements for colourfastness in chlorinated / salted water, for which thresholds must be defined.

2166

Duration of Service Test and Rating		% Weightingper test	Endurance Factors and Requirements		
Test Item	Test Standard		5 points (basic)	10 points (moderate)	15 points (aspirational)
Performance (perf.) Test (materials)		50%			
Pilling Resistance	ISO 12945-1 (Pilling box method) with assessment by ISO Pilling Grade replicas	Woven:6% OR 4% if perf. claim	Smooth surface ≥Grade 3 Products with raised surface ≥ 2-3 5'400 cycles (90min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 7'200 cycles (120 min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 10'800 cycles (180 min)
Martindale Abrasion Resistance (Wovens only)	ISO 12947-2	Woven:6% OR 4% if perf. claim	≤245 gsm :after the rupture of 2 yarns after 7'500 cycles 245 - 339 gsm : after the rupture of 2 yarns after 15'000 cycles >339 gsm : after the rupture of 2 yarns after 25'000 cycles	245 gsm : No rupture after 10'000 cycles 245 - 339 gsm : No rupture after 20'000 cycles >339 gsm : No rupture after 30'000 cycles	≤245 gsm : No rupture after 12'500 cycles 245 - 339 gsm : No rupture after 25'000 cycles >339 gsm : No rupture after 35'000 cycles
Seam slippage (Wovens only)	ISO 13936-2	Woven:6% OR 4% if perf. claim	<220gsm ≤6mm @ 60N ≥220gsm ≤6mm @ 120N	<220gsm ≤4mm @ 60N ≥220gsm ≤4mm @ 120N	<220gsm ≤2mm @ 60N ≥220gsm ≤2mm @ 120N
Density/Weight	EN 12127 / ISO 3801		Report only for bursting strength testing.		
Fabric Tear Strength (Wovens only)	ISO 13937-1 (Values in brackets represent animal fibre products)	Woven:6% OR 4% if perf. claim	<70gsm:≥ 8N 70 - 120 gsm:≥ 10N 121 - 200 gsm:≥12N	<70gsm: ≥ 9N 70 - 120 gsm: ≥ 11N 121 - 200 gsm:≥13N	<70gsm: ≥ 10N 70 - 120 gsm: ≥ 12N 121 - 200 gsm:≥14N

			>200gsm:≥ 16N	>200gsm:≥ 17N	>200gsm: ≥ 18N
Fabric Tensile Strength (Woven fabrics only)	ISO 13934-1 (Values in brackets represent animal fibre products)	Woven:6% OR 4% if perf. claim	<150 gsm: Warp ≥ 220N , (100N) Weft ≥110N (70N) 151 - 200gsm: Warp ≥290N (125N) Weft≥ 130N (80N) 201 -300 gsm: Warp ≥360N, (150N) Weft ≥180N (100N) 301 - 400gsm: Warp =>400N, (200N) Weft 220N (150N) >400gsm: Warp ≥ 490N, (250N) Weft 290N (190N)	<150 gsm: Warp ≥ 270N , (125N) Weft ≥160N (85N) 151 - 200gsm: Warp ≥330N (150N) Weft≥ 180N (100N) 201 -300 gsm: Warp ≥400N, (200N) Weft ≥220N (125N) 301 - 440gsm: Warp =>400N, (250N) Weft 270N (200N) >400gsm: Warp ≥ 530N, (300N) Weft 330N (220N)	<150 gsm: Warp ≥ 310N (145N) Weft ≥200N (100N) 151 - 200gsm: Warp ≥380N (170N) Weft≥ 220N (115N) 201 -300 gsm: Warp ≥440N, (230N) Weft ≥270N (175N) 301 - 440gsm: Warp =>490N, (290N) Weft 310N (230N) >400gsm: Warp ≥ 580N, (380N) Weft 380N (250N)
Fabric Colourfastness	ISO 105 X12 OR AATCC 8 (to crocking) wet rub	Woven:5% OR 4% if perf. claim	Grade ≥3 using ISO / AATCC greyscale for colour change	Grade ≥3-4 using ISO / AATCC greyscale for colour change	Grade ≥4 using ISO / AATCC greyscale for colour change
	ISO 105 E04 OR AATCC 15 (to perspiration)	Woven:5% OR 3% if perf. claim	Shade change ≥Grade 3	Shade change ≥Grade 3-4	Shade change ≥Grade 4
	ISO 105-B02, X hours of light exposure OR AATCC 16, Op3, 20 AFU (to light)	Woven:5% OR 4% if perf. claim	Blue Reference ≥Grade 4 48 hours of light exposure	Blue Reference ≥Grade 4 96 hours of light exposure	Blue Reference ≥Grade 4 144 hours of light exposure
	Colour fastness (chlorinated / salt water)	Woven:5% OR 4% if perf. claim			

Performance Claim	ISO 6330 4N wash/dry conditions based on care instructions. If tumble dry, use 10 wash / 1 dry, plus evaluation standard as per “Performance Claim” table	0% OR 15% if perf. claim	See “Performance Claim” table for requirement by claim type		
Garment integrity assessment on whole garment after appropriate cleaning cycles *. ISO 6330 (washing) or ISO 3175 (dryclean) according to care label.		**50%**	**Cleaning cycles* x15**	**Cleaning cycle* x20**	**Cleaning cycles* x30**
Garment Dimensional Stability Shrinkage & Skew/Twist/Torque	ISO 5077 & ISO 16322 Spirality	20%	Skewness ≤ 5%		
			Shrinkage width ±5% if knitted Shrinkage width ±3% if woven		
Appearance	Visual Examination ISO 15487	30%	ISO Pilling grade replica ≥3-4 No component failure (eg buttons or zippers) ISO Greyscale Colour change Grade ≥4 No broken seams		

2167 * Cleaning cycles based on a combination of accelerated aging and frequency of washing.

2168 Table 58 Duration of service requirements for RP 9 (Swimwear) - knitted

Note	This table is a repetition of the requirements for RP5 with additional requirements for colourfastness in chlorinated / salted water, for which thresholds must be defined.

2169

Duration of Service Test and Rating		% Weightingper test	Endurance Factors and Requirements		
Test Item	**Test Standard**		**5 points (basic)**	**10 points (moderate)**	**15 points (aspirational)**
Performance (perf.) Test (materials)		**50%**			
Pilling Resistance	ISO 12945-1 (Pilling box method) with assessment by ISO Pilling Grade replicas	Knitted:13% OR 10% if perf. claim	Smooth surface ≥Grade 3 Products with raised surface ≥ 2-3 5'400 cycles (90min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 7'200 cycles (120 min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 10'800 cycles (180 min)
Density/Weight	EN 12127 / ISO 3801		Report only for bursting strength testing.		
Bursting Strength (Knitted fabrics only	ISO 13938-2 OR ASTM D3786	Knitted:13% OR 9% if perf. claim	≤ 180gsm ≥ 251 kPa >180gsm ≥ 320 kPa	≤ 180gsm ≥ 279 kPa >180gsm ≥ 360 kPa	≤ 180gsm ≥ 310 kPa >180gsm ≥ 400 kPa
Fabric Colourfastness	ISO 105 X12 OR AATCC 8 (to crocking) wet rub	Knitted:6% OR 4% if perf. claim	Grade ≥3 using ISO / AATCC greyscale for colour change	Grade ≥3-4 using ISO / AATCC greyscale for colour change	Grade ≥4 using ISO / AATCC greyscale for colour change
	ISO 105 E04 OR AATCC 15 (to perspiration)	Knitted:6% OR 4% if perf. claim	Shade change ≥Grade 3	Shade change ≥Grade 3-4	Shade change ≥Grade 4
	ISO 105-B02, X hours of light exposure OR AATCC 16, Op3, 20 AFU (to light)	Knitted:6% OR 4% if perf. claim	Blue Reference ≥Grade 4 48 hours of light exposure	Blue Reference ≥Grade 4 96 hours of light exposure	Blue Reference ≥Grade 4 144 hours of light exposure
	Colour fastness (chlorinated / salt water)	Knitted:6% OR 4% if perf. claim			

Performance Claim	ISO 6330 4N wash/dry conditions based on care instructions. If tumble dry, use 10 wash / 1 dry, plus evaluation standard as per “Performance Claim” table	0% OR 15% if perf. claim	See “Performance Claim” table for requirement by claim type		
Garment integrity assessment on whole garment after appropriate cleaning cycles *. ISO 6330 (washing) or ISO 3175 (dryclean) according to care label.		**50%**	**Cleaning cycles* x15**	**Cleaning cycle* x20**	**Cleaning cycles* x30**
Garment Dimensional Stability Shrinkage & Skew/Twist/Torque	ISO 5077 & ISO 16322 Spirality	20%	Skewness ≤ 5%		
			Shrinkage width ±5% if knitted Shrinkage width ±3% if woven		
Appearance	Visual Examination ISO 15487	30%	ISO Pilling grade replica ≥3-4 No component failure (eg buttons or zippers) ISO Greyscale Colour change Grade ≥4 No broken seams		

2170 * Cleaning cycles based on a combination of accelerated aging and frequency of washing.

2171 Table 59 Duration of service requirements for RP 10 (Apparel accessories) - woven

Note	This table is a repetition of the requirements for RP5 - woven

2172

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	Test Standard		5 points (basic)	10 points (moderate)	15 points (aspirational)
Performance (perf.) Test (materials)		**50%**			
Pilling Resistance	ISO 12945-1 (Pilling box method) with assessment by ISO Pilling Grade replicas	Woven:7% OR 5% if perf. claim	Smooth surface ≥Grade 3 Products with raised surface ≥ 2-3 5'400 cycles (90min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 7'200 cycles (120 min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 10'800 cycles (180 min)
Martindale Abrasion Resistance (Wovens only)	ISO 12947-2	Woven:7% OR 5% if perf. claim	≤245 gsm :after the rupture of 2 yarns after 7'500 cycles 245 - 339 gsm : after the rupture of 2 yarns after 15'000 cycles >339 gsm : after the rupture of 2 yarns after 25'000 cycles	245 gsm : No rupture after 10'000 cycles 245 - 339 gsm : No rupture after 20'000 cycles >339 gsm : No rupture after 30'000 cycles	≤245 gsm : No rupture after 12'500 cycles 245 - 339 gsm : No rupture after 25'000 cycles >339 gsm : No rupture after 35'000 cycles
Seam slippage (Wovens only)	ISO 13936-2	Woven:6% OR 5% if perf. claim	<220gsm ≤6mm @ 60N ≥220gsm ≤6mm @ 120N	<220gsm ≤4mm @ 60N ≥220gsm ≤4mm @ 120N	<220gsm ≤2mm @ 60N ≥220gsm ≤2mm @ 120N
Density/Weight	EN 12127 / ISO 3801		Report only for bursting strength testing.		
Fabric Tear Strength (Wovens only)	ISO 13937-1 (Values in brackets represent animal fibre products)	Woven:6% OR 4% if perf. claim	<70gsm:≥ 8N 70 - 120 gsm:≥ 10N 121 - 200 gsm:≥12N >200gsm:≥ 16N	<70gsm: ≥ 9N 70 - 120 gsm: ≥ 11N 121 - 200 gsm:≥13N >200gsm:≥ 17N	<70gsm: ≥ 10N 70 - 120 gsm: ≥ 12N 121 - 200 gsm:≥14N >200gsm: ≥ 18N

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	Test Standard		5 points (basic)	10 points (moderate)	15 points (aspirational)
Fabric Tensile Strength (Wovens only)	ISO 13934-1 (Values in brackets represent animal fibre products)	Woven:6% OR 4% if perf. claim	<150 gsm: Warp ≥ 220N , (100N) Weft ≥110N (70N) 151 - 200gsm: Warp ≥290N (125N) Weft≥ 130N (80N) 201 -300 gsm: Warp ≥360N, (150N) Weft ≥180N (100N) 301 - 400gsm: Warp =>400N, (200N) Weft 220N (150N) >400gsm: Warp ≥ 490N, (250N) Weft 290N (190N)	<150 gsm: Warp ≥ 270N , (125N) Weft ≥160N (85N) 151 - 200gsm: Warp ≥330N (150N) Weft≥ 180N (100N) 201 -300 gsm: Warp ≥400N, (200N) Weft ≥220N (125N) 301 - 440gsm: Warp =>400N, (250N) Weft 270N (200N) >400gsm: Warp ≥ 530N, (300N) Weft 330N (220N)	<150 gsm: Warp ≥ 310N (145N) Weft ≥200N (100N) 151 - 200gsm: Warp ≥380N (170N) Weft≥ 220N (115N) 201 -300 gsm: Warp ≥440N, (230N) Weft ≥270N (175N) 301 - 440gsm: Warp =>490N, (290N) Weft 310N (230N) >400gsm: Warp ≥ 580N, (380N) Weft 380N (250N)
Fabric Colourfastness	ISO 105 X12 OR AATCC 8 (to crocking) wet rub	Woven:6% OR 4% if perf. claim	Grade ≥3 using ISO / AATCC greyscale for colour change	Grade ≥3-4 using ISO / AATCC greyscale for colour change	Grade ≥4 using ISO / AATCC greyscale for colour change
	ISO 105 E04 OR AATCC 15 (to perspiration)	Woven:6% OR 4% if perf. claim	Shade change ≥Grade 3	Shade change ≥Grade 3-4	Shade change ≥Grade 4
	ISO 105-B02, X hours of light exposure OR AATCC 16, Op3, 20 AFU (to light)	Woven:6% OR 4% if perf. claim	Blue Reference ≥Grade 4 48 hours of light exposure	Blue Reference ≥Grade 4 96 hours of light exposure	Blue Reference ≥Grade 4 144 hours of light exposure

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	Test Standard		5 points (basic)	10 points (moderate)	15 points (aspirational)
Performance Claim	ISO 6330 4N wash/dry conditions based on care instructions. If tumble dry, use 10 wash / 1 dry, plus evaluation standard as per "Performance Claim" table	0% OR 15% if perf. claim	See "Performance Claim" table for requirement by claim type		
Garment integrity assessment on whole garment after appropriate cleaning cycles ISO 6330 (washing) or ISO 3175 (dryclean) according to care label.		**50%**	**Cleaning cycles* x15**	**Cleaning cycle* x30**	**Cleaning cycles* x60**
Garment Dimensional Stability Shrinkage & Skew/Twist/Torque	ISO 5077 & ISO 16322 Spirality	20% OR 10% If WP claim	Skewness ≤ 5%		
			Shrinkage width ±5% if knitted Shrinkage width ±3% if woven		
Product waterproofness (if claimed)	ISO 811	0% OR 10% if WP claim	≥2.6m & <20% Includes assessment of seams (no leaking at any seam, curve, or cross point)		
Fabric water repellence (if Claimed)	ISO 4920	0% OR 10% if WP claim	≥ 4		≥3-4
Appearance	Visual Examination ISO 15487	30% OR 20% if WP claim	No coating degradation or delamination of any membranes ISO Pilling grade replica ≥3-4 No component failure (eg buttons or zippers) ISO Greyscale Colour change Grade ≥4 No broken seams		

2173

2174 Table 60 - Duration of service requirements for RP 10 (Apparel accessories) – Knitted

Note	This table is a repetition of the requirements for RP5 - knitted

2175

Duration of Service Test and Rating		% Weighting per test	Endurance Factors and Requirements		
Test Item	Test Standard		5 points (basic)	10 points (moderate)	15 points (aspirational)
Performance (perf.) Test (materials)		50%			
Pilling Resistance	ISO 12945-1 (Pilling box method) with assessment by ISO Pilling Grade replicas	Knitted:13% OR 10% if perf. claim	Smooth surface ≥Grade 3 Products with raised surface ≥ 2-3 5'400 cycles (90min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 7'200 cycles (120 min)	Smooth surface ≥Grade 3-4 Products with raised surface ≥ 3 10'800 cycles (180 min)
Density/Weight	EN 12127 / ISO 3801		Report only for bursting strength testing.		
Bursting Strength (Knitted fabrics only	ISO 13938-2 OR ASTM D3786	Knitted:13% OR 10% if perf. claim	≤ 180gsm ≥ 251 kPa >180gsm ≥ 320 kPa	≤ 180gsm ≥ 279 kPa >180gsm ≥ 360 kPa	≤ 180gsm ≥ 310 kPa >180gsm ≥ 400 kPa
Fabric Colourfastness	ISO 105 X12 OR AATCC 8 (to crocking) wet rub	Knitted:8% OR 5% if perf. claim	Grade ≥3 using ISO / AATCC greyscale for colour change	Grade ≥3-4 using ISO / AATCC greyscale for colour change	Grade ≥4 using ISO / AATCC greyscale for colour change
	ISO 105 E04 OR AATCC 15 (to perspiration)	Knitted:8% OR 5% if perf. claim	Shade change ≥Grade 3	Shade change ≥Grade 3-4	Shade change ≥Grade 4
	ISO 105-B02, X hours of light exposure OR AATCC 16, Op3, 20 AFU (to light)	Knitted:8% OR 5% if perf. claim	Blue Reference ≥Grade 4 48 hours of light exposure	Blue Reference ≥Grade 4 96 hours of light exposure	Blue Reference ≥Grade 4 144 hours of light exposure
Performance Claim	ISO 6330 4N wash/dry conditions based on care instructions. If tumble dry, use 10 wash / 1 dry, plus evaluation standard as per "Performance Claim" table	0% OR 15% if perf. claim	See "Performance Claim" table for requirement by claim type		

Garment integrity assessment on whole garment after appropriate cleaning cycles ISO 6330 (washing) or ISO 3175 (dryclean) according to care label.		**50%**	**Cleaning cycles* x15**	**Cleaning cycle* x30**	**Cleaning cycles* x60**
Garment Dimensional Stability Shrinkage & Skew/Twist/Torque	ISO 5077 & ISO 16322 Spirality	20% OR 10% If WP claim	Skewness ≤ 5%		
			Shrinkage width ±5% if knitted Shrinkage width ±3% if woven		
Product waterproofness (if claimed)	ISO 811	0% OR 10% if WP claim	≥2.6m & <20% Includes assessment of seams (no leaking at any seam, curve, or cross point)		
Fabric water repellence (if Claimed)	ISO 4920	0% OR 10% if WP claim	≥ 4		≥3-4
Appearance	Visual Examination ISO 15487	30% OR 20% if WP claim	No coating degradation or delamination of any membranes ISO Pilling grade replica ≥3-4 No component failure (e.g. buttons or zippers) ISO Greyscale Colour change Grade ≥4 No broken seams		

2176

2177 Table 61 Duration of service requirements for RP 11 (open-toed shoes)

Test Item	Test Standard	% Weighting of Failure Mode	Endurance Factors and Requirements		
			5 points - basic	10 points - moderate	15 points - aspirational
Product Integrity			30,000 forefoot flex cycles	40,000 forefoot flex cycles	50,000 forefoot flex cycles
Cracking	Whole Shoe Flex test – Visual ISO 24266 30 degrees +/- 1 degrees 140 +/- 10 cycles per minute	25%	No cracking of the upper, midsole or outsole		
Delamination			No peeling or seam separation of the upper No delamination between any component		
Bonding strength	EN ISO 17708 [daN/cm] or [N/mm]	25%	≥ 3 (no outsole or upper material delamination or breakage) ≥ 2,5 (if outsole or upper material delamination or breakage)	≥ 4 (no outsole or upper material delamination or breakage) ≥ 3,5 (if outsole or upper material delamination or breakage)	≥ 5 (no outsole or upper material delamination or breakage) ≥ 4,5 (if outsole or upper material delamination or breakage)
Material level test					
Outsole abrasion resistance	ISO 20871:2018	25%	If density ≥ 0.9 g/cm3, then ≤ 200 mm3 If density < 0.9 g/cm3 , then ≤ 150 mg		
Determination of tear strength for upper materials	EN 13571 ISO 17696	12.5%	40	60	80
Martindale abrasion specific for fabrics	ISO 12947-2 [Cycles]	12.5%	3’000 cycles: coating totally abrased	3’000 cycles: coating partially abrased	3’000 cycles: coating not abrased

2178

2179 Table 62 Duration of service requirements for RP 12 (closed-toed shoes), casual and fashion footwear

Test Item	Test Standard	% Weighting of Failure Mode	Endurance Factors and Requirements		
			5 points - basic	10 points - moderate	15 points - aspirational
Product Integrity			30,000 forefoot flex cycles	40,000 forefoot flex cycles	50,000 forefoot flex cycles
Cracking	Whole Shoe Flex test – Visual ISO 24266 30 degrees +/- 1 degrees 140 +/- 10 cycles per minute	25%	No cracking of the upper, midsole or outsole		
Delamination			No peeling or seam separation of the upper No delamination between any component		
Bonding strength	EN ISO 17708 [daN/cm] or [N/mm]	25%	≥ 3,5 (no outsole or upper material delamination or breakage) ≥ 3 (if outsole or upper material delamination or breakage)	≥ 4,5 (no outsole or upper material delamination or breakage) ≥ 4 (if outsole or upper material delamination or breakage)	≥ 5,5 (no outsole or upper material delamination or breakage) ≥ 5 (if outsole or upper material delamination or breakage)
Material level test					
Outsole abrasion resistance	ISO 20871:2018	25%	if density ≥ 0,9 g/mm3, then ≤ 250 mm3 if density < 0,9 g/mm3, then ≤ 170 mg		
Martindale abrasion resistance (Lining & insock)	ISO 17704	25%	25'600 cycles dry (no worse than moderate abrasion and holes through the material surface)	25'600 cycles dry (no worse than surface abraded but no holes through the material)	25'600 cycles dry (no damage, no change)

2180

2181 Table 63 Duration of service requirements for RP 12 (closed-toed shoes), athletic footwear

Test Item	Test Standard	% Weighting of Failure Mode	Endurance Factors and Requirements		
			5 points - basic	10 points - moderate	15 points - aspirational
Product Integrity			50,000 forefoot flex cycles	60,000 forefoot flex cycles	70,000 forefoot flex cycles
Cracking	Whole Shoe Flex test – Visual ISO 24266 30 degrees +/- 1 degrees 140 +/- 10 cycles per minute	25%	No cracking of the upper, midsole or outsole		
Delamination			No peeling or seam separation of the upper No delamination between any component		
Bonding strength	EN ISO 17708 [daN/cm] or [N/mm]	25%	≥ 4 (no outsole or upper material delamination or breakage) ≥ 3,5 (if outsole or upper material delamination or breakage)	≥ 5 (no outsole or upper material delamination or breakage) ≥ 4,5 (if outsole or upper material delamination or breakage)	≥ 6 (no outsole or upper material delamination or breakage) ≥ 5,5 (if outsole or upper material delamination or breakage)
Material level test					
Outsole abrasion resistance	ISO 20871:2018	25%	if density ≥ 0,9 g/mm3, then ≤ 200 mm3 if density < 0,9 g/mm3, then ≤ 150 mg		
Martindale abrasion resistance (Lining & insock)	ISO 17704	25%	51’200 cycles dry (no worse than moderate abrasion and holes through the material surface)	51’200 cycles dry (no worse than surface abraded but no holes through the material)	51’200 cycles dry (no damage, no change)

2182

2183

Table 64 Duration of service requirements for RP 13 (boots)

Test Item	Test Standard	% Weighting of Failure Mode	Endurance Factors and Requirements		
			5 points - basic	10 points - moderate	15 points - aspirational
Product Integrity			30,000 forefoot flex cycles	40,000 forefoot flex cycles	50,000 forefoot flex cycles
Cracking	Whole Shoe Flex test – Visual ISO 24266 30 degrees +/- 1 degrees 140 +/- 10 cycles per minute	25%	No cracking of the midsole or outsole		
Delamination			No peeling or seam separation of the upper No delamination between any component		
Bonding strength	EN ISO 17708 [daN/cm] or [N/mm]	25%	3	4	5
Material level test					
Outsole abrasion resistance	ISO 20871:2018	12.5% (if the boot has a zipper) 25% (no zipper)	If density ≥ 0.9 g/cm3, then ≤ 200 mm3 If density < 0.9 g/cm3 , then ≤ 150 mg		
Determination of tear strength for upper materials	EN 13571 ISO 17696	12.5%	40	60	80
Martindale abrasion resistance (Lining & insock)	ISO 17704	12.5%	51’200 cycles dry (no worse than moderate abrasion and holes through the material surface)	51’200 cycles dry (no worse than surface abraded but no holes through the material)	51’200 cycles dry (no damage, no change)
Zipper reciprocation	EN 16732	12.5% (if zipper)	500N	750N	1000N

2184