



Supply Chain Taxonomy

For the textiles,
clothing, leather, and
footwear industry

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Overview

The apparel alliance is a collaborative industry working group made up of global organizations Apparel Impact Institute (Aii), Cascale, Textile Exchange, and ZDHC. By combining their complementary expertise, global networks, strategic initiatives and core activities, the apparel alliance aims to accelerate decarbonization to achieve a minimum goal of 45% reduction in greenhouse gas (GHG) emissions by 2030 across the industry. Through joint action, shared knowledge, and aligned goals, the apparel alliance works to drive greater impact and credibility throughout the global supply chain.

The apparel alliance Data Working Group brings together data and reporting representatives from each of the four organizations to build the foundations for more collaborative, aligned data efforts across the textiles, clothing, leather and footwear industry. Together, by harmonizing existing practices and filling gaps, they are establishing consistent, interoperable data practices for clear alignment. This harmonized Supply Chain Taxonomy is part of a larger effort to align the four organizations and the broader industry.

The use of supply chain tiers (1, 2, 3, and 4) is widespread in the textile industry, helping categorize and organize the stages of production, sourcing, and distribution. However, inconsistent interpretation of these tiers often arises due to misaligned definitions and classifications. For example, some categorize “pulp” and “fiber” in Tier 4, while others place them in Tier 3. Such discrepancies can lead to differing results, such as variations in GHG emissions modeling or inconsistencies in supplier disclosure measurements across tiers. A tiered classification helps companies, stakeholders, and regulators manage the complexities of the supply chain more effectively.

This project aims to establish a uniform classification system of the textiles, clothing, leather, and footwear supply chain. The goal is to align this system across all apparel alliance partners, developed in consultation with key industry stakeholders for input and calibration. The classification system is now publicly available to encourage widespread and consistent adoption across the industry.

An industry-aligned supply chain classification offers several key benefits:

- **Clarity and consistency in communication:** A standardized tiered classification ensures all stakeholders use the same terminology, reducing misunderstandings and enhancing more effective collaboration and messaging.
- **Transparency and accountability in reporting:** Uniform reporting of fiber and materials production across tiers promotes transparency and accountability, making it easier to track, compare, and report production data throughout the supply chain.
- **Risk management:** A consistent framework for allocating impact data helps manage risks by clearly defining environmental and social impact boundaries.
- **Efficient collaboration:** Standardization reduces duplicative efforts, leading to more efficient, cost-effective operations and identifying collaboration opportunities.
- **Driving industry improvements:** A consistent approach allows for easier comparison of practices and enhances collaboration among stakeholders, driving improvements and alignment on key industry initiatives.

Methodology

The [apparel alliance](#) partners—Apparel Impact Institute (Aii), Cascale (formerly Sustainable Apparel Coalition), Textile Exchange, and ZDHC—collaborated to create a harmonized Supply Chain Taxonomy, published in November 2024.

This taxonomy builds on previous foundational work in supply chain mapping and classifications, including:

- Aii and World Resources Institute (WRI)’s¹ (Figure 1: Illustration of the Apparel and Footwear Value Chain, p. 4).
- United Nations Environment Programme (UNEP)’s [Sustainability and Circularity in the Textile Value Chain: A Global Roadmap](#)² (Figure 1: Stakeholders associated with the textile value chain, p. 13, and Figure 2: Representation of activities in a circular textile value chain, p. 18).
- Leather Working Group’s *Leather Processing Stages*ⁱ (Leather processing inputs and outputs, p. 1) and Leather Manufacturer Standard Audit Scope.³
- United Nations Economic Commission for Europe (UNECE)’s [Traceability and Transparency in the Textile and Leather Sector, Part 1: High-Level Process and Data Model](#).⁴

This taxonomy also incorporates key terms and definitions, including those outlined in the EU regulations, international standards, and voluntary standards, including:

- EU regulation on textile labeling and fiber composition.⁵
- EU regulation related to labeling materials used in footwear components.⁶
- ISO standards such as ISO 14009:2020(en)⁷ for defining “raw material.”
- Textile Exchange’s raw materials, processes, and products classification, developed with the Global Organic Textile Standard (GOTS), published in [ASR-213 Materials, Processes, & Products Classification](#)⁸ (first released in 2020 and updated in 2021, 2023, 2024, and 2025).

The development process involved consultations with both internal and external stakeholders, to whom we express our gratitude for their contributions.

The taxonomy is not intended to be comprehensive but provides a high-level overview of products and processes. [Overall process categories are set out in the Supply Chain Taxonomy framework on page 7, while page 9 provides a non-exhaustive list of commonly used processes within those process categories.](#) Full alignment on specific product and process definitions is still ongoing and part of a long-term effort.

ⁱ Shared via email in September 2025.

To ensure its effectiveness and applicability, the taxonomy was developed with the following guiding principles in mind:

- **Alignment with regulatory terms:**

It aligns with regulated definitions, providing a standardized approach accepted across the industry.

- **Inclusivity:**

It includes both fiber-based and non-fiber materials (for example, leather, down, and rubber) commonly used in the textiles, clothing, leather, and footwear industry.

- **Simplicity with detail:**

While structured around four main supply chain tiers, it offers flexibility for adding sub-tiers when needed, avoiding unnecessary complexity.

- **Upstream focus on the supply chain up to retail:**

It was developed from a brand's perspective, tracing the supply chain backward to align with the most common approach for supply chain classifications in the textile industry. Though it doesn't encompass the use phase and end-of-life stages, their importance is recognized, especially in the context of circular textile value chains. For mapping fibers and related processes to the different supply chain tiers, a linear visualization was chosen, but it can also be represented as a circle or nested circles to reflect circularity.

- **Consistency in data aggregation:**

Comparable processes and products across fiber and material categories are classified at the same level, enabling consistent data analysis. This approach allows for different aggregation of comparable products (for example, cotton fiber and viscose fiber), even though primary processing for cotton involves mainly one stage (ginning), while for manmade cellulosic fibers (MMCFs), it requires two stages (pulping and extrusion). This approach ensures consistent comparisons by aligning products at equivalent stages of processing, rather than comparing dissimilar products, such as cotton fiber and viscose pulp.

- **Alignment with existing industry efforts:**

It is aligned with key product outputs that are measurable and commonly reported across most fibers and materials. This includes ensuring that dyed yarn is not separately categorized unless it is widely measured. Additionally, it fits within existing supply chain tier scopes used in existing greenhouse gas (GHG) modeling and Life Cycle Assessments (LCA), including WRI and Aii's *Roadmap to Net Zero*,¹ based on impact data from Cascale and production volumes from Textile Exchange, meaning it supports broader sustainability and carbon reduction efforts.

Several key areas of alignment were established to ensure consistency and clarity across the contributors:

- **Processed raw materials (fibers):**

Commoditized raw materials that have undergone primary processing are classified as Tier 4, not Tier 3. This decision is crucial because classifying them in Tier 3 would require reallocating and recalculating the GHG footprint for the industry in ways that are not currently possible. This classification of Tier 4 as “raw material production and primary processing” aligns with the first processing step “obtain fibers for spinning” in the UNECE textile value chain data model.⁴

- **Non-fiber materials (for example, leather):**

“Raw hides” are categorized as processed raw materials in Tier 4, while “leather” is classified as a finished material in Tier 2. This distinction ensures clarity and consistency in material categorization within the supply chain.

- **Vertically integrated facilities:**

For facilities handling multiple processes, specific data points may be challenging to allocate to individual tiers. In such cases, transparency about the allocation method used and compliance with relevant requirements are essential. This approach allows for flexibility while preserving the classification system’s consistency.

Framework

The diagram outlines the Supply Chain Taxonomy Framework.

The following key fibers and raw materials are included in this version:

- Cotton
- Flax (linen), hemp, jute, nettle, and ramie
- Wool, alpaca, angora, camel, cashmere, guanaco, llama, mohair, vicuña, yak, and horsehair
- Silk
- Acetate, diacetate, triacetate, cupro, lyocell, modal, and viscose (rayon)
- Acrylic, elastane (spandex), polyamide (nylon), polyester, polyethylene, polyethylene terephthalate (PET), polylactic acid (PLA), and polypropylene
- Down and feathers
- Leather
- Natural rubber
- Composite materialsⁱⁱ

Additional fibers and raw materials may be included in future versions.ⁱⁱⁱ

ii A combination of any of the above and potentially additional materials.

iii Not covered but listed in *ASR-213 Materials, Processes, & Products Classification*⁸: Acrylonitrile Butadiene Styrene (ABS), Elastomultiester (elasterell-P), Ethylene vinyl acetate, Modacrylic, Polycarbonate (PC), Polycarbonateacrylonitrile butadiene styrene (PC-ABS), Polystyrene, Polyurethane, Thermoplastic Elastomer (TPE), Thermoplastic Rubber (TPR), inorganic materials.

SUPPLY CHAIN TAXONOMY

Supply Chain Taxonomy Framework ^{iv}	Tier 4 (T4) Raw material production and primary processing				Tier 3 (T3) Intermediate material processing		Tier 2 (T2) Material manufacturing		Tier 1 (T1) Finished product manufacturing		Tier 0 (T0) Branding, retailing, and distribution
	Tier 4a extraction, production, collection	Raw material (RMF)	Tier 4b primary processing categories ^v	Processed raw material (PRM) ^{vi}	Tier 3 process categories	Intermediate material (IM)	Tier 2 process categories	Finished material (FM)	Tier 1 process categories	Finished product (FP)	Tier 0 process categories
Primary raw materials											
Cotton	Farming, harvesting	Seed cotton (raw cotton)	Ginning, dyeing	Lint cotton	Spinning --- Dyeing	Yarn --- Dyed yarn	Preparatory , knitting, weaving, non-woven manufacturing --- Pre-treatment , dyeing, printing, washing/laundering , finishing , embellishing	Knitted fabric, woven fabric, non-woven fabric --- Dyed fabric, printed fabric	Manufacturing ^{vii} --- Washing, laundering, dyeing, printing, embellishing,	Finished product, --- Apparel, home textiles, accessories, worn accessories, personal care, hygiene, medical, bedding, footwear, functional accessories, outdoor, industrial, technical	Retail sales, branding, warehousing and distribution
Flax (linen), hemp, jute, nettle, ramie	Farming, harvesting	Harvested plants	Retting, scutching, hackling, degumming, decortication, dyeing	Staple fiber							
Wool, alpaca, angora, camel, cashmere, guanaco, lama, mohair, vicuna, yak, horsehair	Farming, shearing	Greasy wool, ^{viii} greasy animal fibers	Scouring, dyeing	Scoured fibers, combed fibers, tops							
Silk	Farming, harvesting, boiling ^{ix}	Raw silk	Degumming, dyeing	Silk filament							
Cupro, lyocell, modal, viscose (rayon)	Forestry, farming, capturing from air/emissions ^x	Wood, bio-based raw materials, CO ₂ -based raw materials	Pulp making, Extrusion, dyeing	Staple fiber, filament							
Acetate, diacetate, triacetate	Forestry, farming, extracting from the earth (for example, oil, gas) ^{xi}	Wood, bio-based raw materials, fossil-based raw materials	Pulp making, Extrusion, dyeing	Staple fiber, filament							
Acrylic, elastane (spandex), polyamide (nylon), polyester, polyethylene, polyethylene terephthalate (pet), polylactic acid (pla), polypropylene	Extracting from earth (for example, oil, gas), farming and refining ^{xii} , capturing from air/emissions ^{xiii}	Fossil-based raw material, bio-based raw materials, carbon captured from the air	Pre-treatment, Extrusion, dyeing	Staple fiber, filament							
Down and feathers	Farming	-	Slaughtering, Down processing	Down, feather		Filling, stuffing		Filling, stuffing			
Leather	Farming	-	Slaughtering	Raw hide, raw skin	Beamhouse processing , tanning	Tanned hide , tanned skin	Post-tanning , finishing	Leather			
Natural rubber	Forestry, Latex tapping	Liquid latex	Latex processing	Pre-vulcanized rubber latex		Rubber crepes		Rubber sheets			
Composite materials	Often a combination of two or more of the above	Often a combination of two or more of the above	Often a combination of two or more of the above	Often a combination of two or more of the above		Semi-finished composite material	Finishing	Finished composite material			
Secondary raw materials											
Reclaimed (any of the above)	Collecting, Sorting	Reclaimed materials	Mechanical recycling, chemical recycling, biological recycling, extrusion	Recycled staple fiber, recycled filament, recycled down, recycled leather fibers	Mixing	One or more of any of the above		One or more of any of the above		One or more of any of the above	One or more of any of the above

Updated in Supply Chain Taxonomy, AA-PAR-TAX-501-V2.0

^{iv} The above Supply Chain Taxonomy Framework is not comprehensive, nor do all products and processes apply in all cases (for example, spinning fiber into yarn is not used for non-woven materials). It displays examples of the most common processes and products. Primary and secondary raw materials of different kinds can and often are also mixed at different stages across the supply chain.

^v It is important to note that Tier 4 processing may include multiple processing steps as specified in the table.

^{vi} [Processed raw materials can be either dyed or undyed.](#)

^{vii} [Tier 1 manufacturing is also known as Cut, Make, Trim \(CMT\).](#)

^{viii} In the case of pulled wool, the greasy wool is the output after the slaughtering.

^{ix} Boiling is not applied for ahimsa silk.

^x Capturing from air/emissions is only applicable for CO₂e-based manmade cellulosic fibers.

^{xi} Extracting from the earth is only applicable in the case of acetate, diacetate, and triacetate that uses virgin fossil raw materials as partial feedstock.

^{xii} Farming and refining is only applicable for partially or fully biobased synthetics.

^{xiii} Capturing from air/emissions is only applicable for CO₂e-based synthetics.

Taxonomy and definitions

Supply chain tiers

Code	Tier	Name	Description
T0	Tier 0	Branding, retailing and distribution	Marketing and distribution of final products without a production process. Output: Finished products (for example, apparel, home textiles, and footwear).
T1	Tier 1	Finished product manufacturing	Assembly and manufacturing of final products. Output: Finished products (for example, apparel, home textiles, and footwear).
T2	Tier 2	Material manufacturing	Production and finishing of materials (for example, fabrics, and trims) that go directly into finished product. Output: Finished materials (for example, fabrics, finished leather, and composite material).
T3	Tier 3	Intermediate material processing	Processing of raw materials into yarn and equivalent state. Output: Intermediate material (for example, yarn).
T4	Tier 4	Raw material production and primary processing	The extraction and farming of primary raw materials from the earth (for example, fossil fuels), plants (for example, cotton), or animals (for example, wool), and the collection of secondary raw materials (for example, reclaimed textiles), as well as the processing of these raw materials into a commodity state. Tier 4a—Production: Extraction and farming of primary raw materials and collection of secondary raw materials. Output: Raw material (for example, seed cotton, greasy wool, reclaimed materials, latex, petrochemicals, and wood). Tier 4b—Primary processing: Primary processing of (primary/secondary) raw materials into commodity state. Output: Processed raw material (for example, staple fiber and filament and raw hides).

Updated in Supply Chain Taxonomy, AA-PAR-TAX-501-V2.0

Output categories

Code	Term	Description
RMF	Raw material/ feedstock	Primary or secondary material that is used to produce a product.⁷ Where: Virgin material/primary raw material: Material which has never been processed into any form of end-use product.⁷ These include both finite materials (for example, iron ore extracted from the ground) and renewable materials (for example, newly grown cotton). Reclaimed material/secondary raw material/recovered material/non-virgin material: Material that would have otherwise been disposed of as waste or used for energy recovery but has instead been collected and reclaimed as a material input, in lieu of new primary raw material, for a recycling process.⁹
PRM	Processed raw material	Raw material that has been refined into a commodity state that can be further processed into any form of finished or end-use textile product (for example, staple fiber and filament and raw hide).
IM	Intermediate material	Refined raw material that has been processed into yarn and equivalent state for use as intermediate textile products.
FM	Finished material	Processed material that has been further processed into fabric and equivalent state for use as intermediate textile products.
FP	Finished product	Processed material that has been manufactured and transformed for use as end-use product.

Process category and process classification^{xiv}

The table below provides a non-exhaustive list of commonly used processes contained within the process categories outlined in the Supply Chain Taxonomy Framework on page 7.

Tier	Process category	Processes
Tier 1	Manufacturing	Assembling
		Balling
		Bonding (components)
		Buffing (textile, leather)
		Cooling/chilling
		Cutting/skiving
		Fabric marking
		Filling/stuffing
		Gluing
		Hammering/beating
		Hole punching/perforation (textile)

^{xiv} Updated in Supply Chain Taxonomy, AA-PAR-TAX-501-V2.0

Tier	Process category	Processes
		Ironing/pressing
		Seam taping
		Sorting
		Stitching/sewing
		Sundries application
	Washing, laundering	Acid washing
		Enzyme washing
		Standard washing (soap)
		Stone washing
		Water-only washing
	Dyeing	Dip dyeing
		Piece dyeing
		Tie dyeing
	Printing	Burnout printing
		Digital printing
		Heat transfer application
		Screen printing
		Sublimation transfer printing
	Embellishing	Embroidering
		Laser etching
		Sand blasting
		Sanding/sueding
		Spray blasting

Tier	Process category	Processes
Tier 2	Preparatory	Sizing
		Spooling
		Warping
		Winding
	Knitting	Circular knitting
		Flatbed knitting
		Warp knitting
	Weaving	Air-jet loom weaving
		Projectile loom weaving
		Rapier loom weaving

Tier	Process category	Processes
		Shuttle loom weaving
		Water-jet loom weaving
	Non-woven manufacturing	Melt-blowing
		Needle punching
		Spunbond manufacturing
		Spunlace manufacturing
	Pre-treatment	Bleaching
		Desizing
		Fabric scouring
		Mercerization
		Plasma surface treatment
		Singeing
	Dyeing	Exhaust dyeing
		Foam dyeing
		Pad-batch dyeing
		Pad-steam dyeing
		Spray (rota, digital inkjet)
		Supercritical CO ₂ dyeing
	Printing	Digital printing
		Flat-bed screen printing
		Heat-transfer printing
		Rotary screen printing
	Washing, laundering	Neutralization washing
		Soaping
		Softening (batch)
		Softening (continuous)
	Finishing (textiles)	Continuous chemical finishing
		Mechanical finishing
		Pad-batch chemical finishing
		Thermal finishing
	Embellishing	Beading
		Embroidering
		Flocking
	Post-tanning (leather)	Drying
		Dyeing
		Fatliquoring

Tier	Process category	Processes
		Re-tanning
		Shaving
		Staking
	Finishing (leather)	Buffing
		Coating
		Ironing/plating
		Spray finishing

Tier	Process category	Processes
Tier 3	Spinning	Air-jet spinning
		Melt spinning (for yarn)
		Ring spinning
		Rotor spinning
	Dyeing	Beam dyeing
		Hank dyeing
		Package dyeing
		Rope dyeing
		Slasher dyeing
		Spray dyeing
	Beamhouse processes (leather)	Bating
		De-liming
		Fleshing
		Liming
		Pickling
		Soaking
		Splitting
		Unhairing
	Tanning (leather)	Chrome tanning
		Synthetic tanning
		Vegetable tanning

Tier	Process category	Processes
Tier 4b	Ginning	Roller ginning
		Saw ginning
	Scouring	-
	Dyeing	Chemical retting
		Dew retting
		Dope dyeing
		Enzymatic retting
		Fiber dyeing
		Mechanical retting
		Steam retting
		Water retting
	Scutching	Hand scutching
		Mechanical scutching
	Hackling	Hand hackling
		Mechanical hackling
	Degumming	Alkaline degumming
		Chemical degumming
		Enzymatic degumming
		Microbial degumming
		Water degumming
	Decortication	Manual decortication
		Mechanical decortication
	Pulp making	Cotton pulp making
		Wood pulp making
	Extrusion	Dry spinning
		Gel spinning
		Melt spinning (for fiber/filament)
		Wet spinning
	Pre-treatment	-
	Slaughtering	Curing
		Flaying
		Killing
		Stunning
	Down processing	Cleaning
		Drying
		Mixing

Tier	Process category	Processes
		Sorting
		Washing
	Latex processing	Coagulation
		Stabilization
	Mechanical recycling	-
	Chemical recycling	-
	Biological recycling	-

Disclaimer

The apparel alliance partners collaborated on establishing a common Supply Chain Taxonomy Framework for high-level aggregation and reporting of key fibers and raw materials. However, due to the complexities of the textiles, clothing, leather, and footwear supply chain, the alignment of specific and detailed production processes, product outputs, and related definitions is an ongoing process. This document does not override normative documents issued by the different organizations and is seen as a strategic alignment effort. Exceptions to the processes and products defined in the framework may still exist.

Appendix A: Change log

Version	Effective date	Change
V1.0 → V1.1	2026.16.02	The revised version includes minor edits. Additional examples of finished materials (FM) were added to the Supply Chain Taxonomy Framework on page 7.
V1.1 → V2.0	2026.14.07	The revised version includes additional process categories and outputs within the Supply Chain Taxonomy Framework on page 7. It also adds process category to process classification mapping tables from page 9. The changes from the previous version are highlighted in blue throughout the document.

References

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