MSI Contributor Guidance v2.0

Using the Higg MSI Contributor: Submit Data to the Higg MSI

Developed by Cascale (formerly known as the Sustainable Apparel Coalition (SAC)), the Higg Materials Sustainability Index (MSI) reports the environmental impact of different materials, so design and development teams can make more sustainable choices during materials selection. Technology company Worldly makes the MSI available on the Worldly platform.

The MSI Contributor enables anyone to submit materials production data to Higg MSI. By submitting data to the Higg MSI through the MSI Contributor, you contribute to the development of a common and consistent language about materials sustainability for the apparel, footwear, and home textile industries. This consistent language helps educate and influence brand purchasing and design decisions, and ultimately reduces the significant impact materials production has on the environment.

This document provides the following information about submitting data to the MSI:

The guidance described in this document ensures data submissions meet Higg MSI Methodology requirements. Learn more about MSI Methodology:

- MSI Methodology
- MSI FAQ

MSI Data Submission Process

You can submit data to the MSI Contributor here. Please ensure you have reviewed this entire document as well as the MSI Methodology document linked above before completing your submission.

How to create an account and start your submission

The MSI Data Submission process consists of eight steps:

1. Create an account on Jira Service Management
2. Make sure your account notifications are turned on so you can receive progress updates.
3. Complete and submit the "MSI Contributor General Data Collection Form" on the platform. If you are submitting an LCA report (or what we call a Type II submission in the guidance), you may attach both the report and the review report directly with your initial General Data Collection Form submission.
4. If you are doing a Detailed Process Data Submission (inventory data or what we call a Type I submission in the guidance): after we receive your general form, and based on your material selection, Worldly will provide you with the specific Data Collection Template (DCT) to complete and return.
5. After you submit your data, it will be reviewed by the joint Cascale and Worldly review teams as well as the third-party MSI gatekeeper.
6. The MSI results and scores will be sent to you for review and publication approval.
7. If the submission is approved for publication, the data will be added to the MSI in the next scheduled update. MSI updates take place twice a year.
8. You will be invoiced for the hours spent on the third party review.

Data Submission & Review Cost

MSI data submission costs are based on the 3rd party review time. Companies that are not members of Cascale pay $175 per hour. Cascale members receive the first 10 hours for free, then pay $175 per hour, thereafter. The average data submission takes 5 to 6 hours, but this is largely dependent on the complexity of the data, how it fits into MSI taxonomy, and any questions from the review team.

Review & Publication Timeline

The data review process can take several weeks to several months, depending on the complexity of the data, the questions the review team has, and the timely response to our questions. Typically, it takes a few months to go through the gatekeeping process and calculate results.

Two MSI data updates are published per year. When data submission scores are approved by the data submitter for publication in the MSI, the data will be scheduled to appear in the MSI in the next release scheduled.

Data Uses
Material scores and metadata will be available to the public through the Higg MSI on the Worldly platform. In addition, LCIA results will be available for Worldly customers with full MSI access; this includes Cascale members. All scores, LCIA, and meta data need to be approved by the data submitter prior to publication in the MSI tool.

Data Confidentiality
Manufacturing information in the LCA report will only be available to staff and contractors (such as the Gatekeeper) who are required to guard the confidentiality of the information. Our platform's terms of use govern the confidentiality of the exchange of data.

Data review rights
To ensure all submitted information is accurate, credible, and plausible, the Cascale and Worldly review teams might, on a case-by-case basis, occasionally request additional documentation—such as Life Cycle Inventory (LCI) data, certificates, technical reports, site visit confirmations, or other relevant materials. This right will be exercised to verify the plausibility of a submission. Failure to provide adequate and satisfactory supporting documentation upon request may result in the rejection of the submission.

Submission Options: Type I or Type II

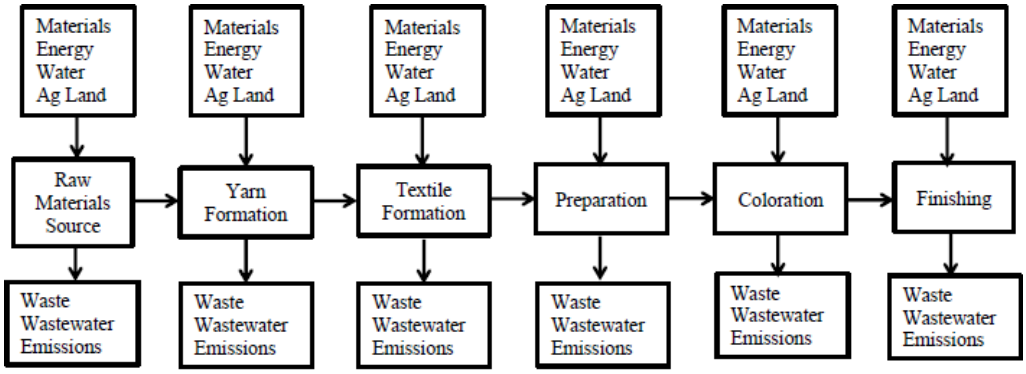
Data may be submitted in the two following forms in order of preference:

- Type I: Detailed Process Data Submission - primary data can be submitted directly.
- Type II: Third party reviewed LCA Report - an LCA report can be submitted.

Below you will find the overview of each type of submission. The full requirements can be found in the section Submission Requirements.

Type I: Detailed Process Data Submission

Material, energy, water, waste, and emissions data can be submitted to the MSI Data Manager to be modeled in LCA software by Worldly (see Figure 1 below). See the section MSI Material Categories and Production Phases for the taxonomy for each material.



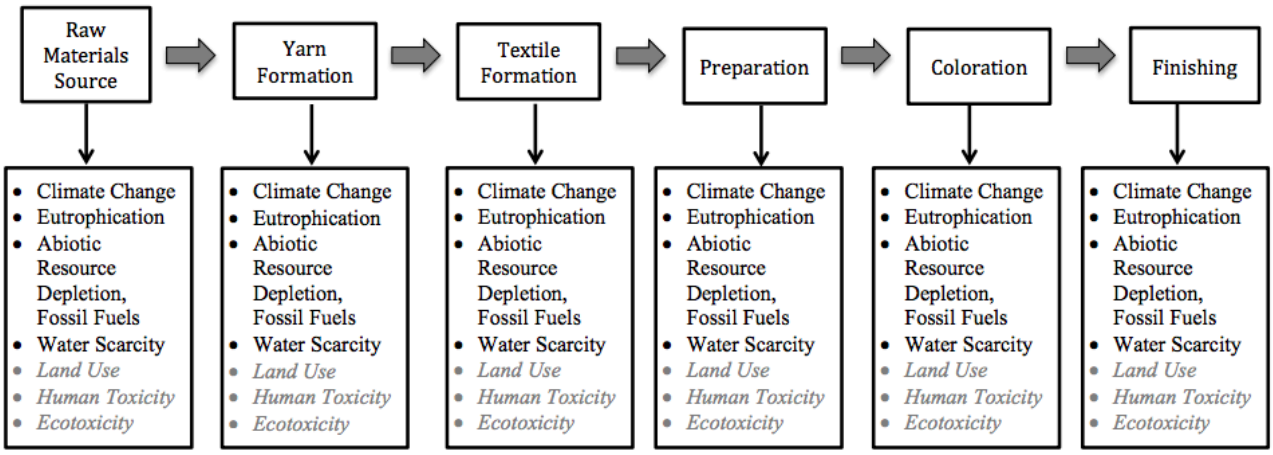
Note: This is an example for Textiles only.

Figure 1: Detailed Process Data Submission (Type 1)- data inputs/outputs at the unit process level

Type I Benefits	Type I Drawbacks
• Type I submissions are typically more cost effective than conducting a full LCA since Worldly will be responsible for modeling the data in the LCA software. Submission costs are based on the hourly rate for review and modeling, while full LCA reports often take much more time. • The data model will be updated using the most current LCA background datasets, ensuring the best alignment with the rest of the Higg MSI. • If impact categories are added or changed in the Higg MSI, there are no additional fees associated with re-modelling. • Midpoints and final scores are integrated into the Higg MSI after approval by the data submitter.	• Detailed production data must be submitted. Only results for MSI impact categories and scores will be provided. • We will do our best to model all submissions, but please note that depending on the complexity and background database availability, Type I data submissions are not always feasible. The team will contact you if that is the case.

Type II: Third party reviewed LCA Report

If an LCA has been conducted and it aligns with MSI Methodology as outlined in full in the MSI Methodology document, characterized results life cycle impact assessment (LCIA) can be submitted to the MSI (see Figure 2 below). In this type of submission, the LCA must have been independently reviewed by someone not involved in the LCA study and a review report must also be submitted. We are looking for a critical review per ISO 14044 (more details of the review requirements/process are in the ISO 14071 standard).



Notes:

All production phases could produce midpoint results.
Inventory metrics for water consumption and biogenic carbon content also need to be provided
This is an example for Textiles only.
Land Use, Human Toxicity, and Ecotoxicity are not currently included directly as part of the MSI impact categories. Results are still modeled and the Ecotoxicity results are used as an input into the Chemistry assessment. Calculating these impacts now will also ease the process of adding them to the MSI in the future.

Figure 2: Characterized results life cycle impact assessment (LCIA) of the inputs at the process level

Type II Benefits	Type II Drawbacks
• If an LCA has already been conducted, results can be reassessed to comply with Higg MSI Methodology (i.e. reuse existing work). See section Previously Conducted LCA Report. • A full LCA includes a deeper analysis of the results, including contribution and sensitivity analysis.	• The overall submission involves more steps and tends to be more costly. Supporting documentation of data and the LCA must be made available to and reviewed by an independent third party. A review report must be submitted along with the LCIA results. • LCIA methodologies must match MSI LCIA methodologies exactly, which can require re-analysis of the existing LCA.

• It is not necessary to provide the same level of production information to the MSI Gatekeeper, MSI Data Manager, Cascale, and Worldly as is required for a Type I submission	• If the Higg MSI assessment methodology changes (e.g. to maintain consistency with the EU-PEF LCIA methods), updated data must be re-submitted. The fee for covering the quality assurance process must be paid each time.

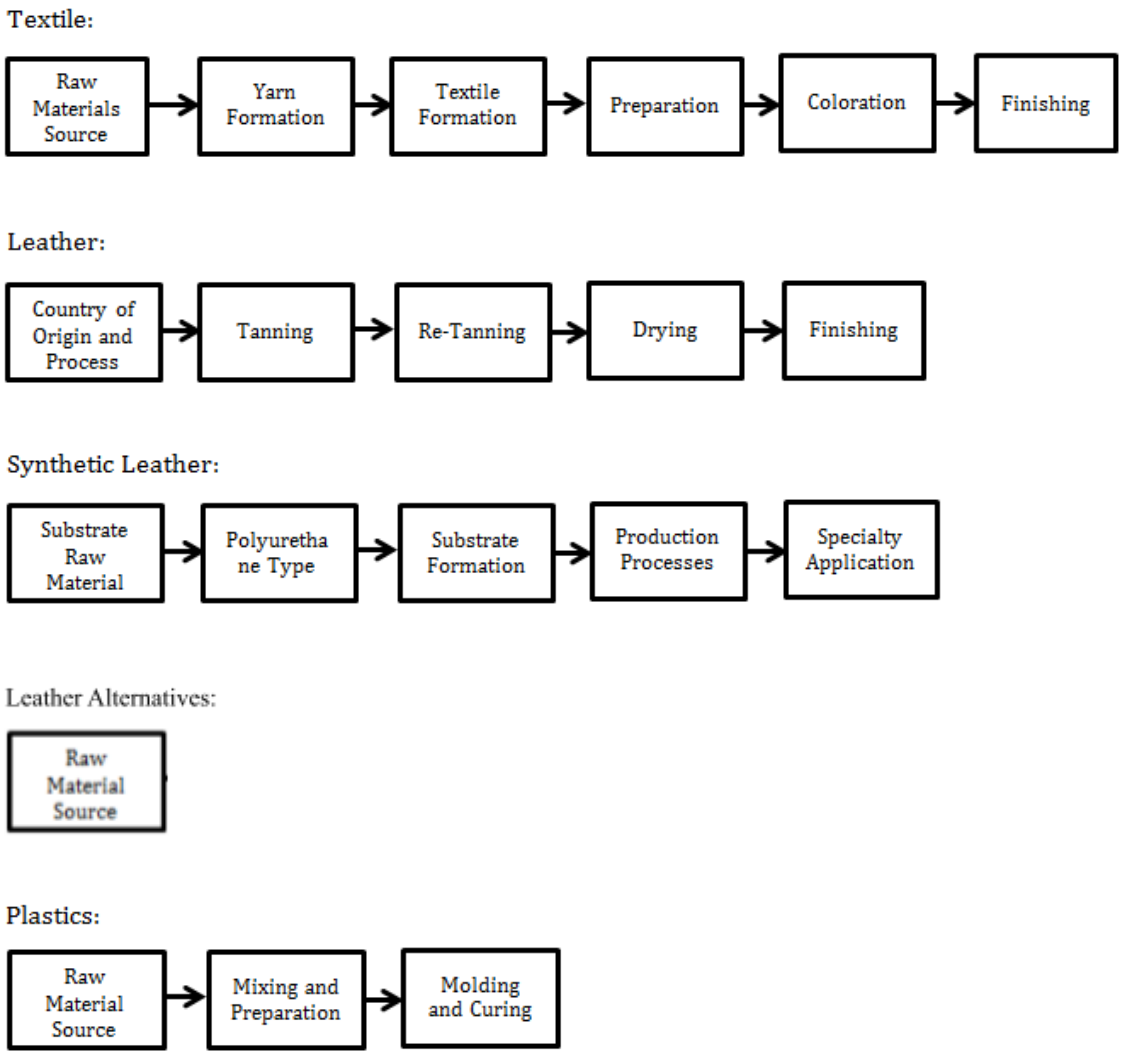
MSI Material Categories and Production Phases

All data submission types must align with the MSI taxonomy. The MSI taxonomy separates the Production Phases of a material.

MSI data submissions are included in the MSI as production processes. MSI users use production processes in the MSI tool to design materials with unique properties.

Batch dyeing is an example of a process. Polyester Fabric is an example of a material.

Submissions may be applicable to more than one Base Material (e.g. a spinning process may be possible for various textiles), but they must fit within the boundaries of one Production Phase. Any submission that covers more than one Production Phase must be split into separate submissions. See the MSI Material Categories and Production Phases in the Figure below.



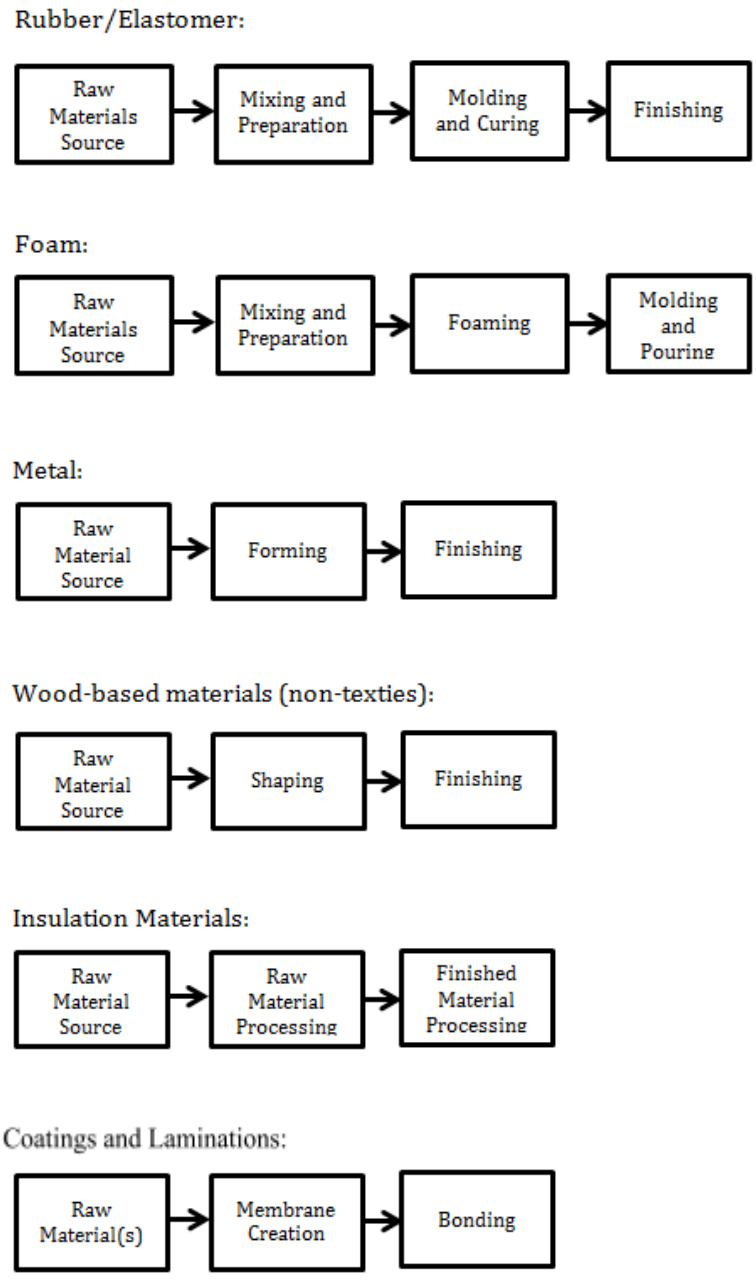


Figure 3. Higg MSI Material Categories and Production Phases

Requirements for Type I: Detailed Process Data Submission

To facilitate the data collection process, Cascale and Worldly will provide you with the Data Collection Template (spreadsheet) that best suits your submission. The Data Collection Template (DCT) will ask you to include information for each of the required items (unless the item is marked as optional on the DCT).

Material or Process to be submitted:	DCT (spreadsheet)	Where to find the requirements:
Non-animal Agricultural Products (i.e. natural fibers - excluding cotton)	*MSI Contributor - Non-animal Agricultural product DCT*	This document sections: Requirements for Type I: Detailed Process Data Submission and Additional Requirements for Agricultural Systems
Cotton Fiber (at farm or gin gate)	*MSI Contributor - Cotton DCT*	Cotton LCA Methodology (sections 2.7 Data Requirements, 3.1 Data collection procedure, 3.2 Inventory data and modeling approaches, and Appendix D: Data collection Template)
All other submissions	*MSI Contributor - General Submission DCT*	This document section: Requirements for Type I: Detailed Process Data Submission

Scope of Data

The scope of the data requirements for submission to the Higg MSI is dependent on the type of material category where your submission fits. Check the processes included in the Higg MSI in the section MSI Material Categories and Production Phases. If your submission covers several production phases, e.g. raw material + yarn formation, you will be required to complete a Data Collection Template for each of these phases separately.

Data Collection Reporting Period

All processes must collect and report 1 year of data of commercial scale production. The 1 year period is averaged out to obtain a representative production cycle and level out any occasional differences.

For batch processes where the innovation does not represent the full production volume on that equipment and there is a justifiable rationale for segregating the data (e.g. traceable production claim) the reporting period must include data for consistent batches at a mature/established production state.

Pilot scale processes can be submitted for review in preparation for commercial scale, but the results will not be published on platform, thus not being official MSI results and not possible to communicate until the Data Submitter can provide 1 year of commercial scale operational data (or mature batch process data as above). The results however, can be used by the Data Submitter for internal purposes.

For agricultural products, see the Additional Requirements for Agricultural Systems section.

Inclusion of data

All known inputs for product production shall be included. Additionally, the following auxiliary operations shall be excluded:

- Labor, commuting and travels of employees and seasonal workers
- Administrative overhead
- Capital equipment and maintenance

Any exclusions must be noted and justified.

Metadata and descriptive information

General information about the submission, additional details about the raw material or production process, and any supporting documentation, must be provided. A description of the source and year of the data, and how the data was gathered, must also be included. Descriptive information is important to ensure a complete understanding of the data in the Higg MSI, and to ensure compatibility and comparability with other materials and processes in the database and other Higg Index Product Tools.

Production outputs

The primary product (or product being submitted) and any co- and by-products from the production process must be provided (See Allocation and multi-functional processes below for further details on allocation).

Material Inputs

Inputs from the Bill of Materials (BOM), recipe, or product design parameters must be provided. Inputs may be in the form of unit process outputs from upstream processes. Please include the total amount of inputs used, including any losses during the production process. Any material inputs that are greater than 1% of the total mass of the finished product must be included. This includes any packaging, chemical, or intermediary inputs into the product system.

Transportation of Materials

Transportation must include the inbound transportation required to move the materials to the manufacturing location.

Energy Inputs
Include all energy used for manufacturing or processing, plus any energy used as feedstock, as inputs to this process. All energy inputs over 1% of total energy inputs must be provided. Electricity use must be identified by wattage (high, medium, or low voltage) and must also be identified by geography. For electricity modeling, PEF modeling rules shall be used (including on-site generation, purchased, etc.).

Renewable Energy Credits
Based on PEFCR Guidance document[1] the following requirements must be met:

- The energy mix must be disclosed as part of the contractual agreement;
- The contractual agreement must ensure that any claimed energy as part of that contract is otherwise "retired" (it needs to be a unique claim);
- The period of electricity consumption measured in the study and the contractual agreement should be the same (or as close as possible).

Water Inputs
Include total water inputs to the process. The total amount of water inputs must be included; water that is returned to the system or discharged will be accounted for in the water outputs section.

Direct Emissions
Direct emissions to air, water, or soil from the process, except for emissions related to combustion of energy (these are counted in the energy inputs) must be provided.

Waste Products
All wastes or non-valuable by-products must be provided, by type of waste and by type of waste disposal method. This includes packaging and any materials sent to recycling.

Water Outputs
Include any water discharged from the process. This includes any water that is discharged directly to the environment, back to the municipality or is treated onsite. The net difference between inputs and outputs will be used to calculate total water consumption.

Biogenic Carbon content
Biogenic carbon refers to the carbon sequestered from the atmosphere due to biomass growth. It can be determined by radiocarbon analysis or stoichiometric analysis. It is reported in kilogram C per kilogram of material. *Note: This is different from the percentage of carbon in the material that is biogenic in origin as different materials can have different carbon content.*

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[1] *European Commission, PEFCR Guidance document, - Guidance for the 14 development of Product Environmental Footprint Category Rules (PEFCRs), version 6.3, December 15 2017.*

Multiple output processes
For processes that produce multiple valuable outputs, the total amount of each output, using the same units for each output stream, must be provided.

Allocation and multi-functional processes
Two main modeling approaches exist for the LCA methodology: attributional and consequential.

The Higg MSI follows the attributional LCA approach. The attributional life cycle model depicts the actual or anticipated specific or average supply chain, use and end-of-life scenarios. The consequential life cycle model depicts the anticipated generic supply chain as a consequence of a potentially relevant decision. The attributional and the consequential life cycle models differ with the manner in which multi-functional processes are considered. In the attributional approach, coproduction processes are allocated based on physical or economic relationships; in the consequential approach, system expansion including avoided processes is applied.

The following multi-functional decision tree shall be used for resolving all multi-functional allocation decisions:

A. For process allocation already covered by existing Higg MSI decisions, follow the prescribed allocation decision[2];
B. Avoid allocation by:
    a. Subdivision (subdivide the process into subprocesses, each with its own distinct inputs and outputs); or
    b. System boundaries expansion[3];
C. If allocation can not be avoided, the allocation choice must be justified and aligned with industry life cycle assessment recommendations (including ISO 14044 Amendment 2, the PEFCR Guide, Together for Sustainability PCF Guidelines, etc). In particular, consideration shall be given to:
    a. Economic allocation for co-products with high economic disparity (factor of 5 difference in price ratio);
    b. Allocation based on a relevant underlying physical relationship (mass or biophysical allocation; substitution may also apply here); or
    c. Allocation based on some other relationship provided it can be sufficiently justified.

Allocation based on a physical relationship can be modeled using direct substitution if a product can be identified that is directly substituted. A direct substitution-effect must be robustly modeled by demonstrating that (1) there is a direct, empirically demonstrable substitution effect, AND (2) the substituted product can be modeled and the resource use and emissions profile data subtracted in a directly representative manner (i.e. both processes must be represented in the Higg MSI).

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[2] Allocation decisions may be found in the Higg MSI Methodology document and/or dataset descriptions on the Worldly platform. If you are not certain if an allocation decision has already been made, please ask for clarification.
[3] System boundary expansion can pose difficulties in ensuring the taxonomical requirements of the Higg MSI are met. It is recommended to gain approval from the Cascale and the MSI Gatekeeper before applying system expansion.

Note: Allocation methods in the Higg MSI are held consistent within the same hierarchy. These prescribed methods include allocation guidance in alignment with PEFCR[4]. For example, manure use in any dataset enters the system burden free as per the Cattle Model working group (WG).

If there is not a prescribed method for that process, the specific allocation method used should be documented and Data Submitters must justify their chosen allocation method. Key allocation decisions are included in the individual process modeling notes (i.e. metadata).

Biomass Balance Approach

If biomass is available, both a biomass (with bio-based feedstock amounts) and a non biomass version of the material should be submitted, and there needs to be a mechanism to verify the biomass amount matches the claim to prevent any double counting of impact reductions.

Carbon Storage and Sequestration

The MSI is a tool to assess intermediate products (cradle to gate) and the lifetime of the material when used in a final product is not known. Therefore, no carbon credits are to be modeled for carbon entrained in the product at this point in the life cycle. Carbon that is embedded in the material or product may be reported separately as biogenic carbon.

Carbon emissions due to direct land use change are to be reported separately and modeled following the guidelines of PAS 2050:2011. Carbon removals (sequestered carbon) due to direct land use change are excluded. Emissions and removals from indirect land use change are excluded. Direct land use changes are the conversion of land used for growing crops to industrial use or conversion from forestland to cropland. Indirect land use change refers to conversions of land use as a consequence of changes in land use elsewhere.

Soil carbon related emissions, typically from aboveground residues, are to be reported under the GWP category. Soil carbon uptake (accumulation) is excluded in alignment with PEFCR Guidance version 6.3.

Other Nutrient Removals

No net removals from additional emissions to water, such as nitrogen (NH3, N2O, and NO3) and phosphorus (PO4 and P) will be included, in accordance with PEFCR[5] guidance on agricultural modeling. Any negative emissions will be removed and set to 0.

Recovered and Recycled Wastes

Wastes generated by the process that are reused in the same process should not be counted as an input. In such cases, include only the net additions to the process. For example, the total amount of a catalyst used in a production process should not be reported, only the portion that is depleted

[4] *European Commission, PEFCR Guidance document, - Guidance for the 14 development of Product Environmental Footprint Category Rules (PEFCRs), version 6.3, December 15 2017.*

[5] *European Commission, PEFCR Guidance document, - Guidance for the 14 development of Product Environmental Footprint Category Rules (PEFCRs), version 6.3, December 15 2017.*

by that process. Another example would be excess product material that can be directly used as an input to the next process. For the two examples above, include only the additional amounts needed for the process, and not the total reused portion.

Proof of the recycled content such as a GRS or RCS certificate is required to claim recycled content inputs. This proof is applicable to all recycled inputs that enter the process and are purchased from external suppliers.

When the recycled input is the result of an internal recycling stream, the Data Submitter must provide two submissions: One with the inputs of the default process, and another with the inputs from the recycled stream.

Note: Having both processes ensures that efficiencies are captured and that 'waste' from inefficient processes is not being commercialized at a premium as recycled content.

Cutoff at Recycling

The Higg MSI utilizes the recycling cut-off approach. For recycled products, the transportation of the waste product to the recycling facility, and burdens of the recycling process, must be provided. No other upstream inputs are included. The chart below demonstrates this cut-off procedure.

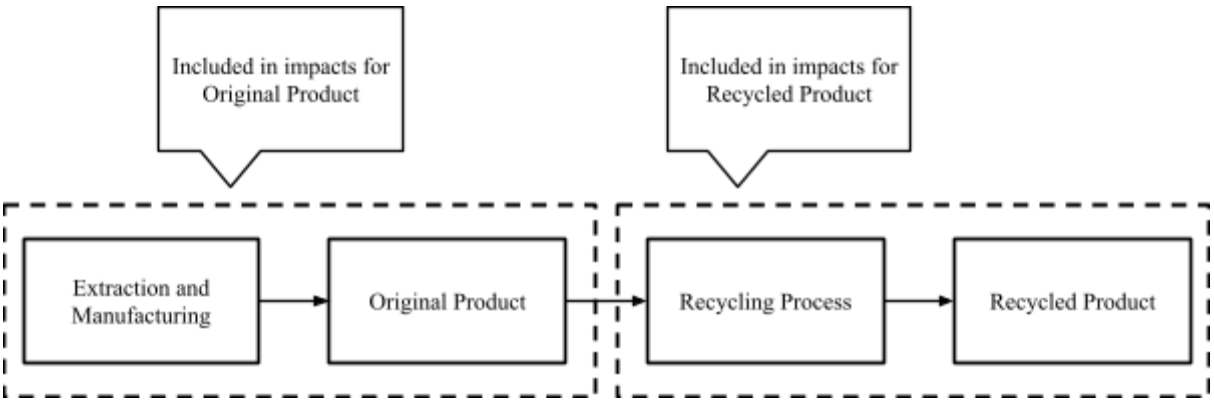

Figure 4: Recycling Cut-off Rules

Definitions of Recycled Content, Pre-Consumer (Post-Industrial) and Post-Consumer materials[6]:

- **Recycled Content:** Proportion, by mass, of recycled material in a product or packaging. Only pre-consumer and post-consumer materials shall be considered as recycled content, consistent with the following usage of terms.

[6] *ISO 14021 Environmental labels and declarations – Self-declared environmental claims (Type II environmental labelling), section 7.8.1.1*

- **Pre-Consumer Material:** Material diverted from the waste stream during a manufacturing process. Excluded is reutilization of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it.
- **Post-Consumer Material:** Material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product which can no longer be used for its intended purpose. This includes returns of material from the distribution chain.

Additional Requirements for Agricultural Systems

In addition to the requirements listed above, the following are requirements specific to agricultural products and systems.

Data Collection Reporting Period

For agricultural systems, 3+ years worth of crop data is the preferred report period to account for harvest variability (seasonality) and to align with the requirements of the PEFCR. If data for annual crops is not available for a 3 year period, at least 1 year of data must be provided and must be updated annually until a 3 year period is achieved (this is not applicable for perennial plants). Data Submitter must ensure that the Data Quality Rating (DQR) of the aggregated multi-year dataset remains as-is with the addition of a single year submission.

Sampling Procedure and Stratification

When collecting data from all farms is unfeasible, data submitters can collect data of a representative sample of farms. Following the PEFCR guidance, a stratified sample shall be used. The total population of farms is divided in relevant sub-populations, or strata, each of which is proportionally represented in the total sample. This prevents some farms (with relevant characteristics) from being excluded or underrepresented.

Data submitters will be asked to define their strata based on three aspects:

- Climate zone (10 categories) derived from the IPCC (2019) guidelines
- Farm size (3 categories)
- Operations type (3 categories)

Table 1: Stratification

Strata characteristics	Definition
Climate zone	
Cool Temperate Moist	Temperature*: > 0°C, precipitation**: > 1
Cool Temperate Dry	Temperature*: > 0°C, precipitation**: < 1
Boreal Moist	Temperature*: < 0°C, precipitation**: > 1
Boreal Dry	Temperature*: < 0°C, precipitation**: < 1

Warm Temperate Moist	Temperature*: > 10°C, precipitation**: > 1
Warm Temperate Dry	Temperature*: > 10°C, precipitation**: < 1
Tropical Montane	Temperature*: > 18°C, at >1000 m elevation
Tropical Wet	Temperature*: > 18°C, precipitation**: > 2000mm
Tropical Moist	Temperature*: > 18°C, precipitation**: > 1000mm
Tropical Dry	Temperature*: > 18°C, precipitation**: < 1000mm
Farm size	
Small	Farm size: < 20ha & not dependent on permanent labor
Medium	Farm size: 20-200ha & dependent on permanent labor
Large	Farm size: > 200ha & dependent on permanent labor
Operations type	
Mechanized	Operations*** are fully mechanized
Partially mechanized	Operations*** are partially mechanized
Non-mechanized	Operations*** are not mechanized (i.e. manual)

** mean annual temperature in Celsius (°C)*
*** ratio evapotranspiration to precipitation. For tropical climates: mean annual precipitation (mm)*
**** farm operations include tillage, bedding, planting, row cleaning, pesticide/fertilizer application and harvesting or harvesting support.*

Categories have been defined in advance to make sure stratification is performed consistently between data submitters. The country is not included separately as a sub-population since data submitters operating in different countries are to provide separate data submissions for each country, and for many countries the difference in climate zone is a better determiner of differences in agricultural practices. To balance complexity in stratifying the sample size, irrigation type is not included as a separate stratifying aspect, but it should be noted that this is still considered as part of the water balance modeling.

The total number of strata to consider is calculated by the following formula:

$$Nsp = c * s * o$$

- c = total number of applicable climate zones
- s = total number of applicable farm sizes
- o = total number of applicable operation types

The required sample size for each identified strata is calculated using the square root of the sub-population size, in alignment with PEFCR sampling requirements . See the equation below.

$$Nss = \sqrt{Nsp}$$

- Nss: required sub-sample size
- Nsp: sub-population size

The total sample size (for the population) is obtained by taking the sum of the sample sizes of the strata. If rounding is required, basic rounding rules apply.

Pesticides

Pescicides includes all herbicides, insecticides, plant growth regulators, fungicides, nematicides, defoilaints, desiccants, boll-openers - natural and synthetic, etc.

The pesticides amounts are to be provided as intensities (i.e. volumes per area like kg/ha). These intensities are to be representative of the whole area. The amounts/volumes are to be entered as amounts of active ingredients. This means data submitters are to review the pesticide product formulation and take into account the weight of the active ingredient relative to the product's total weight.

Fertilizers

Fertilizers include all pre-plant, at-planting and side-dress fertilizers. The fertilizer amounts are to be provided as intensities (i.e. volumes per area like kg/ha). These intensities are to be representative of the whole area.

A breakdown by specific fertilizer type is preferred. In case some portion of applied fertilizers cannot be attributed to specific types, the amounts can be entered as elemental / generic nitrogen, phosphorus or potassium. It is important to prevent double-counting; these elemental or generic amounts should not be accounted for in the breakdown by fertilizer type.

NPK mixes or compositions are to be provided in percentages as displayed on the fertilizer product. For manure, please provide a description of the type of manure applied to allow the Data Modellers to assign appropriate NPK values to this organic fertilizer type.

Agricultural Land Occupation

Agricultural or forest land occupation must be provided if the product being submitted includes agricultural materials (on field, farm, or forest). This impact is not included in the Higg MSI scoring or tool interface at this time, but it is available in Cascale database for future addition to the tool if appropriate.

Requirements for Type II: Third party reviewed LCA Report

If input and output data are not available, LCIA (midpoint) results may be submitted instead. The LCA must meet the requirements in the Requirements for Type I: Detailed Process Data Submission section. The midpoints submitted must use the listed LCIA methods and the prescribed version listed in the Impact Categories section below.

LCA Report Requirements
The LCA report must include:

- Goal and scope
- Functional unit
- Product system and system boundaries (including system diagram and process flow)
- Declaration of system model used (attributional)
- Data collection process
- Modeling approach including background data and software
- Assumptions and limitations
- Cut-off criteria
- LCIA impact methods and results
- For each life cycle stage of the model, the list of reference factors in order of contribution to each impact category
- Data Quality Rating according to table 4. Quality level and rating for the data quality criteria
- Interpretation must include the percentage of water scarcity impact from foreground vs background processes

LCA Report Review Requirements
Since data is less transparent for review, Type II LCIA Data Submissions must be independently reviewed either by a sole reviewer or a review panel prior to submission, and a review report must also be submitted to the MSI Gatekeeper. The reviewer or review panel do not have to be a third party, only independent of the analysis. The submission must include the LCA project report and review results. Any update to the LCA requires a resubmission of a revised report and review report.

Every submission must appropriately fit into the MSI taxonomy, which separates Production Phases. Submissions may be applicable to more than one Base Material (e.g. a spinning process may be

possible for various textiles), but they must fit within the boundaries of one Production Phase. Any submission that covers more than one Production Phase must be split into separate submissions.

If different impact categories are reported in the LCA report (because the LCA was conducted before submitting to the MSI), an addendum to the original report must be provided and the review report must be revised. You can consult ISO 14071 Critical review processes and reviewer competencies for additional guidance.

Impact Categories

Impacts for products and processes are first calculated from a "midpoint" methodology. These approaches come directly from LCIA. The individual impact categories listed in Table B4 are calculated based on methodologies currently available and widely used by the LCA community.

These impact categories were chosen based on their scientific accuracy; their applicability to the apparel, footwear, and home textile industries; and their compatibility with other global product sustainability programs.

There are also two inventory metrics displayed for each process that are not included in the scoring:

- Water Consumption (kg)
- Biogenic carbon content (kg C)

Table 2: MSI required Impact Categories

Impact Category	LCIA Method	Unit	Reference	Notes
Climate Change	IPCC AR6 GWP 100, excl biogenic CO2	kg CO2 eq.	Intergovernmental Panel on Climate Change. 2021. IPCC Sixth Assessment Report. The Physical Science Basis. https://www.ipcc.ch/report/ar6/wg1	Updated from AR5 to AR6 in 2023 starting with MSI 3.7
Eutrophication	CML2001 - Aug. 2016, Eutrophication Potential (EP)	kg PO4 eq.	https://www.universiteitleiden.nl/en/research/research-output/science/cml-ia-characterisation-factors	
Abiotic Depletion (fossil fuels)	CML2001 - Aug. 2016, Abiotic Depletion (ADP fossil)	MJ eq.	https://www.universiteitleiden.nl/en/research/research-output/science/cml-ia-characterisation-factors	
Water Scarcity	EF Method	m3		

Ecotoxicity	USEtox 2.12 (recommend ed only)	CTUe	Usetox (https://usetox.org/) & SAC Chemistry Task Team. 2018. See Appendix D of Cascale Higg MSI Methodology Document	
Water Consumption	Inventory metric	m3 or kg	Blue Water Consumption	
Biogenic carbon content	Inventory metric	kg C/kg	howtohigg.org/higg-msi/faq/	

**In the GaBi software there are multiple AWARE methods that represent different characterizations of the unknown geographies. For this category, the most recent EF Water scarcity method is used.*

In an attempt to not require more frequent data updates from the Data Submitter, we recommend the following midpoints also be submitted. These are the additional categories required for the European Product Environmental Footprinting (PEF) to date:

Table 3: MSI Optional Impact Categories

Impact Category	Method	Unit
Acidification	EF Method	Mole of H+ eq.
Climate Change - total	EF Method	kg CO2 eq.
Climate Change, biogenic	EF Method	kg CO2 eq.
Climate Change, fossil	EF Method	kg CO2 eq.
Climate Change, land use and land use change	EF Method	kg CO2 eq.
Ecotoxicity, freshwater - total	EF Method	CTUe
Ecotoxicity, freshwater inorganics	EF Method	CTUe
Ecotoxicity, freshwater organics	EF Method	CTUe
Eutrophication, freshwater	EF Method	kg P eq.
Eutrophication, marine	EF Method	kg N eq.
Eutrophication, terrestrial	EF Method	Mole of N eq.
Human toxicity, cancer - total	EF Method	CTUh
Human toxicity, cancer inorganics	EF Method	CTUh
Human toxicity, cancer organics	EF Method	CTUh
Human toxicity, non-cancer - total	EF Method	CTUh
Human toxicity, non-cancer inorganics	EF Method	CTUh
Human toxicity, non-cancer organics	EF Method	CTUh
Ionising radiation, human health	EF Method	kBq U235 eq.

Land Use	EF Method	Pt
Ozone depletion	EF Method	kg CFC-11 eq.
Particulate matter	EF Method	Disease incidences
Photochemical ozone formation, human health	EF Method	kg NMVOC eq.
Resource use, fossils	EF Method	MJ
Resource use, mineral and metals	EF Method	kg Sb eq.
Water use	EF Method	m^3 world equiv.

Data Quality Ratings

The dataset quality shall be calculated based on the six quality criteria described below as consistent with the EU PEF data quality requirements.

The Criteria for the semi-quantitative assessment of overall data quality of the submitted datasets are the following:

- Time Representativeness: Degree to which the dataset reflects the specific conditions of the system being considered regarding the time / age of the data, and including background datasets, if any.
- Technological Representativeness: Degree to which the dataset reflects the true population of interest regarding technology, including for included background datasets, if any. Comment: i.e. of the technological characteristics including operating conditions.
- Geographical Representativeness: Degree to which the dataset reflects the true population of interest regarding geography, including background datasets, if any. Comment: i.e. of the given location / site, region, country, market, continent, etc.
- Parameter Uncertainty: Qualitative expert judgment or relative standard deviation as a % if a Monte Carlo simulation is used.
- Note that Completeness (C), and End of Life (EoL) will not be included in the data quality assessment of material production data at this time.

Data Submitter is responsible for updating their process submission if the above criteria are no longer fulfilled, for example: the data is considerably out of date and not representative of the current process, the production has been relocated to a different country or expanded to other countries not accounted on the original submission, inputs to the process have changed, etc.

Table 4: Quality level and rating for the data quality criteria

Quality level	Quality rating	C (Future Measure)	TiR	P	TeR	GR	EoL (Future Measure)
Very good[15]	1	15 PEF Impact Categories	Data[16] are not older than 4 years with respect to the release date or latest review date	≤ 10%	The technologies covered in the dataset are exactly the one(s)modeled	The processes included in the dataset are fully representative for the geography stated in the title and metadata	The EoL formula [2] is implemented in the entire dataset (foreground and all background processes)
Good	2	14 PEF Impact Categories (and all 10 categories classified I or II in ILCD are included[17])	Data are not older than 6 years with respect to the release date or latest review date	10% to 20%	The technologies modeled are included in the mix of technologies covered by the dataset	The processes included in the dataset are well representative for the geography stated in the title and metadata	The EoL formula [2] is implemented in foreground level-1 + level-2 disaggregated processes (see Figures E.2 and E.3)
		II in ILCD are included)			used for similar processes	stated in the title and metadata	
Poor	4	10-11 PEF Impact Categories (and all those covered are classified I or II in ILCD)	Data are not older than 10 years with respect to the release date or latest review date	30% to 50%	Technology aspects are different from what described in the title and metadata	The processes included in the dataset are only partly representative for the geography stated in the title and metadata	The EoL formula [2] is not implemented, but all information and data needed to calculate all parameters in the EoL formula are available and transparently documented
Very poor	5	Less than 10 PEF Impact Categories (and all those	Data are older than 10 years with respect to the release	> 50%	Technology aspects are completely different from	The processes included in the dataset are not representative	The EoL formula [2] is not implemented

Previously Conducted LCA Report

If an LCA has been previously conducted, the results from the LCA report with an LCA submission (Type II) with a few additional steps required. You will need to review and submit the following:

1. Review the methodology in the existing LCA report. The LCA must follow the methodological guidelines of the MSI outlined in this document and the methodology document. It is recommended to pay particular attention to the modeling approach (attributional), allocation/multi-function processes, cut off at recycling.

2. Review the impact categories included in the original LCA report. There are many impact methods and the categories reported in the LCA likely do not match exactly with the required impact categories in MSI.

3. Contact the person or group that conducted the LCA and request that the results for the MSI required impact categories are produced. As the models have already been built in the full LCA, this is typically a simple task.

4. Attach a short addendum to the original report to state that the original models were used to produce the results for MSI and include the table of MSI results in the addendum.

5. This addendum should be third party reviewed before submission.

6. Submit results, LCA report, and report addendum through MSI Contributor for gatekeeper review.

Optional stage: Prior to step 1, MSI Data Manager can briefly review the report to ensure that the methodology is consistent and that no modeling updates will be required.

Data Submission Checklist

Review this checklist when submitting your data. Ensure all information is included in your submission.

Type I and Type II Submissions

- ☐ The data were correctly entered into the data collection template
- ☐ Explanations of material production are clear and relevant production processes are accounted for
- ☐ The scope of the data is consistent with the defined boundary conditions
- ☐ Sources, vintage of the data (timeframe represented), source types, and methods for data collection are documented
- ☐ Methods used for data collection and decision making are scientifically and technically valid
- ☐ Assumptions and limitations are identified and plausible
- ☐ All calculations are correct
- ☐ All data are verifiable and reproducible
- ☐ The processes are organized into the life cycle stages in the Higg MSI taxonomy
- ☐ The data quality is at a minimum "fair" or higher quality rated
- ☐ Contain a draft description of process to be included in the MSI tool including link to company website for more information

Additional criteria for Type II LCIA Submissions

- ☐ LCA project report third-party review results
- ☐ Meets requirements, including exact match to impact categories listed for the LCA Report in LCA Report Requirements section above
- ☐ Third-party review statement

If there are any issues with the data submission, the MSI Gatekeeper will communicate any outstanding issues to the data submitter, who may choose to update or revise the submission.

More Questions?

See additional FAQs and guidance on the Higg MSI here

MSI Contributor team can be reached at: datasubmission@worldly.io

Document Change Log

Document version	Change from previous version	Date
MSI_Contributor_guidance _ v1.1	Updated IPCC Impact Assessment method from AR5 to AR6	09/10/2023
MSI_Contributor_guidance_v2.0	Updated format, graphics, and added additional guidance.	July/2025