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TfS PCF
Data Model:
**How to
report
PCF data**

Introduction

This document describes the data aspect model according to which PCF data shall be exchanged compliant to the Product Carbon Footprint Guideline for the Chemical Industry of Together for Sustainability. It supersedes the Table 5.20, section 5.3.2 in the version 2.0 of the same guideline, and in all following versions it will be managed as a separate cross-linked document.

The purpose of the Tfs PCF Data Model is to specify information requirements to be provided by suppliers alongside PCF values and to facilitate System Integration of the PCF Data Exchange platform of Tfs (read the press release). Additional information besides the PCF value is needed to support the interpretation and verification of PCF data, as well as to provide necessary information for quantification of customer PCFs further down the value chain. In this context it should be mentioned that the PCF covers one environmental impact and no overall statements on the environmental performance of the product can be given. Comparisons of PCF are only possible under certain criteria if all relevant information is reported.

The Tfs PCF Data Model is outlined in the table below and is structured as follows:

- **Headlines:** conventional denomination of the key sections of the data aspect model.
- **Field Labels:** conventional denomination of the data fields of the data aspect model.
- **Technical Field Names:** technical name adopted in the PCF Data Exchange Platform of Tfs.
- **Mandatory, Optional, Default:** characterization of the data field indicating whether it's defined as mandatory (M) or optional (O) for a compliant PCF data exchange. Default (D) indicated that the data field will be defaulted to a given value in the technical data exchange tool (e.g., the PCF Data Exchange Platform of Tfs). If a data field is defined as mandatory starting from a given year (202X), the nomenclature M202X¹ is used.
- **Type:** characterization of the typology of data required for a compliant PCF data exchange (e.g., string, value).
- **Description:** brief description of the data field, with respective purpose, requirements, relationship to other data fields as well as to other guidelines, standards and initiatives.
- **Technical specification:** additional technical description for a compliant formatting and of the data field.
- **Value List/Default Value:** applicable list of values or default value applicable in the data field for a compliant PCF data exchange.
- **Sample Values:** example of data field values with compliant formatting.

An additional API technical description document for a PCF data exchange with the PCF Data Exchange Platform of Tfs according to this Tfs PCF Data Model will be published separately.

¹ M202X means that the technical implementation in a data exchange solution shall be mandatory by the start of year 202X at the latest. Additionally, the reporting of the data field through the data provider (product supplier) shall be mandatory by the end of year 202X at the latest.

Field labels	Technical field names	Mandatory (M) Optional (O) Default (D)	Type	Description	Technical specification	Value list / Default value	Sample values
1 Scope of PCF form							
2	Data model and version	specVersion	M	string array (According URN:FPI: name and version of data model)	Specification of the PCF format/data model, which is used. The required data input fields will be tailored accordingly. Multiple entries are possible. The data model and version can be selected independently of the standard or guidance document, you followed during the assessment of the PCF.	The version of the specification, for the given reporting standard. (can be autofilled by application)	urn:fpi:tfs-initiative.com: datamodel-version:2.0.0
3	Partial or a full PCF declaration	partialFullPcf	D	string (drop down)	A partial PCF (cradle-to-gate) is covering the emissions from resource extraction until the product leaves the gate of your organization (optionally including the distribution stage). A full PCF (cradle-to-grave) is covering the complete life cycle of the product from resource extraction all the way to end-of-life stage.	cradle-to-gate; cradle-to-grave	cradle-to-gate
4 Company and product information							
5 Company information							
6	Company name	companyName	M	string (free text)	State the (legal) name of the company supplying the product and reporting the PCF (data owner).	The name of the company that is the Product Footprint Data Owner, with value a non-empty String.	MyCompany
7	Company IDs	companyIds	M	string array (According URN:FPI as defined by TFS and WBCSD)	Company identifier according to the sharing scheme you are reporting in.	A non-empty set of CompanyIds. Each value of this set is supposed to uniquely identify the ProductFootprint Data Owner. Each entry should be according URN:FPI including domain name of the organization issuing the identifier, the entity and identifier-type and the identifier.	urn:fpi:www.myCompany.com: org-id:401765 ¹ , urn:fpi:www.myCompany.com: suborg-id:401765-DE, urn:fpi:www.BusinessPartner-Company.com:org-id:ABCD1234, urn:fpi:duns.dnb.com:duns-number:12-345-6789, urn:fpi:www.bzst.de:VAT-number:DE99999999
8 Product information							
9	Product name	productNameCompany	M	string (free text)	State the name of the product in order for it to be recognizable by the receiver of the PCF information.	The non-empty trade name of the product.	Green Ethanol
10	Product identifiers	productIds	M	string array (According URN:FPI as defined by TFS and WBCSD)	A set of several relevante product identifiers can be provided including e.g. supplier part number, GTIN, article number, CPC classification and/or CAS Number.	A non-empty set of ProductIds. Each of the values in the set is supposed to uniquely identify the product. What constitutes a suitable product identifier depends on the product, the conventions, contracts, and agreements between the Data Owner and a Data Recipient and is out of the scope of this specification. Each entry should be according URN:FPI including domain name of the organization issuing the identifier, the entity and identifier-type and the identifier.	urn:fpi:mycompany.com: product-id:401765, urn:fpi:mysupplier.com: SupplierComponent-id:ABCD1234, urn:fpi:registry.cas.org:cas-number:71-43-2
11	Product description	productDescription	O	string (free text)	Provide a brief description of the product (for example functions and technical parameters).	The free-form description of the product plus other information related to it such as production technology or packaging.	Ethanol, 95% solution

¹ The term "myCompany.com" is used as a placeholder to represent the actual company domain.

	Field labels	Technical field names	Mandatory (M) Optional (O) Default (D)	Type	Description	Technical specification	Value list / Default value	Sample values
12	Declared unit	declaredUnit	M	string (drop down Unit ISO CODE + "piece")	The declared unit serves as reference to which the inputs and outputs in the PCF calculation are related (e.g. kg of product, piece of component, MJ electrical energy).	The unit of analysis of the product. See Data Type DeclaredUnit for further information.	piece; kilogram; liter; cubic meter; kilowatt hour; megajoule; ton kilometer; square meter	kilogram
13	Quantity (of declared unit)	unitaryProductAmount	M	value (Decimal)	Please specify the quantity (amount) of the declared unit as numerical value.	The amount of Declared Units contained within the product to which the PCF is referring to. The value MUST be strictly greater than 0.		1
14	Product mass [kg] per declared unit	productMassPer DeclaredUnit	M	value (Decimal)	The mass of the product per declared unit (e.g., the declared unit of a circuitboard is one piece; one piece represents 0.123 kg). Product mass excluding packaging.	This is required, especially if piece is selected.		0.123 kg
15	PCF assessment & methodology							
16	PCF assessment information							
17	ID & version							
18	PCF ID	Id	M	string (Accordinging UUID v4)	This ID is used to identify a specific PCF. In case of update a new PCF ID is required. It is automatically generated.	Automatically generated number (UUID). The product footprint identifier has to be a global unique value. In case of manually entry it can be generated by applications like www.uuidgenerator.net/version4		550e8400-e29b-11d4-a716-446655440000
19	Previous PCF IDs	precedingPflds	O	string array (Accordinging UUID v4)		If defined, MUST be non-empty set of preceding product footprint identifiers without duplicates.		550e8400-e29b-11d4-a716-446655440000
20	PCF version	version	D	value (integer; 0..2^31-1)	The PCF version is a pathfinder specific number, which is not used by TfS.	The version of the ProductFootprint with value an integer in the inclusive range of 0..2^31-1.	Default:"1"	1
21	PCF status	pfStatus	D	string (drop down)	The PCF status is a pathfinder specific attribute, which is not used by TfS.	If defined, the value must be one of the following values: Active	Active (Default); Deprecated.	Active
22	Boundary specifications							
23	Cut-off rule	exempted EmissionsPercent	M	value (Decimal; 0..10)	Applied cut-off criteria in percent of total emissions. This specifies which percentage of emissions were excluded from the PCF in total, in order to reduce efforts in data collection of irrelevant processes.	Value has to be between 0 and 10		3
24	Exemption rules: explanation	exempted EmissionsDescription	O	string (free text)	Rationale behind exclusion of specific PCF emissions. Potential Cut-offs are defined in the TfS Guideline	Free Text field		Criteria to exclude certain activities (Cut-off) according TfS guideline.
25	Technology							
26	Important unit processes and used technologies	boundary ProcessesDescription	M 2025	string (free text)	Brief description of the significantly contributing manufacturing steps of the product (including general description of used technologies)	The processes attributable to each lifecycle stage. Example text value: Electricity consumption included as an input in the production phase		Hydrogen liquid chlor-alkali electrolysis
27	Type of recycled content	typeRecycledContent	O	string (drop down)	Choose the type of recycled content		post-industrial; post-consumer	post-industrial
28	CCU CO ₂ -origin	ccuCo2Origin	O	string (free text)	Source from where CO ₂ is captured (e.g. DAC/direct air capture or source ammonia plant)			Direct Air Capture (DAC)

	Field labels	Technical field names	Mandatory (M) Optional (O) Default (D)	Type	Description	Technical specification	Value list / Default value	Sample values
29	Geography							
30	City/state as country subdivision	geographyCountrySubdivision	O	string (ISO 3166-2 Subdivision Code)	The location of factory gate(s) refers to the last manufacturing step. It is the location where the product is produced. State the country subdivision as subdivision code according to ISO 3166-2 (example: Germany, Bavaria = DE-BY); https://www.iso.org/glossary-for-iso-3166.html	If present, the value MUST conform to data type RegionOrSubregion. See § 4.2.1 Scope of a CarbonFootprint for further details. Additionally, see the Pathfinder Framework Section 6.1.2.2.	Value List according ISO 3166	DE-BY
31	Geography country	geographyCountry	O	string (ISO 3166-2 alpha-2 country code)	The location of factory gate(s) refers to the last manufacturing step. It is the location where the product is produced. State the country as country code according to ISO 3166-1 alpha-2 (example: US:=United States, FR:=-France); https://www.iso.org/glossary-for-iso-3166.html	"If present, the value MUST conform to data type ISO3166CC. See § 4.2.1 Scope of a CarbonFootprint for further details. Example value in case the geographic scope is France"	Value List according ISO 3166	DE
32	Geography with region or subregion	geographyRegionOrSubregion	M	string (drop down)	Region of the supplier production site according to ISO 3166 (Example: "Global", "Europe", "Eastern Europe")		Africa; Americas; Asia; Europe; Oceania; Australia and New Zealand; Central Asia; Eastern Asia; Eastern Europe; Latin America and the Caribbean; Melanesia; Micronesia; Northern Africa; Northern America; Northern Europe; Polynesia; South-eastern Asia; Southern Asia; Southern Europe; Sub-Saharan Africa; Western Asia; Western Europe; Global	Europe
33	Time							
34	Reference period start	referencePeriodStart	M	DateTime (ISO 8601; UTC Timezone)	Start of time period of data collection for primary data sources (this does not refer to publication dates of secondary data)			2021-11-20T08:30:00.000Z
35	Reference period end	referencePeriodEnd	M	DateTime (ISO 8601; UTC Timezone)	End of time period of data collection for primary data sources			2022-11-20T08:30:00.000Z
36	Date of issue	created	M	DateTime (ISO 8601; UTC Timezone)	The time stamp at which the PCF has been declared, independantly of when or if it has been shared. This represents the validity period start unless specified seperately.	The time stamp at which the PCF has been declared, independantly of when or if it has been shared. This represents the validity period start (timestampValidityperiodStart) unless specified seperately.		2023-11-20T08:30:00.000Z
37	Validity period start	validityPeriodStart	O	DateTime (ISO 8601; UTC Timezone)				2022-11-20T08:30:00.000Z
38	Validity period end	validityPeriodEnd	M	DateTime (ISO 8601; UTC Timezone)	Time stamp declaring the expected end of the use period for this declaration or date of expected update (i.e. when does the data validity period end?).	Resolving attribute: 5 years after "reference period start"		2025-11-20T08:30:00.000Z
39	PCF methodology							
40	Standards							
41	Cross-sectoral standards applied	crossSectoralStandardsUsed	M	string array (drop down)	Standards the PCF calculation is based on (multiple entries are possible). Please note: the PCF can be calculated according to another standard than the standards which defines the communication format.	List of selected standard. Can be multiselect.	ISO 14067; Pathfinder v1; Pathfinder v2; GHG Protocol Product; PAS 2050; ISO 14040-44; PEF; Other	ISO 14067

	Field labels	Technical field names	Mandatory (M) Optional (O) Default (D)	Type	Description	Technical specification	Value list / Default value	Sample values
42	Product or sector rules	productOrSector SpecificRules	M	string array (free text dropdown-can be overwritten)	Name the most specific rule (Sector specific guidance frameworks, such as Product Category Rules (PCR), are sets of rules how to calculate and document Life Cycle Assessments. They provide product category specific guidance and enhance comparability between assessments of the different suppliers for the same category (sector). The same applies to Product Environmental Footprint Category Rules (PEFCR)).	Free text of applied sector rules should be TfS Guideline. V 2.0. Other values are for example Catena-X Rulebook; EN 50693; EN 15804; BPX 30-323; £Not specified	TfS Guideline. V 2.0	"TfS Guideline V2.0, Catena-X Rulebook"
43	GWP characterization factor details							
44	IPCC report version of GWP values	characterizationFactors	M	string (drop down)	The IPCC (Intergovernmental Panel of Climate change) frequently releases (GWP) global warming potential values for climate gases related to CO ₂ . These GWP values are released in Assessment Reports (AR), which are numbered. The AR number can be used to track the age and accuracy of the GWP values used in reporting.	Resolving attribute AR6. Prefilled, but changeable updated and including carbon feedback	AR1; AR2; AR3; AR4; AR5; AR6; unspecified	AR6
45	Data sources and quality							
46	Allocation in foreground (own processes)							
47	Allocation rules used	allocationRules Description	M	string (free text)	Describe the allocation rules applied to your foreground data and explain the underlying reasons (way of allocating all activities from your manufacturing steps to the declared unit).			Mass balance
48	Allocation approach used for waste incineration with energy recovery	allocationWaste Incineration	M	string (dropdown)	Material recycling and waste treatment with energy recovery are considered separate and not equal. Incineration is the least favorable solution because it is a final disposal. One of the three allocation approaches shall be followed: Cut-off approach also known as recycled content approach; Reverse Cut-off approach also known as waste allocation; Substitution. Please state which approach was applied and if available.		cut-off; reverse cut-off; system expansion	cut-off
49	Allocation approach used for recycled material & c-content	allocationRecycled Carbon	O	string (dropdown)	e.g. Upstream system expansion or cut-off.		upstream system expansion; cut-off	cut-off
50	Allocation approach used for CCU	allocationCcuCarbon	O	string (free text)	e.g. System expansion and substitution.			System expansion and substitution
51	Data sources							
52	Primary Data Share (PDS)	primaryDataShare	M 2025	value (0-100)	Share of primary data in the final PCF, calculated according to current WBCSD Pathfinder Framework.			
53	Secondary data source and version	secondaryEmission FactorSources	M	string array (free text; non-empty)	Which secondary data sources and versions have been used by you or by suppliers (e.g. data bases such as ecoinvent)?			ecoinvent v3.8

Field labels	Technical field names	Mandatory (M) Optional (O) Default (D)	Type	Description	Technical specification	Value list / Default value	Sample values
54 Data quality							
55 Quantitative uncertainty							
56	Coverage of data quality assessment	coveragePercent	D	value (0-100)	Coverage of data quality assessment (%)	Default: "100"	100
57	Technological representativeness	technologicalDQR	M 2025	value (Decimal between 1 and 3)	"The degree to which the data reflects the actual technology(ies) used 1 -Good: Data generated using the same technology 2 -Fair: Data generated using a similar but different technology (based on secondary data sources) 3 -Poor: Data of a different or unknown"	Value has to be between 1 and 3. Fractions are allowed.	2.1
58	Temporal representativeness	temporalDQR	M 2025	value (Decimal between 1 and 3)	"The degree to which the data reflects the actual time (e.g., year) or age of the process 1 -Good: Data from the same reporting year 2- Fair: Data less than 5 years old 3 -Poor: Data more than 5 years old"	Value has to be between 1 and 3. Fractions are allowed.	2.1
59	Geographical representativeness	geographicalDQR	M 2025	value (Decimal between 1 and 3)	"Geographical representativeness. The degree to which the data reflects the actual geographic location of the processes within the inventory boundary (e.g., country or region) 1 -Good: Data from the same country or country subdivision 2- Fair: Data from the Same region or subregion 3 -Poor: Global data or from an unknow region"	Value has to be between 1 and 3. Fractions are allowed.	1.4
60	Completeness	completenessDQR	M 2025	value (Decimal between 1 and 3)	"Completeness. The degree to which the data is statistically representative of the process sites. 1 -Good: Activity data collected for all relevant sites for specified period 2- Fair: Activity data collected for <50% of sites for specified period or >50% of sites for shorter period 3 -Poor: Activity data collected for <50% of sites for shorter time period or unknown"	Value has to be between 1 and 3. Fractions are allowed.	1.4
61	Reliability	reliabilityDQR	M 2025	value (Decimal between 1 and 3)	"Reliability. The degree to which the sources, data collection methods, and verification procedures used to obtain the data are dependable. 1 -Good: Measured activity data 2- Fair: Activity data partly based on assumptions 3 -Poor: Financial data or nonqualified estimate"	Value has to be between 1 and 3. Fractions are allowed.	2.1

Field labels	Technical field names	Mandatory (M) Optional (O) Default (D)	Type	Description	Technical specification	Value list / Default value	Sample values
62 General							
63	Comment	comment	O	string (free text)	Comment/Document of anything relevant for the receiving party or your own company, necessary to understand the representativeness of this PCF for his/her application. This free text may contain any non-confidential information, which can't be documented in the attributes with specific purpose of this PCF documentation above.		
64 System boundary							
65	Packaging	packaging EmissionsIncluded	M	string (boolean dropdown)	The value 'true' shall be selected, if emissions related to the preparation and packaging of your products are included.	True; False	True
66 Life Cycle Inventory results							
67 Production stage							
					The emissions of the packaging shall be included in the "Production Stage" if the "packagingEmissionsIncluded" has been set to "True"		
68	Production stage: GWP total (incl. bio.)	pCfIncludingBiogenic	M 2025	value (Decimal; kgCO ₂ e)		kg CO ₂ e/declared unit	0.1 kg CO ₂ e/kg
69	Production stage: GWP total (excl. bio.)	pCfExcludingBiogenic	M	value (Decimal; >=0; kgCO ₂ e)		kg CO ₂ e/declared unit	0.1 kg CO ₂ e/kg
70	Production stage: GWP fossil	fossilGhgEmissions	M 2025	value (Decimal; >=0; kgCO ₂ e)		kg CO ₂ e/declared unit	2.0 kg CO ₂ e/kg Ethanol
71	Production stage: GWP biogenic CO ₂ e-emissions (only other GHG emissions than CO ₂ – excludes biogenic CO ₂)	biogenicCarbonEmissionsOtherThanCO2	M 2025	value (Decimal; kgCO ₂ e)		kg CO ₂ e/declared unit	Default "ext" 0.4 kg CO ₂ e/kg Ethanol (from Methane)
72	Production stage: GWP biogenic CO ₂ -withdrawal (biogenic CO ₂ contained in the product)	biogenicCarbonWithdrawal	M 2025	value (Decimal; kgCO ₂ e)		kg CO ₂ e/declared unit	0.1 kg CO ₂ e/kg
73	Production stage: GWP direct land use change (dLUC)	dLucGhgEmissions	M 2025	value (Decimal; kgCO ₂ e)		kg CO ₂ e/declared unit	0.1 kg CO ₂ e/kg
74	Production stage: GWP and use (LU)	luGhgEmissions	M 2025	value (Decimal; kgCO ₂ e)		kg CO ₂ e/declared unit	0.1 kg CO ₂ e/kg
75	Production stage: GWP Aviation emissions	aircraftGhgEmissions	M 2025	value (Decimal; kgCO ₂ e)		kg CO ₂ e/declared unit	0.1 kg CO ₂ e/kg
76 Amendment categories							
77 Packaging							
78	Packaging: GWP total (incl. bio.)	packagingGhgEmissions	O	value (Decimal; kgCO ₂ e), or "n.a."	IF "packagingEmissionsIncluded=True" the user may declare the emission impact of packaging for transparency only. However, the emission impact of the packaging shall be included in the production stage PCF. IF "packagingEmissionsIncluded=False" the field will be pre-filled as "n.a." (not available).	kg CO ₂ e/declared unit	Default "0 kgCO ₂ e" 0 kg CO ₂ e/kg

Field labels	Technical field names	Mandatory (M) Optional (O) Default (D)	Type	Description	Technical specification	Value list / Default value	Sample values
79 Distribution stage				Outbound logistics			
80	Distribution stage: GWP total (incl. bio.)	distributionStage PCfIncludingBiogenic	O	value (Decimal; kgCO ₂ e)	kg CO ₂ e/declared unit	Default "ext"	ext
81	Distribution stage: GWP total (excl. bio.)	distributionStage PCfExcludingBiogenic	O	value (Decimal; kgCO ₂ e)	kg CO ₂ e/declared unit	Default "ext"	ext
82	Distribution stage: GWP fossil	distributionStage FossilGhgEmissions	O	value (Decimal; kgCO ₂ e)	kg CO ₂ e/declared unit	Default "ext"	ext
83	Distribution stage: GWP biogenic CO ₂ e-emissions (only other GHG emissions than CO ₂ – excludes biogenic CO ₂)	distributionStage BiogenicCarbon EmissionsOtherThanCO2	O	value (Decimal; kgCO ₂ e)	kg CO ₂ e/declared unit	Default "ext"	ext
84	Distribution stage: GWP biogenic CO ₂ -withdrawal (biogenic CO ₂ contained in the product)	distributionStage BiogenicCarbon Withdrawal	O	value (Decimal; kgCO ₂ e)	kg CO ₂ e/declared unit	Default "ext"	ext
85	Distribution stage: GWP direct land use change (dLUC)	distributionStage DluCghgEmissions	O	value (Decimal; kgCO ₂ e)	kg CO ₂ e/declared unit	Default "ext"	ext
86	Distribution stage: GWP land use (LU)	distributionStageLu GhgEmissions	O	value (Decimal; kgCO ₂ e)	kg CO ₂ e/declared unit	Default "ext"	ext
87	Distribution stage: GWP Aircraft emissions	distributionStage AircraftGhgEmissions	O	value (Decimal; kgCO ₂ e)	kg CO ₂ e/declared unit	Default "ext"	ext
88 Carbon content							
89	Total carbon content (per DU)	carbonContentTotal	M	value (Decimal; kg C)	kg total C/declared unit		0.52 Kg total C/Kg ethanol
90	Fossil carbon content (per DU)	fossilCarbonContent	D	value (Decimal; kg C)	kg fossil C/declared unit	Default "Total carbon content - Biogenic carbon content"	0.52 kg fossil C/kg ethanol
91	Biogenic carbon content (per DU)	carbonContentBiogenic	M 2025	value (Decimal; kg C)	kg biogenic C/declared unit		0.1 kg biogenic C/kg ethanol
92	Recycled carbon content (physical or mass balance)	carbonContentRecycled	O	value (Decimal; kg C)	kg recycled-C/declared unit		0.5 kg recycled C /kg Ethanol
93	CCU-based carbon content	carbonContent CcuBased	O	value (Decimal; kg C)	Carbon Capture and Utilization (CCU) base carbon content kg CCU-C/declared unit		0.5 kg CCU C /kg Ethanol



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