# Detailed description of data types defined for the IEDC prototype.

After revising the data types and their data models in January 2019, the `types` tables of the IEDC contained 28 data types, which are defined and described below.

**Table:** Data types of the IEDC that have been defined so far. Version: State of data models for submission of revised manuscript, 19-Feb-2019.

| Data category and description | Data type and first ID letters | Description | Layer(s) | Mandatory aspects | Optional aspects (selected) |
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| **Flow (1)** Objects flowing between processes | **Flow (1_F_)** | Objects (good/ substance) flowing between processes | Mass, energy, monetary value, pieces, | [material/commodity] from [origin_process] in [origin_region] to [destination_process] in [destination_region] in [time] | [layer], if not globally defined, [age-cohort] of material/commodity flowing, [scenario] |
| | **Process inventory (1_PI_)** | flows entering and leaving process, for LCI datasets | Mass, energy, monetary value, pieces, | [layer] of [material/commodity] of [material_category] and [material_group] from [origin_process] in [origin_region] to [destination_process] in [destination_region] in [time period] | [age-cohort] of process technology, [scenario] |
| | **Births_deaths (1_BD_)** | flows of people being born and dying | People | [people] born/died in [region] in [time] period | [sex], [year(s)] of birth or death, [scenario] |
| **Stock (2)** Object residing in a process | **Stock (2_S_)** | Objects (good/ substance) residing in process | Mass, energy, monetary value, pieces | [material/commodity] in [process] in [region] in [time] period | [age-cohort] of products, [scenario], [component] |
| | **In-use stock (2_IUS_)** | Objects (good/ substance) residing in use phase | Mass, energy, monetary value, pieces | [material/commodity] in [process = use phase] in [region] in [time] period | [age-cohort] of products, [scenario] |
| | **Population (2_P_)** | Population in region | People | Residence [region], [time] point | [age-cohort] of people, [scenario] |

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| **Material/Product property (3)** Intensive (per unit) property of materials or products | **Lifetime (3_LT_)** | typically in use phase, or residence time in landfill etc. | Time | [material/commodity] in [process] in [region] | [age-cohort] of products, [scenario] |
| | **Material composition (3_MC_)** | m.c. of products, alloys, waste/scrap, etc. | Mass ratio | [material] in [material/commodity] | [age-cohort], [region] of production, [scenario] |
| | **Share (3_SHA_)** | share (in %) of something | Mass ratio, mass per area, mass per volume, mass per unit | [material/chemical element] in [material/commodity] | [process], [time], [region], [scenario] |
| | **Price (3_PR_)** | price data | Value per mass, value per unit | [material/commodity], [time], [region] | [process], [scenario] |
| | **Intensity of use of products (3_IUP_)** | service (physical or immaterial) extracted from products | Service per unit | [service] category per [commodity] in [process] in [region] in [time] period | [age-cohort], [technology] of product, [scenario] |
| | **Specific energy consumption of products (3_EIP_)** | energy per unit of use of products, e.g., MJ/km of vehicle driven | Energy per unit of service, energy per hour of operation | [energy carrier] of [commodity] in [process] in [region] in [time] period per [service] category (unit of use) | [age-cohort], [technology] of product, [scenario] |
| | **Characterisation factor (3_CF_)** | Environmental or social midpoint or endpoint indicator per unit of substance listed in life cycle inventory | Per unit impacts | [impact_indicator] per [material] in [process]<br><br>Here, the process aspects describes the compartment for which impacts are assessed. | |

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| **Process parameter (4)** Intensive (per unit) property of processes | **Process yield (4_PY_)** | material yield of processes | Mass ratio | [material] in [input_commodity] into [output_commodity] in [process] in [region] | [technology] of process, [age-cohort], [scenario] |
| | **Process extensions (4_PE_)** | Extension per output | per unit emissions, per unit resource uptake | [material/commodity] per [output_commodity] in [process] in [region] in [time]<br><br>[time] can be time point (exact measurement) or period (representative average value). | [technology] of process, [age-cohort], [scenario] |
| | **Process costs (4_PC_)** | Costs per capacity | per unit costs | [layer] per [output_commodity] in [process] in [region] | [technology] of process, [age-cohort], [scenario] |
| | **Unit process inventory (4_UPI_)** | flows entering and leaving process, normalized, for LCI datasets | Mass, energy, monetary value, pieces, | [layer] of [material/commodity] of [material_category] and [material_group] from [origin_process] in [origin_region] to [destination_process] in [destination_region] valid for [time] period<br><br>(exactly one exchange is labelled as material_group = 'ReferenceProduct') | [age-cohort] of process technology, [scenario] |
| | **Transfer coefficients (4_TC_)** | transfer coefficients, e.g., those used in ecoinvent | mass, energy, … | [layer] of [input_material] to [process] in [region] to [layer] of [output_material] for [time] period | [scenario] |
| | **Activity parameters (4_PAR_)** | parameters, e.g., those used in ecoinvent | Parameter name | [process] in [region] for [time] period and [layer] | Here, [layer] is the parameter name. [scenario] |
| **Process properties (5)** extensive properties of processes | **Process capacity (5_CAP_)** | Capacity of processes | Mass flow, energy flow, number of items per time, | [output_commodity] in [process] in [region] in [time] | [technology] of process, [age-cohort], [scenario] |

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| **General ratios (6)** Ratios of quantities of types 1-5 | **Per capita stock (6_PCS_)** | Stock per person, e.g., cars per capita | Mass, energy, monetary value, pieces, | [good/substance] in [process] in [region] at [time] point | [age-cohort of product], [scenario] |
| | **Per capita flows (6_PCF_)** | Flows per persion, e.g., GDP per capita | Mass, energy, monetary value, pieces, | [good/substance] from [origin_process] in [origin_region] to [destination_process] in [destination_region] in [time] period | [scenario] |
| | **Material substitution coefficient (6_MSC_)** | Amount of material 1 substituted by amount of material 2. | Mass ratio | new [material/substance] per old [material/substance] in [commodity] | [region], [time], [scenario] |
| | **Misc_intensive (6_MIP_)** | miscellaneous intensive properties, e.g., those used in ecoinvent | carbon content, dry matter content, … | [material] from [origin_process] in [origin_region] to [destination_process] in [destination_region] for [time] period and [layer] | [scenario] |
| | **Criticality (6_CR_)** | criticality indicators | different criticality metrics | [material] in [process] in [region] for [time] period and [Impact_indicator] | Here, [Impact_indicator] is a criticality indicator. [scenario] |
| | **Impact indicators (6_IMI_)** | impact indicators, e.g., from LC impact assessment | mass, energy, … | [material] from [origin_process] in [region] to [destination_process] for [time] period and [layer] and [Impact_indicator] | [scenario] |
| | **Flow_prices (6_FPR_)** | price information for flows (not products: 3_PR) | price (value per mass/energy) | [material] from [origin_process] in [origin_region] to [destination_process] in [destination_region] for [time] period and [layer] | Here, [Layer] is a price layer. [scenario] |
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| **Correspondence tables (7)** between different classifications | **Correspondence table (7_CT_)** | Contains the links (correspondence) to a different classification | Correspondence | [aspect1 classification item] corresponds to [aspect2 classficiation item] | |

Each dataset in the IEDC has a unique name (id), which is a combination of the data category number, the data type acronym, and some descriptive text, all as one word.

**Examples:**

1_F_WIO_Japan_Nakamura_Kondo_2002 - The Japanese waste-input-output table from the 2002 publication by Nakamura and Kondo.

4_PE_EnergyIntensity_AluminiumCycle_Liu_2012 - Specific energy consumption in the aluminium cycles from the 2012 publication of Liu et al.

3_MC_Buildings_Ortlepp_2016 - Material content of buildings from the 2016 publication of Ortlepp et al.

From the examples it is clear that the id structure helps to quickly identify data category, type, author, and some description but that it is by no means a complete description of the dataset.

At the moment, there is no routine to check whether all mandatory aspects for the different datasets are provided. There is also flexibility in the aspect description to accommodate for the large diversity of data source in our field. It is the responsibility of the authors to build meaningful and complete data models (in form of the aspect structure) of the data they submit to a database, and it is the responsibility of the data reviewers to check the correctness and completeness of the data model for each dataset submitted, and to request changes if the model is ambiguous or incomplete.