

Use Case: Exchange of a Material and Properties

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Status: Draft

Mentor: PDM-IF

Use Case: Exchange of Material and Properties

Aim

The aim is to enable the exchange of Materials, Coating Layers and Surface Conditions, which is:

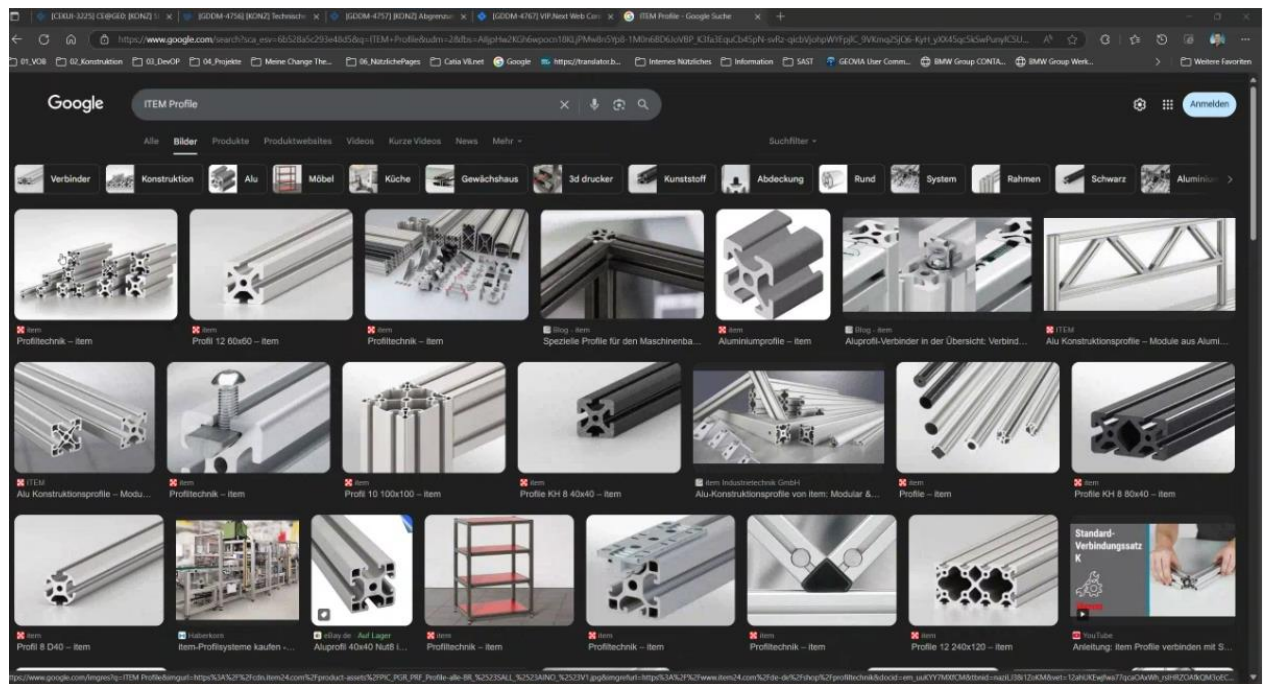
- 1) Material:
 - Main attributes like Id, Name, Standard, Owner, Date
 - Properties (e.g. density, conductivity, hardness, ...) with measurement environment (e.g. humidity, temperature, ...)
- 2) Coating Layer:
 - One or multiple (ordered) Coating Layer of a Part, with material identification, thickness and optional Surface Condition
- 3) Surface Condition:
 - One or multiple (ordered) Surface Conditions of a Part, with their definition

Properties may be repeated from the Material standard or may be customized in the PDM system.

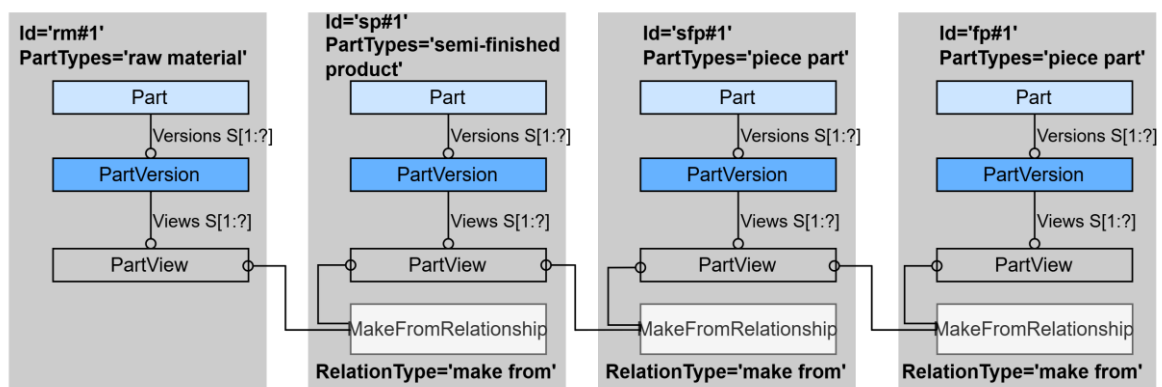
Raw material and Coating Layer material condition are mapped as a Part.

Physical Parts are classified as standard parts, semi-finished products or piece parts.

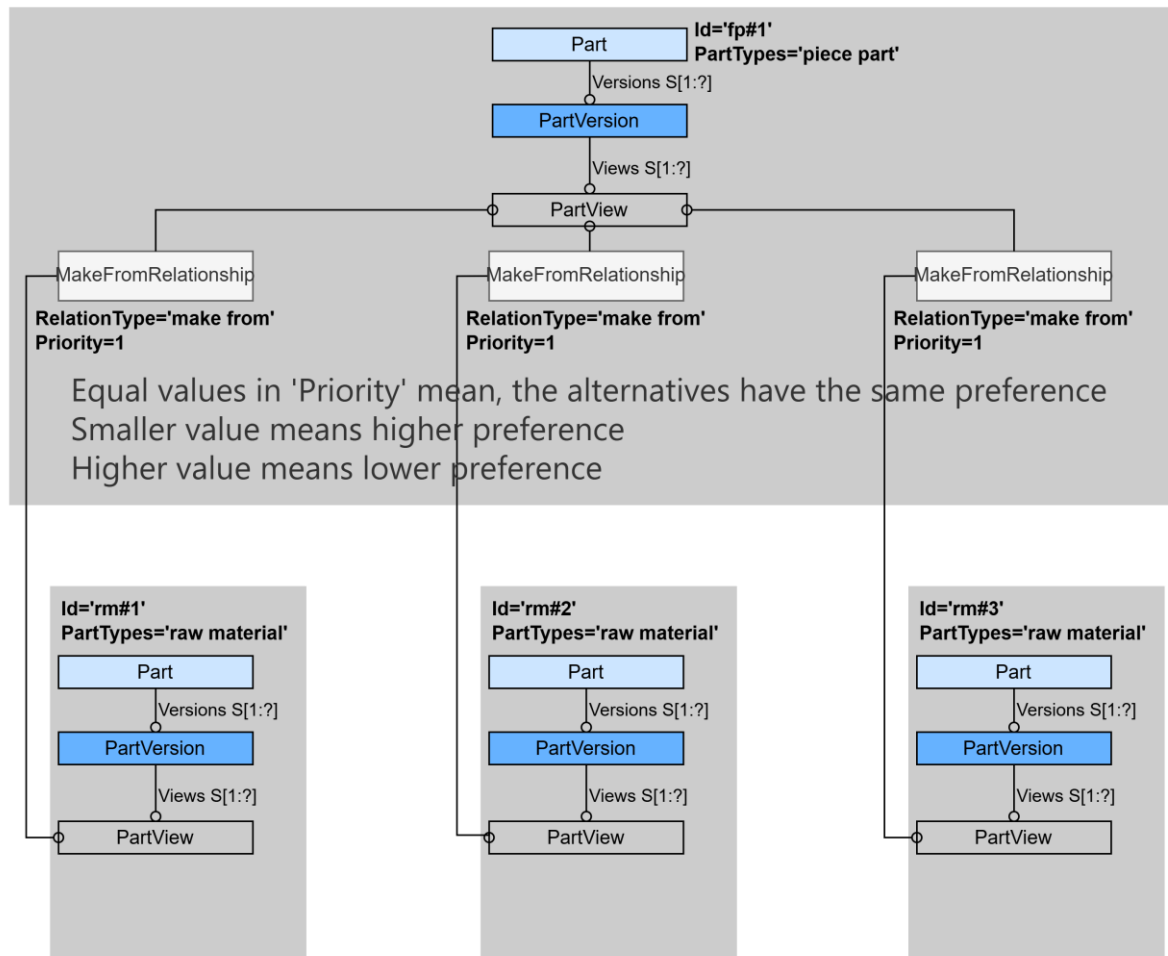
Semi-finished products (e.g. profiles, coils, rolls, ...) are catalogue parts that are typically cut to the write length:



The manufacturing of these parts may be defined as a 'make from' chain:



During the design phase, a Part may have potentially alternative Materials:



Use case diagram

The diagram below illustrates the use case process within a scenario with file exchange and systems synchronisation.

Actors

- OEM: owner of the catalogue of materials that may be used by the suppliers
- Supplier Partners: Responsible for choosing the materials or proposing further ones
- OEM: proposing alternative materials to a Part
- Supplier Partners: proposing one alternative
- OEM: describing the 'make from' chain + Coating Layers and Surface Conditions
- Supplier Partners: consuming this information

Benefits

- Normalized exchange of Material and Properties (for example according to 231-200):

Nr.	Title	Description
1	Identifier	Database key, variable depending on user data
2	Standard type	Abbreviation of the respective standard type; e.g., DIN, EN, GS, SAE
3	Standard number	Number of the underlying standard
4	Legal owner	Creator of the standard document, especially important for internal company standards
5	Issue date	Issue Date of the underlying standard
6	Abbreviation	The abbreviation of the material as defined in the standard
7	Characteristics (according to standard)	Any additional characteristics necessary for identification as defined in the underlying rule, such as information on heat treatments or coatings
8	<u>Additional information</u>	Possibility to provide additional company-specific information to identify the material.

- Supporting the exchange of Material Catalogues (without parts)
- Flexible level of detail:
 - Either referencing the standard for all material properties
 - Repeating some of them in the data exchange
 - Adding material properties (part of the PDM customization)
- 'make from' chain of Parts along the manufacturing lifecycle
- Alternative Materials during early design phase

Out of Scope

- Material, Properties and Coating Layers on CAD body level (within a Part)
- Surface Conditions on single CAD shapes (within a Part)