



International Material Data System

IMDS Recommendation	IMDS 001
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General Structure

1 Purpose

This general recommendation describes the principle requirements for the creation of Material Data Sheets (MDS) within IMDS.

For some types of materials (e.g. material groups like oils, fat, plastics etc.), other requirements are valid listed in the specific requirements.

The data sheets are passed along the supply chain (tier n, tier n-1 to the OEM).

The recommendations are agreed by all car manufacturers using the IMDS and define the harmonized recommendations valid throughout the supply chain. The recommendations for the data were commonly agreed in order to guarantee a cost-effective and efficient transfer of the data on materials.

2 References

EN 10027, ISO 1043, ISO 1629, all IMDS-Recommendations but also other international standards (ASTM, JIS, etc.)

3 Definition

3.1 Structural aspects

The data sheet is built up in a tree structure. Each element consists of sub-elements as described in the subsequent topics looking at the individual symbols. One element may only consist of the same type of sub-elements. This means it may be built up only of the same kind of . E.g. a component top node may only have children that all are sub-components, semi-components, or materials. These child nodes may not be a mixture of different symbols.

3.2 Component

3.2.1 Symbol

3.2.2 Description

3.2.2.1 Component

A **Component** is a complete assembly or a component within an assembly that represents a complete part. A **Component** must have at least one material, one semi-component or one component/sub component attached to it. The component name (description) shall be reported in English, the name may be added in other languages.



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3.2.2.2 Sub-Component

A **Component** on a lower level is usually called a **Sub-Component**. When used it must have at least one material, one semi-component or one other sub-component associated with it. The sub-component name must be descriptive. The total weight of the materials under a sub-component must equal the total sub-component weight. A sub-component is described by the same symbol as a component.

3.2.3 Weight ranges

The range of the specified mass of a component may not exceed the tolerance listed on the production part drawing or in Quality Management Guidelines (e.g. QS9000/PSW (Part Submission Warrant), VDA Book 2).

The calculated weight of the component must be within the tolerance of the measured weight.

3.2.4 Synonyms

System, Sub-system, Assembly, Sub-assembly, Component, Sub-component, Part, Single part

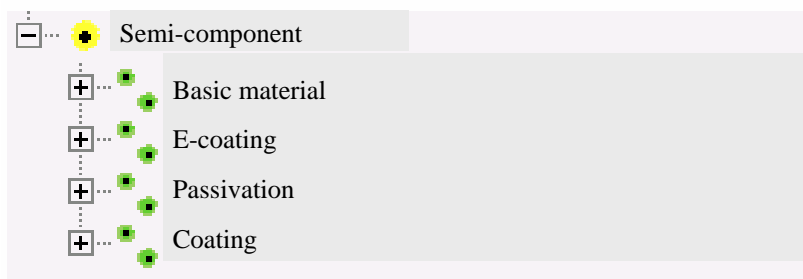
3.3 Semi-Component

3.3.1 Symbol



3.3.2 Description

A **Semi-Component** is not the same thing as a sub-component within a part. It is a semi-finished product, e.g. steel coil, pipe, leather hide, which will go through further process steps (cutting, stamping) to make a finished component. Before further processing the weight cannot be defined, therefore it has to be put into IMDS without a weight attached. A **Semi-Component** must have at least one material or one semi-component associated with it. It can contain several materials e.g. with coated sheet metal (basic material, e-coating, passivation and coating, see IMDS Recommendation 007) or electric wires (copper core, isolation, see IMDS Recommendation 019) etc.



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IMDS allows to define the portion of a semi-component, material or basic substance used in semi-components and materials. The portion may be a fix percent value, the rest - calculated on the value of the other nodes of the parent - or a range "from X to Y %". If the portion type "range" is selected, for semi-components or materials which are listed below a semi-component the following rules for the portion ranges apply.

Portion: from X% to Y%	Maximum M = Y% - X%
$0 < X \leq 100$	$M \leq 20$

MDSs published by the Steering Committee (Supplier: IMDS-Committee, ID 423; IMDS-Committee/ILI Metals, ID 18986 or Steel & Iron List / Stahl und Eisen Liste, ID 313) are excepted from this rule.

3.3.4 Synonyms

Semi-finished product (e.g.: Textile, wire rod, round bar, square bar, coil, pipe etc).

3.4 Material**3.4.1 Symbol****3.4.2 Description**

A **Material** normally consists of basic substances only. The total of all basic substances must be 100%. In exceptional cases a material can consist of other materials (e.g. filled thermoplastics consisting of the basic polymer, master batch colour and master batch flame retardant which are processed into a new coloured, flame-retarding, filled thermoplastic, see Recommendation IMDS 010). This must lead to a homogeneous material. Mixing a base material and coatings is prohibited because this would need to be described in two (or more) different materials.

A material has to be described in the state which it has in the finished component. Only the basic substances that are contained in the processed component must be reported (e.g. hardened glue or coatings without the evaporating solvents). For details on basic substances see section 3.5.

Several metallic materials (Classification 1 – 4), which are defined in public norms, were published in the IMDS (Supplier: IMDS-Committee, IMDS-Committee/ILI Metals, Stahl- und Eisen-Liste). For Materials manufactured to a public norm or standard these materials must be used. They must be referenced or attached to a tree structure. The same applies to further materials published by the IMDS Steering Committee (passivations, chromate films, electro-plated coatings, electroless metal coatings, screen printing ink etc.; Details are described in the respective Recommendations). Copying these materials or changes to them after copying are not allowed. These materials have to be referenced and are preferred within check procedures (simplified check procedures). In the case that a material, which is defined with its chemical composition in a public specification like EN, JIS, ASTM etc. is not published by the Steering Committee (Supplier: IMDS-Committee, IMDS-Committee/ILI Metals, Stahl- und Eisen-Liste), it is recommended to ask the IMDS Help Desk to add this standard material (e.g. imds-eds-helpdesk@eds.com for EU, other Help Desks see Home Page of IMDS).

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Fields:

The screenshot shows the IMDS software interface. On the left, there is a tree view under the heading 'Name' containing six entries: Substance 1, Substance 2, Substance 3, Substance 4, Substance 5, and Substance 6, each with a blue triangle icon. At the top of the interface, there are navigation icons and a dropdown menu set to 'GADSL'. On the right, a 'Details' panel is open, displaying the following fields and values:

- Type: Material (MDS)
- ID / Version: system
- MDS Supplier: IMDS-Committee
- Name: mandatory (EN)
- Trade name: mandatory/optional (EN)
- Internal Mat.-No.: optional
- Std. Mat.-No.: mandatory/optional
- Symbol: mandatory/optional
- Classification: mandatory
- Norms/Standards: mandatory/optional
- Inhouse Norms: optional
- Supplier: optional
- Remark: optional (EN)
- Development Sample Report: (optional)

ID/Version:

Number / Version number, is automatically generated by the system when a new material is created. With this number the material can be clearly identified.

MDS Supplier:

MDS creating company.- automatically generated by system.

Name:

The material name must always define the material and not be a trade name. Material names shall be chosen from existing standards, e.g.

- for metallic material:
 - steel – Steel / Iron List, EN 10027, JIS norms, e.g. STM-C 540
 - aluminium alloys – EN 573, JIS norms, e.g. Al-Si12
 - copper alloys – ISO norms, e.g. CuAl5
 - etc.
- for plastics – ISO 1043-1 to 4 (see IMDS 010), e.g. PE-LD
- for elastomers – ISO 1629 (see IMDS 003), e.g. ACM
- for thermoplastic elastomers – ISO 18064 (see IMDS 013), e.g. TPA-ES

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If no name is available which is described in an international specification the name must be descriptive like

- adhesive layer (for adhesives)
- fatting agent (e.g. for leather)
- finish (e.g. for textiles)
- lamination material (e.g. laminate for textiles)
- primer, basecoat, clearcoat (for paints)

The name must be entered in English in the EN field. The name in other languages is optional.

Internal Mat. No.: The suppliers often use internal material numbers to identify their products. Here this supplier internal material number can be added. This entry is not mandatory and must not be mixed up with the standard material number, described in the chapter **Std. Mat. No°:**

Trade name:

Product trade name. For standard products which are defined in public norms (e.g. most metallic materials), this entry is not mandatory. In drawings these trade names sometimes are pre-defined. Then the entry is mandatory. For materials which are not defined in public norms (e.g. plastic materials, oils, fats, flake layers, glue etc.) this entry is not mandatory but useful in order to uniquely identify the product. The mandatory disclosure of materials and contained substances is not affected by the reporting of a trade name.

Std. Mat. No°:

For metallic materials (Classification 1 - 4) for which a material number is defined in public norms this entry is mandatory. For other materials it is optional or even impossible (e.g. thermoplastics filled/unfilled or elastomers), because in some cases material numbers are not defined.

Symbol:

Mandatory for thermoplastics (filled/unfilled, ISO 1043 1 - 4, see Recommendation IMDS 010), thermoplastic elastomers (ISO 18064, see Recommendation 013), and elastomers (ISO 1629, see Recommendation IMDS 003). For other materials it is optional or even impossible.

Classification:

Mandatory. All materials have to be assigned a correct classification.

Norms/Standards:

Public norms, in which material compositions are defined (e.g. EN, DIN, JIS, ASTM, ISO etc.). For materials described in these norms an entry is mandatory.

In-house norms:

This is no free text field. These norms are specific to a particular car manufacturer's material specification. Only users of the creating company and the car manufacturer whose norm it is will be able to see the norm when used. Optional e.g. for materials which are not defined in public norms.

Supplier:

For data sheets that are created by you for your material supplier. This is only useful for small suppliers and should only be used rarely.

Remark:

This is a free text field and is not searchable. Customer-required comments or Disclaimer for this field are not acceptable or useful. This field must be used for material related comments only.

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Optional at the moment. With the integration of IMDS into the development process this field becomes useful. For initial samples other check procedures will be introduced which will be adapted to the less detailed description. Details are published in Recommendation 023.

3.4.3 Portion ranges

For materials which are listed below a semi-component or a material you have to enter the portion ranges in which they are applied (in %). The limits for these portion ranges are listed in the table below:

Portion: from X% to Y%	Maximum M = Y% - X%
$0 < X \leq 100$	$M \leq 20$

MDSs published by the Steering Committee (Supplier: IMDS Steering Committee, Steel & Iron list or ILI) are excepted from this rule.

3.4.4 Synonyms

Not applicable

3.5 Basic substance**3.5.1 Symbol****3.5.2 Description**

A **Basic substance** is part of a material.

- The basic substances available have to be chosen from the existing list in the IMDS. If basic substances are missing they can be inserted by an IMDS Help Desk. You have to send them your request and all available information. Not all requests are guaranteed. Substances may not yet exist in the basic substance list and may not represent a mixture of different substances
- The basic substance must be entered in the form it exists in the material, i.e. elemental breakdown for polymers (C, H, N, O etc.) is NOT acceptable
- The sum of the basic substances attached to a material must be 100% (or > 100% if ranges are used) before the material datasheet can be sent to another company.
- If applicable, a basic substance must always be associated with the most specific CAS-number. Exceptions from this are defined in the respective Recommendations (e.g. basic polymers, basic duromers, textile fibers etc.).
- **Maximum range of a portion of basic substances**
The maximum range of a substance which can be applied to a material depends on the classification of the material. For the following classifications
 - 5.1.x Thermoplastics
 - 5.2 Thermoplastic elastomers
 - 5.3 Elastomers / elastomeric compounds
 - 5.4 / 5.4.x Duromers
 - 5.5.1 Plastics (in polymeric compounds)
 - 6.2 Adhesives, sealantsthe following ranges apply:

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Portion: from X% to Y%	Maximum M = Y% - X%
$0 \leq X \leq 7.5$	$M \leq 3$
$7.5 < X \leq 20$	$M \leq 5$
$20 < X \leq 100$	$M \leq 10$

In the case of material classification

- 9.2 Lubricants

this alternative table applies:

Portion: from X% to Y%	Maximum M = Y% - X%
$0 \leq X \leq 5$	$M \leq 4$
$5 < X \leq 20$	$M \leq 6$
$20 < X \leq 100$	$M \leq 10$

In case of the other material classifications, there is a special table used for basic substances:

Portion: from X% to Y%	Maximum M = Y% - X%
$0 \leq X \leq 10$	$M \leq 2$
$10 < X \leq 20$	$M \leq 4$
$20 < X \leq 50$	$M \leq 6$
$50 < X \leq 100$	$M \leq 10$

If such a range is used (e.g. 5 % - 7 %) the smaller number defines the range limits to be used. Therefore the range 9 % - 12 % is not allowed because for 9 % only a range of +/- 1 % can be applied.

Exceptions:

- If a basic substance is defined in a public norm as part of a material with a larger range
- If a basic substance is defined in an inhouse specification of a supplier with a larger range. This inhouse specification has to be part of the delivery conditions. This exception must be noted in the Remark field
- All materials from the IMDS Steering Committee (IMDS-Committee, IMDS-Committee/ILI Metals, Stahl und Eisen Liste)

Basic substance are subdivided into four different “substance types”

1. **Basic Substances / Constituents**

Include the material's main ingredients (constituents) e.g. basic polymer, filler material. This information is mandatory.

2. **Declarable Substances**

Substances, which have to be declared according to the GADSL list (former ILRS, VDA 232-101, GMW3059, Ford WSS-M99P9999-A1 (Hex9), TSZ0001G) because they are duty-to-declare and/or prohibited. These substances appear in IMDS in colored letters and cannot be marked confidential (see next section).

3. **Confidential Substances**

Not declarable and/or prohibited substances (i.e. substances which do not belong to the GADSL list, black characters) can – according to several rules – be marked “confidential” (**in total not more than 10 % of the homogeneous material**). These data then can only be seen by “trusted users”. These trusted users can be defined by the client manager of the IMDS creating company and are employees of OEMs or other suppliers. The creating company of the data sheet hence remains the data owner. Along the process / supply chain this information is only visible to these trusted users.

4.

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Highly Confidential Substances

Small amounts of not declarable and/or prohibited substances, i.e. substances which do not belong to the GADSL list, may be declared as highly confidential substances (**in total not more than 10%**, unless otherwise specified). These are entered into IMDS using wild cards ("jokers") (see section 3.5.4). In this case the data owner is obliged to archive the data (for a minimum of 30 years). In special justified cases, on customer's request (health care, environmental protection), the data shall be made accessible to the requestor.

If legal requirements, the GADSL, or other restricted substance lists change so that any part of the substances replaced by a wild card becomes declarable and/or prohibited the respective MDS has to be up-dated by the supplier accordingly (see the Change Management Recommendation 022)

In total, the substance levels 3 and 4 must not cover more than 10 % of the substances in a material (unless it is in a material classification permitted in other Recommendations or published by IMDS-Committee, IMDS-Committee/ILI Metals or Stahl und Eisenliste).

3.5.3 Synonyms

Ingredients, Chemicals, Constituents, Hazardous Materials, Chemical Agents

3.5.4 High Confidential Substances „Wild Card“

Wild Cards must not

- replace declarable and/or reportable substances
- be marked confidential

Wild Cards can be used in certain circumstances

- for Highly Confidential Substances (see 3.5.2, point 4),
- **in a total not exceeding 10 %**. All materials by the IMDS Steering Committee (IMDS-Committee, IMDS-Committee/ILI Metals, Stahl und Eisen Liste) are excluded from this regulation.
- to complete MDS of material or assemblies under development, which are not available during the data collection
- "Wild Cards" have the CAS number "system". Only 9 of them are available in IMDS.

MDS and Module Search						
No.	Name	CAS No.	EU-Index	Einecs-No.	Synonym	ILRS
1	Flame Retardant, not to de...	system	system	system	-	-
2	Further Additives, not to de...	system	system	system	Additives, not...	-
3	Impact modifier, not to decl...	system	system	system	-	-
4	Inorganic Ingredient, not to ...	system	system	system	Mineral Mater...	-
5	Misc., not to declare	system	system	system	Miscellaneous	-
6	not yet specified, not to dec...	system	system	system	-	-
7	Organic Ingredient, not to d...	system	system	system	Natural Ingre...	-
8	Pigment portion, not to decl...	system	system	system	colorant, not t...	-
9	Plasticizer, not to declare	system	system	system	-	-

3.5.4.1 Wild card >Flame retardant, not to declare<

This wild card may not be used in plastics, in that case, please refer to the IMDS Recommendation 010.

3.5.4.2 Wild card >Further Additive, not to declare <

Additives in e.g. polymers, which are not described by one of the other wild cards.

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3.5.4.3 Wild card >Impact modifier, not to declare <

This wild card is meant to describe substances, which have influence on the cold impact behavior. Most plastics include the impact modifier in the pseudo substance (see Recommendation IMDS 010).

3.5.4.4 Wild card >Inorganic Ingredient, not to declare <

Can be used to describe inorganic substances as pure substances of the materials (rock powder, ash content)

3.5.4.5 Wild card >Misc., not to declare <

Can be used to describe impurities or residues.

3.5.4.6 Wild card >not yet specified<

- only allowed for development parts
- applicable in cases where the data is not available during the development phase
- must not be used for the report of a production part

3.5.4.7 Wild card >Organic Ingredient, not to declare <

Can be used for an organic substance as pure substance (e.g. wood fibers)

3.5.4.8 Wild card >Pigment portion, not to declare <

Can be used to describe pigments (Color pigments, Pigment portion, Color agent)

3.5.4.9 Wild card >Plasticiser, not to declare <

Can be used to describe ingredients in plastic products, which influence the deformation of the product. The up-to-date plasticisers can be found in Recommendation 010.

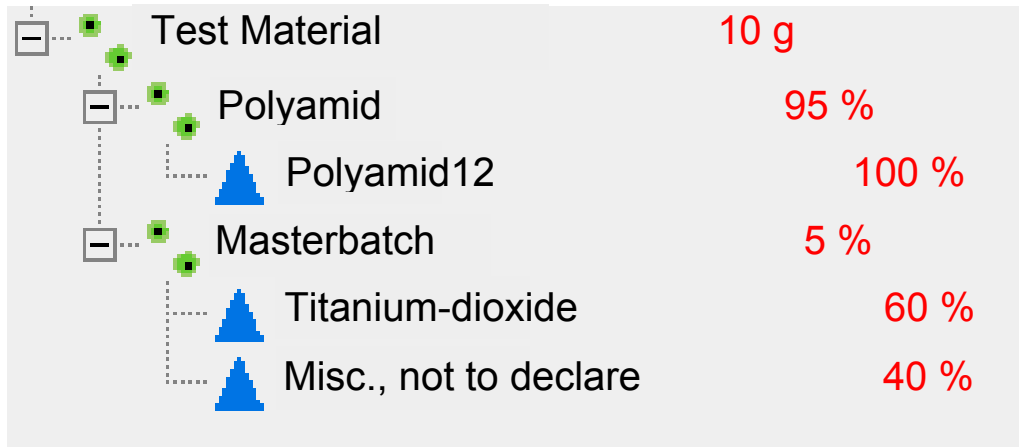
3.5.4.10 Example for limiting unspecified basic substances.

This example of a filled thermoplastic is accepted because the sum of the maximum values of the ranges of the wild cards is within the limit of 10%.

Test material	range	specified	unspecified (wild cards)
▲ PVC	57-64	57-64	
▲ GF-Fibre	30-35	30-35	
▲ Further Additives, not	4-6		4-6
▲ Pigment portion, not to	1-2		1-2
▲ Inorganic Ingredient, n	0-1		0-1
▲ Misc., not to declare	0-1		0-1
		Σ 87-99	Σ 5-10

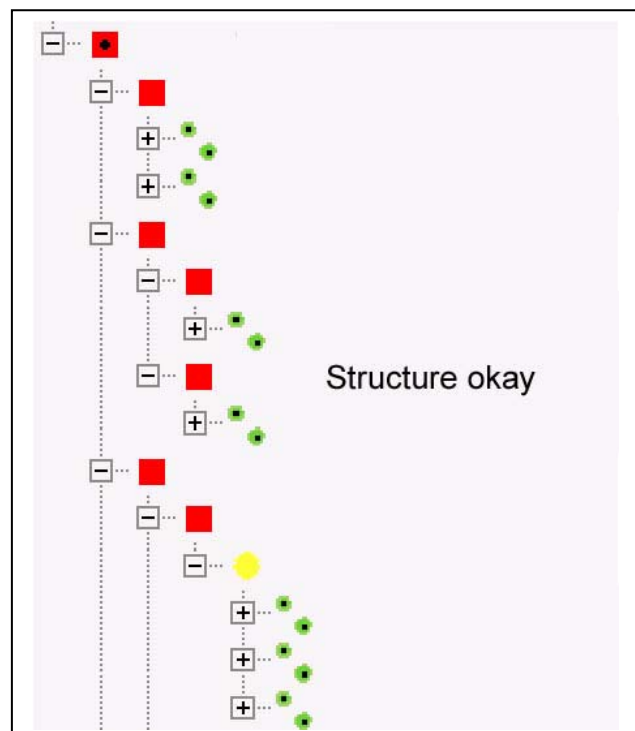
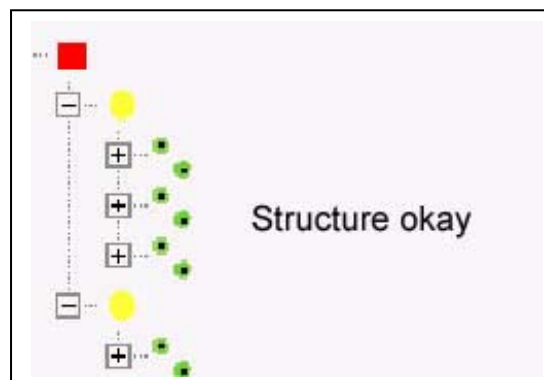
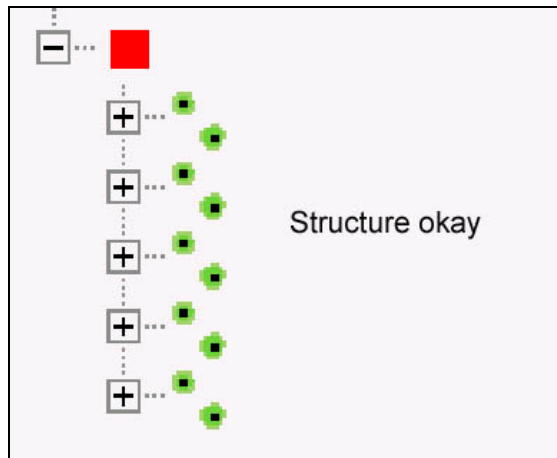
For adding unspecific substances (wild cards, confidential substances) the sum of the maximum possible percentage is limited.

If a material consists of several sub-materials (e.g. material filled thermoplastic consisting of the sub-materials basic polymer, master batch colour pigment, and master batch flame retardant) the limitation of the total unspecified substances has to be met at the material top-node. At the level of the sub-materials the share of unspecified substances can be higher.



4 Examples

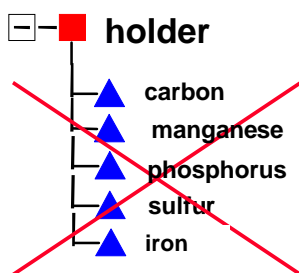
4.1 Graphics of valid structures



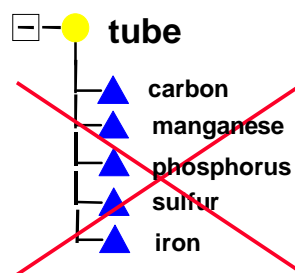
4.2 Mistakes

The following structures are not allowed:

1. Missing material level (for MDS created now not possible because of system check)



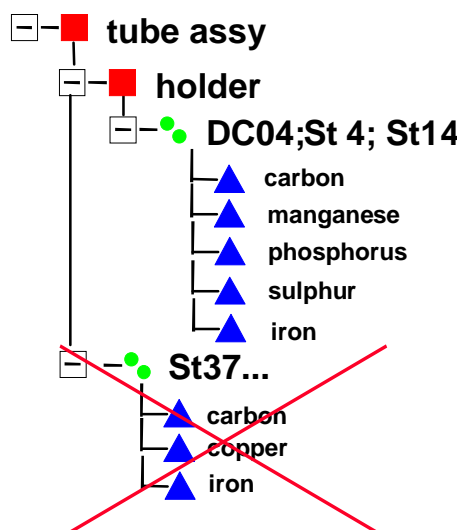
Structure is wrong, because the material level is missing; since release 2.0 this fault is checked by the system



Structure is wrong, because the material level is missing; since release 2.0 this fault is checked by the system

2. Assembly without sub-assembly/part and different symbols in one structural level

Assemblies shall only contain sub-assemblies and/or single parts, but not materials. In one structural level only the same kind of elements may be used. It indeed gives a datasheet that is easier to understand.





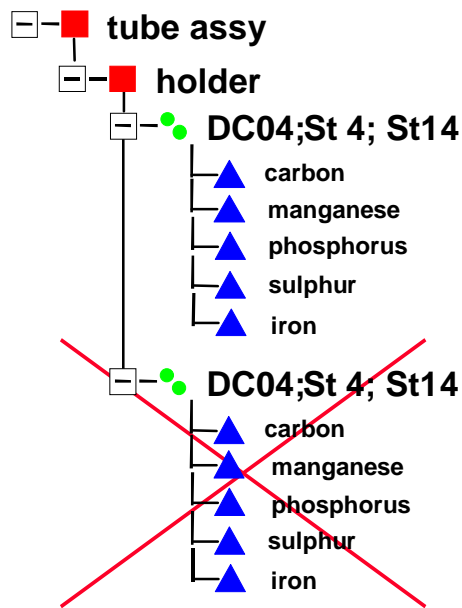
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3. An identical material should not be put twice on the same structure level.

If a part or a sub-part consists of two identical materials these materials shall be combined to one material with the weight of both of them.





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The recommendation was first approved and released on December 13th 2002.

5.2 Revision

Rev.	Date	Description / Reason	Originating Committee
1	Aug. 2003	Better definitions of the material and basic substances levels	IMDS SC
2	24.09.03	Editorial changes	IMDS SC
3	30.10.03	More specific definitions in points: 1, 3.5.2 and 3.5.4	IMDS SC
4	Dec 2005	3.2.2.3 definition FBOM 3.2.3 specification of weight ranges 3.3.2 extended description of semi-components and example 3.3.3 portion ranges of semi-components 3.4.2 extended definition and description of materials 3.4.3 portion ranges of materials 3.5.2 extended description of basic substances 3.5.4.10 example for the use of wild card additional editorial changes	IMDS SC
5	March 2007	Adapted to check procedure of release 4.0: 3.3.3 Ranges for semi-components 3.4.2 Fields updated (Release 4.0), Std. Mat.-No / Internal Mat.-No. defined 3.5.2 Ranges for substances adjusted to the different classifications 4.2 Example added additional editorial changes	IMDS SC