

Cover Sheet

Title: IMDS-Material-Data-Sheet treatment
Topic: Specifications
Key Words: IMDS; MDB; RoHS

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This Technical Guideline is also available in German

Preparation	Revision	Date	Prepared by	Approved by
Initial Publication	00	12.10.04	Notarangelo	R&D
Change	Revision	Date	Changed by	Approved by
A.3 Symbols; A.4.5 - A.4.12 deleted	01	01.11.06	M.Keidel	R&D
update	02	28.08.07	M.Keidel	

Title: IMDS-Material-Data-Sheet treatment

1 Purpose

The enclosure defines the criteria of the Buehler Motor GmbH for receipt of Material Data Sheets (MDS) on the International Material Data System (IMDS).

Following these regulations should avoid, that:

- troubles within the PPAP-release-process occur and
- the electronic material data sheets from the suppliers has to be rejected.

2 Validity

This specification applies for all substances, preparations and products, which will be delivered to the Buehler Motor Group by suppliers.

The submission of the IMDS data is mandatory for the PPAP approval.

3 Terms, Abbreviations

IMDS	International Material Data System
MDS	Material data Sheet
RoHS	Removal of Hazardous Substances Directive(2002/95/EC)
GADSL	Global Automotive Declarable Substance List
ILI-List	ILI-Metalldata base

4 Symbols

Symbols



The red quadrangle stands as a symbol for a **Component**.

- **Component**

A **Component** is a complete assembly or a component within an assembly that builds up 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.

- **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.

- **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.



The yellow circle is the symbol for a **semi-component**.

- **semi-component**

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, pipes, 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.

Portion ranges

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.



Two small green circles symbolize **material**.

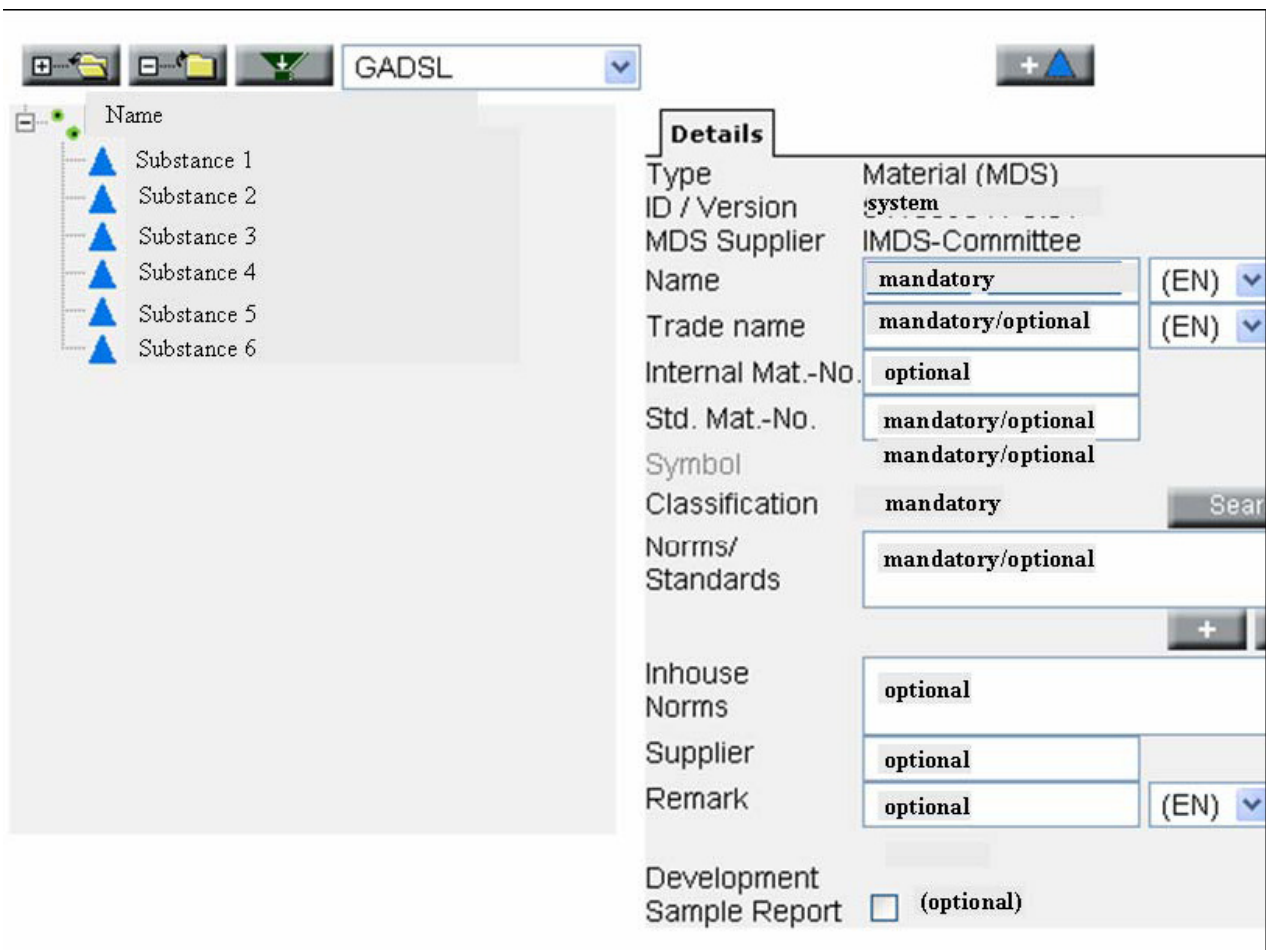
- **Material**

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 have to be inserted which are contained in the processed component (e.g. hardened glue, burned or hardened coatings without the evaporating solvents). For details on basic substances see page 6.

Several metallic materials (Classification 1 – 4), which are defined in public norms, were published in the IMDS (Supplier: ILI, IMDS-Committee, Steel & Iron list). These materials have to be preferably used. They can be referenced. The same applies to further materials published by the IMDS Steering Committee (passivations, chromate films, electro-plated coatings, electro less 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).

Fields:



The screenshot shows a software interface with a tree view on the left and a 'Details' form on the right. The tree view lists six substances. The 'Details' form is for a material named 'GADSL' and includes the following fields:

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	<input type="checkbox"/> (optional)

ID/Version:

Number / Version number, are 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.

Name:

The material name should always define the material and not be generic.

Material name shall be chosen from existing standards, e.g.

- for metallic material:
 - o steel – Steel / Iron List, EN 10027, JIS norms, e.g. STM-C 540
 - o aluminium alloys – EN 573, JIS norms, e.g. Al-Si12
 - o copper alloys – ISO norms, e.g. CuAl5
 - o 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)

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.

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 are sometimes 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.

Internal Material 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** :

Material-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 no material numbers are 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).

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:

Optional e.g. for materials which are not defined in public norms.

Comment:

Free text, not searchable. Customer-required comments for this field are not acceptable / useful.

Initial sample:

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

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.



A blue triangle symbolizes a basic substance.

Basic substances

- 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 the IMDS Help Desks. By doing so also a check is carried out whether this substance exists already or whether it is a mixture of different substances. In these cases the entry is refused.
 - 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 equal 100% (or > 100% if ranges are used) before the material datasheet can be sent to another company.
 - If applicable, a basic substance should 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, sealants
 the following ranges apply:

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 levels”

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 creator of the MDS and can be employees at OEMs or also employees of another supplier. The creator of the data sheet hence remains the data owner. Along the process / supply chain this information is only visible to these trusted users.

4. 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 min. 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).

5 Regulations

On receipt of material data sheets (MDS) the following things will be checked:

- Buehler part number
- Part description
- Tree structure (Hierarchy)
- Complete amount of parts
- Material name
- Trade name
- Material classification according to VDA 231-106 ILRS
- Confidential basic substances
- Use of jokers
- Forbidden basic substances and basic substances for which the duty of declaration is needed, according to VDA 232-101
- Information about sampling

5.1 Part number

The Buehler part number (11-digit) has to be filled in the sheet „recipient data“. The part number has to be filled in left-aligned, without blanks and without special characters (e.g. point).

Reasons for refusals

- Missing part number
- Part number non-conform to Buehler
(deviates from Buehler part number 11-digit, e.g. supplier part number)
- One MDS for several part numbers
(e.g. for left and right part at the same time)

5.2 Part description

The part description has to be given according to the Buehler drawing, respectively CAD-data file (this is analog for semi-finished product numbers).

Reasons for refusals

- Missing part description
- Part number non-conform to Buehler (e.g. part description of supplier)

5.3 Weight of parts

Reasons for refusals

- Deviation of the calculated weights beyond tolerance

5.4 Tree structure

The tree structure has to be completed. The hierarchy must be correct for the use of symbols.

- Hierarchy**
- On one level there have only to be the same symbols
 - Single parts and semi-components have to be described by materials
 - The appropriate basic substances have to be assigned to the materials
 - Small parts of numerous assemblies could be reasonable summarized to material groups.

Reasons for refusals

- Missing level of material
(basic substance is added directly to the part, respectively to the semi-component)
- Different symbols on one level
- (Confidential basic substance + Joker) if 10 %-limit is crossed

Advice Missing information about constituents (especially about dangerous substances) have to be investigated with analyses by suppliers if necessary.

5.5 ID number and Version number

The ID number is given automatically from the system and should not be changed due to correction of the MDS or new drawing index. **To correct an already sent MDS create a new version.**

6 Responsibility

- Materials
- R&D

7 Other applicable documents

- End of life vehicles Directive (2000/53/EC)
- Removal of hazardous substance Directive (RoHS 2002/95/EC)
- 76/769/EEC Restrictions on the marketing and use of certain dangerous substances and preparations
- For special products: phthalate 2005/84/EC