

ESMDB: European Space Materials Database

Adrian J Graham

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- To help increase the competitiveness of the European Space Industry by:
 - Defining the minimum dataset required to characterise a material for space use
 - Provide a system of storing and exchanging the materials data
 - Identifying materials that should be characterised
 - Dividing the work for commonly used materials
 - Review and approve the materials data
 - Populating the system with the relevant data
- **Testing shall be performed and materials data shared by the members on a no exchange of funds basis**

Working Group Members



MTPB

ESMDB Steering Board

Working Group

Metals

Organics

Ceramics

- Access will be given to individuals working in
 - European (ESA member states) Space Industry
 - NASA and JAXA (reciprocal agreement)
 - Case by Case basis for those working in partnership with a European International or National Space Agencies or other European space projects
- Access vetted by the ESMDB steering board

Data Sources



Testing

Manufacturer

Data

DMPL

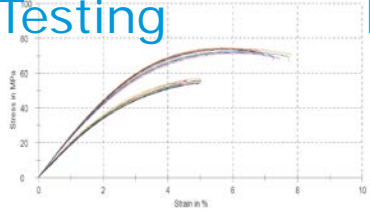


Table D-3: Example of raw B and DPL
DECLARED PROCESS LIST (DPL)

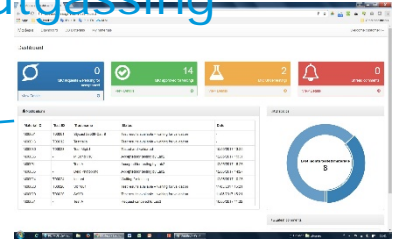
Item No.	Item Name	Item Description	Item Category	Item Status	Item Type	Item Value	Item Unit	Item Code	Item Date	Item Location	Item Remarks
1
2
3
4
5



ESMDB



Outgassing



- Materials needs a unique name for indexing
 - Synonyms will be stored with the unique name
- Organic Materials
 - The English name of the Technical Data Sheet shall be used
- Metallic Materials
 - Common name depends on alloy class
 - Still under discussion
- Composites
 - Compound name based on Matrix and Reinforcement
- Ceramics and Glasses
 - The English name of the Technical Data Sheet shall be used
- Coatings
 - Still under discussion

Naming convention - Organics



	Rules	Example
1	The English name of the Technical Data Sheet shall be used	
2	The first letter of each word of the name shall be in capital, the following letters not	Loctite Stycast 2651MM
3	Special character like "/ ; > < ® ™" shall not be used, if necessary the "/" can be replaced by a "."	Hexcel Redux® 312/5 → Redux 312_5
4	If there is a trade mark, the name of the manufacturer shall not be added and the trademark sign ® or ™ shall not be indicated	Hexcel Redux® 312 → Redux 312 3M™ Scotch-Weld™ DP 490 → Scotch-Weld DP 490
5	If there is no trademark, the name of the supplier shall be added before the name of the material	CV-2500 → Nusil CV-2500 Electrical Tape 92 → 3M Electrical Tape 92
6	The weight, the packaging or the chemical nature in the name shall not be indicated	3M™ Scotchcast™ Electrical Resin 5230N → Scotchcast 5230N Loctite Stycast 2651 MM 25KG → Loctite Stycast 2651 MM
7	If the material is delivered necessarily in two parts like type A and B, "A and B" shall not appear in the name. If a second or third component is required but can be selected from several options, then refer to rule 10 to include all the components selected.	3M™ Scotch-Weld™ Epoxy Adhesive EC-2216 B/A Gray → Scotch-Weld EC-2216 Gray
8	No generic materials are allowed (Kapton, Vespel...). Generic names must be identified with their specific grade.	'Vespel' is not permitted but Vespel SP-1
9	If there are several types of color for a same material, several materials shall be created with appropriate naming.	Scotch-Weld EC-2216 Gray Scotch-Weld EC-2216 Translucent Scotch-Weld EC-2216 Tan NS
10	For mixing or association of two or more materials, the name shall be written according to this rule: « Name1 + Name2 + Name3 + ... ». (Matrix + Fiber or Resin + Hardener + Catalyst)	Cytec LTM 123 + Toray M40J Araldite AW139 + Huntsman HV998
11	For the catalyst, the naming « Cat. » shall be used, except if there is a specific name in the technical datasheet	Loctite Stycast 2651 MM + Loctite Cat. 9
Note	Many materials are referred to by their common names in discussions. For inclusion in the ESMDB their names in the 'usual name' field shall follow the rules above.	Tape 5 → 3M 5 Electrical Tape



Naming – Proposed Metallics

Type of metallic	Rules	Example
Aluminium and alloys	EN 573-1 including heat treatment designation for wrought products. EN XXX for cast	AlCu4MgSi → 2017 AlCu4Mg1 → 2024 AlMg1SiCu → 6061
Copper and alloys	EN 1412	CDA 353, UZ 36 → Cu64Zn36 DIN CEN/TS 13388:2008-08 Cu-HCP --> CW021A
Nickel and alloys	Commercial name	Hastelloy C Nimonic 75 Duranickel
Titanium and alloys	ASTM B265	Titane 100% → Ti Grade 1 UT40 → Ti Grade 2 TA6V → Ti Grade 5
Steels and Stainless steels	EN 10027	316L → X2CrNiMo17-12-2 304L → X2CrNi19-11

Metallic naming convention still under discussion

Organics

- Outgassing
- Thermal analysis (DSC, TMA, DMA)
- IRTF
- Outgassing species analysis (GCMS)
- CTE
- Thermal conductivity
- Electrical conductivity
- Dry extract (primers)
- Expansion level (foams)
- Hardness (Shore)

Metals

- Modulus
- Strength
- CTE
- Density / Porosity
- Thermal conductivity
- Electrical conductivity

Ceramics

- Thermal analysis (DSC, TGA)
- CTE
- Density / Porosity
- Thermal conductivity
- Electrical conductivity

Tasks Underway



- Legal Agreement
- Definition of the sub-groups
- Prioritisation of the materials

