

ELECTRONIC MATH MODEL AND DRAWING DATA CREATION STANDARD DATA ORGANIZATION - UNIGRAPHICS

A5B

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1 INTRODUCTION. This version of the standard will utilize and encompass the new technology and functionality that is part of Unigraphics V11.X with GM/PDM.

Information related to file naming has been removed, the identity of a file is replaced by dataset context.

2 FILE CONTENT.

2.1 MASTER DATA. It is intended that all part data exist electronically only once. If the data exists more than once, then one of them must be designated as the MASTER.

2.2 COPIED DATA. Copied data is a duplication of the master data. This will occur when a user, nonowner of the data, cannot directly access the database of the design group responsible for the data.

2.3 FILE APPLICATION. A file contains the 3D mathematical definition of a single part. Purchased assemblies may be managed in a single file when the parts of assembly do not have GM part numbers.

No more than one part description may be in any Unigraphics part file, however, less than a complete part description may be in a file when more than one file is necessary to define a part.

In GM/PDM, only one UGMASTER dataset type will be stored per ITEM/REVISION. See Section E.

2.4 FILE TYPES.

2.4.1 Single Part Files. The data must correspond with the required DCS category names that are automatically created by the **required categories** program when the file is created. Required reference sets will be created by using the **organize file** program.

2.4.2 Assembly Files. These files will consist of component entities which access the single part files and/or other assembly files. All data must be assigned to properly named reference sets created by the **organize file** program. These files may also contain certain 3-D geometry for promoted bodies, i.e., assembly level features and mechanisms.

2.4.3 Drawing Files. These files will consist of a component entity(s) which accesses the part and/or assembly files. This file also contains a drawing format created by the **drawing format program**. Annotation and geometry required to support an engineering drawing may also reside in these files.

Drawing files will be stored as a UGPART dataset type, in the manifestation folder in GM/PDM. A UGMASTER dataset type must exist in the specification folder.

Example dataset names of required files for a layout drawing:

1L123456.001.drawing001

This file is a UGPART dataset type in the manifestation folder. The drawing format and component entity of the UGMASTER dataset will be in this file. This file may also contain compo-

nent entities for reference data. The LYTFMT classification attribute will be in this file.

1L123456.001.geo_fin001

This file is a UGMASTER dataset type in the specification folder. It will not contain a drawing. This file will contain component entities of some or all parts shown on the drawing. The MLASM classification attribute will be in this file.

2.5 ALPHA-NUMERIC NUMBERS. Alpha-numeric numbers will be used as a unique item identifier and will not replace GM part numbers. These numbers will not be assigned or tracked by PDS (Product Description System). The correlation between the alpha-numeric item identifier and the GM part number will be maintained with an attribute in the UG file. The GM part number (attribute) will be entered into the Part No. field of the file log, where as the alpha-numeric number will remain in the Object Number field.

Alpha-numeric numbers will be assigned by the GM/PDM.

2.6 FILE IDENTITY.

2.6.1 Dataset naming will consist of 3 fields separated by periods.

2.6.1.1 Field One. The **first** field is the Item ID.

2.6.1.2 Field Two. The **second** field is the Item Revision ID.

2.6.1.3 Field Three. The **third** field is the dataset context. See Section E for dataset context definitions and Table 4 in this section for mapping to file classifications.

2.6.1.4 Example Dataset Names:

34567890.005.geo_fin001
12345678.011.geo_env001
AAA56432.027.geo_fin001
ABC23456.001.pr_stat001
34567899.001.drawing001
3L887790.001.drawing001
3L887790.001.drawing002

3 VALID CLASSIFICATIONS. An attribute to support the previous TDMF classifications, as defined in Section E, will be required. The classification will be input through the **file log** program and is maintained to support sharing of data between GM/PDM sites and non GM/PDM sites. The corporate file checker will use these attributes to determine the file type being checked.

CRITIA (Criteria)
DWGFMF (Drawing Format)
LYTFMT (Layout Format)
MDATA (Bulk Master Data) for legacy files only*
MLDES (Master Layout Design)
MLASM (Master Layout Assembly)

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MLELEC (Master Layout Electrical)

MLREF (Master Layout Reference) for sites using TDMF/
UNIX

PKG (Package)

STDPRF (Standard Part) for legacy files only*

*File classifications for legacy files will be validated by the file checker that they existed in a version of UG prior to version 11.

4 DATA ORGANIZATION. In order to organize geometry into logical collections of data, program created Attributes, Categories and Reference Sets will be used. These program created categories and reference sets will be referred to as required categories or reference sets throughout the rest of this standard.

4.1 ATTRIBUTE USAGE.

4.1.1 Part Administrative Data. Part administrative data, will be assigned as UG part attributes. See Section D for a list of the attribute names to be assigned.

The **file log** program will be used to define the File Information Log and part attributes that are necessary to convey administrative information about the file.

4.2 CATEGORY USAGE.

4.2.1 Required Categories. Required categories will be used to label and collect layers. Each of these layers must be assigned an appropriate category name. These categories are generated by the **required categories** program. The order of category assignment is not important, however, the user will be prompted to enter a start layer. The category must be assigned to a layer that the corresponding data type reside on.

The required categories generated by the program are as listed below:

Layer	Categories
1	Part, Solid
2	Part, Wireframe
3	Part, Centerline
4	Theoretical
5	Section
6	Developmental
7	Mate

4.2.1.1 Category Definitions.

Solid - Solids and sheet bodies required to define the part.

Wireframe - Lines and curves required to define the part that is not defined by the solid(s). Drop off wireframe is no longer required.

Centerline - Lines and curves used as centerlines as required for sweeps and extruded solids, such as pipes, etc. The **organize file** program will change the line font to centerline.

Theoretical - Lines and curves used as theoretical intersections as required for drawing purposes. The **organize file** program will change the line font to phantom.

Section - Sections shown to define material thickness and part development when used in a nondrawing file.

Developmental - All geometry types used to develop the part, i.e., sketches, smart curves, trimmed sheet bodies, swept curves, datum planes, etc.

Mate - Datum planes, datum axes and saved coordinate systems used for mating conditions.

4.2.2 Optional Categories.

4.2.2.1 Section Naming. Optional section categories are used when in-depth information pertaining to the section may be needed. Any optional section category must also be accompanied by the category name 'SECTION'.

Some examples are below:

SECTION, X500.0
SECTION, SA
SECTION, X-150.275
SECTION, Y50
SECTION, Y-100
SECTION, Z1000.5
SECTION, Z-1000.5
SECTION, R98.5

4.2.2.1.1 A planar cross section is one cut along the X, Y or Z axis and is identified as such. For example:

X500
X2302.25

Rules for planar section naming are as follows:

- Must have an X, Y, Z, character in the first position of its name.
- Name must be at least 2 and no more than 12 characters in length.
- Name cannot contain more than 3 digits after a decimal point.
- Name may contain a minus (-) sign in the second position.
- All characters of the name except the first character, decimal point and the minus sign must be numeric.

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4.2.2.1.2 When section data for skewed sections is required the additional naming convention is used.

Saa - Skewed sections. (aa = A through Z for the first 26, then AA through ZZ)

Rules for skewed section naming are as follows:

- Must have an S character in the first position of the name.
- Must be at least 2 characters in length.
- May be a maximum of 3 characters.
- All characters must be alphabetic.

4.2.2.1.3 When radial sections are required (i.e., tire envelope) the additional naming convention is used:

Rnnn.nn - Radial section (use positive angles)

Rules for radial sections naming are as follows:

- Must have an R in the first position of the name.
- Must be at least 2 characters in length.
- May be a maximum of 8 characters.
- Name cannot contain more than 3 digits before a decimal point.
- All characters except the first character and the decimal point must be numeric.

4.2.2.2 User Defined Categories. User defined category names may be assigned in addition to the required category names but they must be preceded by an underscore thus sketch.

4.3 REFERENCE SET USAGE. Reference Sets will be used in single part files and intermediate assemblies to collect specific sets of component part data. The **organize** file program automatically builds reference sets depending on the data that exists within the categories as defined in Table 3.

All nondrawing part files will always contain at least 2 required reference sets **PART** and **REP**. A nondrawing part file may contain a **DRAW** and/or a **MATE** reference set.

PART - Geometry required to define the part.

REP - A representation of the part for quick display.

DRAW - All part geometry and theoretical intersection lines for drawing purposes.

MATE - All part geometry as well as datum planes, datum axes and saved coordinate systems used for mating conditions.

Assembly files will always contain component entities that collect reference sets of the component parts.

4.3.1 Site Defined Reference Sets. Site defined reference sets can be defined at each site in addition to the 4 reference sets listed above. To be valid these reference sets must be listed in a special text file: **site_optional_refsets**. Details of where to get this file and how to set it up are in Appendix B in this section.

4.4 COMPONENT ENTITY USAGE. In Unigraphics virtual assembly files, component entities, are used to access reference sets from single part files or subassemblies. The **organize** file program will change the component entity name to that of the part name.

4.5 REVISED DATA. Revised Data to be addressed at a future date.

4.6 LAYER RANGES. The layering convention, shown below will be used in all part files. Where a range of layers is indicated, local/site preference for detailed delineation of data within the range is allowed.

TABLE 1

Layer Number	Layer Content
1 - 252	Model Geometry
253	Drawing Format & Annotation
254	Drawing Format & Annotation
255	Data Received via C4 Translator
256	Saved Coordinate System Entities for In-vehicle Position

The **required categories** program places the required categories on layers 1 through 7 unless another start layer is entered.

Layers 253 and 254 will be empty in any nondrawing file.

Layer 255 must be empty at the time of file checking. Data received via the C4 translator must be moved and organized.