

TOOL DESIGN - MANUFACTURING DESIGN SPECIFICATIONS FOR TOOLING AND EQUIPMENT
SECTION A - DOCUMENT NUMBERING AND SUBMISSION

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TOOL DESIGN SPECIAL PURPOSE TOOLING & EQUIPMENT DOCUMENT SUBMISSION SPECIFICATIONS & REQUIREMENTS

The purpose of these specifications & requirements is to provide conventions & practices to ensure consistent and complete electronic document submissions for special purpose tooling & equipment supplied to Delphi Thermal Systems.

A.1 NUMBERING CLASSIFICATIONS

1000000	MISCELLANEOUS
2000000	OLD T NUMBERS (NOT USED FOR NEW TOOLS)
2200000	DIE BUSHINGS (OLD TB)
2600000	PUNCHES (OLD TP)
4000000	PLANT EQUIPMENT (OLD PE)
4500000	PLANT EQUIPMENT STATIONS OR SUB-SYSTEMS (INCLUDING SPARE SUBASSEMBLIES)
5000000	CONTROLS FOR CORRESPONDING PLANT EQUIPMENT
5200000	COMMON CONTROLS ITEMS OR DETAILS
5500000	CONTROLS STATIONS OR SUB-SYSTEMS
6000000	COMMON MECHANICAL ITEMS OR DETAILS
7000000	TOOLS AND DIES
7500000	TOOL AND DIE STATIONS OR SUB-SYSTEMS
9100000	GAGES

A.2 MODEL & DRAWING FILE NAMING CONVENTION

FILE NAMES ARE THE CONCATENATION OF THE FOLLOWING:

- LETTER "H"
- 7 DIGIT TOOL NUMBER
- LETTERS "ME"
- 3 DIGIT VERSION NUMBER
- DASH "-"
- LETTER "A" (ASSEMBLY) OR "D" (DETAIL) OR "S" (SHEET)
- 4 DIGIT NUMBER (CORRESPONDS TO "A", "D", OR "S")
- PERIOD "."
- 3 DIGIT REVISION NUMBER
- PERIOD "."
- FILE SUFFIX (SEE TABLE)

E.G.: the drawing file name for the initial submission of sheet 9 for the second version of 4009479 would be:

H4009479ME002-S0009.000.dwg

Note: The number on the 2D drawing title block would be 4009479.002

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SUFFIXES TABLE			
	ASSEMBLY	PART	DRAWING (2D)
UNIGRAPHICS (UG)	.prt	.prt	.prt
SOLIDEDGE	.asm	.par	.dft
SOLIDWORKS*	.sldasm	.sldprt	.slddrw
AUTOCAD	NA	NA	.dwg

*SOLIDWORKS SUFFIXES WILL BE USED FOR EXAMPLES

A.3 BILL OF MATERIAL (BM) FILE NAMING CONVENTION

FILE NAMES ARE THE CONCATENATION OF THE FOLLOWING:

- LETTER "H"
- 7 DIGIT TOOL NUMBER
- LETTERS "ME"
- 3 DIGIT VERSION NUMBER
- PERIOD "."
- 3 DIGIT REVISION NUMBER
- PERIOD "."
- FILE SUFFIX (XLS)

E.G.: The BM file name for the initial submission for the second version of 4009479 would be:

H4009479ME002.000.xls

Version - the version number is incremented when the basic design and function remains unchanged, but changes cause the item to be unique requiring a new document set. Where multiple identical items are ordered at the same time, there should be a separate version document set for each to allow for future independent changes. This always applies to equipment. An exception would be multiple fixtures used as a set. E.g.: 14 fixtures built for a single production cell would be the same version. *Note: The Delphi naming system has inadequacies at the subassembly level of machines with incremented versions. In the Delphi nomenclature there is no method to differentiate documents of subassemblies between two different versions with same base tool number. Thus if changes are made to a subassembly of one version there is no way to document these changes independently of the other versions. It is to the supplier's benefit, before design starts, to request clarification from the Delphi Thermal Project Engineer whether machines are to have incremental versions or unique tool numbers for each individual machine even if they are to be identical.*

Revision - revisions are changes that are made to specific details within a version. Revisions do not cause a version (suffix) change.

Note: When a subassembly is to be designated as a spare part then it should be documented using (45xxxxx) number. Any controls associated with this subassembly may be shown on the associated controls documents (5xxxxxx) or on a corresponding (550xxxxx) (E.G.: 5501234ME013 for 4501234ME013). It is to the supplier's benefit, before design starts, to request which subassemblies will

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be designated as spares, and which method is to be used to avoid rework of documents later. An exception to this are tools that may have some electrical components (E.G.: sensors) but no wiring. These may have the electrical components documented on the tool documents (7xxxxxx).

Note: control drawings (5xxxxxx) will have the same last 5 digits & version as the equipment number (4xxxxxx).

- Controls Sheet Numbering
 - Electrical – Start at sheet 1
 - Pneumatic – Start at sheet 100
 - Hydraulic – Start at sheet 200

Note: tool and die stations or sub-systems drawings (75xxxxx) will have the same last 5 digits & version as the tools and dies number (7xxxxxx).

Note: tool numbers are assigned by tool design.

A.4 SUBMISSION & APPROVAL PROCESS

GOAL:

- Approved documents ready to ship with equipment & tooling.

INITIAL SUBMISSION:

- Supplier will submit printed hardcopies to the Delphi Thermal Project Engineer after design is complete.
- These will include all drawing sheets (mechanical & controls) on 11 x 17 paper & all BM tabs (Directory, BM & Revision) on 8.5 x 11 paper.
- These may be printed from native 2d files to avoid having to translate into AutoCAD .dwg format multiple times during the approval process.
- The Delphi Thermal Project Engineer will review & return red lined (redlines) documents to supplier. The following will be reviewed:
 - a. All drawings & BM's must be on appropriate Delphi Thermal templates. It is recommended that supplier submit initial files for BM's & drawings to Delphi Thermal Project Engineer for approval. This will allow both the content of title blocks and file nomenclature to be checked prior to creating all sheets.
 - b. Drawings accurately reflect actual construction unless instructed otherwise by Delphi Thermal Project Engineer.
 - c. Items on print are detailed on BM & visa versa.
 - d. Sheet references are correct
 - e. Check drawing directory for correct numbering and completeness
 - f. Title block & headings filled in accurately & completely.
 - g. Weldments numbered as 6a, 6b, 6c, not 6 on the page and a, b, c next to details
 - h. No modifications to templates and nothing drawn outside of template.
 - i. Verify that I/O on the electrical drawings matches on the pneumatics & hydraulics drawings & the labels on the actual item.
 - j. Verify material, color & finish on each detail.
 - k. Item name on drawings matches name on BM's. Note: Exact item name is to be supplied by Delphi Project Engineer.

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- l. Spare parts are identified & existing codes input. Columns associated with spare parts must be filled in.
 - m. Subassemblies needed as spares are on “sub” drawings.
 - n. Parts required as spares of items purchased as assemblies are listed, identified as spares & the quantity input as “ref”.
- Delphi Thermal Project Engineer will advise the supplier, depending on the number of redlines, whether another iteration of hardcopies will be required before approval submission.
- Supplier must return the redlines to Delphi Thermal Project Engineer with any corrected submission.

APPROVAL SUBMISSION:

- Supplier will submit a single CD (preferred) or DVD if contents can not fit on a single CD to the Delphi Thermal Project Engineer.
- This will include all new & revised documents outlined below. Supplier should not resubmit BM's & .DWG's that have not been revised. The Model files & folder revision digits should be incremented & include all files at all revision levels.
- Supplier must return the redlines to Delphi Thermal Project Engineer with any corrected submission.
- The Delphi Thermal Project Engineer will review submission for the following:
 - a. Redlines incorporated
 - b. Adherence – does submission follow format & nomenclature
 - c. Completeness – are all files present?
 - d. Integrity – can files be opened and viewed without errors or items missing.
 - e. Title block must list numbered revisions or “initial submission” at revision “000”. File name reflects current revision.
- The Delphi Thermal Project Engineer may correct minor issues or instruct the supplier to do so and resubmit. This is at the Delphi Thermal Project Engineers' discretion.
- After the Delphi Thermal Project Engineer is satisfied, the submission will be forwarded to Tool Design for further review, final approval and filing. Completed designs that do not follow Tool Design specifications shall be considered incomplete and will be returned to the supplier for correction.
- Once designs are filed the documents in the supplier's possession are considered obsolete. Any future changes must be made to files requested from Delphi tool design.

A.5 LABELING & FILE DIRECTORY STRUCTURE

The surface of the disc will be marked or labeled with the following:

- TOOL DESIGN DOCUMENTS
- MACHINE NAME
- SUPPLIER NAME
- JOB NUMBER
- TOOL NUMBER
- DATE SUBMITTED
- SUPPLIER TRACKING NUMBER

The data held within the disk will be organized into these folders:

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YYMMDD TOOL_NUMBER.VERSION JOB XXXXX
MODELS
MECHANICAL
CONTROLS

(Note: Date is the date of submission)

EXAMPLE:

D:\101102 H4009667ME001 JOB 43030
MODELS
H4009667ME001-A0001.000
H4009667ME001-A0001.000.SLDASM
H4509667ME001-A0001.000.SLDASM
H4509667ME002-A0001.000.SLDASM
H4509667ME00X-A0001.000.SLDASM
H7001234ME001-A0001.000.SLDASM
H6002345ME001-A0001.000.SLDASM
H9103456ME001-A0001.000.SLDASM
H1004567ME001-A0001.000.SLDASM
CAP SCREW 1/4-20 X 1.SLDPRT

Note: There should be only one top level assembly model per job. All other assemblies / subassemblies should be included in that top level assembly model.

Note: Include parasolids (.x_t) of production part models used in the modeling process.

Note: All native assembly, part & 2d drawing files, etc. Related to the project must be in same directory so interrelationship of all files may be maintained ("pack-n-go" in SolidWorks)

Note: Logical naming of non-tool number details may be used. This pertains mainly to part files.

Note: Include models of existing Delphi Thermal assemblies used in the modeling process.

Note: All 2D native files for all Delphi Thermal tool numbers must following file naming convention and match dwg files in naming and content.

MECHANICAL
H4009667ME001
H4009667ME001.000.XLS
H4009667ME001-S0001.000.DWG
H4009667ME001-S0002.000.DWG
H4009667ME001-S000X.000.DWG
H4509667ME001

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H4509667ME001.000.XLS
H4509667ME001-S0001.000.DWG
H4509667ME001-S0002.000.DWG
H4509667ME001-S000X.000.DWG
H4509667ME002
H4509667ME002.000.XLS
H4509667ME002-S0001.000.DWG
H4509667ME002-S0002.000.DWG
H4509667ME002-S000X.000.DWG
H7001234ME001
H7001234ME001.000.XLS
H7001234ME001-S0001.000.DWG
H7001234ME001-S0002.000.DWG
H7001234ME001-S000X.000.DWG
H6002345ME001
H6002345ME001.000.XLS
H6002345ME001-S0001.000.DWG
H6002345ME001-S0002.000.DWG
H6002345ME001-S000X.000.DWG
H9103456ME001
H9103456ME001.000.XLS
H9103456ME001-S0001.000.DWG
H9103456ME001-S0002.000.DWG
H9103456ME001-S000X.000.DWG
H1004567ME001
H1004567ME001.000.XLS
H1004567ME001-S0001.000.DWG
H1004567ME001-S0002.000.DWG
H1004567ME001-S000X.000.DWG

Note: dwg's are not required for UG submissions.

Note: Suffixes for 450xxxx BM's now follow the same suffix naming convention as 4xxxxxx BM's. (i.e.: no more .5xx suffixes)

Note: Bills of material for tools & gages with only a few details may be placed on the drawings. A separate .xls is not required.

CONTROLS

H5009667ME001
H5009667ME001.000.XLS
H5009667ME001-S0001.000.DWG
H5009667ME001-S0002.000.DWG
H5009667ME001-S000X.000.DWG

- When updating a document set that was designed in solids the update should be made to the model & all documents. Drawing files should not be changed without changing the associated solid model.

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- When a document set is used as the basis to create a new version, then all documents for the new version must use current standards & formats.
- When a document set is revised, then it is not required that documents use current standards & formats, but rather may use those standards & formats consistent within the document set.
- Documentation is to be to Delphi standards. Mistakes in supplied originals do not alleviate the responsibility of supplier to deliver revised documents to standard. Except build only.
- If modifications to documents are required by supplier to “build to print”, then it is the suppliers’ responsibility to “redline” documents and deliver them to the Delphi Project Engineer for update.
- Formats for Delphi documents must not be altered. Information must be provided in areas allotted. Information outside formatted areas is discouraged and will not be considered.
- Supplier is responsible for updating drawings with all changes incorporated in subsequent machine(s) when multiples are ordered at the same time.
- Model subassemblies may be named using two different methods
 - Within the main assembly
 - E.G.: H4009667ME001-A0002.000.SLDASM, H4009667ME001-A0003.000.SLDASM
 - IN THIS METHOD THERE IS ONLY ONE 2D DRAWING SET & ONE BM.
 - As separate subassemblies using 450XXXX
 - E.G.: H4509667ME001-A0001.000.SLDASM, H4509667ME002-A0001.000.SLDASM
 - IN THIS METHOD THERE WOULD BE A 2D DRAWING SET & BM FOR EACH .SLDASM
 - IF A 450... SUBASSEMBLY HAD SUBASSEMBLIES THEN THE "A" VALUE MUST BE INCREMENTED (E.G.: H4509667ME001-A0002.000.SLDASM, H4509667ME001-A0003.000.SLDASM, ...) ALTHOUGH EACH 450XXXX SUBASSEMBLY MAY HAVE ONLY ONE BM REGARDLESS OF THE NUMBER OF THE MODELED SUBASSEMBLIES IT CONTAINS.
 - Delphi Thermal Project Engineer preapproval is required for the subassembly method to be used.

Note: Recent form changes highlighted.