

MILITARY SPECIFICATION  
DRAWINGS, ENGINEERING AND ASSOCIATED LISTS

This amendment forms a part of Military Specification DOD-D-1000B dated 28 October 1977, and is approved for use by all Departments and Agencies of the Department of Defense.

REPLACE "MIL-STD-100" by "DOD-STD-100" wherever it appears.

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Add a new paragraph:

"3.5.2.3 Standardized Military Drawing (SMD). An SMD shall be prepared in accordance with DOD-STD-100 and in lieu of specification and source control drawings. Standardized Military Drawing Program (SMDP) is related to the Configuration Management and Parts Control Programs. SMD items are documented as required by DOD-STD-100. Nonstandard microcircuit parts approval is obtained through the procedures of MIL-STD-965."

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5.1.1 Delete and substitute:

"5.1.1 Microfilm. When a delivery of microfilm of drawings is a contractual requirement, preparation for delivery shall conform to MIL-M-9868 or as specified in the contract or order, except that a data list(s) conforming to DOD-STD-100 and entitled "MIL-M-9868, Shipping List(s)" may be substituted for the shipping list(s) as defined in paragraph 5.3 of MIL-D-5480, providing the data list(s) contain the information required and all items not included in the shipment are deleted from the data list(s) (such as when; partial, incremental, update, final or make-up (corrected) shipments are made)."

Add a new paragraph:

"5.1.3 Pre-delivery list of drawings. When delivery of a pre-delivery list of drawings is a contractual requirement, the contractor shall provide a list of every drawing to be delivered. The contractor shall provide the list at least 60 days prior to data delivery and provide changes to the list which occur before delivery of the drawings. Changes shall be in the form of a supplemental list which indicates changes, additions, and deletions to the list."

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6.2 Add the following at the end of the last sentence:

"and utilization of the attached Appendix."

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6.2.1 Add a new subparagraph as follows:

"(v) Whether Standardized Military Drawings (SMDs) shall be prepared in lieu of control drawings."

The margins of this amendment are marked with an asterisk or vertical lines to indicate where changes (additions, modifications, corrections, deletions) from the previous amendment were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous amendment.

Custodians:

Army - AR  
Navy - OS  
Air Force - 16  
DLA - DH

Preparing Activity:

Army - AR

(Project DRPR-0287)

Review Activities:

Army - AT, AV, CE, CR, ME, MI  
Navy - AS, EC, MC, SA, SH, YD, TD  
Air Force - 11  
DLA - DH, CS, IS  
NSA - NS

User Activities:

Army - GL  
DLA - ES

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GUIDE FOR APPLICATION AND TAILORING OF THE SPECIFICATION

(This appendix does not form a part of the requirements of the specification)

10. SCOPE

10.1 Scope. This guide is provided to aid the procuring activity in the selection of the appropriate Level(s) of engineering drawings and associated lists to be acquired in support of a procurement and in the further cost effective application and tailoring of this specification.

10.1.1 Application. The application of the specification for a particular procurement involves a number of people of specialized skills at various organizational levels. Unless this application and tailoring is accomplished with insight, coordinated effort (common understanding) and sound judgement, the result may not be cost effective.

20. APPLICABLE DOCUMENTS.

STANDARDS

Military

MIL-STD-280	Definitions of Item Levels, Item Interchangeability, Models, and Related Terms
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30. General. In order to acquire the minimum essential engineering drawings and associated lists to satisfy a particular procurement, consideration should be given to:

- a. Proper identification of the equipment model as defined in MIL-STD-280. (See 30.1 and Table 1).
- b. Drawing preparation requirements as applicable to the selected Level(s). (See 30.2 and Table 2).
- c. Acquisition of engineering drawings and associated lists to support the use of the equipment. (See 30.3.3).

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30.1 Equipment model. To assure the effective implementation of the specification to a program, proper establishment of program requirements must be defined and be consistent with mission objectives. Table 1 is provided to correlate the phraseology and life cycle phases of the current directive documents with the definitions of MIL-STD-280.

REFERENCED DOCUMENT	EQUIPMENT MODELS				
MIL-STD-280	Exploratory development (breadboard)	Advanced development (brassboard)	Engineering development (service test)	Preproduction (prototype)	Production
DIRECTIVE DOCUMENT	LIFE CYCLE PHASES				
OMB No. A-109	Exploration of alternative systems	Competitive demonstration (concept prototype)	Full scale development, initial production, test and evaluation		Production deployment and operation
DoD Directive 5000.1 & 2	Program initiation	Demonstration and validation	Full scale engineering development, limited production, test and evaluation		Production and deployment
DAR 3.808.6	Basic research, applied research, & exploratory development	Advanced development (prototype test)	Engineering development & Operational systems development		1st production Follow-on production and supply

Table 1

30.2 Level(s). The equipment model (MIL-STD-280) selected to satisfy the phase in the program's life cycle will determine the Level(s) (DOD-D-1000) to be selected and will influence the types and number of engineering drawings and associated lists required. Unless unusual factors of equipment use, complexity, quantity produced, state-of-the-art, acquisition, etc., influences selection, the Level(s) shown in Table 2 may be applied.

MIL-STD-280	DOD-D-1000B
Exploratory development	Level 1
Advanced development	Level 1
Engineering development	Level 1 or 2
Preproduction	Level 2 or 3
Production	Level 2 or 3

Table 2

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30.3 Preparation of drawings. Paragraph 3.4.3 of the specification states that "Unless otherwise specified in the contract or order (see 6.2.1), the contractor is responsible for the selection of the types and number of engineering drawings necessary to satisfy the content and requirements of the Level(s) ordered." The most significant variables between Level(s) are:

- a. The types and number of drawings prepared
- b. The application of DOD-STD-100 requirements
- c. Acquisition of engineering drawings and associated lists

30.3.1 Types and number of drawings prepared. Drawings are prepared to facilitate or accommodate the manufacturing process (e.g. model shop vs low or high quantity production techniques) and may differ considerably between the various phases of manufacture. A significant difference exists between the drawing requirements for a development model produced generally in an engineering environment and production models which are produced using many specialty departments, supported by related disciplines. For example:

- a. Wiring harnesses are normally required for production models and would be documented, while wiring harnesses are not normally required for development or preproduction models.
- b. Mono-detail drawings may be required for production models to better distribute the work to specialty fabrication areas, while multi-detail drawings may be used for preproduction models.
- c. Alternate methods of fabrication such as weldment vs castings, etc. (development vs production) can often result in the elimination of assembly and subassembly drawings.

30.3.2 The application of DOD-STD-100 requirements. Level 1 and Level 3 drawing preparation requirements as defined in 3.3 and 3.5 are reasonably concise and unambiguous. However, Level 2 as defined in 3.4, unless tailored to obtain optimum data and cost benefits to the program, will result in imposing the same preparation requirements for Level 2 as for Level 3. Level 2 requirements should be reviewed to minimize the requirements of DOD-STD-100.

30.3.3 Acquisition of engineering drawings and associated lists. Although a "single complete set" of engineering drawings and associated lists (complete to the appropriate detail) are prepared to satisfy the equipment model and program phase in all cases, care should be exercised to avoid requiring the delivery of unnecessary drawings. The procuring activity and the contractor should analyze the equipment end use and determine the minimum data required to support that use. The drawings should be selected to permit fulfillment of specific needs (i.e., evaluation, interface, etc.) in keeping with the

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ultimate use of the equipment. For example:

- a. If the equipment is an exploratory or advanced model, design evaluation or possibly interface control drawings to evaluate interrelated systems may be adequate; most often, delivery of engineering drawings are not required for this type of equipment.
- b. If the procurement is an engineering development model, perhaps drawings to support installation, operation and maintenance may be adequate.
- c. Drawings to enable reprourement and logistic support of the equipment without additional design recourse to the original design activity are generally required only for production programs.

It is essential that delivery of engineering drawings and associated lists be minimized and be consistent with the government's need for the drawings.

40. Ordering data. Paragraph 6.2.1 of the specification lists the procurement requirements for a contract or order. Table 3 identifies these same requirements and in addition provides comments relating to conditions which should be considered for effective application and tailoring of the specification.

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Procurement Requirements of DOD-D-1000B Paragraphs 6.2.1	Subject To Tailoring For Level			Legend T = Requirement Subject To Tailoring A = Requirement Not Subject To Tailoring (Applicable) O = Requirement Subject To Option - = Not Applicable	Comment
	1	2	3		
a) Title, Number & Date of This Specification	A	A	A		o Must be specified for all procurements of drawings and associated lists. o Service implementing documents will not be substituted.
b) The Level of the Engineering Drawings required for Specific Items and for Groups of Items requiring different levels	U	O	O		o Use the guidelines set forth in this appendix to select the proper level of drawings to fit the hardware, program, and life-cycle phase
c) Whether a Government Design Activity or Contractor Design Activity Name, Commercial and Government Entity (CAGE) Code and drawing number will be placed in the title block of the engineering drawing(s) and associated list(s).	O	O	O		a. Government drawing numbers and Commercial and Government Entity (CAGE) Codes should be specified when the original drawing are to be delivered to a DoD designated activity, when specified. The location of the ordering instructions for obtaining Government drawing numbers and Government drawing forms must be specified. b. Contractor drawing numbers and Commercial and Government Entity (CAGE) Codes should usually be specified for procurement not meeting the criterion above and used for commercial off-the-shelf items.
d) When Government Design Activity drawing numbers are to be assigned identify the assigning activity and if Government drawing formats are to be supplied, identify the source.	A	A	A		
e) Whether any parts of DoD-STD-100, shall be applied to Level 1 requirements.	T	-	-		o DoD-STD-100 requirements should not as a rule be called out for level 1 drawings. However, a procuring agency may call out the requirements set forth in paragraphs 3.2 (a), (b), and (c) of this specification.
f) The applicable data item description	T	T	T		o The data item description cited in paragraph 6.2.2 shall be used. The requirements of this DID may be tailored downward. o Service implementing documents are not permitted. o Addenda and appendices to the DID shall not contain more extensive or greater requirements. See the foreword to DOD-STD-1476 for guide lines to be followed in calling for SI metrics in a design.
g) Whether the metric system shall be used in new design	O	O	O		
h) Whether Tailoring of Needs is Required	T	T	T		o A "Single Complete Set" is normally specified for initial Procurements whereas "New and Revised" only is normally specified for follow-on Procurements o Consideration should be given to permitting the delivery of drawings (levels 1 & 2) with outstanding change orders not incorporated but attached to affecting drawings o Types and number of drawings to be delivered should be tailored to find use of hardware being procured o Give consideration to accepting contractors advanced techniques of data preparation. See Paragraphs 6.3.1 and 6.3.2 o When procuring off the shelf items (Commercial Procurement) consider waiving DOD-B-1000 and DoD-STD-100 requirements.
i) Whether Company Standards shall be Accepted	-	T	T		o The requirements of paragraph 3.7 represent maximum requirements. For Procurements not destined for competitive procurement, the requirements of paragraph 3.7 may be relaxed or adjusted downward
j) Kinds of Associated Lists Required	-	T	T		o Data Lists should be specified for items destined for production. May not be required for Level 2 o Parts Lists are usually generated when separate parts are required to be assembled. Usually prepared as a matter of course by most manufacturers o Index Lists should be specified for complex equipment o Associated Lists should be specified only to meet specific requirements
k) Drawing Assembly Level at which Associated Lists will be prepared	-	T	T		o If lists are specified, the contractor must be furnished guidance on the level of assembly the list is to address.

**TABLE 3. Ordering data**

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l) Identify whether the Mono-Detail System will be used	-	T	T	<ul style="list-style-type: none"> <li>o The use of Mono-Detail or Multi-Detail drawings should be left to the option of the contractor unless Mono-Detail drawings are required to fulfill a specific requirement of the procuring agency. To change a contractor's drawing system without compelling reason may not be cost effective.</li> <li>o See Paragraphs 201.2.1 and 201.2.2 of DoD-STD-100</li> <li>o Existing Multi-Detail drawings should be used whenever possible without redraw.</li> </ul>
m) Selection of Types of Engineering Drawings if different than 3.4.3	-	T	T	<ul style="list-style-type: none"> <li>o If the procuring agency has a special kind of drawing or will not permit the contractor to select the types of drawings necessary, then this must be set forth in the statement of work as an exception to paragraph 3.4.3.</li> </ul>
n) Whether Control Drawings in accordance with DoD-STD-100 shall be prepared	-	0	0	<ul style="list-style-type: none"> <li>o Control drawings are normally specified commercial items. See paragraphs 3.5.2</li> <li>o Specification and source control drawings are not usually required for Level 1.</li> </ul>
o) Whether parts Lists shall be Integral with separate from the Drawings	-	0	0	<ul style="list-style-type: none"> <li>o Unless a requirement exists for identifying whether the parts lists should be integral with or separate from the engineering drawing, the option should be left to the contractor. To change a contractor's system without reason may not be cost effective.</li> </ul>
p) Drawing Format Material	-	T	T	<ul style="list-style-type: none"> <li>o Specific materials on which originals (master) are to be prepared should be specified only when                             <ul style="list-style-type: none"> <li>(a) Government drawing numbers and Cage Codes are specified and</li> <li>(b) The originals are to be transferred to a DoD designated activity</li> </ul> </li> <li>o When the material is specified, it should include the class, grade, type, applicable specification(s), etc.</li> </ul>
q) Quantity and Type of Reproduction	T	T	T	<ul style="list-style-type: none"> <li>o Nonreproducible copies normally are not specified. However, they may be suitable for use during design evaluation and in-process reviews</li> <li>o Reproducible copies, in a form other than microfilm, should be specified only when facilities for handling microfilm are not available or when a specific type document is needed for competitive or breakout procurement purposes (e.g., Stable Base Artwork)</li> <li>o When specified, the type, grade, class, etc of the material must be specified.</li> </ul>
r) Whether Microfilm is required	T	T	T	<ul style="list-style-type: none"> <li>o Microfilm and tabulating cards are normally specified when copies of the drawings and associated lists are to be stored at a DoD designated activity</li> <li>o A data deck is normally ordered when microfilm copies are ordered and are to be stored at a DoD designated activity</li> <li>o The contractor may be given the option to submit microfiche film in lieu of microfilm</li> <li>o If microfilm (microfiche) is ordered the type, grade, class, care type, punching instructions, etc must be specified</li> </ul>
s) Whether Delivery of Original Drawings and undimensioned Drawings are required	T	T	T	<ul style="list-style-type: none"> <li>o Original (master) drawings and undimensioned drawings should be specified only when the drawings are required for support of the system or equipment. If they are procured an activity must be designated the responsibility to receive and maintain the originals in a current status.</li> <li>o Dimensionally stable plastic master drawings are costly to prepare, ship, and store. Stability is a relative term and together with proper protection the probability of long term usefulness of stored "Masters" should be equated in terms of real need and cost. While microfilm (microfiche) blowback of undimensional drawings may be dimensionally inadequate as "Masters", they will normally provide the engineering data and sufficient dimensions that "Masters" can be recreated without design or reengineering effort. Consider also that different manufacturing techniques may result in "Master" being of little value as a tool when used for reprourement</li> </ul>
t) What special Packaging of Originals, when Ordered, is required	T	T	T	<ul style="list-style-type: none"> <li>o Delivery Schedule and destination must be specified</li> <li>o Special packing instructions when required shall be specified when ordering originals (Masters) of engineering drawings and associated lists.</li> </ul>
u) Delivery Schedule, and to whom the Engineering Drawings and Supporting Documents are to be delivered	A	A	A	<ul style="list-style-type: none"> <li>o Delivery of drawings must be coordinated with the entire program. To specify to early delivery will result in increased change control activity and increased costs. Too late delivery may be equally costly if it delays procurement provisioning, etc.</li> <li>o Also see paragraph 6.2.3 Deferred delivery and deferred ording of drawings</li> </ul>
v) Whether Standardized Military Drawings (SMDs) shall be prepared in lieu of control drawings	-	-	T	<ul style="list-style-type: none"> <li>o SMDs are prepared in response to MPCAG recommendation and as a result of a non-standard parts approval request</li> <li>o SMDs are prepared for non-standard, FSC 5962 microcircuits (class B, MIL-STD-883) not covered by existing MIL-M-38510 specification sheets or DFSC drawings.</li> </ul>

**TABLE 3. Ordering data-continued**