

SEMI E36-0704

SEMICONDUCTOR EQUIPMENT MANUFACTURING INFORMATION TAGGING SPECIFICATION

This Standard was technically approved by the Information & Control Global Technical Committee. This edition was approved for publication by the global Audits and Reviews Subcommittee on December 18, 1998. Available at www.semi.org in July 2004; originally published in 1995; previously published February 1998.

NOTICE: This Standard or Safety Guideline has an Inactive Status because the conditions to maintain Current Status have not been met. Inactive Standards or Safety Guidelines are available from SEMI and continue to be valid for use.

NOTICE: The designation of SEMI E36 was updated during the 0704 publishing cycle to reflect the revision of SEMI E36.1.

1 Purpose

1.1 The purpose of Semiconductor Equipment Manufacturing Information Tagging is to define a markup philosophy, a markup framework, and an information markup which is rich enough to facilitate:

- Electronic interchange and distribution of information;
- Quality hardcopy printing and screen display of information;
- Consistent high-precision online searching; and
- Reuse and repurposing of information for such applications as integrating source material into training material and online support applications.

1.2 The intent of this Document is to create an information interchange specification, not an authoring specification or an electronic presentation specification. Semiconductor Equipment Manufacturing Information Tagging will define the markup necessary for exchanging documents electronically, for facilitating retrieval of information content, and for validating information interchanges.

NOTE 1: The Document Type Definitions, schemas, and documentation defined in other parts of Semiconductor Equipment Manufacturing Information Tagging may be used freely without permission or payment of royalties or other licensing charge, provided this source and/or its associated specifications are cited.

2 Scope

2.1 *Information Scope* — Semiconductor Equipment Manufacturing Information Tagging is intended to cover the types of technical and commercial information typically needed to support the selection, installation, use, and maintenance of semiconductor manufacturing equipment.

2.2 The following list gives examples of information types within scope; this list is not exhaustive.

- *Operations Manuals/Guides* — Typically used by equipment operators at customer sites to perform the tasks for which the equipment was designed.
- *Installation Manuals* — Typically used by supplier and customer engineers to install the equipment at the customer site.
- *Maintenance Manuals* — Typically used by trained maintenance technicians at customer sites to perform repair and upkeep of equipment.
- *Maintenance Schedules* — Typically used by site coordinators and customer facility managers to schedule and document normal preventive maintenance.
- *Spares/Parts Lists* — Typically used by on-site field service engineers and customers to maintain a sufficient stocking level to ensure prompt delivery of parts.
- *Repair/Troubleshooting Manuals* — Typically used by equipment operators and qualified maintenance technicians to identify and correct equipment problems.

- *Release Notes* — Typically used by operators, technicians and system administrators to identify changes in software configuration.
- *Training Manuals* — Typically used by supplier training personnel and customers to train operators and maintenance technicians.

Additional information on potential use and re-use of these information types in electronic form can be found in the Auxiliary Information for this Specification.

2.3 Content of SEMI E36 — Semiconductor Equipment Manufacturing Information Tagging will be issued in three parts:

- this base Document,
- associated information models such as SGML and XML Document Type Definitions (DTDs) and schema, and
- the documentation for these information models, including at least a comprehensive Tag Library.

Semiconductor Equipment Manufacturing Information Tagging does **not** include implementation advice, suggestions, or notes on how to implement the models described here. This material will be presented in the form of Auxiliary Information associated with Semiconductor Equipment Manufacturing Information Tagging.

Semiconductor Equipment Manufacturing Information Tagging by design does not include tutorials on SGML, XML, how to use the defined elements or modules, or how to create document content.

2.4 SGML and XML — Any documents marked up according to Semiconductor Equipment Manufacturing Information Tagging will be ‘valid’ XML documents: that is, ‘well-formed’ XML documents that have an associated document type declaration and that comply with the constraints expressed therein. Since valid XML documents are by definition type-valid SGML documents, such documents will be valid SGML documents as well.

Initially, information models will be maintained in both XML and SGML, with all changes made in parallel. SEMI will issue a dual set of models whenever a change is made, and both will always be (within the limits of their syntax) the same. Although parallel maintenance is unfortunate, it is intended to make it easier for members to create documents using current SGML or XML tools. As Web-SGML implementations and alternative XML schema syntax become more common, modules may be maintained in other syntactic forms.

2.5 Examples of SEMI Content Specifications — There are other SEMI Standards and Specifications that regulate the content of a Document. Semiconductor Equipment Manufacturing Information Tagging is expressly not in conflict with any of them, since it specifies only how to identify the content present in the documents, and in some contexts, how to electronically structure the content. Semiconductor Equipment Manufacturing Information Tagging does not address what information is to be included. Examples of SEMI content-related or content guideline-related Standards and Specifications can be seen in § 7.

NOTICE: SEMI Standards and Safety Guidelines do not purport to address all safety issues associated with their use. It is the responsibility of the users of the Documents to establish appropriate safety and health practices, and determine the applicability of regulatory or other limitations prior to use.

3 Referenced Standards and Documents

Semiconductor Equipment Manufacturing Information Tagging references the following information standards, which should be referred to in their entirety for full details:

3.1 ISO Standards¹

ISO-8879-1986 — International Standard for SGML

ISO 10744 — HyTime Standard

¹ International Organization for Standardization, ISO Central Secretariat, 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland; Telephone: +41.22.749.01.11, Fax: +41.22.733.34.30, <http://www.iso.org>

3.2 Other References

The Extensible Markup Language (XML) V 1.0 Recommendation of the World Wide Web Consortium (W3C)²
W3C specifications for Extensible Linking Language (XLL)²

NOTICE: Unless otherwise indicated, all documents cited shall be the latest published versions.

4 Terminology

4.1 *Attribute* — an attribute is a markup construct that resides within the start tag of an element to provide additional information about the element. (Note: the start tag is the tag that is placed directly before the element in the datastream and determines where the element begins.)

4.2 *Conforming Authoring Application* — a conforming authoring application must be able to produce conforming documents. There is no requirement that all internal work in the application be performed in the markup described by Semiconductor Equipment Manufacturing Information Tagging, only that the end product, exported for interchange, must be a conforming document.

4.3 *Conforming Document* — a conforming document is one that meets the markup rules and specific information models defined in Semiconductor Equipment Manufacturing Information Tagging for the class of document. This specification comprises three parts: this base document, a set of information models, and the documentation for those models. A conforming document must conform to all three parts.

A conforming document created by one application must be interchangeable with a conforming application without significant information loss.

NOTE 2: Explicit rendering instructions such as font family and type size are not considered to be significant information.

4.4 *Conforming Element* — a conforming element is one that uses the names and markup rules defined in Semiconductor Equipment Manufacturing Information Tagging for the class of element. A conforming element created by a conforming application must be interchangeable with another conforming application without information loss.

4.5 *Conforming Rendering Application* — rendering (presentation) is the process and means by which the elements in a document shall be made visually or otherwise understandable to the end user, for example, printing a document on paper, browsing a series of elements on screen, or stating a series of elements through voice synthesis. A conforming rendering application must be able to print or display conforming documents without significant loss of information. The presentation should be consistent with the intent of the originating system.

A conforming rendering application may not impose structural requirements that are not required by the DTD or other document models as stated in the second part of Semiconductor Equipment Manufacturing Information Tagging. For example, a rendering engine may not require an element which is optional in the models or require an attribute that is implied. A rendering application may require that the rules in this Base Specification and those in the Tag Library are followed.

For example, if the DTDs say that an element is optional, a Rendering Application may not require that it be present. If the Tag Library says that the contents of an element must be some particular information, the Rendering Application may require that it be so. More specifically, if the <description> element is optional, a Rendering Application may not fail to process a document because it does not contain <description>s. If the Tag Library says that the contents of a 'datechanged' attribute is a date in YYYYMMDD format, a Rendering Application may fail if the attribute does not contain a valid date.

4.6 *Document* — a logical assembly of elements, that, if correctly ordered, is a means of transmitting an internally consistent piece of information. A document is made up of one or more elements which must all be contained in one 'root' element.

4.7 *Document Class* — a document class consists of all of the documents or information fragments that follow a single set of markup rules, including the same elements and element relationships. In general, a class of documents

² World Wide Web Consortium, Massachusetts Institute of Technology Laboratory for Computer Science, 545 Technology Square, Cambridge, MA 02139, USA, <http://www.w3.org>

can be considered to be documents that are nearly the same in structure and have similar types of content. A document class is usually (but not necessarily) defined by a structural model (such as a DTD or Schema) that governs its existence.

4.8 *Document Exchange* — for SEMI E36, ‘document exchange’ is synonymous with ‘document interchange’ (see definition).

4.9 *Document Interchange* — document interchange entails passing one or more elements, usually as a document, from one conforming system to one or more other systems (also known as ‘exchange’).

4.10 *Document Model* — ‘document model’ is a term for a set of structural rules that describe the legal markup for a particular class of documents. DTDs and Schema are types of document models.

4.11 *Document Type Definition (DTD)* — a DTD is a document model or list of markup rules, which may be used in both SGML and XML. As specified in the SGML standard, ISO 8879, a DTD is:

“Rules, determined by an application, that apply SGML to the markup of documents of a particular type. A document type definition includes a formal specification, expressed in a document type declaration, of the element types, element relationships and attributes and references that can be represented by markup. It thereby defines the vocabulary of the markup for which SGML defines the syntax.” (ISO 8879 4.105)

4.12 *Element* — an element is one named, contiguous piece of information in the information stream. Usually the data within an element has a semantic or structural relationship as well, for example a person’s surname, an error code, a pointer to external data, a paragraph, or a procedure that contains steps. In the previous version of this specification (i.e., in SEMI E36-95) an element is also referred to as an ‘information component.’

An element is:

- A uniquely addressable unit of information within the document; and/or
- An identifier to an addressable unit of information outside the document.

4.13 *Markup* — for Semiconductor Equipment Manufacturing Information Tagging, markup is defined as additional data characters that are added to data to provide information about the data and make the data more useable. The markup described by Semiconductor Equipment Manufacturing Information Tagging is internal markup, that is, markup which resides in the same data stream as the data—in specific SGML and XML markup.

4.14 *Non-Conforming Document* — a non-conforming document is one that does not use the markup properly or follow the markup rules defined in Semiconductor Equipment Manufacturing Information Tagging.

4.15 *Standard Generalized Markup Language (SGML)* — the Standard Generalized Markup Language is an International Organization for Standardization (ISO) standard. The ISO Reference Number is ISO 8879:1986(E). SGML is a meta-language for constructing markup. See also Extensible Markup Language (XML).

4.16 *Tag* — a tag is a string of characters delimited by rules set out in the SGML standard (and used in XML and HTML). Tags are placed in the datastream to indicate where an element begins and ends. In Semiconductor Equipment Manufacturing Information Tagging, tags match as closely as possible the names of the elements in English.

4.17 *Extensible Linking Language (XLL)* — when released, XLL is intended to be the syntax and semantics for both simple hypertext linking (as exemplified by HTML) and more complex linking, providing such functionality as multi-way links, multi-ended links, and addressing from an external document based on structure. A W3C Working Group is in the process of producing a draft specification, which uses many of the concepts from HyTime (Hypermedia/Time-based Document Representation Language ISO/IEC 10744) and the TEI (Text Encoding Initiative) extended pointers.

4.18 *Extensible Markup Language (XML)* — XML is a W3C Recommendation that describes a subset of SGML syntax and functionality intended for use on the World Wide Web. XML is, by design, simpler, less complex, and easier to implement than SGML. XML is also, by design, far less flexible than SGML because it includes only the most commonly implemented SGML features.

XML is a family of Recommendations that includes a linking specification (XLL); it may in the future include other specifications such as a stylesheet specification (XSL). The XLL linking specification will provide the syntax for hypertext links defined in Semiconductor Equipment Manufacturing Information Tagging. The XSL stylesheet language will be neither mandated nor prohibited in SEMI E36-98.