

SEMI E36.1-0704

SPECIFICATION FOR THE SEMICONDUCTOR EQUIPMENT

MANUFACTURING INFORMATION TAGGING STANDARD SEMI E36

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 March 14, 2004. Available at www.semi.org in July 2004.

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.

1 Purpose

1.1 The purpose of this Specification provides the consolidated Tag Library required in implementing the SEMI E36 Standard.

NOTE 1: The Document Type Definitions, schemas, and Tag Library defined in this Standard 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 The specification contains two levels of compliance necessary in implementing the electronic documentation standard. The following two components make up the compliance levels.

2.1.1 *Level One Identity* — Allows for content to be uniquely identified, most notably the Item ID and Edition ID attributes.

2.1.2 *Level Two Type and Metadata* — Association of semantic detail with items. Important information about the item that allows us to interpret the item correctly. Compliance is established for this level by ensuring that the item uses a standard tag name and is equipped with a small standard set of metadata properties as defined by the Specification.

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

- 3.1 See <http://www.w3.org/TR/2000/CR-RDF-schema-20000327/> - RDF specification.
- 3.2 See <http://www.w3.org/TR/2000/CR-rdf-schema-20000327/#s2.3.1> for the related RDF schema.
- 3.3 See <http://dublincore.org/schemas/xmls/simpledc20020312.xsd> for the related XML schema.
- 3.4 See <http://dublincore.org/> - Dublin Core Metadata Initiative (DCMI).
- 3.5 For a list of Dublin Core metadata elements, see <http://dublincore.org/documents/dces/>.

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

4 Terminology

- 4.1 None.

5 Consolidated Tag Library

5.1 The consolidated tag library is required to implement SEMI E36-0699. The first layer, identity, is supported by the element 'E36Item', which identifies the tagged information as complying with SEMI E36-0699. The second layer, metadata, provides the tags most important for managing and retrieving the documentation.

5.2 Level two compliance is achieved by the inclusion of one or more of the metadata elements described below. For elements inserted for Level 2 compliance, all attributes are considered optional, unless otherwise indicated.

5.3 Attributes associated with the elements appearing below are multi-valued; no restrictions on cardinality are expressed or implied. If an attribute has multiple values, the attributes statement must be repeated, once for each value.

5.4 Element Name — *E36Item*

5.4.1 *Element Description* — This element serves as the basic super type from which, by default, all of the elements in the SEMI E36 tag set are derived. An *E36Item* element can contain arbitrary content. The *E36Item* element has the following attributes:

- *ItemID* — Globally unique URI¹ used to distinguish each *E36Item*. This attribute partitions the space of *E36Items* into equivalence classes, each of which represents an individual item of information.
- *EditionID* — Globally unique URI² used to distinguish each member of an equivalence class, as defined by the *ItemID*. This attribute is used to control variation within an equivalence class.

5.4.2 *Metadata* — The following namespaces are defined for *E36Item* metadata:

5.4.2.1 *DC* — representing the Dublin Core³ namespace.

5.4.2.2 *RDF* — representing the Resource Description Framework⁴ namespace.

5.4.2.3 *e36base* — representing the E36 basic namespace.

5.4.3 In the DC namespace, standard interpretations of the following items of metadata are utilized:

5.4.3.1 Title

5.4.3.2 Publisher

5.4.3.3 Subject

5.4.3.4 Description

5.4.3.5 Format

5.4.3.6 Source

5.4.3.7 Language

5.4.3.8 Rights

5.4.4 In the *e36base* namespace, the following items of metadata are utilized:

5.4.4.1 *ReleaseDate* — This item is a Date describing the moment when the content contained in the tag becomes valid. (mandatory)

5.4.4.2 *ExpirationDate* — This item is a Date describing the moment when the content contained in the tag becomes invalid.

5.4.4.3 *VersionString* — This is a string to be used in assigning a human-readable version name to an individual edition of an *E36Item*.

5.4.5 In the RDF namespace, we make use of the following metadata item:

5.4.5.1 Type (see: <http://www.w3.org/TR/2000/CR-rdf-schema-20000327/#s2.3.1>).

5.5 Element Name — *Manual*

5.5.1 *Element Description* — The *Manual* element is used to define the documents in a document manual set. The content of the *Manual* element is not interpreted.

¹ We recommend using GUID-based URI for this function, although any scheme which generates URI which are guaranteed to be globally unique is acceptable.

² See footnote number one.

³ See <http://dublincore.org/> for information relating to the Dublin Core Metadata Initiative (DCMI). See <http://dublincore.org/schemas/xmls/simpledc20020312.xsd> for the related XML schema. For a list of Dublin Core metadata elements, see <http://dublincore.org/documents/dces>.

⁴ See <http://www.w3.org/TR/2000/CR-RDF-schema-20000327/> for the latest RDF specification.

5.5.2 *Metadata* — In addition to the metadata available from the E36Item tag, the Manual element supports the following additional metadata, all in the e36base namespace:

5.5.2.1 *ManualType*

5.5.2.1.1 *OperationsManual* — Manual type typically used by equipment operators at customer sites to perform the tasks for which the equipment was designed.

5.5.2.1.2 *InstallationManual* — Manual type typically used by supplier and customer engineers to install the equipment at the customer site.

5.5.2.1.3 *MaintenanceManual* — Manual type typically used by trained maintenance technicians at customer sites to perform repair and upkeep of equipment.

5.5.2.1.4 *MaintenanceSchedule* — Manual type typically used by site coordinators and customer facility managers to schedule and document normal preventive maintenance.

5.5.2.1.5 *PartsList* — Manual type typically used by on-site field service engineers and customers to identify parts to order and to maintain a sufficient stocking level to ensure prompt delivery of parts.

5.5.2.1.6 *TroubleshootingManual* — Manual type typically used by equipment operators and qualified maintenance technicians to identify and correct equipment problems.

5.5.2.1.7 *ReleaseNotes* — Manual type typically used by operators, technicians and system administrators to identify changes in software configuration.

5.5.2.1.8 *TrainingManual* — Manual type typically used by supplier training personnel and customers to train operators and maintenance technicians.

5.6 *Element Name — Configuration*

5.6.1 *Element Description* — The Configuration element is used to describe a unique piece of semiconductor manufacturing equipment. The content of the Configuration element is not interpreted.

5.6.2 *Metadata* — In addition to the metadata available from the E36Item tag, the Configuration element supports the following additional metadata, all in the e36base namespace:

5.6.2.1 *WaferSize* — Specific to the wafer size for the specific semiconductor manufacturing equipment set; may be 200 mm, 300 mm, or 'Other'. (mandatory)

5.6.2.2 *Mainframe* — Designation of mainframe type for the specific semiconductor manufacturing equipment set.

5.6.2.3 *TechnologyArea* — The area in which the semiconductor manufacturing equipment set is located in the semiconductor manufacturing process.

5.6.2.3.1 Lithography

5.6.2.3.2 Etch

5.6.2.3.3 Planarization

5.6.2.3.4 Diffusion

5.6.2.3.5 Thin Film

5.6.2.3.6 Implant

5.6.2.3.7 Analytical

5.6.2.3.8 Sort

5.6.2.3.9 Assembly/Test

5.6.2.4 *Process* — Free text field allowable for process type used in the specific semiconductor manufacturing equipment.

5.6.2.5 *Equipment* — Supplier-defined identifier for a specific type of semiconductor manufacturing equipment.

5.7 Element Name — Recipe

5.7.1 Element Description — The Recipe element defines a semiconductor manufacturing equipment recipe or set of instructions pertaining to the process, test or qualification on the specified semiconductor manufacturing equipment. The content of the Recipe element is not interpreted.

5.7.2 Metadata — In addition to the metadata available from the E36Item tag, the Recipe element supports the following additional metadata, all in the e36base namespace:

5.7.2.1 RecipeType

5.7.2.1.1 Process — Use this value if the recipe is for the processing of wafers on the specific semiconductor manufacturing equipment.

5.7.2.1.2 Test — Use this value if the recipe is for testing to validate an adjustment or functional operation of a component or semiconductor manufacturing equipment.

5.7.2.1.3 Qualification — Use this value if the recipe is for the qualification of equipment parameters within the specified range limits on the specified semiconductor manufacturing equipment.

5.8 Element Name — Procedure

5.8.1 Element Description — The Procedure element describes a sequence of equipment related operations, typically performed by operations or service personnel. The content of a Procedure element is interpreted as information describing the sequence of operations or instructions represented by the procedure.

5.8.2 Metadata — In addition to the metadata available from the E36Item tag, the Procedure element supports the following additional metadata, all in the e36base namespace:

5.8.2.1 ProcedureType

5.8.2.1.1 Maintenance — To include procedures but not limited to calibrations, qualifications, retrofits, cleaning, repair, preventive, corrective, diagnostic, troubleshooting, and software around semiconductor manufacturing equipment.

5.8.2.1.2 Installation — To include procedures but not limited to, setup, startup, and install around semiconductor manufacturing equipment.

5.8.2.1.3 Operation — To include procedures around the operation of semiconductor manufacturing equipment.

5.8.2.1.4 ToolRemoval — To include procedures but not limited to, shipping, decontamination, and de-install around semiconductor manufacturing equipment.

5.8.2.1.5 Safety — To include procedures concerning safety during the handling, assembly, installation, use, and removal of semiconductor manufacturing equipment.

5.8.2.1.6 Usage — To include procedures of usage of a non-technical nature.

5.8.2.2 ScheduleType — For periodic procedures, describes the frequency pattern exhibited by the procedure. On specific semiconductor manufacturing equipment, one of:

5.8.2.2.1 Wafer Based.

5.8.2.2.2 CalendarTimeBased.

5.8.2.2.3 ProcessTimeBased.

5.8.2.3 ScheduleUnits — For periodic procedures, describes the nominal frequency for performing the procedure.

5.8.2.3.1 When scheduleType is Wafer Based, this is the number of wafers.

5.8.2.3.2 When scheduleType is CalendarTimeBased, this is the number of elapsed days.

5.8.2.3.3 When scheduleType is ProcessTimeBased, this is the number of elapsed process hours based on the specific semiconductor manufacturing equipment.

5.9 *Element Name — Component*

5.9.1 *Element Description* — The Component element represents a physical or logical part of semiconductor manufacturing equipment. The content of a Component element is not interpreted.

5.9.2 *Metadata* — In addition to the metadata available from the E36Item tag, the Component element supports the following additional metadata, all in the e36base namespace:

5.9.2.1 *SupplierPartNumber* — Contains a supplier-defined part number for an identified system or component on specific semiconductor manufacturing equipment.

5.9.2.2 *OEMPartNumber* — Original Equipment Manufacturer Part number system or component on a semiconductor manufacturing equipment set.

5.9.2.3 *PartName* — Contains the Supplier designated part name for a system or component on specific semiconductor manufacturing equipment set.

5.9.2.4 *OEMName* — Original Equipment Manufacturer Company Name for an identified system or component on a specific semiconductor manufacturing equipment set.

5.10 *Element Name — Narrative*

5.10.1 *Element Description* — The Narrative element represents arbitrary content related to the specific semiconductor manufacturing equipment. The content of a Narrative element is interpreted as text and graphics.

5.10.2 *Metadata* — None.

5.11 *Element Name — ErrorCode*

5.11.1 *Element Description* — The ErrorCode element represents an equipment-generated error code on a specific equipment set. The content of an ErrorCode is interpreted as text describing the error code. This text should be applicable to the context of the end-user.

5.11.2 *Metadata* — In addition to the metadata available from the E36Item tag, the ErrorCode element supports the following additional metadata, all in the e36base namespace:

5.11.2.1 *ErrorNumber* — An alphanumeric string defined by the supplier to identify the error on a specific semiconductor manufacturing equipment set.

5.12 *Element Name — Media*

5.12.1 *Element Description* — The Media element represents a generic linked media resource. The content of a Media element is not interpreted.

5.12.2 *Metadata* — In addition to the metadata available from the E36Item tag, the Media element supports the following additional metadata, all in the e36base namespace:

5.12.2.1 *MediaURL* — A well-formed URL describing the location of the file containing the media element data.

5.12.2.2 *Caption* — A short description of the information contained in the media element, suitable for presentation to the end user.

5.12.2.3 *MediaCategory* — Captures the basic purpose of the media element.

5.12.2.3.1 *ElectricalSchematic* — A schematic diagram representing electrical application, theory, and/or process for the specified semiconductor manufacturing equipment.

5.12.2.3.2 *MechanicalDrawing* — A drawing or diagram showing the mechanical structure of a part, number of associated parts, assembly of parts and/or associated parts for the specified semiconductor manufacturing equipment or represent of this equipment in part or in its entirety.

5.12.2.3.3 *PlumbingSchematic* — A schematic diagram representing Gas/Pneumatic/Vacuum/Hydraulic application, theory, and/or process for the specified semiconductor manufacturing equipment.

5.12.2.3.4 *FacilityLayout* — A diagram noting specific installation requirements (space, electrical, plumbing, environmental) for the specified semiconductor manufacturing equipment.