



Designation: E 1443 – 94 (Reapproved 1999)

Standard Terminology Relating to Building and Accessing Material and Chemical Databases¹

This standard is issued under the fixed designation E 1443; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This terminology standard covers some of the principal terms relating to building and accessing material and chemical databases. The definitions in some few cases are restricted to make them particularly applicable and practicable for use in standards relating to building and accessing such databases.

2. Referenced Documents

2.1 ASTM Standards:

E 548 Guide for General Criteria Used for Evaluating Laboratory Competence²

E 699 Practice for Criteria for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating Building Components in Accordance with Test Methods Promulgated by ASTM Committee E-6²

E 1313 Guide for Recommended Formats for Data Records Used in Computerization of Mechanical Test Data for Metals³

E 1314 Practice for Structuring Terminological Records Relating to Computerized Test Reporting and Materials Designation Formats³

3. Terminology

3.1 Definitions:

access status—a descriptor used to characterize the allowed access to a database or portion thereof.

DISCUSSION—Possible values include: unrestricted, commercially proprietary, government classified, export controlled, sensitive but unclassified, and national use only. **E49.05.001**

allowable, n —a property value to be used for design purposes as issued by a warranting authority; for example, a reference value divided by a stated factor of safety; or, for some design reference works, a value derived in terms of statistical expectations—at least $x\%$ of the population of values is expected to exceed the allowable value with a confidence of $y\%$.

allowed unit—a member of a unit class appropriate for a

numeric data value for a specified property or variable.

DISCUSSION—For example, megapascals, pounds per square inch, and kilograms per square centimeter are all allowed units of the strength unit class; pounds or grams are not allowed.

allowed value—a member of a defined set of permitted values; for example, a category set, a value set, etc.

DISCUSSION—For quantitative parameters, the set is a theoretically or experimentally based range of possible numeric values; for qualitative parameters, the set shall consist of a finite number and enumerated list of standard words or a well-defined system of codes. **E49.03**

category set, n —the closed set of permissible data values from which actual values must be taken for a particular attribute or specific data element.

chemical family, n —a generic category into which chemical substances may be classified.

DISCUSSION—Inorganic categories might include borides, halides, oxides, etc.; polymers are usually classed by the predominant monomer species.

data access capability—the function provided by a central locator directory or index, printed or computerized, to make users aware of the existence and location of scientific and technical information or data and, possibly, how to obtain it.

data access procedures—protocols and modes by which the data values in a data set, data collection, or database can be individually recognized and extracted. **E49.03**

data certification, n —the process of warranting that certain data are valid for a stated application within a stated level of uncertainty.

data element—an individual piece of information used to describe a material or to record test results; for example, a variable name, test parameter, etc., synonymous with data item. **E 1313**

data exchange, n —the movement of data, electronically or otherwise, between two or more computers, systems or locations; synonymous with data interchange.

data integrity, n —the quality ascribed to data when they are handled as intended and are not exposed to accidental or malicious modification, destruction, or disclosure.

data interchange format, n —a plan of organization or arrangement of computerized information that facilitates sharing of information among computers and computer programs.

DISCUSSION—A data interchange format may include an implicit or

¹ This terminology standard is under the jurisdiction of ASTM Committee E-49 on Computerization of Material and Chemical Property Data and is the direct responsibility of Subcommittee E49.03 on Terminology.

Current edition approved July 15, 1994. Published September 1994. Originally published as E 1443 – 91. Last previous edition E 1443 – 93d.

² *Annual Book of ASTM Standards*, Vol 14.02.

³ *Annual Book of ASTM Standards*, Vol 14.01.

explicit data model and may specify a data language.

data quality indicator, *n*—any of several descriptors characterizing the quality of a data record, a database, or of the operation of a data system, to enable a user to make an assessment of the data, database, or data system for the intended purpose. **E49.05**

data security—the degree to which a collection of data is protected from exposure to accidental or malicious alteration, disclosure, or destruction.

data value—a quantitative or qualitative representation of an attribute; quantitative values are expressed numerically and require specification of appropriate units; qualitative values may be expressed as character strings, codes, or symbols.

derived data, *n*—data that are computed or otherwise obtained from other data by application of a specified procedure.

derived variable, *n*—a variable that is related to other variables or physical processes through a relationship which can be developed or calculated from physical principles among the variables.

descriptor, *n*—a term or information element which details the definition of an entity.

DISCUSSION—Descriptors may be used to describe materials, test, data types, etc.

essential field—a field in a record which must be completed in order to make the record meaningful in accordance with the pertinent guidelines or standard.

DISCUSSION—Failure to complete an essential field may render the record unusable in a database or in data exchange. **E49.03**

evaluation—the process of establishing the accuracy and integrity of property data.

DISCUSSION—Evaluation may involve examination and appraisal of the data presented, assessment of experimental technique and associated errors, consistency checks for allowed values and units, comparison with other experimental or theoretical values, reanalysis and recalculation of derived quantities as required, selection of best values, and assignment of probable error or reliability. **E49.05.001**

field—an elementary unit of a record that may contain a data item, a data aggregate, a pointer or a link.

field name—a label used to identify a field.

form—a family name describing the general or specific geometric shape of a material produced by a manufacturing process and from which the test sample was taken to obtain the reported data.

DISCUSSION—Many forms are common to different manufacturing processes or test procedures, or both. Typical classes are: sheet, bar, extruded section, tube. Dimensional limits for these forms may vary among materials groups according to industry practice.

identification code—a unique character string which distinguishes an object (such as a material, chemical entity, machine part, sub-assembly component, software module or database) from similar objects.

intrinsic property, *n*—a property of a substance whose value is independent of the test measurement process and technique.

key—one or more attributes that in combination uniquely characterize a data record and serve to locate it in a computer database. **E49.03**

manufacturer's designation—a distinguishing mark, name, or code associated by the manufacturer with a material or part and which may be used in the acquisition process. **E49.03**

material class—any of several broad groups of materials into which a given material may be classified; for example, metals, ceramics, polymers, composites, or energetic materials. **E49.03**

material designation—any one of several names or codes for a specific material.

material identification code—a character string or strings intended to identify uniquely a material to a specified level of completeness; that is, establishes the sameness in all that matters in using the material described or represented. **E49.03**

metadata—information used to identify, define, and describe the characteristics of data.

non-intrinsic property, *n*—a property of a material which is dependent on the method of test, sample parameters, and test conditions.

primary process—the initial means by which a material is converted from the state in which it was produced to another state, usually a more useful form. **E49.03**

property—a measurable or derivable attribute of a material.

DISCUSSION—A property of a given material may take different values as influenced by one or more independent variables. It is therefore often referred to as a dependent variable. **E49.03**

property class—any of several broad groups of properties; for example, physical, mechanical, or chemical properties. **E49.03**

quality assurance—a planned system of activities whose purpose is to provide assurance that the overall quality control program (see **quality control**) is in fact being effectively implemented.

DISCUSSION—This system involves a continuing evaluation of the adequacy and effectiveness of the overall quality control program with a view to having corrective action initiated where necessary. For a specific material, product, service, etc., this involves verifications, audits, and evaluations of the quality factors that affect the specification, production, inspection, and use of the material, product, service, system, or environment. **E 699, E-6; E 548, E-36**

quality control—a planned system of activities whose purpose is to provide a level of quality that meets the needs of users; also, the use of such a system.

DISCUSSION—The objective of quality control is to provide an overall system integrating the quality factors of several related steps including: the proper specification for what is wanted; production to meet the full intent of the specification; inspection to determine whether the resulting material, product, service, etc., is in accord with the specification; and review of usage to determine necessary revisions of the specification, service, system, or environment. **E 699, E-6**

raw data—experimental test results; data which are not yet