



Standard Practice for Data Collection for Sustainability Assessment of Building Products¹

This standard is issued under the fixed designation E2129; 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 practice covers a set of instructions for collecting data to be used in assessing the sustainability of building products for use in both commercial and residential buildings.

1.1.1 There are many features of a building that contribute to sustainability; one of them is the selection of products for use in a building. Other key features influencing sustainability include, but are not limited to: overall efficiency of the design of the building, the impact the building has on the habits of the occupants, and the impact the building has on the microclimate and macroclimate. This standard addresses sustainability issues related to building products. This standard does not address sustainability issues related to overall building design, site selection, building operations, or other features influencing sustainability.

1.1.2 While it is recommended that users rely on professional judgment informed by both environmental expertise and specific knowledge of the intended use of the product, this standard provides no instruction as to interpretation of the data obtained. Interpretation of the data obtained is the responsibility of the user of this standard.

1.1.3 This document cannot replace education or experience and should be used in conjunction with professional judgment. Not all aspects of this practice may be applicable in all circumstances. This practice is not intended to represent or replace the standard of care by which the adequacy of a given professional service must be judged, nor should this document be applied without consideration of a project's many unique aspects. The word “standard” in the title means only that the document has been approved through the ASTM consensus process.

1.2 This standard is organized according to the Construction Specifications Institute's (CSI) **MasterFormat**² sections to promote consistency in the evaluation of building products.

¹ This practice is under the jurisdiction of ASTM Committee E60 on Sustainability and is the direct responsibility of Subcommittee E60.01 on Buildings and Construction.

Current edition approved Oct. 1, 2010. Published November 2010. Originally approved in 2001. Last previous edition approved in 2005 as E2129 – 05. DOI: 10.1520/E2129-10.

² The term “MasterFormat” and the MasterFormat logo are trademarks of The Construction Specifications Institute (CSI), 99 Canal Center Plaza, Suite 300, Alexandria VA 22314, <http://www.csinet.org>.

1.2.1 CSI **MasterFormat** version 1995 is used to organize information in **Table 2. Appendix X1** provides a cross reference comparison to CSI **MasterFormat** 2004.

1.3 This standard includes general, comprehensive data requirements. Depending upon the building product, certain data requirements may not apply given the unique characteristics of the product and the potential environmental impacts related to the intended use of the product. Depending upon the building product, certain data requirements may need to be added as appropriate to the unique characteristics of the product and the potential environmental impacts related to the intended use of the product.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:³

C618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

C989 Specification for Slag Cement for Use in Concrete and Mortars

C1240 Specification for Silica Fume Used in Cementitious Mixtures

D5359 Specification for Glass Cullet Recovered from Waste for Use in Manufacture of Glass Fiber

D6400 Specification for Compostable Plastics

E631 Terminology of Building Constructions

E1480 Terminology of Facility Management (Building-Related)

E2114 Terminology for Sustainability Relative to the Performance of Buildings

2.2 ANSI Standards:⁴

ANSI A208.2 Medium Density Fiberboard

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

TABLE 1 General Questions

	Question	Yes or No	N/A	U/K	Comments
DIVISION 1—GENERAL REQUIREMENTS					
Criterion No. 1—Materials (Product Feedstock)					
1.1	Have efforts (such as mining management, site restoration, and so forth) been made to minimize or avoid negative environmental impacts, or both, (such as impact to rare or endangered resources or species, releases of toxic chemicals or hazardous air pollutants, and so forth) in obtaining raw materials for this product? If yes, describe these efforts.				
1.2	Is the product a recycled content product? If YES, indicate what percentage of the product is recycled and differentiate between pre-consumer and post-consumer recycled content.				
1.3	If applicable, does the recycled content product contain the percentage of recovered materials recommended by the U.S. EPA's Comprehensive Procurement Guidelines ?				
1.4	Is the product 100% recyclable? If NO, please indicate what percentage of the product is recyclable.				
1.5	Is the product a biobased product (i.e. agricultural or forestry material)? If YES, please indicate the source and biobased content percentage. If percentage refers to a component rather than the entire product, please specify.				
1.6	Is the product made from a renewable resource? If YES, indicate the renewable cycle time and what percentage of the product that resource represents.				
1.7	Does the product, in the specified condition of use, meet EPA's National Volatile Organic Compound (VOC) ?				
1.8	Does the product in the specified condition of use, meet the requirements of South Coast Air Quality Management District for content of VOCs?				
Criterion No. 2—Manufacturing					
2.1	Has the manufacturer taken steps to minimize the use of nonrenewable energy from the point at which raw materials are gathered to the point at which the final product is transported to the building site? If yes, describe these measures.				
2.2	Is any of the waste produced in making this product reclaimed on-site? If yes, what percentage of the waste is reclaimed? Of the waste that is not reclaimed on-site, how is that waste handled?				
2.3	Does the process for manufacturing this product avoid the use of listed substances above the levels that would require reporting under the U.S. EPA's Toxics Release Inventory ? If NO, indicate how much of each substance is released per unit of product.				
2.4a	Does the process for manufacturing the product avoid the addition of substances listed in the National Toxicology Program's Report on Carcinogens ?				
2.4b	If substances listed in the National Toxicology Program's Report on Carcinogens are added directly in the manufacturing process or are reported by suppliers on Material Safety Data Sheets (MSDS), do the concentrations fall below levels required to be reported under federal regulations on the products' MSDS? If NO, indicate the substance, classification and concentration per unit of product.				
2.5	Have any recent improvements been made to limit negative environmental impacts relating to the manufacturing process? If YES, describe the benchmark against which the improvements are measured and the degree of improvement.				
2.6	If water is used during the production process, have water conservation or recycling measures, or both, been initiated? If yes, describe the measures and what percentage of the total water usage they address.				
2.7	Has the manufacturer undertaken any of the following actions? If yes, indicate when the action(s) was (were) taken and describe the benchmark against which the improvements are measured and the degree of improvement.				
2.7a	Redesigned a production process to decrease greenhouse gas emissions?				
2.7b	Redesigned a production process to decrease liquid effluents?				
2.7c	Redesigned a production process to utilize less toxic materials?				
2.7d	Substituted safer solvents in a production process?				
2.7e	Instituted more stringent dust controls?				
2.7f	Installed smoke-stack particulate collectors or gas scrubbers?				
2.7g	Installed or improved in-plant solid and toxic waste reduction programs?				
2.8	Does the manufacturing facility comply with or exceed applicable occupational, health, and safety requirements?				
Criterion No. 3—Operational Performance of Installed Product					
3.1	If applicable, does the product qualify for an EPA Energy Star Program rating or meet the energy efficiency recommendations of the DOE's Federal Energy Management Program ?				
3.2	Describe the product's energy efficiency impacts.				
3.3	Describe routine maintenance procedures for the product.				
3.4	How long will the product last in the building if maintained properly with routine maintenance procedures?				
3.5	Does the manufacturer provide detailed instructions with the product upon delivery to the job site for the proper use and maintenance required in order to ensure that this product will last this long?				
Criterion No. 4—Indoor Environmental Quality^A					

	Question	Yes or No	N/A	U/K	Comments
4.1	Is there any other information about how this product contributes to indoor environmental quality (positively or negatively, e.g. acoustical properties, lighting, potential risks to workers during application, and so forth) that has not already been reported, but that sender of this questionnaire should know? If YES, describe. (If this product is not intended to be used in the indoor environment or to interface with the occupants, indicate N/A.)				
Criterion No. 5—Corporate Environmental Policy					
5.1	Does the manufacturer have a written environmental policy? If YES, indicate how the sender of this questionnaire could obtain a copy of this policy upon request.				
5.2	Does the manufacturer have a reclamation program or any other program in place to facilitate the recycling or reuse of its product by accepting return of the product at the end of its useful life? If NO, comment on the environmental impact of the product as a waste material. If yes, comment on how much of the product is actually reused or recycled at the end of the product's useful life.				
5.3	Does the manufacturer have a program in place to reduce the amount of the product's packaging? If YES, describe.				
5.4	Does the manufacturer have a program in place to facilitate the return, reuse, recycling, or composting of the product's packaging? If YES, describe.				
5.5	Does the manufacturer provide information on the service life of the product or encourage the use of professional guidelines to determine the service life of the product?				
5.6	Does the manufacturer provide information regarding natural disaster mitigation, such as performance of the product during a natural disaster or appropriate response after a natural disaster?				
5.7	Is documentation available to support the product's environmental claims? If YES, please indicate how copies may be obtained upon request.				
5.8	Is there other information, for which you could provide objective evidence, about the environmental quality of the building product you offer that you would like taken into consideration? If YES, describe the information and indicate how copies of this evidence could be obtained upon request.				

^A Note that some of the questions under Criterion No. 1 (Materials [Product Feedstock]) refer to attributes of products, for example, toxicity, that pose concerns for indoor environmental quality as well. In the interest of avoiding repetition, those questions are not repeated here. Respondents are reminded to answer all questions in the general section of this questionnaire.

2.3 ASHRAE Standards:⁵

ASHRAE 90.1 Energy Efficient Design of New Buildings
Except Low-Rise Residential Buildings

ASHRAE 62 Ventilation of Acceptable Indoor Air Quality
ASHRAE 52–76 Gravimetric and Dust-Spot Procedures for
Testing Air-Cleaning Devices Used in General Ventilation
for Removing Particulate Matter

2.4 ASME Standards:⁶

ASME A112.18.1M-1989 Plumbing Fixture Fittings

2.5 CSI Program:⁷

MasterFormat 2004 Edition

2.6 DOE Program:⁸

Federal Energy Management Program

2.7 EPA Standards:

Energy Star Program ⁹

Comprehensive Procurement Guidelines ¹⁰

National Volatile Organic Compound (VOC) Emission
Standards¹⁰

Toxics Release Inventory ¹⁰

2.8 HUD Standards:¹¹

24 CFR Pt. 3280 Manufactured Home Construction and
Safety Standards

10 CFR 435 Voluntary Performance Standards for New
Buildings

2.9 OSHA Standards:¹²

OSHA Regulations

2.10 NFRC Standards:¹³

NFRC 100 Procedure for Determining Fenestration Product
U-Factors

NFRC 200 Thermal Performance & Solar Heat Gain Test
Method

NFRC 300 Test Method for Determining the Solar Optical
Properties of Glazing Materials and Systems

2.11 NTP Reports:¹⁴

⁵ Available from American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE), 1791 Tullie Circle, NE, Atlanta, GA 30329, <http://www.ashrae.org>.

⁶ Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Three Park Ave., New York, NY 10016-5990, <http://www.asme.org>.

⁷ Available from The Construction Specifications Institute (CSI), 99 Canal Center Plaza, Suite 300, Alexandria VA 22314, <http://www.csinet.org>.

⁸ Available from U.S. Department of Energy (DOE), Energy Efficiency and Renewable Energy, Mail Stop EE-1, Department of Energy, Washington, DC 20585, <http://www.eere.energy.gov>.

⁹ Available from United States Environmental Protection Association (EPA), Climate Protection Partnerships Division ENERGY STAR Programs Hotline & Distribution (MS-6202J), 1200 Pennsylvania Ave., NW, Washington, DC 20460, <http://www.epa.gov>.

¹⁰ Available from United States Environmental Protection Agency (EPA), Ariel Rios Bldg., 1200 Pennsylvania Ave., NW, Washington, DC 20460, <http://www.epa.gov>.

¹¹ Available from U.S. Department of Housing and Urban Development (HUD), 451 7th Street S.W., Washington, DC 20410, <http://www.hud.gov>.

¹² Available from Occupational Safety and Health Administration (OSHA), 200 Constitution Ave., NW, Washington, DC 20210, <http://www.osha.gov>.

¹³ Available from National Fenestration Rating Council (NFRC), 8484 Georgia Avenue, Suite 320 Silver Spring, MD 20910, <http://www.nfrc.org>.

¹⁴ Available from National Toxicology Program (NTP), National Institutes of Health's National Institute of Environmental Health Sciences (NIEHS), Research Triangle Park, NC, <http://ntp.niehs.nih.gov>.

TABLE 2 Questions Related to Specific Building Products

	Question	Yes or No	N/A	U/K	Criteria Category(ies)	Comments
DIVISION 2—SITE CONSTRUCTION						
General						
2-A	Does the manufacturer facilitate ultimate deconstruction of buildings or building products, or both, (in which components are taken apart for reuse) by, for example, designing products for disassembly? If YES, describe the process.				☐ Materials ☐ Manufacturing ☐ Op. Performance ☐ IEQ ☒ Corp. Env. Policy	
2-B	Does the product facilitate water treatment on site? If YES, describe the process and indicate the level of treatment.				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☒ Corp. Env. Policy	
Paving						
2-C	Does the manufacturer offer surfaces with high albedo reflectance? What is the albedo reflectance?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
2-D	Does the manufacturer offer pervious paving materials for non-landscaped areas (roadways, surface parking, plazas, pathways)?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
DIVISION 3—CONCRETE						
3-A	Does the product meet the following standards, which refer to recovered materials?				☒ Materials ☐ Manufacturing ☐ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
3-A.1	Specification C618 "Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete?"				☒ Materials ☐ Manufacturing ☐ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
3-A.2	Specification C989 "Specification for Ground Granulated Blast Furnace Slag for use in Concrete and Mortars?"				☒ Materials ☐ Manufacturing ☐ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
3-A.3	Specification C1240 "Specification for Silica Fume for Use in Hydraulic Cement, Concrete, and Mortar?"				☒ Materials ☐ Manufacturing ☐ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
DIVISION 4—MASONRY						
4-A	Does the product meet the following standards, which refer to recovered materials?				☒ Materials ☐ Manufacturing ☐ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
4-A.1	Specification C989 "Specification for Ground Granulated Blast Furnace Slag for use in Concrete and Mortars?"				☒ Materials ☐ Manufacturing ☐ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
4-A.2	Specification C1240 "Specification for Silica Fume for Use in Hydraulic Cement, Concrete, and Mortar?"				☒ Materials ☐ Manufacturing ☐ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
DIVISION 5—METALS						
5-A	Does the product have a factory finish or can it be installed unfinished? If NO, describe recommended field finishing properties.				☐ Materials ☒ Manufacturing ☐ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
5-B	If a finish does exist, can the finish be easily removed to facilitate future recycling of the metal?				☐ Materials ☒ Manufacturing ☐ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
DIVISION 6—WOOD AND PLASTICS						
Wood						

	Question	Yes or No	N/A	U/K	Criteria Category(ies)	Comments
6-A	Is the wood that is used in the product harvested from forests that have been managed for sustainability according to the guidelines of a recognized certification program? If YES, indicate the name of regulation and describe the primary aspects of sustainability that it promotes.				☒ Materials ☐ Manufacturing ☐ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
6-B	Is the product made from a species of wood that is naturally resistant to damage associated with the conditions to which it is exposed? If YES, indicate which definition of “naturally resistant” is used to make this determination and indicate the name of the species.				☒ Materials ☐ Manufacturing ☐ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
6-C	Has the wood been treated with a preservative? If YES, please indicate the preservative that was used and the standard (or standards) to which the wood was treated.				☒ Materials ☒ Manufacturing ☐ Op. Performance ☒ IEQ ☐ Corp. Env. Policy	
6-D	Is the agricultural resource from which this product is made certified organically grown according to the standards of a recognized certification program? If YES, indicate the name of the certification program.				☒ Materials ☐ Manufacturing ☐ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
6-E	Is the medium density fiberboard (MDF), or products made containing MDF, third party certified to comply with the formaldehyde emissions requirements in ANSI A208.2?				☒ Materials ☒ Manufacturing ☐ Op. Performance ☒ IEQ ☐ Corp. Env. Policy	
6-F	Does the binder for plywood or particleboard, or both, meet the Manufactured Home Construction and Safety Standards promulgated by HUD 24 CFR Pt. 3280 for formaldehyde emissions?				☐ Materials ☒ Manufacturing ☐ Op. Performance ☒ IEQ ☐ Corp. Env. Policy	
Plastics and Plastic Composites						
6-G	Are plastics marked to identify materials for recycling?				☒ Materials ☐ Manufacturing ☐ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
6-H	Does the building product (or components of the product) meet the requirements of Specification D6400 “Standard Specification for Compostable Plastics?”				☒ Materials Manufacturing ☐ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
DIVISION 7—THERMAL AND MOISTURE PROTECTION						
Roofing						
7-A	Is the roofing material a light color/high albedo material? If YES, what is the albedo reflectance?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
Sealants and Caulking						
7-B	Do caulking and sealant products come with detailed instructions for proper application in order to minimize health concerns? If YES, indicate how the sender of this questionnaire could obtain a copy of the instructions.				☐ Materials ☐ Manufacturing ☐ Op. Performance ☒ IEQ ☐ Corp. Env. Policy	
7-C	Is the sealant or caulking compound a low-odor, all-weather, waterproof, and vapor-proof coating?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☒ IEQ ☐ Corp. Env. Policy	
Insulation						
7-D	Does the fiberglass insulation product meet the requirements established in Specification D5359 “Specification for Glass Cullet Recovered from Waste for Use in Manufacture of Glass Fiber?”				☒ Materials ☐ Manufacturing ☐ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
7-E	In which R-Values is the insulation product available?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
DIVISION 8—DOORS AND WINDOWS						
8-A	Is the energy efficiency of the windows, doors, or skylights determined in accordance with NFRC 100 (U Factor) and NFRC 200 (SHGC) by an accredited independent laboratory and labeled and certified by the manufacturer?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	



	Question	Yes or No	N/A	U/K	Criteria Category(ies)	Comments
8-B	What is the Visible Light Transmission Coefficient of the windows, doors, and skylights as determined according to NFRC 300 ?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
DIVISION 9—FINISHES						
Flooring						
9-A	Does the carpet product meet the requirements of a third party environmental certification program? If YES, indicate the name of the certification program.				☐ Materials ☐ Manufacturing ☐ Op. Performance ☒ IEQ ☐ Corp. Env. Policy	
9-B	Does the manufacturer recommend the carpet product be aired out prior to installation? If YES, describe the process for airing out.				☐ Materials ☐ Manufacturing ☐ Op. Performance ☒ IEQ ☐ Corp. Env. Policy	
Paints and Coatings						
9-C	Does the finishing product contain plant-sourced oils and solids utilizing only natural or aliphatic solvents, or both?				☒ Materials ☐ Manufacturing ☐ Op. Performance ☒ IEQ ☐ Corp. Env. Policy	
9-D	Is the finish water-borne? If NO, indicate the solvent used.				☐ Materials ☐ Manufacturing ☐ Op. Performance ☒ IEQ ☐ Corp. Env. Policy	
DIVISION 10—SPECIALTIES						
10-A	Is the product modular or otherwise adaptable? If YES, describe the product.				☒ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
DIVISION 11—EQUIPMENT						
There are no questions for Division 11.						
DIVISION 12—FURNISHINGS						
12-A	Are there components of the furnishings that are reused or refurbished? If YES, indicate how much of the furnishings, per unit, is reused or refurbished.				☒ Materials ☐ Manufacturing ☐ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
12-B	Does the finishing product for furnishings contain plant-sourced oils and solids utilizing only natural or aliphatic solvents, or both?				☒ Materials ☐ Manufacturing ☐ Op. Performance ☒ IEQ ☐ Corp. Env. Policy	
12-C	Is the finish water-borne? If NO, indicate the solvent used.				☐ Materials ☐ Manufacturing ☐ Op. Performance ☒ IEQ ☐ Corp. Env. Policy	
12-D	Is the adhesive or fastener products for furnishings manufactured without the addition of urea-formaldehyde?				☐ Materials ☐ Manufacturing ☐ Op. Performance ☒ IEQ ☐ Corp. Env. Policy	
DIVISION 13—SPECIAL CONSTRUCTION						
There are no questions for Division 13.						
DIVISION 14—CONVEYING SYSTEMS						
14-A	Does the elevator operate by using hydraulics? If YES, describe the method used to prevent and mitigate leakage of hydraulic fluid.				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
DIVISION 15—MECHANICAL						
Oils and Lubricants						
15-A	Are the lubricants for the motors, cables, and other moving parts from re-refined sources?				☒ Materials ☐ Manufacturing ☐ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
HVAC						



	Question	Yes or No	N/A	U/K	Criteria Category(ies)	Comments
15-B	Does the manufacturer use software or professional guidelines to calculate proper size and life-cycle cost? If YES, comment on how.				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☒ Corp. Env. Policy	
15-C	Does the HVAC system use non-ozone-depleting refrigerants? Which refrigerant is used?				☒ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
15-D	Can technologies that extract more heat from the heat source be utilized?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
15-E	Is the ignition electric (as opposed to a pilot light)?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
15-F	Are Digital Direct Controls provided?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
15-G	Does the company provide products to facilitate monitoring temperatures by a central computer?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
15-H	Do the programmable thermostats have a night mode?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
15-I	Does the HVAC System meet the energy efficiency performance criteria outlined in 10 CFR 435 ?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
15-J	Does the HVAC System meet or exceed the applicable efficiency levels outlined in ASHRAE 90.1 ?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
15-K	Does the HVAC system provide ventilation in accordance with ASHRAE 62 , Ventilation of Acceptable Indoor Air Quality?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☒ IEQ ☐ Corp. Env. Policy	
15-L	How much CFM of outdoor air per person does the HVAC system provide?				☒ Corp. Env. Policy ☐ Materials ☐ Manufacturing ☒ Op. Performance ☒ IEQ ☐ Corp. Env. Policy	
15-M	Does the air monitoring system have the capability to monitor for carbon monoxide, carbon dioxide, total volatile organic compounds and particulates (including PM-10)?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☒ IEQ ☐ Corp. Env. Policy	
15-N	Do the filters meet the Dust Spot Efficiency Test of ASHRAE 52-76 ?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☒ IEQ ☐ Corp. Env. Policy	
15-O	Is the HVAC sealant manufactured without the addition of formaldehyde, aqueous ammonia, respirable crystalline silica, or ethylene glycol?				☒ Materials ☐ Manufacturing ☐ Op. Performance ☒ IEQ ☐ Corp. Env. Policy	
15-P	Are the filters easy to access, clean, and replace?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☒ IEQ ☐ Corp. Env. Policy	

Plumbing

	Question	Yes or No	N/A	U/K	Criteria Category(ies)	Comments
15-Q	Are fixtures equipped with automatic sensor operations?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
15-R	Are fixtures equipped with low flow devices? What is the flow-rate of the faucets? What is the flush rate of the toilets/urinals?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
15-S	Do the showerheads, faucets, toilets and other water sources comply with ASME A112.18.1M-1989 flow requirements?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
15-T	Does the manufacturer offer a product(s) to facilitate the use of gray water for acceptable applications (such as irrigation or sprinklers)? If YES, indicate how the sender of this questionnaire could obtain product information.				☒ Materials ☐ Manufacturing ☐ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
15-U	Does the product use solar power, or other renewable form(s) of energy, or both, to heat hot water? If YES, describe the energy source(s).				☒ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
15-V	Is the hot water available "on demand" (as opposed to stored)? If YES, please indicate the type of system utilized.				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
15-W	What is the recovery efficiency of the hot water heater?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
15-X	What is the stand-by loss of the water heater?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
DIVISION 16—ELECTRICAL						
16-A	How many watts does the product use?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
16-B	What is the average lamp efficiency (lumens/watt)?				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	
16-C	Does the manufacturer offer occupancy/motion sensors? If YES, indicate the type of sensors utilized.				☐ Materials ☐ Manufacturing ☒ Op. Performance ☐ IEQ ☐ Corp. Env. Policy	

Report on Carcinogens (RoC)

2.12 SCAQMD Standards:¹⁵

South Coast Air Quality Management District Regulations for Content of VOCs

3. Terminology

3.1 Definitions:

3.1.1 For terms related to the field of building, refer to Terminology **E631**.

3.1.2 For terms relating to the operation and management of buildings, refer to Terminology **E1480**.

3.1.3 For terms related to sustainability relative to buildings, refer to Terminology **E2114**. Some of these terms are reprinted here for ease of use.

3.1.3.1 *biobased products, n*—products fabricated from alternative agricultural materials or forestry materials, or both.

3.1.3.2 *life-cycle cost (LCC) method, n*—a technique of economic evaluation that sums over a given study period the costs of initial investment (less resale value), replacements, operations (including energy use), and maintenance and repair of an investment decision (expressed in present or annual value terms).

¹⁵ Available from South Coast Air Quality Management District (SCAQMD), 21865 Copley Dr., Diamond Bar, CA 91765, <http://www.aqmd.gov>.

3.1.3.3 *post-consumer, adj*—refers to materials that are reclaimed from products that have already served their intended end-use as a consumer item. Waste from industrial processes are not considered post-consumer. Post consumer materials are a subset of recovered materials.

3.1.3.4 *pre-consumer, adj*—refers to materials that are reclaimed from manufacturing and other industrial processes, and products which have not served their intended end-use as a consumer item such as overissue publications and obsolete inventories. Pre-consumer materials include: culls, trimmed materials, print overruns, overissue publications, and obsolete inventories.

3.1.3.5 *recovered materials, n*—waste material and by-products which have been recovered or diverted from the waste stream, but such term does not include those materials and by-products generated from, and commonly reused within, an original manufacturing process.

3.1.3.6 *recycled content products, n*—refers to products that contain pre-consumer or post-consumer material as all or part of their feedstock.

3.1.3.7 *renewable resource, n*—a resource that is grown, naturally replenished, or cleansed at a rate which exceeds depletion of the usable supply of that resource.

Discussion—A renewable resource can be exhausted if improperly managed. However, a renewable resource can last indefinitely with proper stewardship. Examples include: trees in forests, grasses in grasslands, and fertile soil.

3.1.3.8 *sustainability, n*—the maintenance of ecosystem components and functions for future generations.

3.1.3.9 *sustainable development, n*—development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *building product, n*—refers to building elements and assemblies.

3.2.2 *corporate environmental policy, n*—as used in this standard, refers to the published and verifiable position a company maintains with respect to the manufacture of a building product. Corporate environmental policy may include both environmental and social aspects. Corporate environmental policy may include goals, programs, and specific requirements related to the materials, manufacturing process, operational performance, and IEQ.

3.2.3 *energy efficient, adj*—refers to a building product that requires less energy to manufacture or uses less energy, or both, when operating in comparison with a benchmark for energy use.

3.2.3.1 *Discussion*—For example, the product may meet a recognized benchmark, such as EPA's Star Program¹⁶ standards.

3.2.4 *indoor environmental quality (IEQ), n*—refers to the condition or state of the indoor built environment in which the building product is installed. Aspects of IEQ include: light quality, acoustic quality, and air quality.

3.2.5 *manufacturing process, n*—refers to the process of creating a building product and includes manufacturing, fabrication, and distribution procedures.

3.2.6 *materials (product feedstock), n*—refers to the material resources that are required for the manufacture or fabrication, or both, of a building product.

3.2.6.1 *Discussion*—Material resources include raw materials and recycled content materials.

3.2.7 *operational performance (product installed), n*—refers to the functioning of a building product during its service life. Specific measures of operational performance will vary depending upon the product. Aspects of operational performance include: durability, maintainability, energy efficiency, and water efficiency.

4. Summary of Practice

4.1 This standard is organized according to CSI's **Master-Format** Organization (Divisions 1-16).

4.1.1 General questions are considered applicable to all building products.

4.1.2 Specific questions are considered applicable to particular building product types as indicated.

4.2 Depending on the particular building product and application, some of the questions may not be applicable. The user of this standard should indicate "not applicable" (N/A) in the response as appropriate.

4.3 The user of this standard may not know the answer to a certain question or the answer may not be available. In such cases, the user of this standard should indicate "unknown" (U/K) in the response.

4.4 There are five criteria categories referenced in this standard as follows: Materials (Product Feedstock); Manufacturing Process; Operational Performance of Installed Product; Indoor Environmental Quality; and, Corporate Environmental Policy.

4.4.1 In **Table 1**, the general questions are subdivided into these five criteria categories.

4.4.2 In **Table 2**, the specific questions indicate the criteria category(ies) affected with an "X" in the column entitled "Criteria Categories." The user may indicate additional criteria categories, as appropriate.

4.5 Depending on the particular building product and application, additional questions may be necessary. The user of this standard may choose to add additional questions as appropriate.

5. Significance and Use

5.1 This standard provides a practice for data collection for the purpose of assessing the sustainability of building products. Such data can inform decisions relative to construction, renovation, repair, and maintenance of buildings with the goal of promoting sustainability and sustainable development.

5.1.1 The users of this standard include building industry professionals who possess a broad, general understanding of sustainability issues relative to the performance of buildings. Such users may include planners, developers, architects, engineers, interior designers, contractors, owners, financial organizations related to the buildings industry, building materials and

¹⁶ The term "Energy Star" and the Energy Star logo are trademarks of United States Environmental Protection Association (EPA), Ariel Rios Bldg., 1200 Pennsylvania Ave., NW, Washington, DC 20460, <http://www.epa.gov>.

product manufacturers, government agencies including building officials, and other building professionals.

5.1.2 Users should note that, subsequent to the preliminary assessment facilitated by the comparative information collected in accordance with this standard, additional detailed and more technical information may be required in order to adequately assess specific needs for specific applications.

5.2 There are many environmental features and issues, each with local, regional, and global implications, involved in sustainability. It is becoming increasingly necessary to be able to quantify complex sustainability data relative to building industry information tools. This standard provides a format for relating the commonly accepted sustainability principles to building industry data collection methods. Users may wish to consider other building product attributes for which sustainability principles are deemed to be important or measurement methodologies may exist, or both. For example, the embodied energy of the product and greenhouse emitted over a product's lifecycle, which can have a significant effect on the overall sustainability of a building product, may be deemed important.

5.3 The format for data collection is intended to facilitate a cost-effective and efficient assessment of sustainability issues relative to building materials.

5.4 The scientific understanding of the functioning and interrelation of ecosystems continues to evolve; nevertheless, there are many accepted principles relative to the design, construction, and operation of buildings for improved sustainability. Commonly accepted environmental principles are addressed in the five criteria categories, with an emphasis on the following characteristics: the selection and acquisition of materials (Criteria Category 1), the manufacturing process (Criteria Category 2), the operational performance of the installed building product (Criteria Category 3), the impact of the building product on IEQ (Criteria Category 4), and the

corporate environmental policy of the company manufacturing or fabricating the building product, or both (Criteria Category 5).

5.5 To the greatest extent feasible, questions are designed to prompt simple yes-or-no responses.

5.5.1 For questions prompting a yes-or-no response, a "yes" response is typically indicative of the more sustainable response. However, this standard provides no instruction as to the degree of impact on sustainability of a "yes" response relative to a "no" response for a particular question; and, this standard provides no instruction as to the degree of impact on sustainability of one question relative to another question.

5.5.2 The user is cautioned to review each question and the comments associated with each question. Unique characteristics of a building product and unique applications of a building product may affect interpretation of the data.

5.5.3 Comments may be provided where there is information which will elucidate the topic and improve understanding relative to the complexities of the particular question.

5.5.4 "N/A" may be indicated where questions request information that is not applicable or not available, or both.

5.5.5 "U/K" may be indicated where questions request information that is unknown or unavailable.

6. Procedure

6.1 **Table 1** and **Table 2** are data collection questionnaires intended to be completed on a product-by-product basis for the express purpose of facilitating comparisons between similar building products.

7. Keywords

7.1 building product; energy efficiency; environmental; green building; indoor environmental quality (IEQ); sustainability; sustainable; sustainable development

APPENDIX

X1. CROSS REFERENCE COMPARISON OF CSI MASTERFORMAT 1995 TO CSI MASTERFORMAT 2004

X1.1 See **Table X1.1**.

TABLE X1.1 Cross Reference Comparison of CSI MasterFormat 1995 to CSI MasterFormat 2004^A

MasterFormat 1995		MasterFormat 2004 ^A	
Division 1	General Requirements	Division 01	General Requirements
Division 2	Site Construction	Division 02	Existing Conditions
		Division 31	Earthwork
		Division 32	Exterior Improvements
		Division 33	Utilities
Division 3	Concrete	Division 35	Waterway and Marine Construction
Division 4	Masonry	Division 03	Concrete
Division 5	Metals	Division 04	Masonry
Division 6	Wood and Plastics	Division 05	Metals
Division 7	Thermal and Moisture Protection	Division 06	Wood, Plastics, and Composites
Division 8	Doors and Windows	Division 07	Thermal and Moisture Protection
Division 9	Finishes	Division 08	Openings
Division 10	Specialties	Division 09	Finishes
Division 11	Equipment	Division 10	Specialties
		Division 11	Equipment
		Division 42	Process Heating, Cooling, and Drying Equipment
		Division 43	Process Gas and Liquid Handling, Purification, and Storage Equipment
		Division 44	Pollution Control Equipment
		Division 45	Industry-Specific Manufacturing Equipment
Division 12	Furnishings	Division 12	Furnishings
Division 13	Special Construction	Division 13	Special Construction
		Division 25	Integrated Automation
Division 14	Conveying Systems	Division 14	Conveying Systems
		Division 34	Transportation
		Division 41	Material Processing and Handling Equipment
Division 15	Mechanical	Division 21	Fire Suppression
		Division 22	Plumbing
		Division 23	Heating, Ventilating, and Air Conditioning
Division 16	Electrical	Division 26	Electrical
		Division 27	Communications
		Division 28	Electronic Safety and Security
		Division 48	Electrical Power Generation
		Division 40	Process Integration

^A Gaps in Division numbering above are to permit future expansion.

ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.

This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org). Permission rights to photocopy the standard may also be secured from the ASTM website (www.astm.org/COPYRIGHT/).