



Product Category Rule (PCR) Guidance for Building-Related Products and Services

1

Part B: Builders Hardware EPD Requirements



2 **Publisher:**
3 UL Environment

4
5 **Tracking of versions**

Version	Comments	History
1.0	Creation of PCR Part B for Builders Hardware Products to conform with ISO 21930: 2017 and UL Part A. This PCR has been updated to align with international standards with the intent of allowing manufacturers to create EPDs which are global in scope.	xxxxxxx, 2019

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7 This PCR is valid for a period of five (5) years, set to expire in xxxxxxxx, 2024.

8 **I. Background Information and Acknowledgements**

9 These sub-category Product Category Rules (PCR) were developed to address the product specific rules
10 for the creation of Environmental Product Declarations (EPD) for “builders hardware” and includes all
11 commercially available products under the ANSI/BHMA A156 series of standards except for A156.10,
12 A156.18, A156.27, A156.28, A156.32, A156.115, and A156.115-W, collectively referenced throughout this
13 PCR as “builders hardware”. When used to self-reference this document, “PCR” refers to “sub-category
14 PCR.”

15 Other PCRs considered in the development of this PCR update include:

- 16 • Part A: Life Cycle Assessment Calculation Rules and Report Requirements UL Environment
17 December 2018, version 3.2)
- 18 • ISO 21930: 2017 - Sustainability in building construction -- Environmental declaration of building
19 products
- 20 • EN 15804: 2012-04 - Sustainability of construction works - Environmental Product Declarations -
21 Core rules for the product category of construction product.
- 22 • PCR Guidance-Texts for Building-Related Products and Services, From the range of
23 Environmental Product Declarations of Institute Construction and Environment e.V. (IBU), Part B:
24 Requirements on the EPD for locks and fittings, July 2013

25
26
27 This PCR assumes a 75 year building service life to be consistent with ASHRAE 189.1 (2014, Section
28 9.5.1).

29 Interested Parties

30 This Part B has been prepared with input from the following stakeholders:

31 Trade associations

- 32 • Builders Hardware Manufacturing Association (BHMA)

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34
35
36 Governance

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38 There are a number representatives of building hardware manufacturers participating in the creation of
39 this Product Category Rule (“PCR”) for builders hardware, including the Builders Hardware Manufacturing
40 Association (BHMA). These parties represent a majority of the companies in their particular sector of the
41 builders hardware industry. Moreover, the manufacturing parties participating in the PCR update
42 represent the vast majority of the building hardware systems sold in North America in the product
43 categories included in this PCR. The very purpose and function of a trade association is to inform its
44 members of important industry developments and to represent their interests in projects such as the
45 update of a PCR affecting their products. This is important because it effectively demonstrates that a
46 large percentage of the builders hardware industry is represented in the effort to renew the PCR for
47 builders hardware products.

48 In the development of this document, Part B, participants are responsible for ensuring alignment with Part
49 A and conformance with the scoped standards: ISO 21930, EN 15804, and ISO 14025.

50 Involvement of Interested Parties

51
52 UL Environment shall be responsible for producing the PCR document by establishing an open
53 consultation process that includes the involvement of interested parties (ISO 21930 Section 5.2 and
54 6.2.1). Reasonable efforts were made to achieve a consensus throughout the process (ISO 14020:2000,
55 4.9.1, Principle 8 and cited in both ISO 14025 and ISO 21930), demonstrated by a vote of participating
56 interested parties.

57 BHMA informed their memberships of the PCR creation through their regularly scheduled association
58 committee meetings, newsletters, e-mail messages, and similar types of outreach. Trade associations
59 operate at the behest of its members, and the fact that trade associations are participating in the update
60 of a PCR for builders hardware products is an indication that their memberships are aware of this project
61 and have authorized their association to represent them in this important endeavour.

62 UL Environment posted an open call for participation in this PCR update in xxxxxx 2019 via its standards
63 website, social media outlets, and outreach to original committee stakeholders.

64 Update Process

65
66 The PCR is valid for a duration of five (5) years from the publication date, at which time it may be revised
67 at the request of industry stakeholders. The PCR may be revised before the five year date if the following
68 occurs in the industry:

- 69 ● The industry desires an update
- 70 ● Core governing standards ISO 14040, 14044, 14025, 21930, or EN 15804 are updated with
71 substantial material changes

72
73 Note: When the PCR is updated, the Program Operator shall communicate with the original committee,
74 any new EPD participants, and initiate a new public call for interested parties.

75 Public Consultation

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77
78 Public consultation was utilized during the PCR review process. The public consultation of the completed
79 draft PCR included a minimum 30-calendar-day period for comments to be submitted to UL Environment.
80 After public comments were submitted, the PCR committee reviewed and developed responses for all
81 comments. All comments from the review panel and public consultation were addressed and satisfactorily
82 resolved by the PCR committee prior to the publication of this PCR.

83 Review

84
85



Mortise Locks & Latches	ANSI/BHMA A156.13-2017	08 71 00
Sliding and Folding Door Hardware2)	ANSI/BHMA A156.14-2013	08 71 00
Release Devices: Closer Holder, Electromagnetic and Electromechanical	ANSI/BHMA A156.15-2015	08 71 00 or 28 15 15
Auxiliary Hardware	ANSI/BHMA A156.16-2018	08 71 00
Self-Closing Hinges & Pivots	ANSI/BHMA A156.17-2014	08 71 00
Strap and Tee Hinges and Hasps	ANSI/BHMA A156.20-2017	08 71 00
Thresholds	ANSI/BHMA A156.21-2014	08 71 00
Door Gasketing and Edge Seal Systems	ANSI/BHMA A156.22-2017	08 71 00
Electromagnetic Locks	ANSI/BHMA A156.23-2017	08 71 00 or 28 15 15
Delayed Egress Locking Systems	ANSI/BHMA A156.24-2018	08 71 00 or 28 15 17
Electrified Locking Devices	ANSI/BHMA A156.25-2018	08 71 00 or 28 15 15
Continuous Hinges	ANSI/BHMA A156.26-2017	08 71 00
Exit Locks, Exit Locks with Exit Alarms, Exit Alarms, Alarms for Exit Devices	ANSI/BHMA A156.29-2017	08 71 00
High Security Cylinders	ANSI/BHMA A156.30-2014	08 71 53
Electric Strikes and Frame Mounted Actuators	ANSI/BHMA A156.31-2019	08 71 00 or 28 15 15
Auxiliary Locks	ANSI/BHMA A156.36-2016	08 71 00
Multipoint Locks	ANSI/BHMA A156.37-2014	08 71 00
Residential Bored Locks	ANSI/BHMA A156.39-2015	TBD
Residential Deadbolts	ANSI/BHMA A156.40-2015	TBD

110

111 Non-Applicable Products

112

113 Products that may provide the same function in a different application are not within the scope of this
114 PCR. These excluded products are:

115

- ANSI/BHMA A156.10 – Power Operated Pedestrian Doors
- ANSI/BHMA A156.18 – Materials and Finishes
- ANSI/BHMA A156.27 – Power and Manual Operated Revolving Pedestrian Doors
- ANSI/BHMA A156.28 – Mechanical Keying Systems
- ANSI/BHMA A156.32 – Integrated Door Opening Assemblies
- ANSI/BHMA A156.115 – Steel Doors or Steel Frames

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- 121 ● ANSI/BHMA A156.115 – Wood Doors with Wood or Steel Frames
122 ● ANSI/BHMA A156.33 -- Internally Powered Architectural Hardware Devices
123 ● ANSI/BHMA A156.34 -- Bored Locks and Mortise Locks with Ligature Resistant Trim
124

125
126 System Boundary

127
128 The system boundary for EPDs created using this PCR is either cradle to gate, cradle to gate with
129 options, or cradle to grave.

130
131 The EPD requirements include:

- 132 ● ISO 21930:2017 standard
133 ● EN 15804 standard (optional)
134 ● ULE General Program Instructions v 2.3, February 2018 (available upon request)
135 ● The calculation rules for the Life Cycle Assessment and Requirements on the Project Report are
136 specified in a separate document as Part A of the Product Category Rules
137



138 **III. Industry-Average EPD Requirements**

139 Industry-Average EPD Scope

141 The products represented within an single industry-average EPD created using this PCR are limited to the primary
142 materials defined in the product specification standards in Section 9 that characterize the specific product in
143 commerce.

144 Involvement of Interested Parties

146 A call for involvement of interested parties in the creation of an industry-average EPD shall be published in at least
147 one industry trade publication. At a minimum, at least three (3) different manufacturing locations from no less than
148 three (3) companies should be involved and represented in an industry-average EPD. The method for determining
149 representativeness shall be justified and described per the requirements listed in Section 2.2.4.1.

150 Industry-Average EPD Participation

152 A manufacturer qualifies for participation in an industry-average EPD created using this PCR if the manufacturer
153 provides LCA data used to calculate the EPD average.

154 Retroactive participation:

156 When determining a manufacturer's participation eligibility, the EPD Program Operator shall follow the rules and
157 recommendations of the primary sponsor(s) of the industry average EPD and participating manufacturers unless the
158 Program Operator has information to the contrary, in which case the Program Operator, LCA practitioner, primary
159 sponsor of the industry average EPD, and manufacturer shall confer in an effort to reach consensus.

161 Pending all criteria set forth by the primary sponsor of the industry average EPD are met, a manufacturer desiring
162 retroactive inclusion in the industry average EPD shall provide manufacturing and product data information of the
163 same representativeness submitted in the original industry average EPD to the LCA practitioner. The LCA practitioner
164 will then recommend to the Program Operator a determination for inclusion in the industry average on the basis of
165 results falling within a reasonable range for any impact category. The maximum and minimum should be reported in
166 the LCA background report for each impact category based on the highest and lowest impact product or facility within
167 the original industry-wide LCA.

168 Governance

170 An industry organization, such as a trade association, shall inform possible industry participants through association
171 meetings, newsletters, e-mail messages, and similar types of outreach, including public notices in the trade press
172 publications. Confidential business information shall be collected by a third party. Data from the third party shall be
173 provided to the facilitator as aggregated data with no trace to the original source of data.

174 The development of an industry-average EPD and or update of an EPD should involve a series of meetings and
175 exchanges in which all participants are invited and kept apprised of the developments. Notices of these meetings
176 should be given to all possible participants regardless of their commitment to active involvement. Minutes of
177 meetings, along with meeting notices, should be preserved as documentation of the process and due diligence
178 observed in the creation or renewal of the EPD.

179 Data Responsibility/Ownership

181 Trade associations that lead the development of industry-average EPDs may need to collect confidential business
182 information from individual members. This data can include proprietary chemical formulations and processes or other
183 confidential information. In this case, a designated third-party entity such as an LCA practitioner shall be identified as
184 the "industry agent". The industry agent shall be responsible for activities including collection, secure storage and
185 analysis of such data needed for the EPD development, and will preserve the privacy of individual company
186 information while executing these duties.

187 Per ISO 21930 Section 5.4, the manufacturer, or group of manufacturers, of the construction product is the sole
188 owner of the EPD and is responsible for developing the EPD of the construction product according to the PCR. Only
189



192 the manufacturer or group of manufacturers is authorized to declare the environmental performance of the
193 construction product using an EPD.

194 The group of manufacturers responsible for developing an industry-average EPD shall be responsible for, including
195 but not limited to, ensuring industry-average EPD updates are made based on the most recent LCA modeling
196 software version and impact assessment version available.

197 **Industry-Average EPD Updates**

198
199 Industry-average EPDs created using this PCR shall expire five (5) years after publication. An update to the existing
200 EPD, or new EPD, may need to be developed prior to the five years if: 1) significant¹ changes have occurred in the
201 manufacturing process; 2) new industry participants; 3) significant² changes or alterations in raw materials; 4) major
202 regulatory changes that mandate or trigger changes to operational procedures; or 5) major technological changes
203 would also justify creation of an updated EPD.

204
205 Additional companies may be added to an existing industry-average EPD at the scheduled review by submitting data
206 required for retroactive participation. However, this shall not automatically trigger a recalculation of the industry
207 average impacts.
208

¹ Here, significance refers to +10% changes to inputs or outputs to the manufacturing process(es) in the form of raw materials, energy, and/or emissions

² Ibid



1. Content of an EPD

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	Program Operator Provided
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	Program Operator Provided
MANUFACTURER NAME AND ADDRESS	
DECLARATION NUMBER	Program Operator Provided
DECLARED PRODUCT & FUNCTIONAL UNIT OR DECLARED UNIT	
REFERENCE PCR AND VERSION NUMBER	
DESCRIPTION OF PRODUCT'S INTENDED APPLICATION AND USE (AS IDENTIFIED WHEN DETERMINING PRODUCT RSL)	
PRODUCT RSL DESCRIPTION (IF APPL.)	
MARKETS OF APPLICABILITY	
DATE OF ISSUE	Program Operator Provided
PERIOD OF VALIDITY	Program Operator Provided
EPD TYPE	[Industry-average or product-specific]
RANGE OF DATASET VARIABILITY	[Industry-average only; mean, median, standard deviation]
EPD SCOPE	[Cradle to gate with options (specify options),]
YEAR(S) OF REPORTED MANUFACTURER PRIMARY DATA	
LCA SOFTWARE & VERSION NUMBER	
LCI DATABASE(S) & VERSION NUMBER	
LCIA METHODOLOGY & VERSION NUMBER	
The sub-category PCR review was conducted by:	Program Operator Provided
	Program Operator Provided
	Program Operator Provided
This declaration was independently verified in accordance with ISO 14025: 2006. The UL Environment "Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report," v3.2 (September 2018), based on ISO 21930:2017, serves as the core PCR, with additional considerations from CEN Norm EN 15804 (2012) and the USGBC/UL Environment Part A Enhancement (2017) <input type="checkbox"/> INTERNAL <input type="checkbox"/> EXTERNAL	
	Program Operator Provided
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	
	Program Operator Provided
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	
	Program Operator Provided
<p>LIMITATIONS</p> <p>Environmental declarations from different programs (ISO 14025) may not be comparable.</p> <p>Comparison of the environmental performance of products using EPD information shall be based on the product's use and impacts at the building level, and therefore EPDs may not be used for comparability purposes when not considering the building energy use phase as instructed under this PCR.</p> <p>Full conformance with this PCR allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible". Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared.</p>	



210 **2. General Information**

211 **2.1. DESCRIPTION OF COMPANY/ORGANIZATION**

212 The name of the manufacturing entity(ies) as well as the place(s) of production shall be provided. General information
213 about the manufacturing entity(ies) may be provided, such as the existence of quality systems or environmental
214 management systems, according to ISO 14001 or any other environmental management system in place.

215 **2.2. PRODUCT DESCRIPTION**

216 A narrative description of the product shall be provided that enables clear identification of the product. This
217 description will include:
218

219 **2.2.1 Product Identification**

220 The declared products shall be identified by brand name(s), by material type(s), by production code(s) (if
221 applicable), and by simple visual representation, which may be by photograph or graphic illustration.
222

223 **2.2.2 Product Specification**

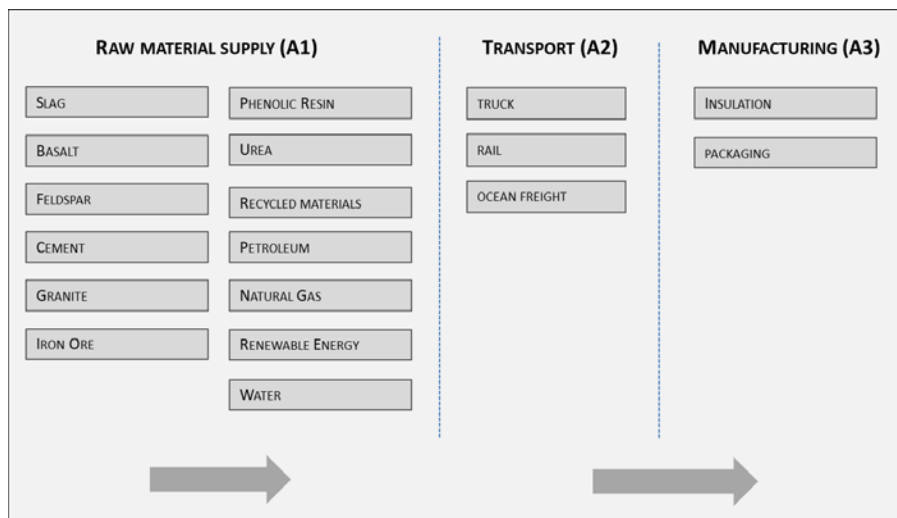
224 Similar products grouped and reported as an average product in the same EPD satisfying the variation
225 criteria of Part A, Section 5 shall constitute an individual declared product. For each declared product, list the
226 physical characteristics defined by the standards in Section 2.5 – in the form that the product would be
227 installed – along with the reference to the test standard for each. Provide a description of the builders
228 hardware product. Other relevant product specification values may be provided here.

229 The appropriate ASTM or CSA product specification shall be provided, including additional pertinent physical
230 properties and technical information.
231

232 **2.2.3 Flow Diagram**

233 A graphical depiction of a flow diagram illustrating main production processes according to the scope of the
234 declaration shall be included such as the examples in Figure 1.

235 FIGURE 1. EXAMPLE PRODUCT FLOW DIAGRAM³



236

237 **2.3. PRODUCT AVERAGE**

238

239 **2.3.1 Industry-Average EPD (if relevant)**

240

241 The method for creating an industry-average EPD shall be described per Part A, Section 2.5.1.
242

³ This example flow diagram is specific to a xxxxxx product and other product types covered in this PCR will differ.



243 **2.3.2 Product Specific EPD**

244 The method for creating a company specific individual product/product group EPD shall be described,
245 including the method for determining a weighted average across products based on production volume as
246 described in Part A, Section 2.5.2.

247 **2.4. APPLICATION**

248 The designated applications for the referenced product(s) shall be specified. The applications of the declared
249 product(s) shall be described.

250 **2.5. MATERIAL COMPOSITION**

251 The material composition of insulation products shall be disclosed and will include components as percentages or
252 ranges of percentages of total mass as required by product Safety Data Sheet (SDS) rules, if relevant.

253 Statements of material non-inclusion, such as "... is free of ..." shall not be used.

254 Regulated Hazardous substances and dangerous substances shall be reported per Part A, Section 4.11.

255 Note: This disclosure is intended to enable the user of the EPD to understand the composition of the product in delivery condition
256 and support a safe and effective installation, use and disposal of the product. With appropriate justification, this requirement does
257 not apply to confidential or proprietary information relating to materials and substances that apply due to a competitive business
258 environment or covered by intellectual property rights or similar legal restrictions. It also might not be appropriate for information
259 concerning intangible products.

260 **2.6. TECHNICAL REQUIREMENTS**

261 A listing of all standards required for the specification of the declared product shall be provided. A listing of all
262 standards required for the testing, evaluation, and approval of the declared product and its application in building
263 assemblies for building code and other regulation compliance shall also be provided and quoted as shown in Section
264 9.

265 Note: Compliance with model building codes does not always ensure compliance with state or local building codes, which may be
266 amended versions of these model codes. Always check with local building code officials to confirm compliance.

267 The final evaluation report/certification/ registration is available at: [Insert link]

268 **2.7. PROPERTIES OF DECLARED PRODUCT AS DELIVERED**

269 The dimensions/quantities of the declared product(s) as delivered to the site of installation/application shall be
270 indicated.

271 **3. Methodological Framework**

272 The following items shall be specified: the type of EPD with respect to life cycle stages, and the life cycle stages
273 covered and not covered (i.e. cradle-to-gate, cradle-to-gate with options, including modules A1-A5 and C1-C4, or
274 cradle-to-grave).

275 The reference conditions for achieving the declared technical and functional performance and the Reference Service
276 Life (RSL) shall be included, per Part A, Section 2.8.2.

277 **3.1. DECLARED UNIT**

278 For EPDs not covering the complete life cycle, e.g. leaving out the use stage, a declared unit is defined. A declared
279 unit shall be applied if the precise function of the product is not stated or not known. Conversion factors (e.g. density,
280 thickness, surface area etc.) shall be provided in order to allow the users to conduct further calculations (e.g.
281 transport impacts, energy simulations). The declared unit shall be one (1) product unit. A weighted average mass or



282 other applicable aspects of the product shall be stated when the EPD deals with a generic or representative product
283 group with different thicknesses. The weights shall reflect the relative production volumes for the relevant materials.

284 **3.1. FUNCTIONAL UNIT**

285 For EPDs covering the complete life cycle, a functional unit shall be defined based on the functional use or
286 performance characteristics of the product integrated into a building or other type of construction in the use phase. A
287 functional unit is defined as the set of the fewest builders hardware elements, together with the fasteners required to
288 affix the product to the building, which comprise one complete builders hardware product. More than one unit may be
289 required in use to perform the required function(s), but less than one unit cannot perform the required function(s).
290 Explanation of the selected functional unit shall be stated clearly, including the reference service life, installation
291 methods and all ancillary materials such as, but not limited to, fasteners and adhesives.

292 The functional unit of a Builders Hardware product must be defined on a case-by-case basis. For example, where the
293 product is a door hinge, the function may be defined as "securing a North American standard 3'x7' door, installed in a
294 North American standard building with an Estimated Service Life of 75 years, with selected Builders Hardware hinges
295 having a Reference Service Life of 25 years.

296 Typical installed usage of the products listed in Table 2 is for a standard 3'x7' single-leaf door, or, where the product
297 is a sliding or folding door, a standard 6'8"-wide opening.

298 The manufacturer of the Builders Hardware product must complete Table 3. The mass to achieve the functional or
299 declared unit shall be indicated in Table 3 as declared.

300 **TABLE 2. BUILDERS HARDWARE PRODUCT SUBCATEGORIES AND DECLARED UNITS**

Builders hardware product sub-category	Reference standard	Declared Unit	Comments supporting definition of Reference Flow (Reference Unit) for a standard 3'x7' single-leaf door application
Butts & Hinges	ANSI/BHMA A156.1-2013	1 Unit	Typical usage is 3 Units per standard door leaf.
Bored and Preassembled Locks and Latches	ANSI/BHMA A156.2-2011	1 Unit	Typical usage is one Unit per standard door leaf.
Exit Devices	ANSI/BHMA A156.3-2008	1 Unit	Typical usage is one Unit per standard door leaf. This subcategory does contain some products besides exit devices that could be used in addition to exit devices so that there could be more than one Unit per door leaf or opening. These other products would still be declared on a Units basis. <i>Specify length per Unit and per door opening, in meters.</i>
Door Controls - Closers	ANSI/BHMA A156.4-2008	1 Unit	Typical usage is one Unit per standard door leaf.
Cylinders and Input Devices for Locks	ANSI/BHMA A156.5-2010	1 Unit	Typical usage is one Unit per standard door leaf.
Architectural Door Trim	ANSI/BHMA A156.6-2010	1 Unit	One or more Units per standard door leaf. <i>Specify length per Unit and per door opening, in meters.</i>
Door Controls - Overhead Stops and Holders	ANSI/BHMA A156.8-2010	1 Unit	Typical usage is one Unit per standard door leaf.
Cabinet Hardware ¹⁾	ANSI/BHMA A156.9-2010	1 Unit	Specify the number of Units per cabinet door or per cabinet shelf, or per other cabinet element.



Cabinet Locks ¹⁾	ANSI/BHMA A156.11-2010	1 Unit	Specify the number of Units per cabinet door or per other cabinet lockable element.
Interconnected Locks & Latches	ANSI/BHMA A156.12-2013	1 Unit	Typical usage is one Unit per standard door leaf.
Mortise Locks & Latches	ANSI/BHMA A156.13-2012	1 Unit	Typical usage is one Unit per standard door leaf.
Sliding and Folding Door Hardware ²⁾	ANSI/BHMA A156.14-2013	1 Unit	Typical usage is one Unit per standard 6'8" door opening.
Release Devices: Closer Holder, Electromagnetic and Electromechanical	ANSI/BHMA A156.15-2011	1 Unit	Typical usage is one Unit per standard door leaf.
Auxiliary Hardware ¹⁾	ANSI/BHMA A156.16-2008	1 Unit	Products in this sub-category are sold per Unit. More than one Unit may be used per standard door leaf, standard door opening, or cabinet element. Some components are used in applications not associated with door openings or cabinets. These external applications are not covered by this PCR.
Self-Closing Hinges & Pivots	ANSI/BHMA A156.17-2010	1 Unit	Typical usage is 3 Units per standard door leaf.
Strap and Tee Hinges and Hasps	ANSI/BHMA A156.20-2012	1 Unit	Typical usage is 3 Units per standard door leaf.
Thresholds	ANSI/BHMA A156.21-2009	1 Unit	Specify length in meters.
Door Gasketing and Edge Seal Systems	ANSI/BHMA A156.22-2012	1 Unit	Specify length in meters.
Electromagnetic Locks	ANSI/BHMA A156.23-2010	1 Unit	Typical usage is one Unit per standard door leaf.
Delayed Egress Locking Systems	ANSI/BHMA A156.24-2012	1 Unit	Typical usage is one Unit per standard door leaf.
Electrified Locking Devices	ANSI/BHMA A156.25-2007	1 Unit	Products complying to this standard typically must comply with other standards too. Typical usage is one Unit per standard door leaf.
Continuous Hinges	ANSI/BHMA A156.26-2012	1 Unit	One Unit is used per door leaf. <i>Specify length in meters</i>
Exit Locks, Exit Locks with Exit Alarms, Exit Alarms, Alarms for Exit Devices	ANSI/BHMA A156.29-2012	1 Unit	Typical usage is one Unit per standard door leaf.
High Security Cylinders	ANSI/BHMA A156.30-2007	1 Unit	Typical usage is one Unit per standard door leaf.
Electric Strikes and Frame Mounted Actuators	ANSI/BHMA A156.31-2007	1 Unit	Typical usage is one Unit per standard door leaf.
Internally Powered Architectural Hardware Devices	ANSI/BHMA A156.33-2019	1 Unit	Typical usage is one Unit per standard door leaf.
Auxiliary Locks	ANSI/BHMA A156.36-2010	1 Unit	Typical usage is one Unit per standard door leaf.
Multipoint Locks	ANSI/BHMA A156.37-201x	1 Unit	Typical usage is one Unit per standard door leaf.
Residential Bored Locks	ANSI/BHMA A156.39-201x	1 Unit	Typical usage is one Unit per standard door leaf.
Residential Deadbolts	ANSI/BHMA A156.40-201x	1 Unit	Typical usage is one Unit per standard door leaf.



302 **TABLE 3. FUNCTIONAL OR DECLARED UNIT PROPERTIES**

Name	Value	Unit
Name of Functional or Declared Unit ¹		
Mass per Declared or Functional Unit, excluding fasteners		kg
Fasteners (pieces x mass/piece) ²		kg

303 *Note 1:* Specify length per Unit, if applicable (see **TABLE 2**, column 4);

304 *Note 2:* Do not duplicate Fasteners in (optional) Module A5 (Installation)

305 **3.2. SYSTEM BOUNDARY**

306 The type of EPD shall be specified as either cradle to gate with end of life, cradle to gate with options, or cradle to
 307 grave. The modules considered in the LCA shall be described in brief as per “System boundaries” outlined in Part A,
 308 Section 2.8. It should be apparent as to what processes are considered in what modules per the module descriptions
 309 in Part A, Section 2.8. Any relevant aspects or impacts not included in an information module shall be supported with
 310 relevant additional environmental information and the omissions shall be justified. Module D shall be reported
 311 separately if included in the EPD.

312 Capital goods and infrastructure flows shall be excluded from unit processes used to model the LCIA unless they
 313 significantly (>10%) affect the conclusions of the LCA or additional environmental information. The LCA report should
 314 specify lifetimes of capital goods and infrastructure included. The impact burden from capital goods and
 315 infrastructure shall be allocated to the product(s) in the LCA by either a) proportional to the specified lifetime of the
 316 asset, or b) proportional to the production output of the asset. Any deviation shall be explicitly specified and justified.

317 **3.3. PRODUCT SPECIFIC CALCULATIONS FOR USE PHASE (MODULES B1-B7)**

318 Use-stage environmental impacts of builders hardware products during building operations depend product
 319 maintenance. Guidance for determining use phase impacts is included in this section.

320 **3.3.1. PRODUCT MAINTENANCE**

321 Information on maintenance shall be provided based on the manufacturer’s recommendations. Typically the
 322 products under the scope of this PCR do not require any servicing during their useful life.

323 **3.4. REFERENCE SERVICE LIFE AND ESTIMATED BUILDING SERVICE LIFE**

324 The reference service life and building estimated service life shall be indicated according to Part A, Section 2.8.2.

325
 326 In the absence of primary data, building hardware products shall be assumed to have a 25 year RSL.

327
 328 The assumptions upon which the designated RSL is based and for which the RSL exclusively applies shall be
 329 provided in Section 4, Table 5. Influences on ageing, when applied, shall be in accordance with the state of the art.

330 **3.5. ALLOCATION**

331 Part A, Section 3.3 shall be used as the basis for allocation decisions, and mass should be used as the primary basis
 332 for co-product allocation in this Part B. Allocation methods deemed more appropriate than on the basis of mass may
 333 be used but only when justified. The allocations of relevance for calculation (appropriation of impacts across various
 334 products) shall be indicated, at least:

- 335 • Allocation in the use of recycled and/or secondary raw materials
- 336 • Allocation of energy, ancillary and operating materials used for individual products in a factory

337
 338 whereby reference shall be made to the modules in which the allocations are performed.



339 **3.6. CUT-OFF RULES**

340 Cut-off rules as specified per the Part A, Section 2.9 shall be used and documented. All known mass and energy
341 flows shall be reported. No known flows should be deliberately excluded.

342 **3.7. DATA SOURCES**

343 Data sources shall be documented per Part A, Section 3.1.

344 **3.8. DATA QUALITY**

345 An evaluation shall be provided regarding data quality, including temporal, geographical, technological
346 representativeness, and completeness and shall follow the requirements outlined in Part A, Section 3.1.1.

347 **3.9. PERIOD UNDER REVIEW**

348 The period under review and ensuing averages shall be documented.

349 **3.10. COMPARABILITY AND BENCHMARKING**

350 Comparison of EPD results between non-competitive products may be included in this section per the requirements
351 in Part A, Section 9.

352 **3.11. ESTIMATES AND ASSUMPTIONS**

353 Key assumptions and estimates for interpretation of the Life Cycle Assessment should be referred to here, provided
354 that they are not addressed elsewhere in this PCR.

355 Transport, installation, and deconstruction procedures are common to all products within the category. In the absence
356 of primary data, the following assumptions should be used for products sold in North America. Any deviations from
357 these assumptions (e.g. different geographies) shall be justified and explained.

358 **TABLE 4. TRANSPORT, INSTALLATION, AND DECONSTRUCTION PROCEDURES**

Product transport from point of manufacturing to building site	Product transport from building site to waste processing	Installation & deconstruction procedures
Mode: Diesel-powered truck/trailer Distance: 800 km	Mode: Diesel-powered truck/trailer Distance: 161 km	Manual (no operational energy use)

359 **3.12. UNITS**

360 SI units are required for all LCA results. Other units commonly used in a regional market may be optionally included
361 in addition to the required SI units.

362 **4. Technical Information and Scenarios**

363 The following information shall be reported for declared modules. Irrelevant or non-applicable modules and tables
364 may be excluded in the EPD; additional information may also be listed if necessary

365 The following technical information is a basis for the declared modules or may be used for developing specific
366 scenarios in the context of a building assessment if modules are not declared (MND).

367
368 Results reported in Table 8 through Table 11 shall be reported over the entire estimated building service life (ESL).
369

370 **4.1. MANUFACTURING**

371 The manufacturing process and locations shall be described and illustrated using a simple flow-chart. If the EPD
372 applies to several locations, the production processes for all locations shall be described and reference to quality
373 management systems may be included.



374 **4.2. PACKAGING**

375 Information on product-specific packaging: type, composition and possible reuse of packaging materials (paper,
376 strapping, pallets, foils, drums, etc.) shall be included in this Section. The EPD shall describe specific packaging
377 scenario assumptions, including disposition pathways for each packaging material by reuse, recycling, or landfill
378 disposal based on packaging type.

379 In the absence of specific primary data, the data assumptions from Part A, Section 2.8.5, Table 3 shall be used.

380 In the case of reusable packaging designed to last for multiple reuse cycles, one reuse shall be assumed in the
381 absence of primary manufacturer data. At the end of its reuse cycle, reusable packaging shall be assumed to go to
382 landfill.

383
384 **4.3. TRANSPORTATION**

385 The following information should be provided to specify any transport after the manufacturing gate: type of transport,
386 type of vehicle, distance, type and amount of energy carrier.

387 TABLE 5. TRANSPORT TO THE BUILDING SITE (A4)

Name	Value	Unit
Fuel type		
Liters of fuel		l/100km
Vehicle type		
Transport distance		km
Capacity utilization (including empty runs, specify whether mass or volume based)		%
Gross density of products transported		kg/m ³
Weight of products transported (if gross density not reported)		kg
Volume of products transported (if gross density not reported)		m ³
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)		-

388 **4.4. PRODUCT INSTALLATION**

389 A description of the type of processing, machinery, tools, dust extraction equipment, ancillary materials, etc. to be
390 used during installation and measures for reducing noise shall be included. Information on industrial and
391 environmental protection may be included in this section.

392 Any waste treatment included within the system boundary of installation waste should be specified.

393 TABLE 6. INSTALLATION INTO THE BUILDING (A5)

Name	Value	Unit
Ancillary materials		kg
Net freshwater consumption specified by water source and fate (e.g., X m3 river water evaporated, X m3 city water disposed to sewer)		m ³
Other resources		kg
Electricity consumption		kWh
Other energy carriers		MJ
Product loss per functional unit		kg
Waste materials at the construction site before waste processing, generated by product installation		kg
Output materials resulting from on-site waste processing (specified by route; e.g. for recycling, energy recovery and/or disposal)		kg
Mass of packaging waste specified by type		kg



Biogenic carbon contained in packaging		kg CO ₂
Direct emissions to ambient air, soil and water		kg
VOC emissions		µg/m ³

394 Industry average scrap rates are currently not available, and industry has committed to develop values representative
395 of practice in the field.

396 The VOC emissions shall be determined in accordance to “Standard Method for the Testing and Evaluation of
397 Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers- version 1.2” CA
398 Specification 01350.

399 **TABLE 7. REFERENCE SERVICE LIFE**

400 A product’s RSL depends on the product properties and reference in-use conditions. These conditions shall be
401 declared with a RSL and it shall be stated that the RSL only applies to these reference in-use conditions. The
402 reference in-use conditions for achieving the declared technical and functional performance of the product and the
403 declared RSL shall include the following, where relevant:

Name	Value	Unit
RSL		Years
Declared product properties (at the gate) and finishes, etc.		Units as appropriate
Design application parameters (if instructed by the manufacturer), including references to the appropriate practices and application codes)		Units as appropriate
An assumed quality of work, when installed in accordance with the manufacturer’s instructions		Units as appropriate
Outdoor environment, (if relevant for outdoor applications), e.g. weathering, pollutants, UV and wind exposure, building orientation, shading, temperature		Units as appropriate
Indoor environment, (if relevant for indoor applications), e.g. temperature, moisture, chemical exposure)		Units as appropriate
Use conditions, e.g. frequency of use, mechanical exposure.		Units as appropriate
Maintenance, e.g. required frequency, type and quality of replacement components		Units as appropriate

404 **4.5. USE**

405 Any relevant information may be provided in this section regarding specific product use conditions and/or limitations
406 relevant to product use, including a description of any maintenance, repair, replacement or refurbishment processes
407 and/or a reference to where a description can be found. Refer to Section 7.2 for optional reporting of energy savings
408 during use.
409

410 **TABLE 8. MAINTENANCE (B2)**

Name	Value	Unit
Maintenance process information (cite source in report)		-
Maintenance cycle		Cycles/ RSL
Maintenance cycle		Cycles/ ESL
Net freshwater consumption specified by water source and fate (e.g., X m ³ river water evaporated, X m ³ city water disposed to sewer)		m ³
Ancillary materials specified by type (e.g. cleaning agent)		kg
Other resources		kg
Energy input, specified by activity, type and amount		kWh
Other energy carriers specified by type		kWh
Power output of equipment		kW
Waste materials from maintenance (specify materials)		kg
Direct emissions to ambient air, soil and water		kg



Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants)		
---	--	--

411 TABLE 9. REPAIR (B3)

Name	Value	Unit
Repair process information (cite source in report)		-
Inspection process information (cite source in report)		-
Repair cycle		Cycles/ RSL
Repair cycle		Cycles/ ESL
Net freshwater consumption specified by water source and fate (e.g., X m3 river water evaporated, X m3 city water disposed to sewer)		m ³
Ancillary materials specified by type (e.g. cleaning agent)		kg
Energy input, specified by activity, type and amount		kWh
Waste materials from repair (specify materials)		kg
Direct emissions to ambient air, soil and water		kg
Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants);		

412 REPLACEMENT (B4) / REFURBISHMENT (B5)

413 The number of replacements of product expected during the building ESL of 75 years shall be declared. Required or
414 expected maintenance are to be modelled according to manufacturer's guidelines. Assumptions and key parameters
415 shall be clearly stated and the manufacturer is to submit supporting documentation to justify the assumptions made.

416 If the RSL is less than the building's ESL of 75 years, the number of replacements that will be necessary to fulfil the
417 required performance and functionality over the building ESL shall be identified.

418 Replacements should be rounded-up to the nearest tenths of the ESL of the building; e.g., 1.47 rounded to 1.5.

419 TABLE 10. REPLACEMENT (B4)

Name	Value	Unit
Reference Service Life		Years
Replacement cycle		(ESL/RSL) - 1
Energy input, specified by activity, type and amount		kWh
Net freshwater consumption specified by water source and fate (e.g., X m3 river water evaporated, X m3 city water disposed to sewer)		m ³
Ancillary materials specified by type and amount (e.g. cleaning agent)		kg
Replacement of worn parts, specify parts/materials		kg
Direct emissions to ambient air, soil and water		kg
Further assumptions for scenario development, e.g. frequency and time period of use		As appropriate

420 TABLE 11. REFURBISHMENT (B5)

Name	Value	Unit
Refurbishment process description (cite source in report)		
Replacement cycle		Cycles/ RSL
Replacement cycle		Cycles/ ESL
Energy input, specified by activity, type and amount		kWh
Net freshwater consumption specified by water source and fate (e.g., X m3 river water evaporated, X m3 city water disposed to sewer)		m ³
Material input for refurbishment, including ancillary materials specified by type (e.g. cleaning agent)		kg



Waste material(s), specified by material		kg
Direct emissions to ambient air, soil and water		kg
Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants);		

421

422 TABLE 12. OPERATIONAL ENERGY USE (B6) AND OPERATIONAL WATER USE (B7)

Name	Value	Unit
Net freshwater consumption specified by water source and fate (e.g., X m3 river water evaporated, X m3 city water disposed to sewer)		m ³
Ancillary materials		kg
Energy input, specified by activity, type and amount		kWh
Equipment power output		kW
Characteristic performance (e.g. energy efficiency, variation of performance with capacity utilization)		Units as appropriate
Direct emissions to ambient air, soil and water		kg
Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants);		As appropriate

423 **4.6. DISPOSAL**

424 The possible disposal channels shall be indicated in accordance with disposal routes and waste classification
425 referenced in Part A, Section 2.8.5 and 2.8.6.

426 TABLE 13. END OF LIFE (C1-C4)

Name		Value	Unit
Assumptions for scenario development (description of deconstruction, collection, recovery, disposal method and transportation)			
Collection process (specified by type)	Collected separately		kg
	Collected with mixed construction waste		kg
Recovery (specified by type)	Reuse		kg
	Recycling		kg
	Landfill		kg
	Incineration		kg
	Incineration with energy recovery		kg
	Energy conversion (specify efficiency rate)		
Disposal (specified by type)	Product or material for final deposition		kg
	Removals of biogenic carbon (excluding packaging)		kg CO ₂

427 **4.7. RE-USE PHASE**

428 The possibilities of re-use, recycling and energy recovery shall be described.

429 TABLE 14. REUSE, RECOVERY AND/OR RECYCLING POTENTIALS (D), RELEVANT SCENARIO INFORMATION

Name	Value	Unit
Net energy benefit from energy recovery from waste treatment declared as exported energy in C3 (R>0.6)		MJ
Net energy benefit from thermal energy due to treatment of waste declared as exported energy in C4 (R<0.6)		MJ



Net energy benefit from material flow declared in C3 for energy recovery		MJ
Process and conversion efficiencies		
Further assumptions for scenario development (e.g. further processing technologies, assumptions on correction factors);		

430

431



5. Environmental Indicators Derived from LCA

5.1. LCA RESULTS FROM LCIA

In Table 15., "Description of the system boundary modules," all declared modules shall be indicated with an "X".

Modules A1, A2, and A3 may be declared as one aggregated module A1-A3.

Per Part A, life cycle impact assessment (LCIA) results shall be declared using scientific notation with three significant digits (e.g. 1.23E-5 = 0.0000123) for each module. Uniform formatting shall be used for all indicator values.

- ▶ North America (Part A, Section 4.7, Table 9, TRACI indicators)
- ▶ EU (Part A, Section 4.8, Table 10, CML indicators)
- ▶ Rest of World (Part A, Section 4.9, Table 11, indicators as provided)

TABLE 15. DESCRIPTION OF THE SYSTEM BOUNDARY MODULES

EPD Type	PRODUCTION			CONSTRUCTION		USE							END OF LIFE				BENEFITS & LOADS BEYOND SYSTEM BOUNDARY	Reference Service Life	
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
	Raw material supply	Transport	Manufacturing	Transport to site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction	Transport	Waste processing	Disposal	Reuse, Recovery, Recycling Potential		
Cradle to gate w/ EOL	Required			Excluded									Required, Depending on Part A, Section 2.8.4.5				Optional	Optional	
Cradle to gate with options	Required			Optional		Optional							Required, Depending on Part A, Section 2.8.4.5				Optional	Optional	
Cradle to grave	Required																Optional	Required	
Declared Modules (Indicate with "X")																			

5.2. LCA RESULTS FROM LCI

Results derived from the product LCI shall be reported as follows:

- ▶ Resource use indicators (Part A, Section 4.1, Table 6)
- ▶ Output flows and waste category indicators (Part A, Section 4.1.2, Table 7)
- ▶ Carbon emissions and removals (Part A, Section 4.6, Table 8)



453 **6. LCA: Interpretation**

454 Interpretation requirements for the Project Report are provided in Part A, Section 5.

455 An interpretation shall be provided in the EPD which discusses the assumptions and limitations associated with the
456 interpretation of results as declared in the EPD, both methodology and data related.

457 This interpretation shall also include a description of the time frame and/or variance of the LCIA results if the EPD is
458 valid for several products. An illustration of the results with figures is recommended in the EPD, e.g. for the
459 dominance analysis, the distribution of impacts across the modules, the CO₂-balance, etc. as appropriate for a
460 reader's understanding of the environmental profile of the declared product.

461 **7. Additional Environmental Information**

462 **7.1. ENVIRONMENT AND HEALTH DURING MANUFACTURING**

463 Measures relating to environmental and health protection during the product manufacturing process extending
464 beyond national guidelines (of the production country) may be described, e.g. reference to a product safety data
465 sheet (SDS), description of Environmental Management Systems or similar, programs addressing air emissions,
466 wastewater, noise, etc.

467 **7.2. ENVIRONMENT AND HEALTH DURING INSTALLATION**

468 Information should be provided in this section on the relationship between the product, the environment and health,
469 including any possible harmful substances or emissions e.g. reference to a product safety data sheet (SDS). Any
470 recommendations concerning cleaning, maintenance, etc. of the declared product should be listed in Section 4
471 "Technical information on scenarios".

472 **7.3. EXTRAORDINARY EFFECTS**

473 FIRE

474 Information should be included on the product's fire performance and possible impacts on the environment e.g.
475 reaction-to-fire, other relevant fire tests as applicable, and emissions to air, including smoke toxicity.

476 WATER

477 Information should be included on the product's performance and possible impacts on the environment following
478 unforeseeable influence of water, e.g. flooding.

479

480 MECHANICAL DESTRUCTION

481 Information should be included on the product's performance and possible impacts on the environment following
482 unforeseeable mechanical destruction.

483 **7.4. DELAYED EMISSIONS**

484 If a manufacturer wishes to declare quantitative or qualitative information on delayed emissions used to calculate
485 Global Warming Potential within the EPD, information may be provided here. See Part A, Section 4.4 for more
486 information.

487 **7.5. ENVIRONMENTAL ACTIVITIES AND CERTIFICATIONS**

488 Other environmental activities, such as participation in recycling or recovery programs along with the details of these
489 programs and contact information, may be provided.

490 For certifications applied to the product and listed in the EPD, a statement shall be included on where an interested
491 party can find details of the certification program.



492 **7.7. FURTHER INFORMATION**

493 A reference source for additional information may be provided here, e.g. homepage, reference source for safety data
494 sheet. Additional environmental information may be provided here according to Part A, Section 4.10.

495 **8. Supporting Documentation**

496 The Project Report Content, Structure, and Accessibility requirements to support an EPD created using this
497 document are provided in Part A, Section 2. Project Report elements include general information (Part A, Section
498 2.1), study goal (Part A, Section 2.2), study scope (Part A, Section 2.8), and the life cycle inventory analysis, impact
499 assessment, and interpretation (Part A, Section 3, 4, and 5). Additionally, the Project Report shall include additional
500 required supporting documentation specified in this sub-category Part B and according to Part A, Section 6.

501 If relevant to the scope of the declared product, or due to the product material composition, it is recommended to
502 provide sufficient supporting documentation in the EPD and Project Report. When providing documentation, testing
503 protocols and other relevant information shall be indicated. If supporting documentation is not provided, the reasons
504 shall be indicated in the EPD and Project Report.

505 As a general rule, all statements shall be documented with measured data (presented by the corresponding test
506 certificates). In the case of non-verifiable substances, the limit of detection shall be included in the declaration.
507 Interpreting statements such as "... free of ..." or "... are entirely harmless ..." are not permissible.

508 **9. References**

509 The literature referred to in the Environmental Product Declaration shall be quoted in full from the following sources.
510 Standards and standards relating to evidence and/or technical features already fully quoted in the EPD do not need
511 to be listed here. This Part B PCR document shall be referenced.

512 **UL ENVIRONMENT**

513 UL Environment General Program Instructions April 2017, version 2.1

514 Part A: Life Cycle Assessment Calculation Rules and Report Requirements UL Environment (December 2018,
515 version 3.2)

516 **CHARACTERIZATION METHODS**

517 IPCC. 2014. CLIMATE CHANGE 2013. THE PHYSICAL SCIENCE BASIS. CAMBRIDGE UNIVERSITY PRESS.
518 [HTTP://WWW.IPCC.CH/REPORT/AR5/WG1/](http://www.ipcc.ch/report/ar5/wg1/) ACCESSED 09DECEMBER 2018

519 Hauschild M.Z., & Wenzel H. Environmental Assessment of Products. Springer, US, Vol. 2, 1998

520 Heijungs R., Guinée J.B., Huppes G., Lankreijer R.M., Udo de Haes H.A., Wegener Sleeswijk A. Environmental Life
521 Cycle Assessment of Products: Guide and Backgrounds. CML. Leiden University, Leiden, 1992

522 Jenkin M.E., & Hayman G.D. Photochemical ozone creation potentials for oxygenated volatile organic compounds:
523 sensitivity to variations in kinetic and mechanistic parameters. Atmospheric Environment. 1999, 33 (8) pp. 1275–1293

524 WMO. 1999. Scientific Assessment of Ozone Depletion: 1998, World Meteorological Organization Global Ozone
525 Research and Monitoring Project – Report No. 44, WMO, Geneva

526 **USE PHASE ASSUMPTIONS**

527 United States Environmental Protection Agency, WaterSense, Office of Wastewater Management (4204M), 2014
528 <https://www.epa.gov/aboutepa/about-office-water#wastewater> Accessed 09 December 2018
529

530 **SUSTAINABILITY REPORTING STANDARDS**

531 EN 15804: 2012-04 - Sustainability of construction works — Environmental Product Declarations — Core rules for the
532 product category of construction product.



- 533 ISO 14025: 2006 - Environmental labels and declarations — Type III environmental declarations — Principles and
534 procedures
- 535 ISO 14040: 2006 - Environmental management – Life cycle assessment – Principles and framework
- 536 ISO 14044:2006 - Environmental management – Life cycle assessment – Requirements and guidelines
- 537 ISO 14046:2013 - Environmental management- Water footprint- Principles, requirements and guidelines
- 538 ISO 15392:2008 - Sustainability in building construction- General principles
- 539 ISO 15686-1:2011 - Buildings and constructed assets- Service life planning Part 1: General principles
- 540 ISO 15686-2:2008 - Buildings and constructed assets- Service life planning Part 2: Service life prediction procedures
- 541 ISO 15686-7:2008 - Buildings and constructed assets- Service life planning Part 7: Performance evaluation for
542 feedback of service life data from practice
- 543 ISO 15686-8:2008 - Buildings and constructed assets- Service life planning Part 8: Reference service life and service
544 life estimation
- 545 ISO 21930: 2017 - Sustainability in building construction -- Environmental declaration of building products
- 546 Product Category Rule Guidance Development Initiative. Guidance for Product Category Rule Development. (August
547 28, 2014, version 1.0).
- 548 TESTING AND CLASSIFICATION REFERENCES
- 549 American Conference of Governmental Industrial Hygienists (ACGIH®) Threshold Limit Values and Biological
550 Exposure Indices
- 551 Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor
552 Sources using Environmental Chambers- version 1.2, January 2017.
553
- 554 RELEVANT FEDERAL STANDARDS AND SOPs
- 555 Environment Canada, National Pollutant Release Inventory (NPRI) (<http://www.ec.gc.ca/inrp-npri/>)
- 556 EPCRA 313 Toxic Release Inventory Reporting (U.S.) (<https://www.epa.gov/toxics-release-inventory-tri-program>)
557 Accessed 08 December 2017.
- 558 US EPA, ORD/NRMRL/Sustainable Technology Division, Systems Analysis Branch, SOP No. S-10637-OP-1-0- Tool
559 for the Reduction and Assessment of Chemical and other Environmental Impacts (TRACI), Software Name and
560 Version Number: TRACI version 2.1, USER'S MANUAL, 24 July, 2012
- 561 US: Resource Conservation and Recovery Act (RCRA), Clause C (<https://www.epa.gov/rcra>) Accessed 08 December
562 2017.
- 563 40 CFR 50 Protection of Environment - Part 50: National Primary and Secondary Ambient Air Quality Standards
564 (U.S.) (<https://www.epa.gov/criteria-air-pollutants/naaqs-table>) Accessed 08 December 2017.
565
- 566 Clean Air Act (CAA) Section 112(r): Accidental Release Prevention/Public Management Rule
567 (https://www.epa.gov/sites/production/files/2013-10/documents/caa112_rmp_factsheet.pdf) Accessed 08 December
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569
- 570 CERCLA Hazardous Substances (U.S.) ([https://www.epa.gov/epcra/epcracerclacaa-ss112r-consolidated-list-lists-
571 march-2015-version](https://www.epa.gov/epcra/epcracerclacaa-ss112r-consolidated-list-lists-march-2015-version)) Accessed 08 December 2017.
- 572 U.S. Department of Labor, Occupational Safety & Health Administration (OSHA 1910.1200 Hazard Communication
573 Standard—Toxic and Hazardous Substances (U.S.)
574 (http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10099)
575



576	RELEVANT PCRS
577	ISO 21930: 2017 - Sustainability in building construction -- Environmental declaration of building products
578	Part A: Life Cycle Assessment Calculation Rules and Report Requirements UL Environment (December 2018,
579	version 3.2)
580	Part B: Requirements on the EPD for Locks and Fittings. Institute of Construction and Environment e.V., Königswinter
581	(July 2013, version 1.5)
582	
583	ANSI STANDARDS
584	
585	ANSI/BHMA A156.1-2013 Butts & Hinges
586	ANSI/BHMA A156.2-2011 Bored and Preassembled Locks and Latches
587	ANSI/BHMA A156.3-2008 Exit Devices
588	ANSI/BHMA A156.4-2008 Door Controls - Closers
589	ANSI/BHMA A156.5-2010 Cylinders and Input Devices for Locks
590	ANSI/BHMA A156.6-2010 Architectural Door Trim
591	ANSI/BHMA A156.7-2009 Template Hinge Dimensions
592	ANSI/BHMA A156.8-2010 Door Controls - Overhead Stops and Holders
593	ANSI/BHMA A156.9-2010 Cabinet Hardware
594	ANSI/BHMA A156.11-2010 Cabinet Locks
595	ANSI/BHMA A156.12-2013 Interconnected Locks & Latches
596	ANSI/BHMA A156.13-2012 Mortise Locks & Latches
597	ANSI/BHMA A156.14-2013 Sliding and Folding Door Hardware
598	ANSI/BHMA A156.15-2011 Release Devices: Closer Holder, Electromagnetic and Electromechanical
599	ANSI/BHMA A156.16-2008 Auxiliary Hardware
600	ANSI/BHMA A156.17-2010 Self Closing Hinges & Pivots
601	ANSI/BHMA A156.20-2012 Strap and Tee Hinges and Hasps
602	ANSI/BHMA A156.21-2009 Thresholds
603	ANSI/BHMA A156.22-2012 Door Gasketing and Edge Seal Systems
604	ANSI/BHMA A156.23-2010 Electromagnetic Locks
605	ANSI/BHMA A156.24-2012 Delayed Egress Locking Systems
606	ANSI/BHMA A156.25-2007 Electrified Locking Devices
607	ANSI/BHMA A156.26-2012 Continuous Hinges
608	ANSI/BHMA A156.29-2012 Exit Locks, Exit Locks with Exit Alarms, Exit Alarms, Alarms for Exit Devices
609	ANSI/BHMA A156.30-2007 High Security Cylinders
610	ANSI/BHMA A156.31-2007 Electric Strikes and Frame Mounted Actuators
611	ANSI/BHMA A156.36-2010 Auxiliary Locks
612	ANSI/BHMA A156.115-2006 Hardware Preparation in Steel Doors or Steel Frames
613	ANSI/BHMA A156.115w-2006 Hardware Preparation in Wood Doors with Wood or Steel Frames
614	
615	