

Environmental Product Declaration

Pemko PDB4131E Acoustic Automatic Door Bottom

"PDB" Series Automatic Door Bottom



The Pemko PDB4131E Acoustic Automatic Door Bottom's high quality design provides excellent acoustic performance as well as a positive seal at the bottom of the door to inhibit air infiltration and smoke leakage.

ASSA ABLOY

ASSA ABLOY is committed to providing products and services that are environmentally sound throughout the entire production process and the product lifecycle. Our unconditional aim is to make sustainability a central part of our business philosophy and culture, but even more important is the job of integrating sustainability into our business strategy. The employment of EPDs will help architects, designers and LEED-APs select environmentally preferable door openings.

ASSA ABLOY will continue our efforts to protect the environment and health of our customers/end users and will utilize the EPD as one means to document those efforts.



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Door Hardware

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According to
ISO 14025

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycle. Exclusions: EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, environmental impact assessments, etc. Accuracy of Results: EPDs regularly rely on estimations of impacts, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. Comparability: EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. EPDs from different programs may not be comparable.

| | | |
|---|--|--|
| PROGRAM OPERATOR | UL Environment | |
| DECLARATION HOLDER | ASSA ABLOY | |
| DECLARATION NUMBER | 478714321.135.1 | |
| DECLARED PRODUCT | Pemko PDB4131E Acoustic Automatic Door Bottom | |
| REFERENCE PCR | Builders Hardware PCR UL 9004 | |
| DATE OF ISSUE | June 19, 2017 | |
| PERIOD OF VALIDITY | 5 Years | |
| CONTENTS OF THE DECLARATION | Product definition and information about building physics Information about basic material and the material's origin Description of the product's manufacturing Indication of product processing Information about the in-use conditions Life cycle assessment results Testing results and verifications | |
| The PCR review was conducted by | The Independent Expert Committee, SVR | |
| This declaration was independently verified in accordance with ISO 14025 by Underwriters Laboratories <input type="checkbox"/> INTERNAL <input checked="" type="checkbox"/> EXTERNAL |  Wade Stout, UL Environment | |
| This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by |  Thomas P. Gloria, Industrial Ecology Consultants | |

¹ **Exclusions:** EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds, e.g., Type 1 certifications, health assessments and declarations, environmental impact assessments, etc. **Accuracy of Results:** EPDs regularly rely on estimations of impacts, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. **Comparability:** EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. EPDs from different programs may not be comparable.



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Product Definition and Information

Product Description

Product name: Pemko Acoustic Automatic Door Bottom

Product characteristic: Automatic Door Bottom

The Pemko PDB-Series Acoustic Automatic Door Bottom creates uniform seal pressure across the entire door bottom resulting in superior acoustic performance. Additional features include:

- Durable, high quality PemkoPrene® gasket
- Designed to have a maximum drop of 0.5"
- "Sealed-in-place" type performance on certain STC openings
- Fire Rated
- Smoke Rated
- GREENGUARD Gold Certified
- Operates with 5lbs of force or less
- Patented design - United States Patent No. 8,925,250 B2
- Product contains several small screws for installation, as well as paper instructions. Otherwise, no other accessory materials are required for installation or use.

Application

The Pemko Acoustic Automatic Door Bottom is ideal for a wide range of applications, including but not limited to high traffic areas, hotels, offices, public buildings, hospitals, institutions, educational facilities, and retail spaces

Technical Data

For the declared product, the following technical data in the delivery status must be provided with reference to the test standard:

| Technical Data | |
|----------------|---------------------------------|
| Length | 36" (Various Lengths Available) |
| Width | 0.5625" |
| Height | 1.875" |
| Metal Finish | Multiple Finishes |
| Gasket | PemkoPrene®, available in black |



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Placing on the Market / Application Rules

The standards that can be applied for the Pemko Acoustic Automatic Door Bottom are:

- ANSI S12.60-2002 Acoustical Performance Criteria, Design Requirements and Guidelines for Schools.
- ASTM 90-2009 for Acoustic Performance
- ASTM E-283 for Air Infiltration
- ANSI/.BHMA A156.22-2012 Door Gasketing Systems
- NFPA 105-99 Installation of Smoke Control Door Assemblies
- UL 10b and 10c Fire Rated
- UL 1784-2001 Smoke Leakage Tests of Door Assemblies
- UL 2818 GREENGUARD for VOC Testing, Gold certified

Delivery Status

Shipments of Pemko products are delivered in a cardboard box with each product individually shrinkwrapped

Base Materials / Ancillary Materials

| Material | Percentage in mass (%) |
|-----------------------|------------------------|
| Brass | 0.00% |
| Stainless Steel | 0.00% |
| Steel | 9.48% |
| Aluminum | 78.06% |
| Electronics/Mechanics | 0.00% |
| Plastics | 9.16% |
| Other | 3.30% |
| Total | 100.00% |

Manufacture

The primary manufacturing processes are made by Tier 1 suppliers and the final manufacturing processes occur in Memphis, TN and Ventura, CA. The components come from processes like stamped steel, turning, and aluminum extrusion.

Environmental and Health During Manufacturing

ASSA ABLOY is committed to producing and distributing door opening solutions with minimal environmental impact, where health & safety is the primary focus for all employees and associates.

- Environmental operations, GHG, energy, water, waste, VOC, surface treatment and H&S are being routinely monitored. Inspections, audits, and reviews are conducted periodically to ensure that applicable standards are met and environment management program effectiveness is evaluated.
- Code of Conduct covers human rights, labor practices and decent work. Management of ASSA ABLOY is aware of their environmental roles and responsibilities, providing appropriate training, supporting accountability and recognizing outstanding performance.
- Any waste metals during machining are separated and recycled. The waste from the water-based painting process is delivered to waste treatment plant.
- The factories in Memphis, TN and Ventura, CA have certification of Environmental Management to ISO 14001:2004 and Occupational Health and Safety to OHSAS 18001:2007.

Product Processing / Installation

Pemko Acoustic Automatic Door Bottoms are distributed through and installed by trained installation technicians, such as locksmiths, carpenters etc. adhering to local/national standards and requirements.



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Packaging

Shipments of Pemko products are delivered in a cardboard box with each product individually shrinkwrapped

| Material | Quantity (% By Weight) |
|--------------|------------------------|
| Cardboard | 96% |
| Other | 4% |
| Total | 100% |

Conditions of Use

Periodic adjustment of the plunger/actuator may be required to maintain sufficient contact with the flooring surface. It may be desired to periodically wipe the case of the door bottom with warm soapy water using a mild detergent to clear any dirt or grime from the door bottom case that has accumulated from normal traffic. Cleaning should be done with care

Environmental and Health During Use

There is no harmful emissive potential. No damage to health or impairment is expected under normal use corresponding to the intended use of the product.

Reference Service Life

The reference service life is 5 years.

Extraordinary Effects

Fire

No negative environmental impact will result from exposure to fire.

Water

Contains no substances that have any impact on water in case of flood.

Mechanical Destruction

No danger to the environment can be anticipated during mechanical destruction.

Re-use Phase

The product can be moved from one door to another during the reference service life, thus enabling re-use.

Disposal

The product can be mechanically disassembled to separate the different materials. 93% of the materials used are recyclable. The remainder of components are disposed of according to standard municipal solid waste deposition.

Further Information

ASSA ABLOY Architectural Door Accessories
5535 Distribution Drive
Memphis, TN 38141



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Life Cycle Assessment

Declared Unit

The declaration refers to the functional unit of 1 unit (or piece) of the Pemko PDB4131E Acoustic Automatic Door Bottom, as specified in the Builders Hardware PCR

| Name | Value | Unit |
|---------------------------|-------|---------------------|
| Declared unit | 1 | unit of Door Bottom |
| Mass | 0.683 | kg |
| Conversion factor to 1 kg | 1.465 | - |

System Boundary

This is a cradle to gate with options Environmental Product Declaration. The following life cycle phases were considered:

| Product Stage | | | Construction Process Stage | | Use Stage | | | | | | | End of Life Stage* | | | | Benefits and Loads Beyond the System Boundaries |
|---------------------|-----------|---------------|---------------------------------|------------------------------------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-----------|------------------|----------|---|
| Raw material supply | Transport | Manufacturing | Transport from gate to the site | Construction/ installation process | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstruction /demolition | Transport | Waste processing | Disposal | Reuse- Recovery- Recycling potential |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| X | X | X | X | X | MND | MND | MND | MND | MND | MND | MND | MND | X | X | X | X |

Description of the System Boundary Stages Corresponding to the PCR

(X = Included; MND = Module Not Declared)

*This includes provision of all materials, products and energy, packaging processing and its transport, as well as waste processing up to the end-of waste state or disposal of final residues.

Estimates and Assumptions

End of Life

In the End of Life phase, for all the materials which can be recycled, a recycling scenario with 100% collection rate was assumed.

Cut-off Criteria

In the assessment, all available data from the production process are considered, i.e. all raw materials used, auxiliary materials (e.g. lubricants), thermal energy consumption and electric power consumption - including material and energy flows contributing less than 1% of mass or energy (if available). In case a specific flow contributing less than 1% in mass or energy is not available, worst case assumption proxies are selected to represent the respective environmental impacts. Impacts relating to the production of machines and facilities required during production are out of the scope of this assessment.

Background data

For life cycle modeling of the considered products, the GaBi 6 Software System for Life Cycle Engineering, developed by thinkstep, is used GaBi 6 2013. The GaBi-database contains consistent and documented datasets which are documented in the online GaBi-documentation GaBi 6 2013D. To ensure comparability of results in the LCA, the basic data of GaBi database were used for energy, transportation and auxiliary materials.



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Data Quality

The data sources used are complete and representative of North America in terms of the geographic and technological coverage and are a recent vintage (i.e. less than ten years old). The data used for primary data are based on direct information sources of the manufacturer. Secondary data sets were used for raw materials extraction and processing, end of life, transportation, and energy production flows. Wherever secondary data is used, the study adopts critically reviewed data for consistency, precision, and reproducibility to limit uncertainty.

Period Under Review

The period under review is the full calendar year of 2015.

Allocation

Allocation was determined on a per unit basis.

Comparability

A comparison or an evaluation of EPD data is only possible if all data sets to be compared were created according to EN 15804 and the building context, respectively the product-specific characteristics of performance, are taken into account. Environmental declarations from different programs may not be comparable. Full conformance with the PCR for North American Builders Hardware products allows EPD comparability only when all stages of a Builders Hardware product's life cycle have been considered. However, variations and deviations are possible.

LCA: Modeling Scenarios and Additional Technical Information

The following technical information is a basis for the declared modules or can be used for developing specific scenarios in the context of a building assessment if modules are not declared.

| Installation into the building (A5) | | |
|--|-------|----------------|
| Name | Value | Unit |
| Auxiliary | - | kg |
| Water consumption | - | m ³ |
| Other resources | - | kg |
| Electricity consumption | - | kWh |
| Other energy carriers | - | MJ |
| Material loss | - | kg |
| Output substance following waste treatment on-site | 0.13 | kg |
| Dust in the air | - | kg |
| VOC in the air | - | kg |

| Reference Service Life | | |
|------------------------|-------|-------|
| Name | Value | Unit |
| Reference Service Life | 5 | years |

| End of life (C1-C4) | | |
|---------------------------------------|--------|------|
| Name | Value | Unit |
| Collected separately | 0.5977 | kg |
| Collected as mixed construction waste | 0.0850 | kg |
| Reuse | 0.0625 | kg |
| Recycling | 0.5798 | kg |
| Energy recovery | - | kg |
| Landfilling | 0.0625 | kg |



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LCA Results

Results shown below were calculated using TRACI 2.1 Methodology.

| TRACI 2.1 Impact Assessment | | | | | | | | | |
|-----------------------------|--|-------------------------|---------|---------|---------|---------|---------|---------|----------|
| Parameter | Parameter | Unit | A1-A3 | A4 | A5 | C2 | C3 | C4 | D |
| GWP | Global warming potential | kg CO ₂ -Eq. | 4.1E+00 | 5.1E-02 | 2.5E-02 | 3.2E-03 | 3.0E-03 | 6.0E-03 | -7.8E-01 |
| ODP | Depletion potential of the stratospheric ozone layer | kg CFC-11 Eq. | 3.3E-10 | 1.9E-12 | 5.7E-14 | 1.2E-13 | 1.0E-13 | 7.0E-15 | 2.6E-08 |
| AP Air | Acidification potential for air emissions | kg SO ₂ -Eq. | 2.2E-02 | 3.0E-04 | 1.3E-04 | 1.9E-05 | 1.8E-05 | 2.7E-05 | -1.8E-03 |
| EP | Eutrophication potential | kg N-Eq. | 5.0E-04 | 1.7E-05 | 2.3E-05 | 1.1E-06 | 8.8E-07 | 1.0E-05 | -1.5E-05 |
| SP | Smog formation potential | kg O ₃ -Eq. | 2.0E-01 | 8.4E-03 | 1.2E-03 | 5.2E-04 | 4.4E-04 | 1.1E-04 | -1.8E-02 |
| FFD | Fossil Fuel Depletion | MJ-surplus | 4.2E+00 | 9.0E-02 | 8.0E-03 | 5.6E-03 | 4.9E-03 | 9.1E-04 | 8.2E-02 |

Results shown below were calculated using CML 2001 - April 2013 Methodology.

| CML 4.1 Impact Assessment | | | | | | | | | |
|---------------------------|--|--|---------|---------|---------|---------|---------|---------|----------|
| Parameter | Parameter | Unit | A1-A3 | A4 | A5 | C2 | C3 | C4 | D |
| GWP | Global warming potential | kg CO ₂ -Eq. | 4.1E+00 | 5.1E-02 | 1.4E-01 | 3.2E-03 | 3.0E-03 | 6.8E-03 | -7.7E-01 |
| ODP | Depletion potential of the stratospheric ozone layer | kg CFC-11 Eq. | 3.1E-10 | 1.9E-12 | 5.5E-14 | 1.2E-13 | 1.0E-13 | 6.6E-15 | 2.4E-08 |
| AP Air | Acidification potential for air emissions | kg SO ₂ -Eq. | 2.3E-02 | 2.5E-04 | 8.8E-05 | 1.6E-05 | 1.6E-05 | 1.1E-05 | -1.8E-03 |
| EP | Eutrophication potential | kg(PO ₄) ³ -Eq. | 1.2E-03 | 4.5E-05 | 3.2E-05 | 2.8E-06 | 2.3E-06 | 1.1E-05 | -5.3E-05 |
| POCP | Formation potential of tropospheric ozone photochemical oxidants | kg ethane-Eq. | 1.3E-03 | 2.9E-05 | 1.9E-05 | 1.8E-06 | 1.9E-06 | 2.8E-06 | -3.9E-04 |
| ADPE | Abiotic depletion potential for non-fossil resources | kg Sb-Eq. | 8.5E-05 | 2.1E-11 | 4.6E-09 | 1.3E-12 | 5.2E-12 | 2.9E-10 | -7.7E-06 |
| ADPF | Abiotic depletion potential for fossil resources | MJ | 4.7E+01 | 6.4E-01 | 6.8E-02 | 4.0E-02 | 3.8E-02 | 7.2E-03 | -8.2E+00 |

Results below contain the resource use throughout the life cycle of the product.

| Resource Use | | | | | | | | | |
|--------------|--|----------------|---------|---------|---------|---------|---------|---------|----------|
| Parameter | Parameter | Unit | A1-A3 | A4 | A5 | C2 | C3 | C4 | D |
| PERE | Renewable primary energy as energy carrier | MJ | 1.8E+01 | 0.0E+00 | 8.8E-03 | 0.0E+00 | 0.0E+00 | 6.1E-04 | 4.1E-01 |
| PERM | Renewable primary energy resources as material utilization | MJ | 2.4E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| PERT | Total use of renewable primary energy resources | MJ | 2.0E+01 | 0.0E+00 | 8.8E-03 | 0.0E+00 | 0.0E+00 | 6.1E-04 | 4.1E-01 |
| PENRE | Nonrenewable primary energy as energy carrier | MJ | 5.0E+01 | 6.5E-01 | 7.3E-02 | 4.0E-02 | 4.0E-02 | 7.5E-03 | -7.3E+00 |
| PENRM | Nonrenewable primary energy as material utilization | MJ | 2.4E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| PENRT | Total use of nonrenewable primary energy resources | MJ | 5.2E+01 | 6.5E-01 | 7.3E-02 | 4.0E-02 | 4.0E-02 | 7.5E-03 | -7.3E+00 |
| SM | Use of secondary material | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| RSF | Use of renewable secondary fuels | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| NRSF | Use of nonrenewable secondary fuels | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| FW | Use of net fresh water | m ³ | 1.9E+01 | 0.0E+00 | 4.6E-03 | 0.0E+00 | 0.0E+00 | 3.3E-04 | -1.7E-03 |



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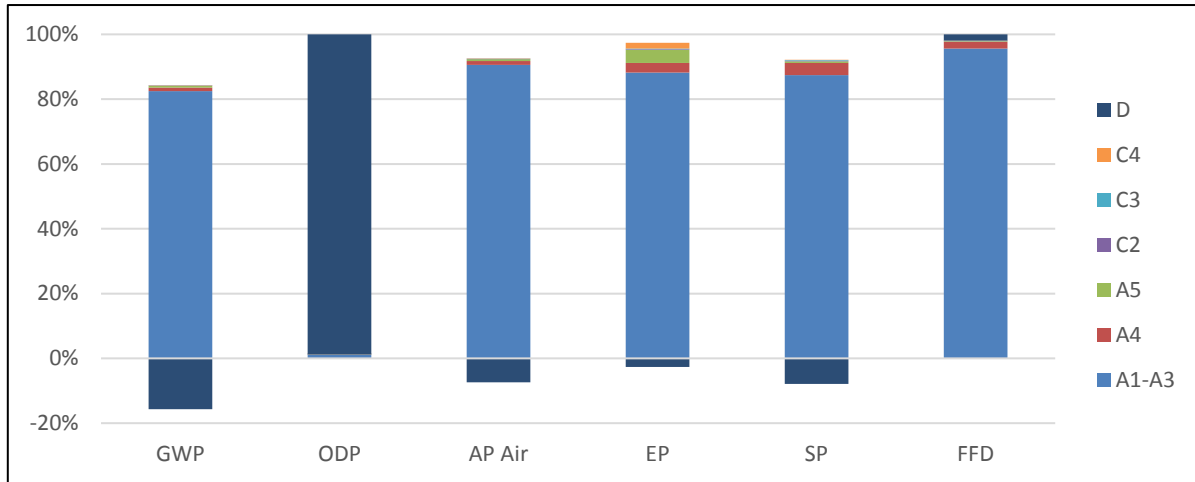


According to ISO 14025

Results below contain the output flows and wastes throughout the life cycle of the product.

| Output Flows and Waste Categories | | | | | | | | | |
|-----------------------------------|-------------------------------|------|---------|---------|---------|---------|---------|---------|----------|
| Parameter | Parameter | Unit | A1-A3 | A4 | A5 | C2 | C3 | C4 | D |
| HWD | Hazardous waste disposed | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | -4.0E-04 |
| NHWD | Non-hazardous waste disposed | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.9E-02 |
| RWD | Radioactive waste disposed | kg | 9.8E-04 | 0.0E+00 | 1.7E-06 | 0.0E+00 | 0.0E+00 | 1.3E-07 | 2.5E-04 |
| CRU | Components for re-use | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| MFR | Materials for recycling | kg | 2.3E-01 | 0.0E+00 | 1.3E-01 | 0.0E+00 | 3.0E-02 | 0.0E+00 | 3.8E-03 |
| MER | Materials for energy recovery | kg | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| EEE | Exported electrical energy | MJ | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 |
| EEE | Exported thermal energy | MJ | 0.0E+00 | 0.0E+00 | 1.2E-01 | 0.0E+00 | 0.0E+00 | 2.1E-03 | 0.0E+00 |

The production life cycle stage (A1-A3) dominates the impacts across all impact categories, with the exception of ozone depletion. This is due to the upstream production of metals used in the product, along with electricity use in the manufacturing of the product. Potential benefits in the global warming, acidification, eutrophication, and smog impact categories are due to the potential avoided burden of recycled materials after disposal.



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References

- PCR Part A UL Environment and Institut Bauen und Umwelt e.V., Königswinter (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report. July 2014, version 1.3
- PCR Part B UL Environment and Institut Bauen und Umwelt e.V. (IBU). Product Category Rules Part B: Requirements on the Environmental Product Declaration for Locks and Fittings.
- GaBi 6 thinkstep.one: GaBi Software-System and Databases for Life Cycle Engineering. version 6.110. Copyright, TM. Stuttgart, Echterdingen. 1992-2015
- ISO 14025 ISO 14025:2011-10, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.
- ISO 14040 ISO 14040:2009-11, Environmental management — Life cycle assessment — Principles and framework.
- ISO 14044 ISO 14044:2006-10, Environmental management — Life cycle assessment — Requirements and guidelines.
- EN 15804 EN 15804:2012-04: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction product
- ULE 2013 UL Environment, General Program Instructions, 2013.
- TRACI 2.1 US EPA, Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI)
- CML 2001 Center of Environmental Science of Leiden University impact categories and characterisation methods for impact assessment (CML)
- ANSI S12.60-2002 American National Standard Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools
- BHMA A156.22 Standard for Door Gasketing Systems
- ASTM E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- ASTM E283 Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
- NFPA 105 Standard for the Installation of Smoke Door Assemblies and Other Opening Protectives
- UL 10(b) Standards for Fire Tests for Door Assemblies
- UL 10(c) Standards for Positive Pressure Fire Tests for Door Assemblies
- UL 1784 Standard for Air Leakage Tests of Door Assemblies and Other Opening Protectives
- UL 2818 GREENGUARD Certification Program for Chemical Emissions for Building Materials, Finishes and Furnishings

