

ENVIRONMENTAL PRODUCT DECLARATION

DETEX CORPORATION

AO19 / M2000 AUTOMATIC DOOR OPENER



Detex Corporation has its origins in a predecessor company established in the 1870's to manufacture and sell stationary watchlocks. Through a series of changes Detex has become a world-class manufacturer and distributor of a variety of products that assure the life safety and security objectives of our customers.

Since the 1870's Detex Corporation has seen a lot of changes. Back then few knew what sustainability was or considered the environmental impacts of the products they bought. However, today is different.

Today we believe that our customer's requests for increased sustainability and transparency is an essential evolution of the marketplace. As such we have begun to evaluate the full life cycle impacts of all our products so that we can reduce the environmental footprint necessary to keep our customer's buildings secure. We have reduced energy, water and waste and are moving towards full transparency with the release of EPDs for all our major products.



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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 | Detex Corporation |
| DECLARATION NUMBER | 4787156239.103.1 |
| DECLARED PRODUCT | AO19/M2000 Automatic Door Opener |
| REFERENCE PCR | Product Category Rule (PCR) for preparing an Environmental Product Declaration (EPD) for Product Group, Builders Hardware UL9004. Version: April 3rd, 2014. |
| DATE OF ISSUE | January 29, 2016 |
| 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 manufacture Indication of product processing Information about the in-use conditions Life cycle assessment results Testing results and verifications |
| The PCR review was conducted by: | Expert Review Panel epd@ulenvironment.com |
| 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 |

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Product Description

Company

Detex Corporation is a world-class manufacturer and distributor of products that protect people, secure property, and assure the life safety and security objectives of our customers. We strive to create the highest customer value in our worldwide markets while obtaining the highest possible return for our other stakeholders.

For more than a century, Detex has earned the trust of architects and owners who rely on Detex products for the safety and security of people and property. A USA company, Detex designs, manufactures, markets and ships products around the world from New Braunfels, Texas. Detex is known internationally for life safety and security door hardware, loss prevention and architectural hardware, integrated door security systems, and guard tour verification.

Product

The AO19 Series Automatic Operator for single doors is an easy to install, heavy-duty product for high use and high abuse low energy applications. The AO19 Series meets requirements for ANSI/BHMA A156.19 (American National Standard for Power Assist and Low Energy Power Operated Doors) and provides standard features that meet the requirements of the American Disabilities Act.

AO19 is also sold under the product name M2000.

The primary function of the product is to open a door through electrical assistance.

The LCA for the AO19 product represents a specific product from a specific factory of the manufacturer.

Product Characterization

The product is provided to the customer through a fax, phone or email ordering system. The product is shipped directly to customers in packaging material that includes cardboard box, shipping labels and plastic materials. The amount of packaging materials is dependent on the size of the customer's order. Installation instructional sheets are provided. Accessory materials, such as installation screws are provided with the product.

Technical Information

The declared unit is one unit designed to fit a 3' (36") door.



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Application

General Standards:

1. ANSI/BHMA A156.19-2013 (American National Standard for Power Assist and Low Energy Power Operated Doors)

Other relevant standards include:

1. Meets ADA requirements

Base Materials

The following is a summary of the base materials in the products.

| | AO19 / M2000 |
|---------------|--------------|
| Aluminum | 50% |
| Steel | 30% |
| Electrical | 17% |
| Brass | <1% |
| Paper | <1% |
| Nylon | <1% |
| Polyester | <1% |
| Polypropylene | <1% |
| PVC | <1% |
| Rubber | <1% |
| Silicon | <1% |
| Total | 100% |

Manufacturing

Production occurs at Detex Corporation's manufacturing facility in New Braunfels, TX. Production begins when raw materials are received from suppliers. Electrical components (if applicable) are assembled onto boards. This is typically a manual process. Non-electrical components, such as steel, aluminum and plastic parts, are selected, cut to specification, finished and assembled to create the body of the product. Assembly may occur by manual or electrical means depending on the part. Final Assembly is the next stage in the process. In Final Assembly electrical boards and wires (if applicable) are installed inside the body of the product, along with other non-electrical parts. The body is then closed using another piece of steel or aluminum (depending on the model or product) and affixed with screws.

Products are then tested to assure functionality. Once products pass the functionality testing they are packaged and prepared for shipping. Standard carriers ship individual or small bulk orders separately. Large orders may be palletized.



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Environment and Health During Manufacturing

Detex Corporation meets all federal and state standards related to the Environment and Health during manufacturing. Additionally, Detex employs a strict waste minimization and recycling program that reduces and recycles waste produced in the manufacturing process.

Packaging

Packaging is dependent on the size of the customer's order. Packaging typically includes cardboard, paper packing list and plastic protective sleeves. Wooden pallet skids are utilized when customer order is large enough to warrant its use. All materials are recyclable at the site of installation.

Product Installation

Detailed installation instructions are provided with the product. These instructions can also be found at <http://www.detex.com/>. Accessory materials, such as screws and a mounting template are required and provided with the product. A power drill is recommended. Packaging waste is generated and disposed of in this stage.

Environment and Health During Use

There are no environment and health considerations during use.

Re-use Stage

Products can be deconstructed. The majority of steel, aluminium and plastic parts can be recycled. Electronic components should be disposed of appropriately.

Disposal

Although Detex recommends that products are recycled at the end of their useful life, AO19 / M2000 products can be disposed of in common municipal landfills without additional requirements.



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Life Cycle Assessment

Declared Unit

| | AO19 / M2000 | Unit |
|-----------------------------------|--------------|------|
| Weight per Declared | 20.66 | Kg |
| Fasteners (pieces x weight/piece) | 1.9 | Kg |
| Declared Unit | 22.56 | Kg |

System Boundary

According to table 3 of the PCR, a LCA for products in which a functional life is not declared can be one of three options. These options include a Cradle to Shipping Gate LCA, a Cradle to Building LCA or a Cradle to Building-with EOL stage LCA.

This particular LCA is a Cradle to Grave study.

A summary of the life cycle stages included in this LCA is presented in the following table.

| Module Name | Description | Summary of Included Elements |
|-------------|--|---|
| A1 | Product Stage: Raw Material Supply | Raw Material sourcing and processing as defined by secondary data. |
| A2 | Product Stage: Transport | Shipping from supplier to manufacturing site. Fuel use requirements estimated based on product weights and mapped distance. |
| A3 | Product Stage: Manufacturing | Energy, water and material inputs required for manufacturing gasketing and thresholds from raw materials. Packaging Materials included as well. |
| A4 | Construction Process Stage: Transport | Shipping from manufacturing site to project site. Fuel use requirements estimated based on product weights and mapped distance. |
| A5 | Construction Process Stage: Installation | Installation and packaging material waste. |
| B1 | Use Stage: Use | Electricity draw of AO19/M2000 to perform function of opening door. |
| B2 | Use Stage: Maintenance | Module Not Declared |
| B3 | Use Stage: Repair | Module Not Declared |
| B4 | Use Stage: Replacement | Module Not Declared |
| B5 | Use Stage: Refurbishment | Module Not Declared |
| B6 | Operational Energy Use | For AO19, this module includes the electricity demand required to use the automatic door opener, which is hardwired into the building. |
| B7 | Operational Water Use | Water not required for use. |
| C1 | EOL: Deconstruction | No inputs required for deconstruction. |
| C2 | EOL: Transport | Shipping from project site to landfill. Fuel use requirements estimated based on product weight and |



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| | | |
|----|------------------------|--|
| | | mapped distance. |
| C3 | EOL: Waste Processing | Waste processing not required. All waste can be processed as is. |
| C4 | EOL: Disposal | Assumes all products are sent to landfill. Landfill impacts modeled based on secondary data. |
| D | Benefits beyond system | Recycling potential of steel materials. |

Estimates and Assumptions

The electrical requirements of the power drill used during installation were excluded. Data of sufficient quality was not available since the power drill is used intermittently during installation. However, in relation to the electrical requirements of the production and use stages the electrical requirement of the power drill is below the 1% energy cut-off threshold.

All products are considered landfilled at end of life. While recycling is an option, the choice of landfilling represents a conservative estimation of the end of life pathway in lieu of having actual verifiable data of end of life recycling.

The inclusion of overhead energy, water and waste data was determined appropriate due to limited sub-metering energy tracking systems.

Cut-off Criteria

All inputs in which data were available were included.

Material inputs greater than 1% (based on the total mass of the final product) were included within the scope of analysis. Material inputs less than 1% were included if sufficient data was available to warrant inclusion and/or the material input was thought to have significant environmental impact. Cumulative excluded material inputs and environmental impacts are less than 5% based on the total weight of the declared unit.

No hazardous and toxic releases, which are mandatory to be monitored and reported to the U.S TRI, are released from the facility.

Background Data

All background data was sourced from GaBi databases. GaBi version 6.4.1.20 was used to complete the assessment.

Data Quality

Geographical Coverage

The geographical scope of the manufacturing portion of the life cycle is New Braunfels, TX. Primary data were collected from this location. The geographic coverage of primary data is considered excellent.

The geographical scope of the raw material acquisition, customer distribution, site installation and use portions of the life cycle is the United States of America. Locations and shipping distance values were determined through the analysis of purchasing and sales data using GIS mapping software. This data is considered very good.

Disposal and end-of-life geographic coverage (i.e. site of disposal location) was assumed based on research relating to the average distance an American lives from a landfill. This data is considered good.

Time Coverage



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Primary data were provided by Detex Corporation associates and represent calendar year 2014. Calendar year 2014 was the most recently completed 12-month period year at the beginning of the study. Using 2014 data meets the PCR requirements that manufacturer specific data be within the last 5 years. Time coverage of this data is considered very good.

Data necessary to model cradle-to-gate unit processes was sourced from PE International LCI datasets. Time coverage of the GaBi datasets varies from approximately 2002 to present. All datasets use at least 1-year of data to average energy inputs. Overall time coverage of the datasets is considered good and meets the requirement of the PCR that all data be updated within a 10-year period.

Technological Coverage

Primary data provided by Detex Corporation is specific to the technology that the company uses in manufacturing their product. It is site specific and considered of good quality. It is worth noting that the energy and water used in manufacturing the product includes overhead energy such as lighting, heating and sanitary use of water. Sub-metering was not available to extract process only energy and water use from the total energy use. Sub-metering would improve the technological coverage of data quality.

Data necessary to model cradle-to-gate unit processes was sourced from GaBi LCI datasets. Technological coverage of the datasets is considered good relative to the actual supply chain of Detex Corporation. While improved life cycle data from suppliers would improve technological coverage, the use of lower quality generic datasets does meet the goal of this LCA.

Allocation Procedures

General principles of allocation were based on ISO14044. Where possible allocation was avoided. When allocation was necessary it was done on a physical mass basis.

LCA Results

The following tables disclose the life cycle results for Detex Corporation's AO19 / M2000 line of Automatic Door Operators. Impact categories were determined through reference to the BHMA Product Category Rules for Builder Hardware (UL9004).



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TRACI 2.1

| AO19 / M2000, TRACI 2.1 | | | | | | | | | | | | | |
|---|---------------------|----------|----------|----------|----------|-------|-----|-----|-----|----------|----------|-----|----------|
| Parameter | Unit | A1-A3 | A4 | A5 | B1 | B2-B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Global Warming Air, incl. biogenic carbon | [kg CO2-Equiv.] | 1.23E+02 | 2.30E+00 | 6.51E-01 | 0.00E+00 | MND | MND | MND | MND | 4.95E+02 | 0.00E+00 | MND | 1.67E-01 |
| Ozone Depletion Air | [kg CFC 11-Equiv.] | 8.01E-08 | 1.97E-11 | 2.54E-12 | 0.00E+00 | MND | MND | MND | MND | 5.05E-09 | 0.00E+00 | MND | 1.43E-12 |
| Acidification | [kg SO2-Equiv.] | 5.50E-01 | 9.75E-03 | 6.32E-04 | 0.00E+00 | MND | MND | MND | MND | 4.27E+00 | 0.00E+00 | MND | 7.11E-04 |
| Eutrophication | [kg N-Equiv.] | 2.53E-02 | 9.25E-04 | 2.89E-04 | 0.00E+00 | MND | MND | MND | MND | 6.05E-02 | 0.00E+00 | MND | 6.74E-05 |
| Smog Air | [kg O3-Equiv.] | 5.76E+00 | 3.02E-01 | 6.21E-03 | 0.00E+00 | MND | MND | MND | MND | 3.34E+01 | 0.00E+00 | MND | 2.20E-02 |
| Abiotic Depletion for fossil resources | [MJ surplus energy] | 1.19E+02 | 4.37E+00 | 1.01E-01 | 0.00E+00 | MND | MND | MND | MND | 3.01E+02 | 0.00E+00 | MND | 3.18E-01 |

CML 2001-April 2013

| AO19 / M2000, CML 2001 | | | | | | | | | | | | | |
|--|-----------------------|----------|----------|----------|----------|-------|-----|-----|-----|----------|----------|-----|----------|
| Parameter | Unit | A1-A3 | A4 | A5 | B1 | B2-B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Global Warming Potential | [kg CO2-Equiv.] | 1.22E+02 | 2.33E+00 | 8.28E-01 | 0.00E+00 | MND | MND | MND | MND | 4.95E+02 | 0.00E+00 | MND | 1.70E-01 |
| Ozone Layer Depletion Potential | [kg R11-Equiv.] | 7.51E-08 | 1.85E-11 | 2.39E-12 | 0.00E+00 | MND | MND | MND | MND | 3.20E-04 | 0.00E+00 | MND | 1.35E-12 |
| Acidification Potential | [kg SO2-Equiv.] | 5.57E-01 | 7.53E-03 | 2.39E-04 | 0.00E+00 | MND | MND | MND | MND | 4.66E+00 | 0.00E+00 | MND | 5.49E-04 |
| Eutrophication Potential | [kg Phosphate-Equiv.] | 3.85E-02 | 1.90E-03 | 8.35E-04 | 0.00E+00 | MND | MND | MND | MND | 1.65E-01 | 0.00E+00 | MND | 1.39E-04 |
| Photochem. Ozone Creation Potential | [kg Ethene-Equiv.] | 4.02E-02 | 9.13E-04 | 2.10E-04 | 0.00E+00 | MND | MND | MND | MND | 4.65E-01 | 0.00E+00 | MND | 6.66E-05 |
| Abiotic Depletion | [kg Sb-Equiv.] | 3.07E-03 | 3.02E-07 | 1.05E-08 | 0.00E+00 | MND | MND | MND | MND | 5.48E-06 | 0.00E+00 | MND | 2.20E-08 |
| Abiotic Depletion for fossil resources | [MJ surplus energy] | 1.46E+03 | 3.22E+01 | 7.82E-01 | 0.00E+00 | MND | MND | MND | MND | 7.07E+03 | 0.00E+00 | MND | 2.35E+00 |



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Resource Use

| Key | | | |
|-------|---|-------|---|
| PERE | Use of renewable primary energy excluding renewable primary energy resources used as raw materials | PENRT | Total use of non renewable primary energy resources (primary energy and primary energy resources used as raw materials) |
| PERM | Use of renewable primary energy resources used as raw materials | SM | Use of secondary materials |
| PERT | Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) | RSF | Use of renewable secondary fuels |
| PENRE | Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials | NRSF | Use of non renewable secondary fuels |
| PENRM | Use of non renewable primary energy resources used as raw materials | FW | Net use of fresh water |

| AO19 / M2000, Resource Use | | | | | | | | | | | | | |
|----------------------------|-------------------------|----------|----------|----------|----------|-------|-----|-----|-----|----------|----------|-----|----------|
| Parameter | Unit | A1-A3 | A4 | A5 | B1 | B2-B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| PERE | MJ, net calorific value | 2.13E+02 | 5.08E-01 | 4.79E-02 | 0.00E+00 | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | MND | 3.70E-02 |
| PERM | MJ, net calorific value | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | MND | 0.00E+00 |
| PERT | MJ, net calorific value | 2.13E+02 | 5.08E-01 | 4.79E-02 | 0.00E+00 | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | MND | 3.70E-02 |
| PENRE | MJ, net calorific value | 1.68E+03 | 3.24E+01 | 8.17E-01 | 0.00E+00 | MND | MND | MND | MND | 8.61E+03 | 0.00E+00 | MND | 2.36E+00 |
| PENRM | MJ, net calorific value | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | MND | 0.00E+00 |
| PENRT | MJ, net calorific value | 1.68E+03 | 3.24E+01 | 8.17E-01 | 0.00E+00 | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | MND | 2.36E+00 |
| SM | Kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | MND | 0.00E+00 |
| RSF | MJ, net calorific value | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | MND | 0.00E+00 |
| NRSF | MJ, net calorific value | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | MND | 0.00E+00 |
| FW | M ³ | 2.02E+02 | 1.05E-01 | 2.70E-02 | 0.00E+00 | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | MND | 7.67E-03 |



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Outputs and Waste

| Key | | | |
|------|---------------------------------|-----|-------------------------------|
| HWD | Disposed-of-hazardous WASTE | CRU | Components for reuse |
| NHWD | Disposed-of non-hazardous WASTE | MFR | Materials for recycling |
| RWD | Disposed-of Radioactive WASTE | MET | Materials for energy recovery |
| | | EEE | Exported electrical energy |
| | | EET | Exported thermal energy |

| AO19 / M2000, Waste and Output Flows | | | | | | | | | | | | | |
|--------------------------------------|-------------------------|----------|----------|----------|----------|-------|-----|-----|-----|----------|----------|-----|----------|
| Parameter | Unit | A1-A3 | A4 | A5 | B1 | B2-B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| HWD | Kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | MND | 0.00E+00 |
| NHWD | Kg | 6.93E+02 | 3.01E-01 | 8.92E-01 | 0.00E+00 | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | MND | 2.19E-02 |
| RWD | Kg | 8.35E-02 | 6.74E-05 | 1.38E-05 | 0.00E+00 | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | MND | 4.92E-06 |
| CRU | Kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | MND | 0.00E+00 |
| MFR | Kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | MND | 0.00E+00 |
| MET | Kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | MND | 0.00E+00 |
| EEE | MJ, net calorific value | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | MND | MND | MND | MND | 0.00E+00 | 0.00E+00 | MND | 0.00E+00 |



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Comparability of EPDs

Results presented in this EPD are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins, or risks.

Results are not intended to be used to determine superiority of one product over another.

Environmental declarations from different programs may not be comparable.

The comparison of the environmental performance of Builders Hardware products using the EPD information shall be based on the product's use in and its impacts on or within the building, and shall consider the complete life cycle with all information modules.

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.

Life Cycle Assessment Interpretation

Dominance Analysis

A dominance analysis evaluates each life cycle stage and compares the impacts from that stage to the sum of the impacts calculated for all declared modules. Results from the dominance analysis were presented in the LCA report. In general, the vast majority of impacts (70-90%) are due to the B6 portion of the life cycle. This is due to the use of electricity during the use phase of the product.

Data Quality Assessment

Overall data quality is considered good. Improvements can be made through the modification of datasets to incorporate more regional specificity, both in terms of energy and technology. However data were considered appropriate in relation to the goal, scope and budget of the project.

Regarding primary data quality. For energy, water and waste, annual consumption was normalized based on total units of all goods produced during the same time frame. The resulting energy, water and waste per unit values were used for all products within the study. In reality, some products may result in more energy, water and waste being used and generated than others, however sub-metering at the per unit level was not available.

References

1. *Life Cycle Assessment, Detex Corporation, Exit Devices: Value Series V40, Advantex 10 Series. Automatic Door Operator: AO19/M2000. WAP Sustainability Consulting. September, 2015.*
2. Product Category Rule (PCR) for preparing an Environmental Product Declaration (EPD) for Product Group, Builders Hardware UL9004. Version: April 3rd, 2014.
3. ISO 14044: 2006 Environmental Management – Life cycle assessment – Requirements and Guidelines.
4. ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations – Principles and Procedures.

