



## Statement of Verification

BREG EN EPD No: 000830

Issue: 01

This is to verify that the Environmental Product Declaration provided by:

### Honeywell International Inc

are in accordance with the requirements of:

**EN 15804:2012+A2:2019**

and

BRE Global Scheme Document SD207

**This declaration is for:** 1 Unit of New S200 Advanced Protocol Detectors (Photoelectric smoke Detector, Thermal Sensor, Dual Photoelectric/ Thermal Multi-Criteria Detector, Photoelectric/ Thermal Multi-Criteria Detector) for a service life of 12 years

### Company Address

Pittway Tecnologica S.r.l. / Honeywell  
International Inc  
Via Caboto 19/3,  
34147 Trieste, Italy



**NOTIFIER**  
by Honeywell

**Honeywell**

**SYSTEM  
SENSOR**

**Honeywell**

# Honeywell

Signed for BRE Global Limited

Hayley Thomson

Operator

10 July 2026

Date of this Issue

10 July 2026

Date of First Issue

09 July 2031

Expiry Date



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# Environmental Product Declaration

EPD Number: 000830

## General Information

| EPD Programme Operator                                                                                                                                                                                                                                                                                                                  | Applicable Product Category Rules                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BRE Global<br>Watford, Herts<br>WD25 9XX<br>United Kingdom                                                                                                                                                                                                                                                                              | BRE 2025 PCR (PN 514 Rev 3.2) Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A2:2019<br><br>EN 50693:2019 - Product category rules for life cycle assessments of electronic and electrical products and systems |
| Commissioner of LCA study                                                                                                                                                                                                                                                                                                               | LCA consultant/Tool                                                                                                                                                                                                                                                              |
| Pittway Tecnologica S.r.l. / Honeywell<br>Caboto 19/3,<br>34147 Trieste, Italy                                                                                                                                                                                                                                                          | Sustainability Centre of Excellence, Honeywell Technology & Connected Solutions (HTCS) Madurai/ BRE LINA A2                                                                                                                                                                      |
| Declared/Functional Unit                                                                                                                                                                                                                                                                                                                | Applicability/Coverage                                                                                                                                                                                                                                                           |
| 1 Unit of New S200 Advanced Protocol Detectors (Photoelectric smoke Detector, Thermal Sensor, Dual Photoelectric/ Thermal Multi-Criteria Detector, Photoelectric/ Thermal Multi-Criteria Detector) for a service life of 12 years                                                                                                       | <b>Coverage - Product Specific.</b><br><br><b>Applicability - In the absence of full-year production data, the LCI was modelled using representative data from comparable products. As a result, the EPD outcomes may be associated with limited uncertainty.</b>                |
| EPD Type                                                                                                                                                                                                                                                                                                                                | Background database                                                                                                                                                                                                                                                              |
| Cradle to Grave                                                                                                                                                                                                                                                                                                                         | Ecoinvent 3.8                                                                                                                                                                                                                                                                    |
| Demonstration of Verification                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                  |
| CEN standard EN 15804 serves as the core PCR <sup>a</sup>                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                  |
| Independent verification of the declaration and data according to EN ISO 14025:2010<br><input checked="" type="checkbox"/> Internal <input type="checkbox"/> External                                                                                                                                                                   |                                                                                                                                                                                                                                                                                  |
| (Where appropriate <sup>b</sup> ) Third party verifier:<br>Kim Allbury                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                  |
| a: Product category rules<br>b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)                                                                                                                                                                          |                                                                                                                                                                                                                                                                                  |
| Comparability                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                  |
| Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A2:2019. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A2:2019 for further guidance |                                                                                                                                                                                                                                                                                  |



## Information modules covered

| Product                             |                                     |                                     | Construction                        |                                     | Use stage                           |                                     |                                     |                                     |                                     |                                     |                                     | End-of-life                         |                                     |                                     |                                     | Benefits and loads beyond the system boundary |
|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-----------------------------------------------|
|                                     |                                     |                                     |                                     |                                     | Related to the building fabric      |                                     |                                     |                                     |                                     | Related to the building             |                                     |                                     |                                     |                                     |                                     |                                               |
| A1                                  | A2                                  | A3                                  | A4                                  | A5                                  | B1                                  | B2                                  | B3                                  | B4                                  | B5                                  | B6                                  | B7                                  | C1                                  | C2                                  | C3                                  | C4                                  | D                                             |
| Raw materials supply                | Transport                           | Manufacturing                       | Transport to site                   | Construction – Installation         | Use                                 | Maintenance                         | Repair                              | Replacement                         | Refurbishment                       | Operational energy use              | Operational water use               | Deconstruction demolition           | Transport                           | Waste processing                    | Disposal                            | Reuse, Recovery and/or Recycling potential    |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/>           |

Note: Ticks indicate the Information Modules declared.

### Manufacturing site

Pittway Tecnologica S.r.l. / Honeywell  
Via Caboto 19/3,  
34147 Trieste, Italy

Data Coverage Period: 01-01-2025 - 31-12-2025

### Construction Product:

#### Product Description

The innovative New S200 Advanced Protocol detectors range delivers a completely new range of detectors combining the reliability of multiple decades of field applications with new key compliance requirements and improved features with advanced digital protocol. The New S200 spot detectors series incorporates fully redesigned mechanics for the device assembly, more harmonized across the same range of detectors, a new hardware introducing unmatched dual angle dual wavelength detection principle and software enhancements that together set a new standard in optical-heat detection.

Equipped with dual optical dual wavelength detection technology, the new Dual Photoelectric detector has been characterized for analysing the particles size and shape parameters and promptly detect fire at the early stages of its development, meanwhile rejecting another different stimulus. In addition to this, the Optical-heat detectors and Optical point detectors range complies with the EN54-29 standard, which is becoming increasingly relevant for the safety of buildings occupants. This compliance ensures that the Honeywell fire detection system meets stringent safety regulations, offering enhanced protection for those within the premises.

Below are the products that belong to the New S200 Advanced Protocol Detector range.

#### Dual Photoelectric/ Thermal Multi-Criteria Detectors (22151T2EI-xx-yy, NFXI-O2TB-yy, TC840MDEI-yy):

The Advanced Protocol multi-criteria, multi-sensor, dual angle dual wavelength photodetector with thermal detection uses the best optical detection technology for smoke detection and particle characterization to ensure to detect smoke particles and reject other particles for defining the condition of a fire alarm.

#### Photoelectric/ Thermal Multi-Criteria Detectors (22151TEI-xx-yy, NFXI-OT-yy, MI-PTSI-yy, TC840MEI-yy):



The Advanced Protocol multi-criteria, multi-sensor, photo, thermal detector uses thermal assistance to the core photoelectric smoke detector to give enhanced false alarm immunity and faster response to a wide range of incipient fires.

**Photoelectric Smoke Detectors (22151EI-xx-yy, NFXI-O-yy, MI-PSI-yy, TC806EI1012-yy):**

The Advanced Protocol photoelectric smoke detector has a redesigned improved new detection chamber design, result of many years of research and development. This delivers improved responsiveness, constant sensitivity, even throughout the entire life of the product, thanks to dust compensation algorithm and reduced false alarms resulting from ingress of insect and other debris.

**Thermal Sensors (52151Elcc-xx-yy, NFXI-THcc-yy, MI-THSIcc-yy, TC808Elcc-yy):**

The thermal devices offer 58- and 78-degrees fixed temperature analogue addressable sensors employing redundant thermistors and microprocessor technology for fast response and linear temperature sensing. The rate-of-rise uses the same thermistor and microprocessor technology to provide an alarm when the rate of rise in temperature exceeds 10°C/minute (typical) or if the temperature exceeds a threshold of 58°C (Response Class A1R).

At the time of LCA modelling and EPD verification, full-year production data was not yet available. LCI modelling therefore draws on data from comparable products. As they are also manufactured in the same plant using similar technology and at scale. Therefore, the EPD results may carry increased uncertainty and should be interpreted with caution.

| Part No         | Description                                          | Brand         | Mass of the Product (Kg) |
|-----------------|------------------------------------------------------|---------------|--------------------------|
| NFXI-O2TB-yy    | Dual Photoelectric/ Thermal Multi-Criteria Detectors | NOTIFIER      | 0.099                    |
| TC840MDEI-yy    | Dual Photoelectric/ Thermal Multi-Criteria Detectors | Honeywell     | 0.099                    |
| 22151T2EI-xx-yy | Dual Photoelectric/ Thermal Multi-Criteria Detectors | System Sensor | 0.099                    |
| TC840MEI-yy     | Photoelectric/ Thermal Multi-Criteria Detectors      | Honeywell     | 0.099                    |
| 22151TEI-xx-yy  | Photoelectric/ Thermal Multi-Criteria Detectors      | System Sensor | 0.099                    |
| NFXI-OT-yy      | Photoelectric/ Thermal Multi-Criteria Detectors      | NOTIFIER      | 0.099                    |
| MI-PTSI-yy      | Photoelectric/ Thermal Multi-Criteria Detectors      | Morley-IAS    | 0.099                    |
| NFXI-O-yy       | Photoelectric Smoke Detectors                        | NOTIFIER      | 0.099                    |
| MI-PSI-yy       | Photoelectric Smoke Detectors                        | Morley-IAS    | 0.099                    |
| TC806EI1012-yy  | Photoelectric Smoke Detectors                        | Honeywell     | 0.099                    |
| 22151EI-xx-yy   | Photoelectric Smoke Detectors                        | System Sensor | 0.099                    |
| NFXI-THcc-yy    | Thermal Sensors                                      | NOTIFIER      | 0.093                    |
| MI-THSIcc-yy    | Thermal Sensors                                      | Morley-IAS    | 0.093                    |



|                 |                 |               |       |
|-----------------|-----------------|---------------|-------|
| TC808Elcc-yy    | Thermal Sensors | Honeywell     | 0.093 |
| 52151Elcc-xx-yy | Thermal Sensors | System Sensor | 0.093 |

xx- represents different colours

yy- represents different protocol ID

cc- represents thermal detection classes

## Technical Information

| Technical Information                  | Photoelectric Smoke Detectors                | Dual Photoelectric / Thermal Multi-Criteria Detectors                             | Photoelectric / Thermal Multi-Criteria Detectors                                     | Thermal Sensors                                                                             |
|----------------------------------------|----------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Operating Voltage Range                | 15-31 V                                      |                                                                                   |                                                                                      |                                                                                             |
| Max. Standby Current (no comm.):       | 100 $\mu$ A @24 V and 25°C                   |                                                                                   |                                                                                      |                                                                                             |
| (comm. LED blink enabled - 5 sec)      | 150 $\mu$ A @24 V and 25°C                   |                                                                                   |                                                                                      |                                                                                             |
| (Read 16 sec. LED blink 8 sec)         | 120 $\mu$ A @24 V and 25°C                   |                                                                                   |                                                                                      |                                                                                             |
| Max. Alarm Current (RED LED on):       | 3.5 mA @ 24 V and 25°C                       |                                                                                   |                                                                                      |                                                                                             |
| Operating Humidity Range:              | 10% to 93% Relative Humidity, Non-Condensing |                                                                                   |                                                                                      |                                                                                             |
| Nominal Activation Temperature         | 58°C                                         |                                                                                   |                                                                                      |                                                                                             |
| Independently tested and certified to: | EN 54-7: 2018 and EN 54-17: 2005             | EN 54-5: 2017 + A1: 2018, Cat. A1R, EN 54-7: 2018, EN 54-17: 2005, EN 54-29: 2015 | EN 54-5: 2017 + A1: 2018, Cat. A1R, EN 54-7: 2018, EN 54-17: 2005 and EN 54-29: 2015 | EN 54-5: 2017 + A1: 2018, Cat. P (tested and approved to Cat. A1S, A1R, BS), EN 54-17: 2005 |

The above listed technical characteristics of the products are listed in the installation manuals. For more information, please visit <https://buildings.honeywell.com>.

## Products Image

### Dual Photoelectric / Thermal Multi-Criteria Detectors



NFXI-O2TB-yy



22151T2EI-xx-yy  
/ TC840MDEI-yy

### Photoelectric / Thermal Multi-Criteria Detectors



NFXI-OT-yy



22151TEI-xx-yy  
/ MI-PTSI-yy  
/ TC840MEI-yy

### Photoelectric Smoke Detectors



NFXI-O-yy



22151EI-xx-yy  
/ MI-PSI-yy  
/ TC806EI1012-yy

### Thermal Sensors



NFXI-THcc-yy



52151Elcc-xx-yy  
/ MI-THSlcc-yy  
/ TC808Elcc-yy



## Main Product Contents

| Material                        | Content %                    |                                                      |                                                 |                |
|---------------------------------|------------------------------|------------------------------------------------------|-------------------------------------------------|----------------|
|                                 | Photoelectric Smoke Detector | Dual Photoelectric / Thermal Multi-Criteria Detector | Photoelectric / Thermal Multi-Criteria Detector | Thermal Sensor |
| Acrylonitrile Butadiene Styrene | 21.32%                       | 21.27%                                               | 21.27%                                          | 22.71%         |
| Bronze                          | 2.03%                        | 2.03%                                                | 2.03%                                           | 2.16%          |
| Electronics                     | 7.59%                        | 7.84%                                                | 7.84%                                           | 8.10%          |
| Polycarbonate                   | 60.93%                       | 60.77%                                               | 60.76%                                          | 63.79%         |
| Polyoxymethylene                | 7.11%                        | 7.09%                                                | 7.09%                                           | 2.16%          |
| Stainless Steel                 | 1.02%                        | 1.01%                                                | 1.01%                                           | 1.08%          |
| Total Composition (%)           | 100%                         | 100%                                                 | 100%                                            | 100%           |

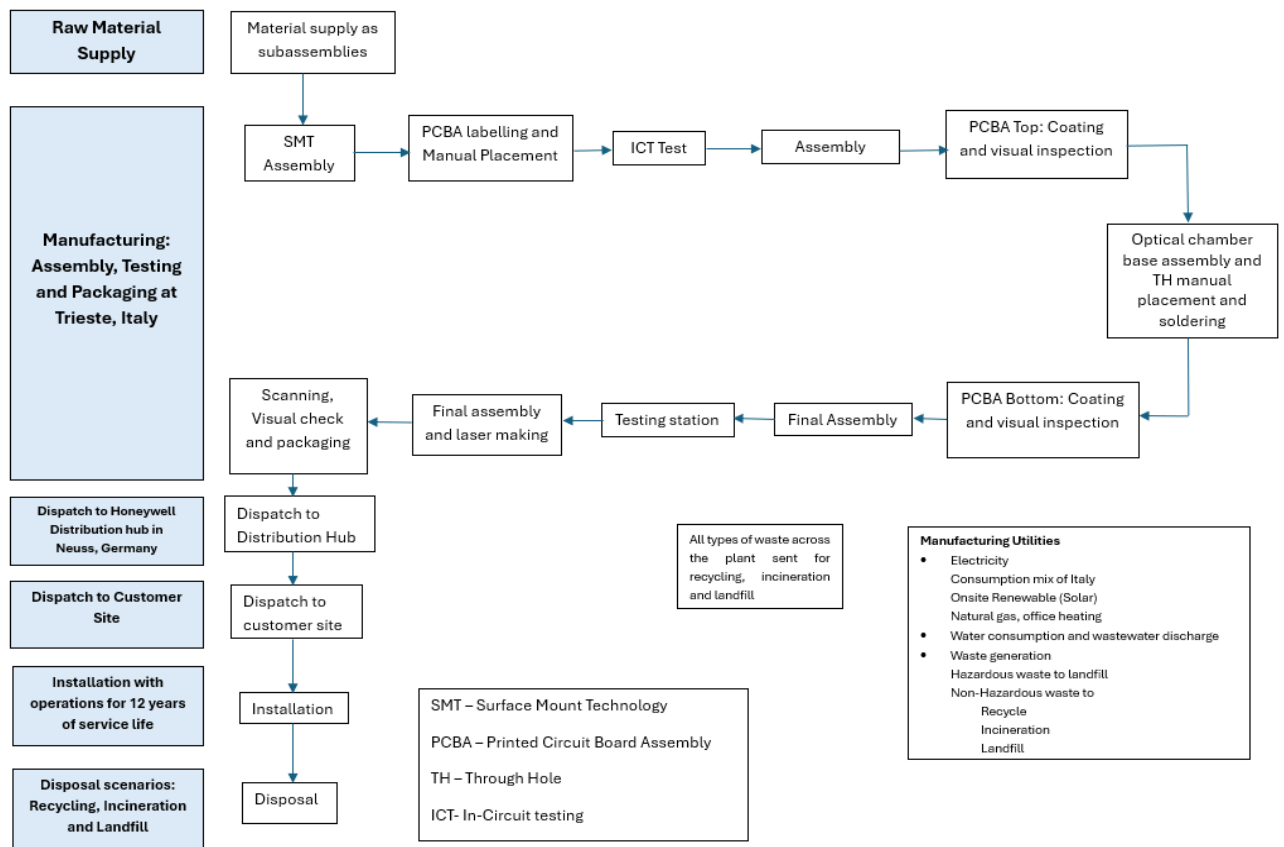
## Packaging Content

| Material               | Mass (Kg)                    |                                                      |                                                 |                |
|------------------------|------------------------------|------------------------------------------------------|-------------------------------------------------|----------------|
|                        | Photoelectric Smoke Detector | Dual Photoelectric / Thermal Multi-Criteria Detector | Photoelectric / Thermal Multi-Criteria Detector | Thermal Sensor |
| Amorphous Polyethylene | 0.024                        | 0.024                                                | 0.024                                           | 0.024          |
| Cardboard              | 0.029                        | 0.029                                                | 0.029                                           | 0.029          |

## Manufacturing Process

The manufacturing process at Honeywell's Trieste factory involves assembly process. Various subassemblies, parts, and components are sourced from regional and global suppliers and assembled at the factory following sophisticated technology and standard industrial practices, with robust inspection and testing. The process flow diagram of the assembly process is provided below. During the assembly process, there is no multi-output generation on the production lines. The factory utilities used for the production are the electricity mix which consists of both Italy grid mix and Onsite renewable (solar) electricity, Natural gas, Industrial furnace and Water. The production waste at the time of manufacturing which consists of Hazardous and Non-hazardous wastes are also considered in the process flow. All products are assembled using the same technology and process which works on standard industrial practices and all the products are inline quality tested. The automated line used for comparable products consistently delivers high first-pass performance with minimal rework or scrap, and this same line will support production of the New S200 Advanced Protocol detectors, ensuring a robust and efficient manufacturing process. A set of representative products from every batch gets tested at the laboratory to ensure the product compliance with regulations and certifications.

## Process flow diagram



## Construction Installation

The installation phase involves only manual activities and does not consume any energy. This phase also includes the disposal of packaging waste to the nearest incineration facility. For the disposal of packaging and documentation after installation, a transport distance of 100 km is assumed based on the PSR-0019-ed1EN-2023 06 06.

## Use Information

Under typical usage condition, the product has a service life for 12 years. It remains in standby-mode in most of the time and did not need any use (B1) maintenance (B2), repair (B3), parts replacement (B4), refurbishments (B5) and water use (B7) during its operation. Hence, the use stage environmental impacts are associated to the operational electricity consumption (B6).

Since, this product is part of a fire detection and alarm system, for which system maintenance is required. As well as routine testing, Grade A systems should be inspected and serviced at periods not exceeding 6 months in accordance with the recommendations of BS 5839. Typically, this responsibility falls to an external fire alarm servicing organisation, in which case a competent person with specialist knowledge of fire detection and fire alarm systems, will visit the fire system for maintenance twice a year.

The electricity consumption in use phase is calculated based on PSR-0019 ed1EN-2023 06 06 PEP Eco passport.

According to the PSR-0019 ed1 EN-2023 06 06 PEP ecopassport® guideline, the electricity consumption during 10-minute alarm state is negligible over the annual operating hours (8760 hours).



The Current consumption of the detectors in the standby mode=100uA

Operating voltage=24V

The total energy consumed per annum is calculated using the formula below

$C_t = P_c \times 8760 \times DVR$

where  $C_t$ : Total energy consumption (kWh),  $P_c$ : Power consumption in quiescent condition (kW), DVR: Dynamic voltage restorer is assumed as 1.

Annual power consumption=  $0.000100 \times 24 \times 365 \times 24 = 21.024Wh$

The total energy consumed for the service life of 12 years = 0.252 kWh

## End of Life

The end-of-life scenario has been selected by referencing EN50693:2019 PCR recommendations

**C1 Deconstruction:** The product has reached the end of waste state at C1. No additional input materials, energy or water required to dismantle the product at end of life of the product. It can be dismantled using standard equipment and tools by manual operation. Hence module C1 did not have any environmental impacts.

**C2 Transport:** A typical transport distance of 100 km by road using a lorry (>32 metric ton) from the demolition site to the waste processing plant is assumed.

**C3 Waste Processing & C4 Disposal:** The product consists of 3-4% Metal ,7-8% electronics, and 89-90% Plastics. The End-of-life specific allocation rules in C3 for materials to recycling, incineration, and disposal in landfills in C4 are considered based on EN50693:2019 PCR recommendations as given below.

| Material     | Recycling | Incineration | Disposal in landfill |
|--------------|-----------|--------------|----------------------|
| ABS          | 20%       | 40%          | 40%                  |
| Bronze       | 60%       | NA           | 40%                  |
| PCB (Metals) | NA        | NA           | 100%                 |
| Plastics     | NA        | 50%          | 50%                  |
| Steel        | 80%       | NA           | 20%                  |

### Module D:

The allocation of environmental burden of waste recycling or reuse shall be assigned to the product system generating the waste and the waste comes as burden free and accounted in Module D.

In addition, the benefits of Module D include the energy credits from incineration of waste product at end-of-life. Non-combustible contents have been excluded and only the remaining combustible content (plastics and rubber) are accounted for in Module D energy recovery calculations.



## Life Cycle Assessment Calculation Rules

### Functional unit description

1 Unit of New S200 Advanced Protocol Detectors (Photoelectric smoke Detector, Thermal Sensor, Dual Photoelectric/ Thermal Multi-Criteria Detector, Photoelectric/ Thermal Multi-Criteria Detector) for a service life of 12 years

### System boundary

The system boundary considered in the LCA study is cradle to grave which covers all production stages (A1-A3), transportation to site (A4), installation (A5), use stages (B1-B7), and end-of-life stages (C1-C4 and D) in accordance with EN 15804:2012+A2:2019. Additionally, this EPD complies with EN 50693:2019 PCR for the evaluation of electronic and electrical products and systems. The LCA study also complies with BRE 2025 Product Category Rules (PN 514 Rev 3.2).

The study period of this LCA is 12 years which is same as the reference service life of the product for the entire system boundary from A1-C4. Impacts and losses/wastage in production, transport, use stage and end of life stage are accounted in their respective modules.

LCA is completed for all the products.

### Data sources, quality and allocation

Specific primary data and secondary data for the manufacturing of Detector (Photoelectric, Thermal, Dual Photoelectric & Thermal, Photoelectric & Thermal detectors) in Honeywell factory in Trieste have been modelled using BRE LINA A2. The manufacturer-specific data for the production period for the study is 1-January-2025 to 31-December-2025. In accordance with requirements of EN15804, the most current available data has been used. The main sources for primary data are the Bill of Materials (BOM) and technical drawings, while site specific foreground data are provided by Honeywell HSE Facility Management. For all secondary data, obtained for all other upstream and downstream processes that are beyond the control of the manufacturer (i.e. raw material production), are generic data originating from Ecoinvent 3.8. All datasets are complete within the context used and conform to the system boundary and the criteria for the exclusion of inputs and outputs, according to the requirements specified in EN 15804:2012+A2:2019. The factory also produces other products in addition to the Detectors therefore the grid electricity, natural gas, water and waste generated have been allocated to all products by unit volume according to the provisions in the BRE 2025 PCR (PN 514 Rev 3.2) and EN 15804:2012+A2:2019. The LCA-method selected for this study is Cut-off, EN 15804+A2. The electricity consumption per product arrived based on allocation of the overall factory energy consumption to production volume based on one year data. Site wide values for energy, water and wastewater have been taken from Honeywell ERP systems. The factory has onsite solar energy generation facility for 567KWp PV panels for factory operations. Figures for the raw materials, ancillary materials and packaging are from actual usages. Emissions to air, water and soil during assembly process are negligible and hence not accounted. All the primary data such as BOM, energy consumption, supply chain details, are clearly mapped to the corresponding processes and the most specific datasets. For the Electricity mix Location-based approach is used. The LCIA methodology used is the EN 15804:2012+A2:2019 based on Environmental Footprint 3.1. Specific regional datasets are used in this LCA. The geographical scope of product is Modules A1-A3: Italy, A4-A5: Region Europe, Module B: Region Europe and Module C: Region Europe are considered for geography. There is less than 1 years between the LCI reference year (2025) and the time period for which the LCA (2025-2026) is undertaken. Hence the quality of geographical and technical representativeness is therefore very good. Italy grid consumption mix was used for electricity with an emissions factor of 0.548 kg CO<sub>2</sub>eq /kWh. Natural gas data (for facility discrete heat) was used with an emissions factor of 0.074 kg CO<sub>2</sub>eq /kWh and Solar electricity Italy (from multi-Si panel) of 0.0724CO<sub>2</sub>eq /kWh.

In the end-of-life allocation, substitution approach has been applied. This allocation approach is based on the perspective that a material that is recycled into a secondary material at end of life will substitute another material based on technical substitutability. Hence, a credit is given to account for the material substitution based on mass or average grid energy. The allocation percentage for end of life for the WEEE products are considered based on EN50693:2019 PCR recommendations. The EPD follows the additional requirements for construction products considered as Electronic or Electric Equipment



#### Assumptions considered in the LCA Study:

1. The manufacturing data is for the detectors in this study is based on previous generation of detectors as they are yet to be manufactured on a commercial scale.
2. Regional / Global datasets are used where specific data are unavailable.
3. Scraps for metal working and plastic processes are cut off as they are included in the secondary datasets.
4. Surface treatments like plating, galvanizing is accounted in the secondary datasets.
5. Onsite solar generation data is considered in the LCA model
6. Volume based allocation is done across all products based on the production volumes
7. Emissions to air, water and soil during assembly process are negligible and hence not accounted.
8. In the EoL, Bronze is modelled using copper datasets and Stainless Steel is modelled using Steel dataset.

| ISO14044 Guidance<br>Quality Level | Geographical<br>representativeness | Technical<br>representativeness                                                                                                           | Time<br>representativeness                                                                                                 |
|------------------------------------|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Very Good                          | Data from area under study         | Data from processes and products under study. Same state of technology applied as defined in goal and scope (i.e., identical technology). | There is less than 5 years between the Ecoinvent LCI reference year, and the time period for which the LCA was undertaken. |

BRE LINA+A2 uses the characterisation factors that are specified in annex C of the 15804 A2 standard.

The data quality assessment presented above has been carried out in accordance with Table E.1 in the Annex section of the BRE PCR EN 15804+A2 v3.2

#### Cut-off criteria

The LCA study includes input and output flows at every process steps. Life cycle inventory data related to raw material, packaging, consumables, transportation, process energy consumption, water use and waste generation are considered. No relevant processes are excluded. The upstream data related to raw material extraction and processing are factored through background datasets with Ecoinvent following standard industrial practice.

#### LCA Results Summary

For a service life of 12 years,

| Product Description                                 | Product Mass(kg) | Operational energy use during service life (kWh) | Cradle to Gate GWP-total (kg CO <sub>2</sub> -eq) | Cradle to Grave GWP-total (kg CO <sub>2</sub> -eq) |
|-----------------------------------------------------|------------------|--------------------------------------------------|---------------------------------------------------|----------------------------------------------------|
| Photoelectric Smoke Detector                        | 0.099            | 0.252                                            | 1.73E+00                                          | 2.05E+00                                           |
| Dual Photoelectric/ Thermal Multi-criteria Detector | 0.099            | 0.252                                            | 1.84E+00                                          | 2.17E+00                                           |
| Photoelectric/ Thermal Multi-Criteria Detector      | 0.099            | 0.252                                            | 1.84E+00                                          | 2.17E+00                                           |
| Thermal Sensor                                      | 0.093            | 0.252                                            | 1.67E+00                                          | 1.99E+00                                           |

## LCA Results

### 1 Unit of Photoelectric Smoke Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts               |                                      |      | GWP-total             | GWP-fossil            | GWP-biogenic          | GWP-luluc             | ODP         | AP                    | EP-freshwater                          |
|-----------------------------------------------------------|--------------------------------------|------|-----------------------|-----------------------|-----------------------|-----------------------|-------------|-----------------------|----------------------------------------|
|                                                           |                                      |      | kg CO <sub>2</sub> eq | kg CO <sub>2</sub> eq | kg CO <sub>2</sub> eq | kg CO <sub>2</sub> eq | kg CFC11 eq | mol H <sup>+</sup> eq | kg (PO <sub>4</sub> ) <sup>3-</sup> eq |
| Product stage                                             | Raw material supply                  | A1   | 1.43E+00              | 1.43E+00              | 2.91E-03              | 1.30E-03              | 5.47E-08    | 1.45E-02              | 8.33E-04                               |
|                                                           | Transport                            | A2   | 3.60E-02              | 3.60E-02              | 1.49E-05              | 3.75E-06              | 8.26E-09    | 1.81E-04              | 7.38E-07                               |
|                                                           | Manufacturing                        | A3   | 2.62E-01              | 2.45E-01              | 1.58E-02              | 9.27E-05              | 2.80E-07    | 1.15E-03              | 6.23E-05                               |
|                                                           | Total (Consumption grid)             | A1-3 | 1.73E+00              | 1.71E+00              | 1.87E-02              | 1.40E-03              | 3.43E-07    | 1.58E-02              | 8.96E-04                               |
| Construction process stage                                | Transport                            | A4   | 1.72E-02              | 1.72E-02              | 1.67E-05              | 6.19E-06              | 4.11E-09    | 7.19E-05              | 1.07E-06                               |
|                                                           | Construction                         | A5   | 1.03E-01              | 5.75E-02              | 4.55E-02              | 1.87E-06              | 6.94E-10    | 2.85E-05              | 5.39E-07                               |
| Use stage                                                 | Use                                  | B1   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
|                                                           | Maintenance                          | B2   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
|                                                           | Repair                               | B3   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
|                                                           | Replacement                          | B4   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
|                                                           | Refurbishment                        | B5   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
|                                                           | Operational energy use               | B6   | 9.98E-02              | 9.64E-02              | 3.18E-03              | 2.29E-04              | 4.81E-09    | 5.17E-04              | 9.67E-05                               |
|                                                           | Operational water use                | B7   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
| 6% Recycle, 43% Incineration, 51%Landfill                 |                                      |      |                       |                       |                       |                       |             |                       |                                        |
| End of life                                               | Deconstruction, demolition           | C1   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
|                                                           | Transport                            | C2   | 9.00E-04              | 8.98E-04              | 8.73E-07              | 3.23E-07              | 2.15E-10    | 3.75E-06              | 5.59E-08                               |
|                                                           | Waste processing                     | C3   | 1.00E-01              | 1.00E-01              | 9.53E-06              | 3.13E-06              | 7.86E-10    | 3.02E-05              | 7.74E-07                               |
|                                                           | Disposal                             | C4   | 5.94E-03              | 5.94E-03              | 4.09E-06              | 5.97E-07              | 1.62E-10    | 4.80E-06              | 3.93E-07                               |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D    | -4.26E-02             | -4.20E-02             | -5.13E-04             | -5.18E-05             | -2.82E-09   | -6.56E-04             | -5.62E-05                              |

GWP-total = Global warming potential, total;  
 GWP-fossil = Global warming potential, fossil;  
 GWP-biogenic = Global warming potential, biogenic;  
 GWP-luluc = Global warming potential, land use and land use change;

ODP = Depletion potential of the stratospheric ozone layer;  
 AP = Acidification potential, accumulated exceedance; and  
 EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

## LCA Results (continued)

1 Unit of Photoelectric Smoke Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts               |                                      |      | EP-marine | EP-terrestrial | POCP        | ADP-mineral&metals | ADP-fossil              | WDP                              | PM                |
|-----------------------------------------------------------|--------------------------------------|------|-----------|----------------|-------------|--------------------|-------------------------|----------------------------------|-------------------|
|                                                           |                                      |      | kg N eq   | mol N eq       | kg NMVOC eq | kg Sb eq           | MJ, net calorific value | m <sup>3</sup> world eq deprived | disease incidence |
| Product stage                                             | Raw material supply                  | A1   | 1.48E-03  | 1.63E-02       | 5.33E-03    | 1.92E-04           | 1.90E+01                | 5.78E-01                         | 1.05E-07          |
|                                                           | Transport                            | A2   | 6.47E-05  | 7.08E-04       | 1.89E-04    | 2.05E-08           | 5.13E-01                | 9.19E-04                         | 9.50E-10          |
|                                                           | Manufacturing                        | A3   | 2.06E-04  | 2.01E-03       | 6.13E-04    | 2.41E-06           | 4.05E+00                | 1.69E-01                         | 6.92E-09          |
|                                                           | Total (Consumption grid)             | A1-3 | 1.75E-03  | 1.90E-02       | 6.13E-03    | 1.94E-04           | 2.36E+01                | 7.48E-01                         | 1.13E-07          |
| Construction process stage                                | Transport                            | A4   | 2.19E-05  | 2.40E-04       | 7.71E-05    | 3.95E-08           | 2.68E-01                | 1.30E-03                         | 2.02E-09          |
|                                                           | Construction                         | A5   | 1.38E-05  | 1.30E-04       | 3.38E-05    | 1.52E-08           | 2.50E-02                | 2.11E-03                         | 2.45E-10          |
| Use stage                                                 | Use                                  | B1   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
|                                                           | Maintenance                          | B2   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
|                                                           | Repair                               | B3   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
|                                                           | Replacement                          | B4   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
|                                                           | Refurbishment                        | B5   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
|                                                           | Operational energy use               | B6   | 9.02E-05  | 7.85E-04       | 2.14E-04    | 9.66E-08           | 2.08E+00                | 6.93E-02                         | 1.53E-09          |
|                                                           | Operational water use                | B7   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
| 6% Recycle, 43% Incineration, 51%Landfill                 |                                      |      |           |                |             |                    |                         |                                  |                   |
| End of life                                               | Deconstruction, demolition           | C1   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
|                                                           | Transport                            | C2   | 1.14E-06  | 1.25E-05       | 4.02E-06    | 2.06E-09           | 1.40E-02                | 6.76E-05                         | 1.06E-10          |
|                                                           | Waste processing                     | C3   | 1.48E-05  | 1.31E-04       | 3.43E-05    | 2.38E-08           | 3.55E-02                | 2.39E-03                         | 2.78E-10          |
|                                                           | Disposal                             | C4   | 1.24E-04  | 1.74E-05       | 6.24E-06    | 1.87E-09           | 1.28E-02                | 5.70E-04                         | 9.10E-11          |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D    | -5.24E-05 | -6.06E-04      | -1.70E-04   | -1.08E-05          | -6.54E-01               | -2.27E-02                        | -2.43E-09         |

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;  
 EP-terrestrial = Eutrophication potential, accumulated exceedance;  
 POCP = Formation potential of tropospheric ozone;  
 ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Depletion potential of the stratospheric ozone layer;  
 WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and  
 PM = Particulate matter.

## LCA Results (continued)

1 Unit of Photoelectric Smoke Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts               |                                      |      | IRP                     | ETP-fw    | HTP-c     | HTP-nc    | SQP           |
|-----------------------------------------------------------|--------------------------------------|------|-------------------------|-----------|-----------|-----------|---------------|
|                                                           |                                      |      | kBq U <sup>235</sup> eq | CTUe      | CTUh      | CTUh      | dimensionless |
| Product stage                                             | Raw material supply                  | A1   | 1.14E-01                | 8.82E+01  | 1.11E-09  | 5.55E-08  | 3.99E+00      |
|                                                           | Transport                            | A2   | 2.35E-03                | 2.95E-01  | 4.64E-12  | 4.49E-10  | 1.52E-01      |
|                                                           | Manufacturing                        | A3   | 2.83E-02                | 3.66E+00  | 1.03E-10  | 2.70E-09  | 6.70E-01      |
|                                                           | Total (Consumption grid)             | A1-3 | 1.45E-01                | 9.22E+01  | 1.22E-09  | 5.86E-08  | 4.81E+00      |
| Construction process stage                                | Transport                            | A4   | 1.36E-03                | 2.10E-01  | 5.80E-12  | 2.29E-10  | 3.07E-01      |
|                                                           | Construction                         | A5   | 1.77E-04                | 2.30E-01  | 2.14E-11  | 1.77E-10  | 1.38E-02      |
| Use stage                                                 | Use                                  | B1   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Maintenance                          | B2   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Repair                               | B3   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Replacement                          | B4   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Refurbishment                        | B5   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Operational energy use               | B6   | 5.71E-02                | 1.03E+00  | 2.47E-11  | 8.27E-10  | 3.00E-01      |
|                                                           | Operational water use                | B7   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
| 6% Recycle, 43% Incineration, 51%Landfill                 |                                      |      |                         |           |           |           |               |
| End of life                                               | Deconstruction, demolition           | C1   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Transport                            | C2   | 7.08E-05                | 1.09E-02  | 3.03E-13  | 1.20E-11  | 1.60E-02      |
|                                                           | Waste processing                     | C3   | 2.44E-04                | 2.81E-01  | 2.15E-11  | 2.01E-10  | 1.81E-02      |
|                                                           | Disposal                             | C4   | 6.21E-05                | 3.64E-02  | 1.90E-11  | 1.29E-09  | 3.02E-02      |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D    | -1.06E-02               | -4.08E+00 | -9.19E-11 | -6.22E-09 | -3.13E-01     |

IRP = Potential human exposure efficiency relative to U235;  
ETP-fw = Potential comparative toxic unit for ecosystems;  
HTP-c = Potential comparative toxic unit for humans;

HTP-nc = Potential comparative toxic unit for humans; and  
SQP = Potential soil quality index.

## LCA Results (continued)

1 Unit of Photoelectric Smoke Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing resource use, primary energy        |                                      |      | PERE      | PERM     | PERT      | PENRE     | PENRM    | PENRT     |
|-----------------------------------------------------------|--------------------------------------|------|-----------|----------|-----------|-----------|----------|-----------|
|                                                           |                                      |      | MJ        | MJ       | MJ        | MJ        | MJ       | MJ        |
| Product stage                                             | Raw material supply                  | A1   | 1.33E+00  | 0.00E+00 | 1.33E+00  | 1.62E+01  | 2.73E+00 | 1.89E+01  |
|                                                           | Transport                            | A2   | 1.36E+00  | 0.00E+00 | 1.36E+00  | 4.19E+02  | 0.00E+00 | 4.19E+02  |
|                                                           | Manufacturing                        | A3   | 4.65E+00  | 3.68E-01 | 5.02E+00  | 1.04E+01  | 6.92E-01 | 1.11E+01  |
|                                                           | Total (Consumption grid)             | A1-3 | 7.34E+00  | 3.68E-01 | 7.71E+00  | 4.46E+02  | 3.42E+00 | 4.49E+02  |
| Construction process stage                                | Transport                            | A4   | 3.41E-03  | 0.00E+00 | 3.41E-03  | 2.63E-01  | 0.00E+00 | 2.63E-01  |
|                                                           | Construction                         | A5   | 9.53E-05  | 0.00E+00 | 9.53E-05  | 7.36E-03  | 0.00E+00 | 7.36E-03  |
| Use stage                                                 | Use                                  | B1   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Maintenance                          | B2   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Repair                               | B3   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Replacement                          | B4   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Refurbishment                        | B5   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Operational energy use               | B6   | 3.70E-01  | 0.00E+00 | 3.70E-01  | 2.10E+00  | 0.00E+00 | 2.10E+00  |
|                                                           | Operational water use                | B7   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
| 6% Recycle, 43% Incineration, 51%Landfill                 |                                      |      |           |          |           |           |          |           |
| End of life                                               | Deconstruction, demolition           | C1   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Transport                            | C2   | 1.78E-04  | 0.00E+00 | 1.78E-04  | 1.37E-02  | 0.00E+00 | 1.37E-02  |
|                                                           | Waste processing                     | C3   | 2.65E-04  | 0.00E+00 | 2.65E-04  | -1.75E-01 | 1.78E-01 | 3.29E-03  |
|                                                           | Disposal                             | C4   | 2.58E-04  | 0.00E+00 | 2.58E-04  | -1.54E+00 | 1.55E+00 | 1.26E-02  |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D    | -1.06E-01 | 0.00E+00 | -1.06E-01 | -6.56E-01 | 0.00E+00 | -6.56E-01 |

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;  
 PERM = Use of renewable primary energy resources used as raw materials;  
 PERT = Total use of renewable primary energy resources;

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;  
 PENRM = Use of non-renewable primary energy resources used as raw materials;  
 PENRT = Total use of non-renewable primary energy resource

## LCA Results (continued)

1 Unit of Photoelectric Smoke Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing resource use, secondary materials and fuels, use of water |                                      |      |           |                           |                           |                |
|---------------------------------------------------------------------------------|--------------------------------------|------|-----------|---------------------------|---------------------------|----------------|
|                                                                                 |                                      |      | SM        | RSF                       | NRSF                      | FW             |
|                                                                                 |                                      |      | kg        | MJ<br>net calorific value | MJ<br>net calorific value | m <sup>3</sup> |
| Product stage                                                                   | Raw material supply                  | A1   | 3.06E-03  | 0.00E+00                  | 0.00E+00                  | 1.41E-02       |
|                                                                                 | Transport                            | A2   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 2.27E-05       |
|                                                                                 | Manufacturing                        | A3   | 2.28E-05  | 0.00E+00                  | 0.00E+00                  | 4.24E-03       |
|                                                                                 | Total (Consumption grid)             | A1-3 | 3.08E-03  | 0.00E+00                  | 0.00E+00                  | 1.84E-02       |
| Construction process stage                                                      | Transport                            | A4   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 3.19E-05       |
|                                                                                 | Construction                         | A5   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 5.02E-05       |
| Use stage                                                                       | Use                                  | B1   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Maintenance                          | B2   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Repair                               | B3   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Replacement                          | B4   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Refurbishment                        | B5   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Operational energy use               | B6   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 1.77E-03       |
|                                                                                 | Operational water use                | B7   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
| 6% Recycle, 43% Incineration, 51%Landfill                                       |                                      |      |           |                           |                           |                |
| End of life                                                                     | Deconstruction, demolition           | C1   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Transport                            | C2   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 1.67E-06       |
|                                                                                 | Waste processing                     | C3   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 5.69E-05       |
|                                                                                 | Disposal                             | C4   | 3.70E-06  | 0.00E+00                  | 0.00E+00                  | 1.34E-05       |
| Potential benefits and loads beyond the system boundaries                       | Reuse, recovery, recycling potential | D    | -2.77E-04 | 0.00E+00                  | 0.00E+00                  | -5.63E-04      |

SM = Use of secondary material;  
RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;  
FW = Net use of fresh water

## LCA Results (continued)

1 Unit of Photoelectric Smoke Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Other environmental information describing waste categories |                                      |      |           |           |           |
|-------------------------------------------------------------|--------------------------------------|------|-----------|-----------|-----------|
|                                                             |                                      |      | HWD       | NHWD      | RWD       |
|                                                             |                                      |      | kg        | kg        | kg        |
| Product stage                                               | Raw material supply                  | A1   | 1.03E-01  | 2.19E+00  | 3.60E-05  |
|                                                             | Transport                            | A2   | 2.18E-04  | 3.37E-03  | 3.61E-06  |
|                                                             | Manufacturing                        | A3   | 6.64E-03  | 1.21E-01  | 3.62E-06  |
|                                                             | Total (Consumption grid)             | A1-3 | 1.10E-01  | 2.31E+00  | 4.32E-05  |
| Construction process stage                                  | Transport                            | A4   | 2.83E-04  | 4.91E-03  | 1.82E-06  |
|                                                             | Construction                         | A5   | 7.90E-06  | 1.37E-04  | 5.08E-08  |
| Use stage                                                   | Use                                  | B1   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Maintenance                          | B2   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Repair                               | B3   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Replacement                          | B4   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Refurbishment                        | B5   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Operational energy use               | B6   | 7.32E-03  | 4.72E-01  | 1.53E-05  |
|                                                             | Operational water use                | B7   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
| 6% Recycle, 43% Incineration, 51%Landfill                   |                                      |      |           |           |           |
| End of life                                                 | Deconstruction, demolition           | C1   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Transport                            | C2   | 1.48E-05  | 2.56E-04  | 9.48E-08  |
|                                                             | Waste processing                     | C3   | 4.62E-05  | 6.61E-04  | 1.39E-08  |
|                                                             | Disposal                             | C4   | 8.26E-04  | 4.24E-02  | 7.54E-08  |
| Potential benefits and loads beyond the system boundaries   | Reuse, recovery, recycling potential | D    | -4.18E-03 | -2.56E-01 | -3.21E-06 |

HWD = Hazardous waste disposed;  
 NHWD = Non-hazardous waste disposed;  
 RWD = Radioactive waste disposed

## LCA Results (continued)

1 Unit of Photoelectric Smoke Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Other environmental information describing output flows – at end of life |                                      |      |          |          |          |                       |                           |                             |
|--------------------------------------------------------------------------|--------------------------------------|------|----------|----------|----------|-----------------------|---------------------------|-----------------------------|
|                                                                          |                                      |      | CRU      | MFR      | MER      | EE                    | Biogenic carbon (product) | Biogenic carbon (packaging) |
|                                                                          |                                      |      | kg       | kg       | kg       | MJ per energy carrier | kg C                      | kg C                        |
| Product stage                                                            | Raw material supply                  | A1   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Transport                            | A2   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Manufacturing                        | A3   | 0.00E+00 | 5.09E-02 | 8.69E-10 | 0.00E+00              | 0.00E+00                  | 1.17E-02                    |
|                                                                          | Total (Consumption grid)             | A1-3 | 0.00E+00 | 5.09E-02 | 8.69E-10 | 0.00E+00              | 0.00E+00                  | 1.17E-02                    |
| Construction process stage                                               | Transport                            | A4   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Construction                         | A5   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
| Use stage                                                                | Use                                  | B1   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Maintenance                          | B2   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Repair                               | B3   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Replacement                          | B4   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Refurbishment                        | B5   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Operational energy use               | B6   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Operational water use                | B7   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
| 6% Recycle, 43% Incineration, 51%Landfill                                |                                      |      |          |          |          |                       |                           |                             |
| End of life                                                              | Deconstruction, demolition           | C1   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Transport                            | C2   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Waste processing                     | C3   | 0.00E+00 | 3.80E-03 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Disposal                             | C4   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
| Potential benefits and loads beyond the system boundaries                | Reuse, recovery, recycling potential | D    | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |

CRU = Components for reuse;  
MFR = Materials for recycling

MER = Materials for energy recovery;  
EE = Exported Energy



## LCA Results

1 Unit of Dual Photoelectric/ Thermal Multi-criteria Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts               |                                      |      | GWP-total             | GWP-fossil            | GWP-biogenic          | GWP-luluc             | ODP         | AP                    | EP-freshwater                          |
|-----------------------------------------------------------|--------------------------------------|------|-----------------------|-----------------------|-----------------------|-----------------------|-------------|-----------------------|----------------------------------------|
|                                                           |                                      |      | kg CO <sub>2</sub> eq | kg CO <sub>2</sub> eq | kg CO <sub>2</sub> eq | kg CO <sub>2</sub> eq | kg CFC11 eq | mol H <sup>+</sup> eq | kg (PO <sub>4</sub> ) <sup>3-</sup> eq |
| Product stage                                             | Raw material supply                  | A1   | 1.54E+00              | 1.53E+00              | 3.69E-03              | 1.47E-03              | 5.97E-08    | 1.41E-02              | 8.98E-04                               |
|                                                           | Transport                            | A2   | 3.49E-02              | 3.49E-02              | 1.29E-05              | 2.95E-06              | 7.98E-09    | 1.78E-04              | 6.04E-07                               |
|                                                           | Manufacturing                        | A3   | 2.62E-01              | 2.45E-01              | 1.58E-02              | 9.27E-05              | 2.80E-07    | 1.15E-03              | 6.23E-05                               |
|                                                           | Total (Consumption grid)             | A1-3 | 1.84E+00              | 1.81E+00              | 1.95E-02              | 1.57E-03              | 3.48E-07    | 1.54E-02              | 9.61E-04                               |
| Construction process stage                                | Transport                            | A4   | 1.72E-02              | 1.72E-02              | 1.67E-05              | 6.19E-06              | 4.11E-09    | 7.19E-05              | 1.07E-06                               |
|                                                           | Construction                         | A5   | 1.03E-01              | 5.75E-02              | 4.55E-02              | 1.87E-06              | 6.94E-10    | 2.85E-05              | 5.39E-07                               |
| Use stage                                                 | Use                                  | B1   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
|                                                           | Maintenance                          | B2   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
|                                                           | Repair                               | B3   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
|                                                           | Replacement                          | B4   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
|                                                           | Refurbishment                        | B5   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
|                                                           | Operational energy use               | B6   | 9.98E-02              | 9.64E-02              | 3.18E-03              | 2.29E-04              | 4.81E-09    | 5.17E-04              | 9.67E-05                               |
|                                                           | Operational water use                | B7   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
| 6% Recycle, 42% Incineration, 51%Landfill                 |                                      |      |                       |                       |                       |                       |             |                       |                                        |
| End of life                                               | Deconstruction, demolition           | C1   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
|                                                           | Transport                            | C2   | 9.00E-04              | 8.98E-04              | 8.73E-07              | 3.23E-07              | 2.15E-10    | 3.75E-06              | 5.59E-08                               |
|                                                           | Waste processing                     | C3   | 1.00E-01              | 1.00E-01              | 9.53E-06              | 3.13E-06              | 7.86E-10    | 3.02E-05              | 7.74E-07                               |
|                                                           | Disposal                             | C4   | 5.97E-03              | 5.97E-03              | 4.11E-06              | 6.00E-07              | 1.63E-10    | 4.82E-06              | 4.02E-07                               |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D    | -4.26E-02             | -4.20E-02             | -5.13E-04             | -5.18E-05             | -2.82E-09   | -6.56E-04             | -5.62E-05                              |

GWP-total = Global warming potential, total;  
 GWP-fossil = Global warming potential, fossil;  
 GWP-biogenic = Global warming potential, biogenic;  
 GWP-luluc = Global warming potential, land use and land use change;

ODP = Depletion potential of the stratospheric ozone layer;  
 AP = Acidification potential, accumulated exceedance; and  
 EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

## LCA Results (continued)

1 Unit of Dual Photoelectric/ Thermal Multi-criteria Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts               |                                      |      | EP-marine | EP-terrestrial | POCP        | ADP-mineral & metal | ADP-fossil              | WDP                              | PM                |
|-----------------------------------------------------------|--------------------------------------|------|-----------|----------------|-------------|---------------------|-------------------------|----------------------------------|-------------------|
|                                                           |                                      |      | kg N eq   | mol N eq       | kg NMVOC eq | kg Sb eq            | MJ, net calorific value | m <sup>3</sup> world eq deprived | disease incidence |
| Product stage                                             | Raw material supply                  | A1   | 1.58E-03  | 1.72E-02       | 5.47E-03    | 1.95E-04            | 2.03E+01                | 6.19E-01                         | 1.10E-07          |
|                                                           | Transport                            | A2   | 6.41E-05  | 7.02E-04       | 1.85E-04    | 1.53E-08            | 4.94E-01                | 7.58E-04                         | 6.77E-10          |
|                                                           | Manufacturing                        | A3   | 2.06E-04  | 2.01E-03       | 6.13E-04    | 2.41E-06            | 4.05E+00                | 1.69E-01                         | 6.92E-09          |
|                                                           | Total (Consumption grid)             | A1-3 | 1.85E-03  | 1.99E-02       | 6.27E-03    | 1.97E-04            | 2.48E+01                | 7.89E-01                         | 1.18E-07          |
| Construction process stage                                | Transport                            | A4   | 2.19E-05  | 2.40E-04       | 7.71E-05    | 3.95E-08            | 2.68E-01                | 1.30E-03                         | 2.02E-09          |
|                                                           | Construction                         | A5   | 1.38E-05  | 1.30E-04       | 3.38E-05    | 1.52E-08            | 2.50E-02                | 2.11E-03                         | 2.45E-10          |
| Use stage                                                 | Use                                  | B1   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00            | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
|                                                           | Maintenance                          | B2   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00            | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
|                                                           | Repair                               | B3   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00            | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
|                                                           | Replacement                          | B4   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00            | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
|                                                           | Refurbishment                        | B5   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00            | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
|                                                           | Operational energy use               | B6   | 9.02E-05  | 7.85E-04       | 2.14E-04    | 9.66E-08            | 2.08E+00                | 6.93E-02                         | 1.53E-09          |
|                                                           | Operational water use                | B7   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00            | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
| 6% Recycle, 42% Incineration, 51%Landfill                 |                                      |      |           |                |             |                     |                         |                                  |                   |
| End of life                                               | Deconstruction, demolition           | C1   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00            | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
|                                                           | Transport                            | C2   | 1.14E-06  | 1.25E-05       | 4.02E-06    | 2.06E-09            | 1.40E-02                | 6.76E-05                         | 1.06E-10          |
|                                                           | Waste processing                     | C3   | 1.48E-05  | 1.31E-04       | 3.43E-05    | 2.38E-08            | 3.55E-02                | 2.39E-03                         | 2.78E-10          |
|                                                           | Disposal                             | C4   | 1.25E-04  | 1.75E-05       | 6.27E-06    | 1.88E-09            | 1.29E-02                | 5.72E-04                         | 9.14E-11          |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D    | -5.24E-05 | -6.06E-04      | -1.70E-04   | -1.08E-05           | -6.54E-01               | -2.27E-02                        | -2.43E-09         |

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;  
 EP-terrestrial = Eutrophication potential, accumulated exceedance;  
 POCP = Formation potential of tropospheric ozone;  
 ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Depletion potential of the stratospheric ozone layer;  
 WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and  
 PM = Particulate matter.

## LCA Results (continued)

1 Unit of Dual Photoelectric/ Thermal Multi-criteria Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts               |                                      |      | IRP                     | ETP-fw    | HTP-c     | HTP-nc    | SQP           |
|-----------------------------------------------------------|--------------------------------------|------|-------------------------|-----------|-----------|-----------|---------------|
|                                                           |                                      |      | kBq U <sup>235</sup> eq | CTUe      | CTUh      | CTUh      | dimensionless |
| Product stage                                             | Raw material supply                  | A1   | 1.27E-01                | 8.77E+01  | 1.14E-09  | 5.81E-08  | 4.26E+00      |
|                                                           | Transport                            | A2   | 2.24E-03                | 2.76E-01  | 3.95E-12  | 4.33E-10  | 1.11E-01      |
|                                                           | Manufacturing                        | A3   | 2.83E-02                | 3.66E+00  | 1.03E-10  | 2.70E-09  | 6.70E-01      |
|                                                           | Total (Consumption grid)             | A1-3 | 1.58E-01                | 9.16E+01  | 1.25E-09  | 6.12E-08  | 5.04E+00      |
| Construction process stage                                | Transport                            | A4   | 1.36E-03                | 2.10E-01  | 5.80E-12  | 2.29E-10  | 3.07E-01      |
|                                                           | Construction                         | A5   | 1.77E-04                | 2.30E-01  | 2.14E-11  | 1.77E-10  | 1.38E-02      |
| Use stage                                                 | Use                                  | B1   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Maintenance                          | B2   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Repair                               | B3   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Replacement                          | B4   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Refurbishment                        | B5   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Operational energy use               | B6   | 5.71E-02                | 1.03E+00  | 2.47E-11  | 8.27E-10  | 3.00E-01      |
|                                                           | Operational water use                | B7   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
| 6% Recycle, 42% Incineration, 51%Landfill                 |                                      |      |                         |           |           |           |               |
| End of life                                               | Deconstruction, demolition           | C1   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Transport                            | C2   | 7.08E-05                | 1.09E-02  | 3.03E-13  | 1.20E-11  | 1.60E-02      |
|                                                           | Waste processing                     | C3   | 2.44E-04                | 2.81E-01  | 2.15E-11  | 2.01E-10  | 1.81E-02      |
|                                                           | Disposal                             | C4   | 6.24E-05                | 3.66E-02  | 1.90E-11  | 1.29E-09  | 3.03E-02      |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D    | -1.06E-02               | -4.08E+00 | -9.19E-11 | -6.22E-09 | -3.13E-01     |

IRP = Potential human exposure efficiency relative to U235;  
ETP-fw = Potential comparative toxic unit for ecosystems;  
HTP-c = Potential comparative toxic unit for humans;

HTP-nc = Potential comparative toxic unit for humans; and  
SQP = Potential soil quality index.

## LCA Results (continued)

1 Unit of Dual Photoelectric/ Thermal Multi-criteria Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing resource use, primary energy        |                                      |      | PERE      | PERM     | PERT      | PENRE     | PENRM    | PENRT     |
|-----------------------------------------------------------|--------------------------------------|------|-----------|----------|-----------|-----------|----------|-----------|
|                                                           |                                      |      | MJ        | MJ       | MJ        | MJ        | MJ       | MJ        |
| Product stage                                             | Raw material supply                  | A1   | 1.47E+00  | 0.00E+00 | 1.47E+00  | 1.75E+01  | 2.73E+00 | 2.02E+01  |
|                                                           | Transport                            | A2   | 1.42E+00  | 0.00E+00 | 1.42E+00  | 4.37E+02  | 0.00E+00 | 4.37E+02  |
|                                                           | Manufacturing                        | A3   | 4.65E+00  | 3.68E-01 | 5.02E+00  | 1.04E+01  | 6.92E-01 | 1.11E+01  |
|                                                           | Total (Consumption grid)             | A1-3 | 7.54E+00  | 3.68E-01 | 7.91E+00  | 4.65E+02  | 3.42E+00 | 4.68E+02  |
| Construction process stage                                | Transport                            | A4   | 3.41E-03  | 0.00E+00 | 3.41E-03  | 2.63E-01  | 0.00E+00 | 2.63E-01  |
|                                                           | Construction                         | A5   | 9.53E-05  | 0.00E+00 | 9.53E-05  | 7.36E-03  | 0.00E+00 | 7.36E-03  |
| Use stage                                                 | Use                                  | B1   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Maintenance                          | B2   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Repair                               | B3   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Replacement                          | B4   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Refurbishment                        | B5   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Operational energy use               | B6   | 3.70E-01  | 0.00E+00 | 3.70E-01  | 2.10E+00  | 0.00E+00 | 2.10E+00  |
|                                                           | Operational water use                | B7   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
| 6% Recycle, 42% Incineration, 51%Landfill                 |                                      |      |           |          |           |           |          |           |
| End of life                                               | Deconstruction, demolition           | C1   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Transport                            | C2   | 1.78E-04  | 0.00E+00 | 1.78E-04  | 1.37E-02  | 0.00E+00 | 1.37E-02  |
|                                                           | Waste processing                     | C3   | 2.65E-04  | 0.00E+00 | 2.65E-04  | -1.75E-01 | 1.78E-01 | 3.29E-03  |
|                                                           | Disposal                             | C4   | 2.59E-04  | 0.00E+00 | 2.59E-04  | -1.55E+00 | 1.56E+00 | 1.27E-02  |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D    | -1.06E-01 | 0.00E+00 | -1.06E-01 | -6.56E-01 | 0.00E+00 | -6.56E-01 |

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;  
 PERM = Use of renewable primary energy resources used as raw materials;  
 PERT = Total use of renewable primary energy resources;

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;  
 PENRM = Use of non-renewable primary energy resources used as raw materials;  
 PENRT = Total use of non-renewable primary energy resource

## LCA Results (continued)

1 Unit of Dual Photoelectric/ Thermal Multi-criteria Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing resource use, secondary materials and fuels, use of water |                                      |      |           |                           |                           |                |
|---------------------------------------------------------------------------------|--------------------------------------|------|-----------|---------------------------|---------------------------|----------------|
|                                                                                 |                                      |      | SM        | RSF                       | NRSF                      | FW             |
|                                                                                 |                                      |      | kg        | MJ<br>net calorific value | MJ<br>net calorific value | m <sup>3</sup> |
| Product stage                                                                   | Raw material supply                  | A1   | 3.25E-03  | 0.00E+00                  | 0.00E+00                  | 1.51E-02       |
|                                                                                 | Transport                            | A2   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 1.87E-05       |
|                                                                                 | Manufacturing                        | A3   | 2.28E-05  | 0.00E+00                  | 0.00E+00                  | 4.24E-03       |
|                                                                                 | Total (Consumption grid)             | A1-3 | 3.27E-03  | 0.00E+00                  | 0.00E+00                  | 1.94E-02       |
| Construction process stage                                                      | Transport                            | A4   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 3.19E-05       |
|                                                                                 | Construction                         | A5   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 5.02E-05       |
| Use stage                                                                       | Use                                  | B1   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Maintenance                          | B2   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Repair                               | B3   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Replacement                          | B4   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Refurbishment                        | B5   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Operational energy use               | B6   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 1.77E-03       |
|                                                                                 | Operational water use                | B7   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
| 6% Recycle, 42% Incineration, 51%Landfill                                       |                                      |      |           |                           |                           |                |
| End of life                                                                     | Deconstruction, demolition           | C1   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Transport                            | C2   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 1.67E-06       |
|                                                                                 | Waste processing                     | C3   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 5.69E-05       |
|                                                                                 | Disposal                             | C4   | 3.70E-06  | 0.00E+00                  | 0.00E+00                  | 1.35E-05       |
| Potential benefits and loads beyond the system boundaries                       | Reuse, recovery, recycling potential | D    | -2.77E-04 | 0.00E+00                  | 0.00E+00                  | -5.63E-04      |

SM = Use of secondary material;  
RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;  
FW = Net use of fresh water

## LCA Results (continued)

1 Unit of Dual Photoelectric/ Thermal Multi-criteria Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Other environmental information describing waste categories |                                      |      |           |           |           |
|-------------------------------------------------------------|--------------------------------------|------|-----------|-----------|-----------|
|                                                             |                                      |      | HWD       | NHWD      | RWD       |
|                                                             |                                      |      | kg        | kg        | kg        |
| Product stage                                               | Raw material supply                  | A1   | 1.10E-01  | 2.39E+00  | 3.96E-05  |
|                                                             | Transport                            | A2   | 1.83E-04  | 2.75E-03  | 3.49E-06  |
|                                                             | Manufacturing                        | A3   | 6.64E-03  | 1.21E-01  | 3.62E-06  |
|                                                             | Total (Consumption grid)             | A1-3 | 1.17E-01  | 2.51E+00  | 4.67E-05  |
| Construction process stage                                  | Transport                            | A4   | 2.83E-04  | 4.91E-03  | 1.82E-06  |
|                                                             | Construction                         | A5   | 7.90E-06  | 1.37E-04  | 5.08E-08  |
| Use stage                                                   | Use                                  | B1   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Maintenance                          | B2   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Repair                               | B3   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Replacement                          | B4   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Refurbishment                        | B5   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Operational energy use               | B6   | 7.32E-03  | 4.72E-01  | 1.53E-05  |
|                                                             | Operational water use                | B7   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
| 6% Recycle, 42% Incineration, 51%Landfill                   |                                      |      |           |           |           |
| End of life                                                 | Deconstruction, demolition           | C1   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Transport                            | C2   | 1.48E-05  | 2.56E-04  | 9.48E-08  |
|                                                             | Waste processing                     | C3   | 4.62E-05  | 6.61E-04  | 1.39E-08  |
|                                                             | Disposal                             | C4   | 8.26E-04  | 4.24E-02  | 7.57E-08  |
| Potential benefits and loads beyond the system boundaries   | Reuse, recovery, recycling potential | D    | -4.18E-03 | -2.56E-01 | -3.21E-06 |

HWD = Hazardous waste disposed;  
 NHWD = Non-hazardous waste disposed;  
 RWD = Radioactive waste disposed



## LCA Results (continued)

1 Unit of Dual Photoelectric/ Thermal Multi-criteria Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Other environmental information describing output flows – at end of life |                                      |      |          |          |          |                       |                           |                             |
|--------------------------------------------------------------------------|--------------------------------------|------|----------|----------|----------|-----------------------|---------------------------|-----------------------------|
|                                                                          |                                      |      | CRU      | MFR      | MER      | EE                    | Biogenic carbon (product) | Biogenic carbon (packaging) |
|                                                                          |                                      |      | kg       | kg       | kg       | MJ per energy carrier | kg C                      | kg C                        |
| Product stage                                                            | Raw material supply                  | A1   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Transport                            | A2   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Manufacturing                        | A3   | 0.00E+00 | 5.09E-02 | 8.69E-10 | 0.00E+00              | 0.00E+00                  | 1.17E-02                    |
|                                                                          | Total (Consumption grid)             | A1-3 | 0.00E+00 | 5.09E-02 | 8.69E-10 | 0.00E+00              | 0.00E+00                  | 1.17E-02                    |
| Construction process stage                                               | Transport                            | A4   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Construction                         | A5   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
| Use stage                                                                | Use                                  | B1   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Maintenance                          | B2   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Repair                               | B3   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Replacement                          | B4   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Refurbishment                        | B5   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Operational energy use               | B6   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Operational water use                | B7   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
| 6% Recycle, 42% Incineration, 51%Landfill                                |                                      |      |          |          |          |                       |                           |                             |
| End of life                                                              | Deconstruction, demolition           | C1   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Transport                            | C2   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Waste processing                     | C3   | 0.00E+00 | 3.80E-03 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Disposal                             | C4   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
| Potential benefits and loads beyond the system boundaries                | Reuse, recovery, recycling potential | D    | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |

CRU = Components for reuse;  
MFR = Materials for recycling

MER = Materials for energy recovery;  
EE = Exported Energy



## LCA Results

1 Unit of Photoelectric/ Thermal Multi-criteria Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts               |                                      |      | GWP-total             | GWP-fossil            | GWP-biogenic          | GWP-luluc             | ODP         | AP                    | EP-freshwater                          |
|-----------------------------------------------------------|--------------------------------------|------|-----------------------|-----------------------|-----------------------|-----------------------|-------------|-----------------------|----------------------------------------|
|                                                           |                                      |      | kg CO <sub>2</sub> eq | kg CO <sub>2</sub> eq | kg CO <sub>2</sub> eq | kg CO <sub>2</sub> eq | kg CFC11 eq | mol H <sup>+</sup> eq | kg (PO <sub>4</sub> ) <sup>3-</sup> eq |
| Product stage                                             | Raw material supply                  | A1   | 1.54E+00              | 1.54E+00              | 3.71E-03              | 1.47E-03              | 5.98E-08    | 1.53E-02              | 9.12E-04                               |
|                                                           | Transport                            | A2   | 2.06E-02              | 2.06E-02              | 2.00E-05              | 7.40E-06              | 4.91E-09    | 8.59E-05              | 1.28E-06                               |
|                                                           | Manufacturing                        | A3   | 2.62E-01              | 2.45E-01              | 1.58E-02              | 9.27E-05              | 2.80E-07    | 1.15E-03              | 6.23E-05                               |
|                                                           | Total (Consumption grid)             | A1-3 | 1.82E+00              | 1.81E+00              | 1.95E-02              | 1.57E-03              | 3.45E-07    | 1.65E-02              | 9.76E-04                               |
| Construction process stage                                | Transport                            | A4   | 1.71E-02              | 1.70E-02              | 1.66E-05              | 6.13E-06              | 4.07E-09    | 7.11E-05              | 1.06E-06                               |
|                                                           | Construction                         | A5   | 1.03E-01              | 5.75E-02              | 4.55E-02              | 1.87E-06              | 6.94E-10    | 2.85E-05              | 5.39E-07                               |
| Use stage                                                 | Use                                  | B1   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
|                                                           | Maintenance                          | B2   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
|                                                           | Repair                               | B3   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
|                                                           | Replacement                          | B4   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
|                                                           | Refurbishment                        | B5   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
|                                                           | Operational energy use               | B6   | 9.98E-02              | 9.64E-02              | 3.18E-03              | 2.29E-04              | 4.81E-09    | 5.17E-04              | 9.67E-05                               |
|                                                           | Operational water use                | B7   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
| 6% Recycle, 42% Incineration, 51%Landfill                 |                                      |      |                       |                       |                       |                       |             |                       |                                        |
| End of life                                               | Deconstruction, demolition           | C1   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                               |
|                                                           | Transport                            | C2   | 8.91E-04              | 8.89E-04              | 8.64E-07              | 3.20E-07              | 2.12E-10    | 3.71E-06              | 5.54E-08                               |
|                                                           | Waste processing                     | C3   | 1.00E-01              | 1.00E-01              | 9.53E-06              | 3.13E-06              | 7.86E-10    | 3.02E-05              | 7.74E-07                               |
|                                                           | Disposal                             | C4   | 5.97E-03              | 5.97E-03              | 4.11E-06              | 6.00E-07              | 1.63E-10    | 4.82E-06              | 4.02E-07                               |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D    | -4.26E-02             | -4.20E-02             | -5.13E-04             | -5.18E-05             | -2.82E-09   | -6.56E-04             | -5.62E-05                              |

GWP-total = Global warming potential, total;  
 GWP-fossil = Global warming potential, fossil;  
 GWP-biogenic = Global warming potential, biogenic;  
 GWP-luluc = Global warming potential, land use and land use change;

ODP = Depletion potential of the stratospheric ozone layer;  
 AP = Acidification potential, accumulated exceedance; and  
 EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

## LCA Results (continued)

1 Unit of Photoelectric/ Thermal Multi-criteria Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts               |                                      |      | EP-marine | EP-terrestrial | POCP        | ADP-mineral&metals | ADP-fossil              | WDP                              | PM                |
|-----------------------------------------------------------|--------------------------------------|------|-----------|----------------|-------------|--------------------|-------------------------|----------------------------------|-------------------|
|                                                           |                                      |      | kg N eq   | mol N eq       | kg NMVOC eq | kg Sb eq           | MJ, net calorific value | m <sup>3</sup> world eq deprived | disease incidence |
| Product stage                                             | Raw material supply                  | A1   | 1.62E-03  | 1.77E-02       | 5.70E-03    | 2.04E-04           | 2.04E+01                | 6.24E-01                         | 1.11E-07          |
|                                                           | Transport                            | A2   | 2.62E-05  | 2.86E-04       | 9.21E-05    | 4.72E-08           | 3.21E-01                | 1.55E-03                         | 2.42E-09          |
|                                                           | Manufacturing                        | A3   | 2.06E-04  | 2.01E-03       | 6.13E-04    | 2.41E-06           | 4.05E+00                | 1.69E-01                         | 6.92E-09          |
|                                                           | Total (Consumption grid)             | A1-3 | 1.85E-03  | 2.00E-02       | 6.41E-03    | 2.06E-04           | 2.48E+01                | 7.95E-01                         | 1.20E-07          |
| Construction process stage                                | Transport                            | A4   | 2.17E-05  | 2.37E-04       | 7.63E-05    | 3.91E-08           | 2.66E-01                | 1.28E-03                         | 2.00E-09          |
|                                                           | Construction                         | A5   | 1.38E-05  | 1.30E-04       | 3.38E-05    | 1.52E-08           | 2.50E-02                | 2.11E-03                         | 2.45E-10          |
| Use stage                                                 | Use                                  | B1   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
|                                                           | Maintenance                          | B2   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
|                                                           | Repair                               | B3   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
|                                                           | Replacement                          | B4   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
|                                                           | Refurbishment                        | B5   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
|                                                           | Operational energy use               | B6   | 9.02E-05  | 7.85E-04       | 2.14E-04    | 9.66E-08           | 2.08E+00                | 6.93E-02                         | 1.53E-09          |
|                                                           | Operational water use                | B7   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
| 6% Recycle, 42% Incineration, 51%Landfill                 |                                      |      |           |                |             |                    |                         |                                  |                   |
| End of life                                               | Deconstruction, demolition           | C1   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00                         | 0.00E+00          |
|                                                           | Transport                            | C2   | 1.13E-06  | 1.24E-05       | 3.98E-06    | 2.04E-09           | 1.39E-02                | 6.70E-05                         | 1.05E-10          |
|                                                           | Waste processing                     | C3   | 1.48E-05  | 1.31E-04       | 3.43E-05    | 2.38E-08           | 3.55E-02                | 2.39E-03                         | 2.78E-10          |
|                                                           | Disposal                             | C4   | 1.25E-04  | 1.75E-05       | 6.27E-06    | 1.88E-09           | 1.29E-02                | 5.72E-04                         | 9.14E-11          |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D    | -5.24E-05 | -6.06E-04      | -1.70E-04   | -1.08E-05          | -6.54E-01               | -2.27E-02                        | -2.43E-09         |

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;  
 EP-terrestrial = Eutrophication potential, accumulated exceedance;  
 POCP = Formation potential of tropospheric ozone;  
 ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Depletion potential of the stratospheric ozone layer;  
 WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and  
 PM = Particulate matter.

## LCA Results (continued)

1 Unit of Photoelectric/ Thermal Multi-criteria Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts               |                                      |      | IRP                     | ETP-fw    | HTP-c     | HTP-nc    | SQP           |
|-----------------------------------------------------------|--------------------------------------|------|-------------------------|-----------|-----------|-----------|---------------|
|                                                           |                                      |      | kBq U <sup>235</sup> eq | CTUe      | CTUh      | CTUh      | dimensionless |
| Product stage                                             | Raw material supply                  | A1   | 1.28E-01                | 9.30E+01  | 1.16E-09  | 5.81E-08  | 4.33E+00      |
|                                                           | Transport                            | A2   | 1.62E-03                | 2.50E-01  | 6.93E-12  | 2.74E-10  | 3.67E-01      |
|                                                           | Manufacturing                        | A3   | 2.83E-02                | 3.66E+00  | 1.03E-10  | 2.70E-09  | 6.70E-01      |
|                                                           | Total (Consumption grid)             | A1-3 | 1.58E-01                | 9.69E+01  | 1.27E-09  | 6.11E-08  | 5.37E+00      |
| Construction process stage                                | Transport                            | A4   | 1.34E-03                | 2.07E-01  | 5.74E-12  | 2.27E-10  | 3.04E-01      |
|                                                           | Construction                         | A5   | 1.77E-04                | 2.30E-01  | 2.14E-11  | 1.77E-10  | 1.38E-02      |
| Use stage                                                 | Use                                  | B1   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Maintenance                          | B2   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Repair                               | B3   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Replacement                          | B4   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Refurbishment                        | B5   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Operational energy use               | B6   | 5.71E-02                | 1.03E+00  | 2.47E-11  | 8.27E-10  | 3.00E-01      |
|                                                           | Operational water use                | B7   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
| 6% Recycle, 42% Incineration, 51%Landfill                 |                                      |      |                         |           |           |           |               |
| End of life                                               | Deconstruction, demolition           | C1   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Transport                            | C2   | 7.01E-05                | 1.08E-02  | 2.99E-13  | 1.18E-11  | 1.59E-02      |
|                                                           | Waste processing                     | C3   | 2.44E-04                | 2.81E-01  | 2.15E-11  | 2.01E-10  | 1.81E-02      |
|                                                           | Disposal                             | C4   | 6.24E-05                | 3.66E-02  | 1.90E-11  | 1.29E-09  | 3.03E-02      |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D    | -1.06E-02               | -4.08E+00 | -9.19E-11 | -6.22E-09 | -3.13E-01     |

IRP = Potential human exposure efficiency relative to U235;  
ETP-fw = Potential comparative toxic unit for ecosystems;  
HTP-c = Potential comparative toxic unit for humans;

HTP-nc = Potential comparative toxic unit for humans; and  
SQP = Potential soil quality index.

## LCA Results (continued)

1 Unit of Photoelectric/ Thermal Multi-criteria Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing resource use, primary energy        |                                      |      | PERE      | PERM     | PERT      | PENRE     | PENRM    | PENRT     |
|-----------------------------------------------------------|--------------------------------------|------|-----------|----------|-----------|-----------|----------|-----------|
|                                                           |                                      |      | MJ        | MJ       | MJ        | MJ        | MJ       | MJ        |
| Product stage                                             | Raw material supply                  | A1   | 1.48E+00  | 0.00E+00 | 1.48E+00  | 1.76E+01  | 2.73E+00 | 2.03E+01  |
|                                                           | Transport                            | A2   | 4.08E-03  | 0.00E+00 | 4.08E-03  | 3.15E-01  | 0.00E+00 | 3.15E-01  |
|                                                           | Manufacturing                        | A3   | 4.65E+00  | 3.68E-01 | 5.02E+00  | 1.04E+01  | 6.92E-01 | 1.11E+01  |
|                                                           | Total (Consumption grid)             | A1-3 | 6.13E+00  | 3.68E-01 | 6.50E+00  | 2.83E+01  | 3.42E+00 | 3.17E+01  |
| Construction process stage                                | Transport                            | A4   | 3.38E-03  | 0.00E+00 | 3.38E-03  | 2.61E-01  | 0.00E+00 | 2.61E-01  |
|                                                           | Construction                         | A5   | 9.53E-05  | 0.00E+00 | 9.53E-05  | 7.36E-03  | 0.00E+00 | 7.36E-03  |
| Use stage                                                 | Use                                  | B1   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Maintenance                          | B2   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Repair                               | B3   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Replacement                          | B4   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Refurbishment                        | B5   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Operational energy use               | B6   | 3.70E-01  | 0.00E+00 | 3.70E-01  | 2.10E+00  | 0.00E+00 | 2.10E+00  |
|                                                           | Operational water use                | B7   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
| 6% Recycle, 42% Incineration, 51%Landfill                 |                                      |      |           |          |           |           |          |           |
| End of life                                               | Deconstruction, demolition           | C1   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Transport                            | C2   | 1.76E-04  | 0.00E+00 | 1.76E-04  | 1.36E-02  | 0.00E+00 | 1.36E-02  |
|                                                           | Waste processing                     | C3   | 2.65E-04  | 0.00E+00 | 2.65E-04  | -1.75E-01 | 1.78E-01 | 3.29E-03  |
|                                                           | Disposal                             | C4   | 2.59E-04  | 0.00E+00 | 2.59E-04  | -1.55E+00 | 1.56E+00 | 1.27E-02  |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D    | -1.06E-01 | 0.00E+00 | -1.06E-01 | -6.56E-01 | 0.00E+00 | -6.56E-01 |

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;  
 PERM = Use of renewable primary energy resources used as raw materials;  
 PERT = Total use of renewable primary energy resources;

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;  
 PENRM = Use of non-renewable primary energy resources used as raw materials;  
 PENRT = Total use of non-renewable primary energy resource

## LCA Results (continued)

1 Unit of Photoelectric/ Thermal Multi-criteria Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing resource use, secondary materials and fuels, use of water |                                      |      |           |                           |                           |                |
|---------------------------------------------------------------------------------|--------------------------------------|------|-----------|---------------------------|---------------------------|----------------|
|                                                                                 |                                      |      | SM        | RSF                       | NRSF                      | FW             |
|                                                                                 |                                      |      | kg        | MJ<br>net calorific value | MJ<br>net calorific value | m <sup>3</sup> |
| Product stage                                                                   | Raw material supply                  | A1   | 3.25E-03  | 0.00E+00                  | 0.00E+00                  | 1.52E-02       |
|                                                                                 | Transport                            | A2   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 3.81E-05       |
|                                                                                 | Manufacturing                        | A3   | 2.28E-05  | 0.00E+00                  | 0.00E+00                  | 4.24E-03       |
|                                                                                 | Total (Consumption grid)             | A1-3 | 3.27E-03  | 0.00E+00                  | 0.00E+00                  | 1.95E-02       |
| Construction process stage                                                      | Transport                            | A4   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 3.16E-05       |
|                                                                                 | Construction                         | A5   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 5.02E-05       |
| Use stage                                                                       | Use                                  | B1   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Maintenance                          | B2   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Repair                               | B3   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Replacement                          | B4   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Refurbishment                        | B5   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Operational energy use               | B6   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 1.77E-03       |
|                                                                                 | Operational water use                | B7   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
| 6% Recycle, 42% Incineration, 51%Landfill                                       |                                      |      |           |                           |                           |                |
| End of life                                                                     | Deconstruction, demolition           | C1   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Transport                            | C2   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 1.65E-06       |
|                                                                                 | Waste processing                     | C3   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 5.69E-05       |
|                                                                                 | Disposal                             | C4   | 3.70E-06  | 0.00E+00                  | 0.00E+00                  | 1.35E-05       |
| Potential benefits and loads beyond the system boundaries                       | Reuse, recovery, recycling potential | D    | -2.77E-04 | 0.00E+00                  | 0.00E+00                  | -5.63E-04      |

SM = Use of secondary material;  
RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;  
FW = Net use of fresh water

## LCA Results (continued)

1 Unit of Photoelectric/ Thermal Multi-criteria Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Other environmental information describing waste categories |                                      |      |           |           |           |
|-------------------------------------------------------------|--------------------------------------|------|-----------|-----------|-----------|
|                                                             |                                      |      | HWD       | NHWD      | RWD       |
|                                                             |                                      |      | kg        | kg        | kg        |
| Product stage                                               | Raw material supply                  | A1   | 1.12E-01  | 2.42E+00  | 3.99E-05  |
|                                                             | Transport                            | A2   | 3.38E-04  | 5.87E-03  | 2.17E-06  |
|                                                             | Manufacturing                        | A3   | 6.64E-03  | 1.21E-01  | 3.62E-06  |
|                                                             | Total (Consumption grid)             | A1-3 | 1.19E-01  | 2.55E+00  | 4.57E-05  |
| Construction process stage                                  | Transport                            | A4   | 2.80E-04  | 4.86E-03  | 1.80E-06  |
|                                                             | Construction                         | A5   | 7.90E-06  | 1.37E-04  | 5.08E-08  |
| Use stage                                                   | Use                                  | B1   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Maintenance                          | B2   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Repair                               | B3   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Replacement                          | B4   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Refurbishment                        | B5   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Operational energy use               | B6   | 7.32E-03  | 4.72E-01  | 1.53E-05  |
|                                                             | Operational water use                | B7   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
| 6% Recycle, 42% Incineration, 51%Landfill                   |                                      |      |           |           |           |
| End of life                                                 | Deconstruction, demolition           | C1   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Transport                            | C2   | 1.46E-05  | 2.54E-04  | 9.39E-08  |
|                                                             | Waste processing                     | C3   | 4.62E-05  | 6.61E-04  | 1.39E-08  |
|                                                             | Disposal                             | C4   | 8.26E-04  | 4.24E-02  | 7.57E-08  |
| Potential benefits and loads beyond the system boundaries   | Reuse, recovery, recycling potential | D    | -4.18E-03 | -2.56E-01 | -3.21E-06 |

HWD = Hazardous waste disposed;  
 NHWD = Non-hazardous waste disposed;  
 RWD = Radioactive waste disposed

## LCA Results (continued)

1 Unit of Photoelectric/ Thermal Multi-criteria Detector of mass 0.099Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Other environmental information describing output flows – at end of life |                                      |      |          |          |          |                       |                           |                             |
|--------------------------------------------------------------------------|--------------------------------------|------|----------|----------|----------|-----------------------|---------------------------|-----------------------------|
|                                                                          |                                      |      | CRU      | MFR      | MER      | EE                    | Biogenic carbon (product) | Biogenic carbon (packaging) |
|                                                                          |                                      |      | kg       | kg       | kg       | MJ per energy carrier | kg C                      | kg C                        |
| Product stage                                                            | Raw material supply                  | A1   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Transport                            | A2   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Manufacturing                        | A3   | 0.00E+00 | 5.09E-02 | 8.69E-10 | 0.00E+00              | 0.00E+00                  | 1.17E-02                    |
|                                                                          | Total (Consumption grid)             | A1-3 | 0.00E+00 | 5.09E-02 | 8.69E-10 | 0.00E+00              | 0.00E+00                  | 1.17E-02                    |
| Construction process stage                                               | Transport                            | A4   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Construction                         | A5   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
| Use stage                                                                | Use                                  | B1   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Maintenance                          | B2   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Repair                               | B3   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Replacement                          | B4   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Refurbishment                        | B5   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Operational energy use               | B6   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Operational water use                | B7   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
| <b>6% Recycle, 42% Incineration, 51%Landfill</b>                         |                                      |      |          |          |          |                       |                           |                             |
| End of life                                                              | Deconstruction, demolition           | C1   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Transport                            | C2   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Waste processing                     | C3   | 0.00E+00 | 3.80E-03 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Disposal                             | C4   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
| Potential benefits and loads beyond the system boundaries                | Reuse, recovery, recycling potential | D    | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |

CRU = Components for reuse;  
MFR = Materials for recycling

MER = Materials for energy recovery;  
EE = Exported Energy

## LCA Results (continued)

1 Unit of Thermal Sensor of mass 0.093Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts               |                                      |      | GWP-total             | GWP-fossil            | GWP-biogenic          | GWP-luluc             | ODP         | AP                    | EP-freshwater                                      |
|-----------------------------------------------------------|--------------------------------------|------|-----------------------|-----------------------|-----------------------|-----------------------|-------------|-----------------------|----------------------------------------------------|
|                                                           |                                      |      | kg CO <sub>2</sub> eq | kg CO <sub>2</sub> eq | kg CO <sub>2</sub> eq | kg CO <sub>2</sub> eq | kg CFC11 eq | mol H <sup>+</sup> eq | kg (PO <sub>4</sub> ) <sub>3</sub> <sup>-</sup> eq |
| Product stage                                             | Raw material supply                  | A1   | 1.37E+00              | 1.36E+00              | 2.92E-03              | 1.29E-03              | 5.46E-08    | 1.21E-02              | 8.23E-04                                           |
|                                                           | Transport                            | A2   | 4.10E-02              | 4.10E-02              | 1.70E-05              | 4.29E-06              | 9.40E-09    | 2.06E-04              | 8.45E-07                                           |
|                                                           | Manufacturing                        | A3   | 2.62E-01              | 2.45E-01              | 1.58E-02              | 9.27E-05              | 2.80E-07    | 1.15E-03              | 6.23E-05                                           |
|                                                           | Total (Consumption grid)             | A1-3 | 1.67E+00              | 1.65E+00              | 1.87E-02              | 1.39E-03              | 3.44E-07    | 1.35E-02              | 8.86E-04                                           |
| Construction process stage                                | Transport                            | A4   | 1.62E-02              | 1.62E-02              | 1.57E-05              | 5.81E-06              | 3.86E-09    | 6.75E-05              | 1.01E-06                                           |
|                                                           | Construction                         | A5   | 1.03E-01              | 5.75E-02              | 4.55E-02              | 1.87E-06              | 6.94E-10    | 2.85E-05              | 5.39E-07                                           |
| Use stage                                                 | Use                                  | B1   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                                           |
|                                                           | Maintenance                          | B2   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                                           |
|                                                           | Repair                               | B3   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                                           |
|                                                           | Replacement                          | B4   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                                           |
|                                                           | Refurbishment                        | B5   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                                           |
|                                                           | Operational energy use               | B6   | 9.98E-02              | 9.64E-02              | 3.18E-03              | 2.29E-04              | 4.81E-09    | 5.17E-04              | 9.67E-05                                           |
|                                                           | Operational water use                | B7   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                                           |
| 7% Recycle, 42% Incineration, 51%Landfill                 |                                      |      |                       |                       |                       |                       |             |                       |                                                    |
| End of life                                               | Deconstruction, demolition           | C1   | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00              | 0.00E+00    | 0.00E+00              | 0.00E+00                                           |
|                                                           | Transport                            | C2   | 8.45E-04              | 8.44E-04              | 8.20E-07              | 3.03E-07              | 2.02E-10    | 3.52E-06              | 5.25E-08                                           |
|                                                           | Waste processing                     | C3   | 9.29E-02              | 9.29E-02              | 8.62E-06              | 2.99E-06              | 7.39E-10    | 2.84E-05              | 7.33E-07                                           |
|                                                           | Disposal                             | C4   | 5.59E-03              | 5.59E-03              | 3.86E-06              | 5.61E-07              | 1.53E-10    | 4.51E-06              | 3.88E-07                                           |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D    | -3.99E-02             | -3.94E-02             | -4.76E-04             | -4.88E-05             | -2.64E-09   | -6.41E-04             | -5.47E-05                                          |

GWP-total = Global warming potential, total;  
 GWP-fossil = Global warming potential, fossil;  
 GWP-biogenic = Global warming potential, biogenic;  
 GWP-luluc = Global warming potential, land use and land use change;

ODP = Depletion potential of the stratospheric ozone layer;  
 AP = Acidification potential, accumulated exceedance; and  
 EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment

## LCA Results (continued)

1 Unit of Thermal Sensor of mass 0.093Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts               |                                      |      | EP-marine | EP-terrestrial | POCP        | ADP-mineral&metals | ADP-fossil              | WDP                  | PM                |
|-----------------------------------------------------------|--------------------------------------|------|-----------|----------------|-------------|--------------------|-------------------------|----------------------|-------------------|
|                                                           |                                      |      | kg N eq   | mol N eq       | kg NMVOC eq | kg Sb eq           | MJ, net calorific value | m³ world eq deprived | disease incidence |
| Product stage                                             | Raw material supply                  | A1   | 1.38E-03  | 1.51E-02       | 4.78E-03    | 1.84E-04           | 1.81E+01                | 5.50E-01             | 9.73E-08          |
|                                                           | Transport                            | A2   | 7.36E-05  | 8.06E-04       | 2.15E-04    | 2.36E-08           | 5.85E-01                | 1.05E-03             | 1.09E-09          |
|                                                           | Manufacturing                        | A3   | 2.06E-04  | 2.01E-03       | 6.13E-04    | 2.41E-06           | 4.05E+00                | 1.69E-01             | 6.92E-09          |
|                                                           | Total (Consumption grid)             | A1-3 | 1.66E-03  | 1.79E-02       | 5.61E-03    | 1.86E-04           | 2.27E+01                | 7.20E-01             | 1.05E-07          |
| Construction process stage                                | Transport                            | A4   | 2.06E-05  | 2.25E-04       | 7.24E-05    | 3.71E-08           | 2.52E-01                | 1.22E-03             | 1.90E-09          |
|                                                           | Construction                         | A5   | 1.38E-05  | 1.30E-04       | 3.38E-05    | 1.52E-08           | 2.50E-02                | 2.11E-03             | 2.45E-10          |
| Use stage                                                 | Use                                  | B1   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00             | 0.00E+00          |
|                                                           | Maintenance                          | B2   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00             | 0.00E+00          |
|                                                           | Repair                               | B3   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00             | 0.00E+00          |
|                                                           | Replacement                          | B4   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00             | 0.00E+00          |
|                                                           | Refurbishment                        | B5   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00             | 0.00E+00          |
|                                                           | Operational energy use               | B6   | 9.02E-05  | 7.85E-04       | 2.14E-04    | 9.66E-08           | 2.08E+00                | 6.93E-02             | 1.53E-09          |
|                                                           | Operational water use                | B7   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00             | 0.00E+00          |
| 7% Recycle, 42% Incineration, 51%Landfill                 |                                      |      |           |                |             |                    |                         |                      |                   |
| End of life                                               | Deconstruction, demolition           | C1   | 0.00E+00  | 0.00E+00       | 0.00E+00    | 0.00E+00           | 0.00E+00                | 0.00E+00             | 0.00E+00          |
|                                                           | Transport                            | C2   | 1.07E-06  | 1.17E-05       | 3.78E-06    | 1.94E-09           | 1.32E-02                | 6.35E-05             | 9.93E-11          |
|                                                           | Waste processing                     | C3   | 1.39E-05  | 1.23E-04       | 3.23E-05    | 2.27E-08           | 3.41E-02                | 2.24E-03             | 2.66E-10          |
|                                                           | Disposal                             | C4   | 1.17E-04  | 1.64E-05       | 5.87E-06    | 1.76E-09           | 1.20E-02                | 5.36E-04             | 8.56E-11          |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D    | -5.02E-05 | -5.84E-04      | -1.64E-04   | -1.08E-05          | -6.12E-01               | -2.15E-02            | -2.33E-09         |

EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment;  
 EP-terrestrial = Eutrophication potential, accumulated exceedance;  
 POCP = Formation potential of tropospheric ozone;  
 ADP-mineral&metals = Abiotic depletion potential for non-fossil resources;

ADP-fossil = Depletion potential of the stratospheric ozone layer;  
 WDP = Water (user) deprivation potential, deprivation-weighted water consumption; and  
 PM = Particulate matter.

## LCA Results (continued)

1 Unit of Thermal Sensor of mass 0.093Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing environmental impacts               |                                      |      | IRP                     | ETP-fw    | HTP-c     | HTP-nc    | SQP           |
|-----------------------------------------------------------|--------------------------------------|------|-------------------------|-----------|-----------|-----------|---------------|
|                                                           |                                      |      | kBq U <sup>235</sup> eq | CTUe      | CTUh      | CTUh      | dimensionless |
| Product stage                                             | Raw material supply                  | A1   | 1.11E-01                | 7.86E+01  | 1.08E-09  | 5.58E-08  | 3.85E+00      |
|                                                           | Transport                            | A2   | 2.68E-03                | 3.37E-01  | 5.31E-12  | 5.11E-10  | 1.75E-01      |
|                                                           | Manufacturing                        | A3   | 2.83E-02                | 3.66E+00  | 1.03E-10  | 2.70E-09  | 6.70E-01      |
|                                                           | Total (Consumption grid)             | A1-3 | 1.42E-01                | 8.26E+01  | 1.19E-09  | 5.90E-08  | 4.70E+00      |
| Construction process stage                                | Transport                            | A4   | 1.27E-03                | 1.97E-01  | 5.45E-12  | 2.15E-10  | 2.88E-01      |
|                                                           | Construction                         | A5   | 1.77E-04                | 2.30E-01  | 2.14E-11  | 1.77E-10  | 1.38E-02      |
| Use stage                                                 | Use                                  | B1   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Maintenance                          | B2   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Repair                               | B3   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Replacement                          | B4   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Refurbishment                        | B5   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Operational energy use               | B6   | 5.71E-02                | 1.03E+00  | 2.47E-11  | 8.27E-10  | 3.00E-01      |
|                                                           | Operational water use                | B7   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
| 7% Recycle, 42% Incineration, 51%Landfill                 |                                      |      |                         |           |           |           |               |
| End of life                                               | Deconstruction, demolition           | C1   | 0.00E+00                | 0.00E+00  | 0.00E+00  | 0.00E+00  | 0.00E+00      |
|                                                           | Transport                            | C2   | 6.65E-05                | 1.03E-02  | 2.84E-13  | 1.12E-11  | 1.51E-02      |
|                                                           | Waste processing                     | C3   | 2.33E-04                | 2.62E-01  | 2.01E-11  | 1.88E-10  | 1.77E-02      |
|                                                           | Disposal                             | C4   | 5.84E-05                | 3.47E-02  | 1.90E-11  | 1.29E-09  | 2.84E-02      |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D    | -9.89E-03               | -4.04E+00 | -9.13E-11 | -6.20E-09 | -3.01E-01     |

IRP = Potential human exposure efficiency relative to U235;  
ETP-fw = Potential comparative toxic unit for ecosystems;  
HTP-c = Potential comparative toxic unit for humans;

HTP-nc = Potential comparative toxic unit for humans; and  
SQP = Potential soil quality index.

## LCA Results (continued)

1 Unit of Thermal Sensor of mass 0.093Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing resource use, primary energy        |                                      |      | PERE      | PERM     | PERT      | PENRE     | PENRM    | PENRT     |
|-----------------------------------------------------------|--------------------------------------|------|-----------|----------|-----------|-----------|----------|-----------|
|                                                           |                                      |      | MJ        | MJ       | MJ        | MJ        | MJ       | MJ        |
| Product stage                                             | Raw material supply                  | A1   | 1.29E+00  | 0.00E+00 | 1.29E+00  | 1.55E+01  | 2.55E+00 | 1.80E+01  |
|                                                           | Transport                            | A2   | 1.55E+00  | 0.00E+00 | 1.55E+00  | 4.75E+02  | 0.00E+00 | 4.75E+02  |
|                                                           | Manufacturing                        | A3   | 4.65E+00  | 3.68E-01 | 5.02E+00  | 1.04E+01  | 6.92E-01 | 1.11E+01  |
|                                                           | Total (Consumption grid)             | A1-3 | 7.49E+00  | 3.68E-01 | 7.86E+00  | 5.01E+02  | 3.24E+00 | 5.04E+02  |
| Construction process stage                                | Transport                            | A4   | 3.21E-03  | 0.00E+00 | 3.21E-03  | 2.47E-01  | 0.00E+00 | 2.47E-01  |
|                                                           | Construction                         | A5   | 9.53E-05  | 0.00E+00 | 9.53E-05  | 7.36E-03  | 0.00E+00 | 7.36E-03  |
| Use stage                                                 | Use                                  | B1   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Maintenance                          | B2   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Repair                               | B3   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Replacement                          | B4   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Refurbishment                        | B5   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Operational energy use               | B6   | 3.70E-01  | 0.00E+00 | 3.70E-01  | 2.10E+00  | 0.00E+00 | 2.10E+00  |
|                                                           | Operational water use                | B7   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
| 7% Recycle, 42% Incineration, 51%Landfill                 |                                      |      |           |          |           |           |          |           |
| End of life                                               | Deconstruction, demolition           | C1   | 0.00E+00  | 0.00E+00 | 0.00E+00  | 0.00E+00  | 0.00E+00 | 0.00E+00  |
|                                                           | Transport                            | C2   | 1.67E-04  | 0.00E+00 | 1.67E-04  | 1.29E-02  | 0.00E+00 | 1.29E-02  |
|                                                           | Waste processing                     | C3   | 2.65E-04  | 0.00E+00 | 2.65E-04  | -1.75E-01 | 1.78E-01 | 3.29E-03  |
|                                                           | Disposal                             | C4   | 2.43E-04  | 0.00E+00 | 2.43E-04  | -1.45E+00 | 1.46E+00 | 1.18E-02  |
| Potential benefits and loads beyond the system boundaries | Reuse, recovery, recycling potential | D    | -1.00E-01 | 0.00E+00 | -1.00E-01 | -6.14E-01 | 0.00E+00 | -6.14E-01 |

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;  
 PERM = Use of renewable primary energy resources used as raw materials;  
 PERT = Total use of renewable primary energy resources;

PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;  
 PENRM = Use of non-renewable primary energy resources used as raw materials;  
 PENRT = Total use of non-renewable primary energy resource

## LCA Results (continued)

1 Unit of Thermal Sensor of mass 0.093Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Parameters describing resource use, secondary materials and fuels, use of water |                                      |      |           |                           |                           |                |
|---------------------------------------------------------------------------------|--------------------------------------|------|-----------|---------------------------|---------------------------|----------------|
|                                                                                 |                                      |      | SM        | RSF                       | NRSF                      | FW             |
|                                                                                 |                                      |      | kg        | MJ<br>net calorific value | MJ<br>net calorific value | m <sup>3</sup> |
| Product stage                                                                   | Raw material supply                  | A1   | 3.09E-03  | 0.00E+00                  | 0.00E+00                  | 1.34E-02       |
|                                                                                 | Transport                            | A2   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 2.59E-05       |
|                                                                                 | Manufacturing                        | A3   | 2.28E-05  | 0.00E+00                  | 0.00E+00                  | 4.24E-03       |
|                                                                                 | Total (Consumption grid)             | A1-3 | 3.11E-03  | 0.00E+00                  | 0.00E+00                  | 1.77E-02       |
| Construction process stage                                                      | Transport                            | A4   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 3.00E-05       |
|                                                                                 | Construction                         | A5   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 5.02E-05       |
| Use stage                                                                       | Use                                  | B1   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Maintenance                          | B2   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Repair                               | B3   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Replacement                          | B4   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Refurbishment                        | B5   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Operational energy use               | B6   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 1.77E-03       |
|                                                                                 | Operational water use                | B7   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
| 7% Recycle, 42% Incineration, 51%Landfill                                       |                                      |      |           |                           |                           |                |
| End of life                                                                     | Deconstruction, demolition           | C1   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 0.00E+00       |
|                                                                                 | Transport                            | C2   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 1.56E-06       |
|                                                                                 | Waste processing                     | C3   | 0.00E+00  | 0.00E+00                  | 0.00E+00                  | 5.34E-05       |
|                                                                                 | Disposal                             | C4   | 3.43E-06  | 0.00E+00                  | 0.00E+00                  | 1.26E-05       |
| Potential benefits and loads beyond the system boundaries                       | Reuse, recovery, recycling potential | D    | -2.77E-04 | 0.00E+00                  | 0.00E+00                  | -5.35E-04      |

SM = Use of secondary material;  
RSF = Use of renewable secondary fuels;

NRSF = Use of non-renewable secondary fuels;  
FW = Net use of fresh water

## LCA Results (continued)

1 Unit of Thermal Sensor of mass 0.093Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Other environmental information describing waste categories |                                      |      |           |           |           |
|-------------------------------------------------------------|--------------------------------------|------|-----------|-----------|-----------|
|                                                             |                                      |      | HWD       | NHWD      | RWD       |
|                                                             |                                      |      | kg        | kg        | kg        |
| Product stage                                               | Raw material supply                  | A1   | 9.91E-02  | 2.11E+00  | 3.47E-05  |
|                                                             | Transport                            | A2   | 2.49E-04  | 3.86E-03  | 4.12E-06  |
|                                                             | Manufacturing                        | A3   | 6.64E-03  | 1.21E-01  | 3.62E-06  |
|                                                             | Total (Consumption grid)             | A1-3 | 1.06E-01  | 2.23E+00  | 4.24E-05  |
| Construction process stage                                  | Transport                            | A4   | 2.66E-04  | 4.62E-03  | 1.71E-06  |
|                                                             | Construction                         | A5   | 7.90E-06  | 1.37E-04  | 5.08E-08  |
| Use stage                                                   | Use                                  | B1   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Maintenance                          | B2   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Repair                               | B3   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Replacement                          | B4   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Refurbishment                        | B5   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Operational energy use               | B6   | 7.32E-03  | 4.72E-01  | 1.53E-05  |
|                                                             | Operational water use                | B7   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
| 7% Recycle, 42% Incineration, 51%Landfill                   |                                      |      |           |           |           |
| End of life                                                 | Deconstruction, demolition           | C1   | 0.00E+00  | 0.00E+00  | 0.00E+00  |
|                                                             | Transport                            | C2   | 1.39E-05  | 2.41E-04  | 8.91E-08  |
|                                                             | Waste processing                     | C3   | 4.62E-05  | 6.61E-04  | 1.39E-08  |
|                                                             | Disposal                             | C4   | 8.25E-04  | 3.93E-02  | 7.09E-08  |
| Potential benefits and loads beyond the system boundaries   | Reuse, recovery, recycling potential | D    | -4.01E-03 | -2.47E-01 | -3.00E-06 |

HWD = Hazardous waste disposed;  
 NHWD = Non-hazardous waste disposed;  
 RWD = Radioactive waste disposed

## LCA Results (continued)

1 Unit of Thermal Sensor of mass 0.093Kg for the service life of 12 years.

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

| Other environmental information describing output flows – at end of life |                                      |      |          |          |          |                       |                           |                             |
|--------------------------------------------------------------------------|--------------------------------------|------|----------|----------|----------|-----------------------|---------------------------|-----------------------------|
|                                                                          |                                      |      | CRU      | MFR      | MER      | EE                    | Biogenic carbon (product) | Biogenic carbon (packaging) |
|                                                                          |                                      |      | kg       | kg       | kg       | MJ per energy carrier | kg C                      | kg C                        |
| Product stage                                                            | Raw material supply                  | A1   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Transport                            | A2   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Manufacturing                        | A3   | 0.00E+00 | 5.09E-02 | 8.69E-10 | 0.00E+00              | 0.00E+00                  | 1.17E-02                    |
|                                                                          | Total (Consumption grid)             | A1-3 | 0.00E+00 | 5.09E-02 | 8.69E-10 | 0.00E+00              | 0.00E+00                  | 1.17E-02                    |
| Construction process stage                                               | Transport                            | A4   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Construction                         | A5   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
| Use stage                                                                | Use                                  | B1   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Maintenance                          | B2   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Repair                               | B3   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Replacement                          | B4   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Refurbishment                        | B5   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Operational energy use               | B6   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Operational water use                | B7   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
| 7% Recycle, 42% Incineration, 51%Landfill                                |                                      |      |          |          |          |                       |                           |                             |
| End of life                                                              | Deconstruction, demolition           | C1   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Transport                            | C2   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Waste processing                     | C3   | 0.00E+00 | 3.80E-03 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
|                                                                          | Disposal                             | C4   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |
| Potential benefits and loads beyond the system boundaries                | Reuse, recovery, recycling potential | D    | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00              | 0.00E+00                  | 0.00E+00                    |

## Scenarios and additional technical information

| Scenarios and additional technical information |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                         |               |                          |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------|--------------------------|
| Scenario                                       | Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                         | Units         | Results                  |
| A4 – Transport to the building site            | Transportation of finished product to customer location (A4) is by road transport from Trieste to Neuss, Germany which is a distribution centre for 1116 km. From the distribution centre, the product gets transported to several customer locations throughout Europe. Hence, an average distance of 800 km is taken in the model for calculations of impacts related to downstream transport. During this transportation, a conservative approach is taken assuming that all 100% utilization of products and none of them is accounted for any losses in distribution and installation phase. |                         |               |                          |
|                                                | Fuel type / Vehicle type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                         | Diesel        | Lorry, > 32 metric tonne |
|                                                | Distance: From Factory to Distribution Centre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                         | km            | 1116                     |
|                                                | Distance: From Distribution Centre to Customer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                         | km            | 800                      |
|                                                | Capacity utilisation (incl. empty returns)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                         | %             | NA                       |
|                                                | Bulk density of transported products                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         | kg/m³         | NA                       |
| A5 – Installation in the building              | The installation phase involves only manual activities and does not consume any energy or water to install the product. After installation, the packaging waste generated onsite is taken to the nearest incineration facility for disposal assuming a transport distance of 100 km based on the PSR-0019-ed1EN-2023 06 06. It is assumed that there is no wastage/damage occurred while downstream transportation or installation of the products at the customer location.                                                                                                                      |                         |               |                          |
|                                                | Product                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Package waste Type      | Disposal type | Disposed weight (Kg)     |
|                                                | Photoelectric Smoke Detector                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Cardboard Amorphous PET | Incineration  | 0.029<br>0.024           |
|                                                | Dual Photoelectric/ Thermal Multi-criteria Detector                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |               |                          |
|                                                | Photoelectric/ Thermal Multi-Criteria Detector                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                         |               |                          |
| Thermal Sensor                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                         |               |                          |
| B2 – Maintenance                               | Since, this product falls under fire detection and alarm system, a system maintenance is required for twice a year as per the recommendations of BS 5839 for Grade A systems. Typically, this responsibility falls to an external fire alarm servicing organisation. No known emissions.                                                                                                                                                                                                                                                                                                          |                         |               |                          |
| B3 – Repair                                    | There is no repair work needed during the service life of the products.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                         |               |                          |
| B4 – Replacement                               | There is no replacement activity needed for the products during its service life.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                         |               |                          |
| B5 – Refurbishment                             | There is no refurbishment activity needed for the products during its service life                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |               |                          |
| Reference service life                         | 12 years                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                         |               |                          |

## Scenarios and additional technical information

| Scenario            | Parameter                                                                                                                                                                                                                        | Units                                               | Results                  |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------|
| B6 – Use of energy; | According to the PSR-0019 ed1 EN-2023 06 06 PEP ecopassport® guideline, the electricity consumption during 10-minute alarm state is negligible over the annual operating hours (8760 hours).                                     |                                                     |                          |
|                     | The current consumption of the detectors in Standby mode= 100µA<br>The power consumption of the detectors for the service life of 12 years =0.252 kWh                                                                            |                                                     |                          |
|                     | Photoelectric Smoke Detector                                                                                                                                                                                                     | kWh                                                 | 0.252                    |
|                     | Dual Photoelectric/ Thermal Multi-criteria Detector                                                                                                                                                                              |                                                     |                          |
|                     | Photoelectric/ Thermal Multi-Criteria Detector                                                                                                                                                                                   |                                                     |                          |
| B7 – Use of water   | Thermal Sensor                                                                                                                                                                                                                   |                                                     |                          |
| B7 – Use of water   | N/A There is no water usage associated with the products.                                                                                                                                                                        |                                                     |                          |
| C1- Deconstruction  | At the end of its life, it will be dismantled by hand using standard tools. Therefore, no impacts during the deconstruction                                                                                                      |                                                     |                          |
| C2- Transportation  | A typical transport distance of 100 km by road from the demolition site to the waste processing plant is assumed.                                                                                                                |                                                     |                          |
|                     | Fuel type / Vehicle type                                                                                                                                                                                                         | Diesel                                              | Lorry, > 32 metric tonne |
|                     | Distance                                                                                                                                                                                                                         | km                                                  | 100                      |
| C3-Waste processing | The product consists of 3-4% Metal ,7-8% electronics, and 89-90% Plastics. The most appropriate end-of-life scenario has been selected by referencing EN50693:2019 PCR recommendations.                                          |                                                     |                          |
|                     | Photoelectric Smoke Detector-6% Recycle, 43% Incineration, 51%Landfill                                                                                                                                                           |                                                     |                          |
|                     | Dual Photoelectric/ Thermal Multi-Criteria Detector -6% Recycle, 42% Incineration, 51%Landfill                                                                                                                                   |                                                     |                          |
|                     | Photoelectric/ Thermal Multi-Criteria Detector-6% Recycle, 42% Incineration, 51%Landfill                                                                                                                                         |                                                     |                          |
|                     | Thermal Sensor -7% Recycle, 42% Incineration, 51%Landfill                                                                                                                                                                        |                                                     |                          |
|                     | Waste to recycling                                                                                                                                                                                                               | Photoelectric Smoke Detector                        | 0.0062                   |
|                     |                                                                                                                                                                                                                                  | Dual Photoelectric/ Thermal Multi-criteria Detector | 0.0062                   |
|                     |                                                                                                                                                                                                                                  | Photoelectric/ Thermal Multi-Criteria Detector      | 0.006                    |
|                     |                                                                                                                                                                                                                                  | Thermal Sensor                                      | 0.006                    |
|                     | Waste to incineration                                                                                                                                                                                                            | Photoelectric Smoke Detector                        | 0.0419                   |
|                     |                                                                                                                                                                                                                                  | Dual Photoelectric/ Thermal Multi-criteria Detector | 0.0419                   |
|                     |                                                                                                                                                                                                                                  | Photoelectric/ Thermal Multi-Criteria Detector      | 0.0419                   |
|                     |                                                                                                                                                                                                                                  | Thermal Sensor                                      | 0.039                    |
| C4 - Disposal       | Wastes that are not recycled at the waste processing facility will end up in landfill. For landfilling of waste, the environmental burden of landfilling and capturing and combustion of landfill gas, if any, is assigned to C4 |                                                     |                          |
|                     | Waste to Landfill                                                                                                                                                                                                                | Photoelectric Smoke Detector                        | 0.0504                   |
|                     |                                                                                                                                                                                                                                  | Dual Photoelectric/ Thermal Multi-criteria Detector | 0.0506                   |

| Scenarios and additional technical information |                                                                                                                                                                                                                                                                                                                                                            |                                                     |       |         |         |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-------|---------|---------|
| Scenario                                       | Parameter                                                                                                                                                                                                                                                                                                                                                  |                                                     | Units | Results |         |
|                                                |                                                                                                                                                                                                                                                                                                                                                            | Photoelectric/ Thermal Multi-Criteria Detector      |       | 0.0506  |         |
|                                                |                                                                                                                                                                                                                                                                                                                                                            | Thermal Sensor                                      |       | 0.047   |         |
| Module D                                       | Benefits and loads beyond the system boundary” (module D) accounts for the environmental benefits and loads resulting from the recycling and energy recovery from incineration of waste in the C3 module of waste processing. These benefits and loads are calculated by including the burdens of recycling and the benefit of avoided primary production. |                                                     |       |         |         |
|                                                | Products Recycled Content (post-consumer)                                                                                                                                                                                                                                                                                                                  | Photoelectric Smoke Detector                        |       | Kg      | 0.00086 |
|                                                |                                                                                                                                                                                                                                                                                                                                                            | Dual Photoelectric/ Thermal Multi-criteria Detector |       |         | 0.00086 |
|                                                |                                                                                                                                                                                                                                                                                                                                                            | Photoelectric/ Thermal Multi-Criteria Detector      |       |         | 0.00086 |
|                                                |                                                                                                                                                                                                                                                                                                                                                            | Thermal Sensor                                      |       |         | 0.00086 |
|                                                | Recovered for recycling                                                                                                                                                                                                                                                                                                                                    | Photoelectric Smoke Detector                        |       | Kg      | 0.0053  |
|                                                |                                                                                                                                                                                                                                                                                                                                                            | Dual Photoelectric/ Thermal Multi-criteria Detector |       |         | 0.0053  |
|                                                |                                                                                                                                                                                                                                                                                                                                                            | Photoelectric/ Thermal Multi-Criteria Detector      |       |         | 0.0053  |
|                                                |                                                                                                                                                                                                                                                                                                                                                            | Thermal Sensor                                      |       |         | 0.0053  |
|                                                | Recovered for energy                                                                                                                                                                                                                                                                                                                                       | Photoelectric Smoke Detector                        |       | Kg      | 0.0419  |
|                                                |                                                                                                                                                                                                                                                                                                                                                            | Dual Photoelectric/ Thermal Multi-criteria Detector |       |         | 0.0419  |
|                                                |                                                                                                                                                                                                                                                                                                                                                            | Photoelectric/ Thermal Multi-Criteria Detector      |       |         | 0.0419  |
|                                                |                                                                                                                                                                                                                                                                                                                                                            | Thermal Sensor                                      |       |         | 0.03890 |

## Summary, comments and additional information

### Substances Assessment

The products fulfil requirements of the EU Directive 2011/65/EU amended by 2015/863/EU, on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS 3) and they do not contain SVHC in concentration above 0.1% w/w.

### Recycled Content in Packaging

The product packaging contains recycled materials based on supplier data provided to Honeywell. Each unit contains 5.31% of the total weight as recycled content (pre-consumer and post-consumer). The LCA study is conducted with this information.

### Interpretation of results

Global Warming Potential (GWP) – Total indicator is assessed for finding the environmental hotspots across the product life cycle stages. The highest contribution is from A1 raw material supply stage followed by A3 manufacturing stage. To assess the environmental impacts in raw materials, product stage A1-A3 is considered. It is observed that the printed circuit board assembly (PCBA) has the highest impacts followed by stainless steel.

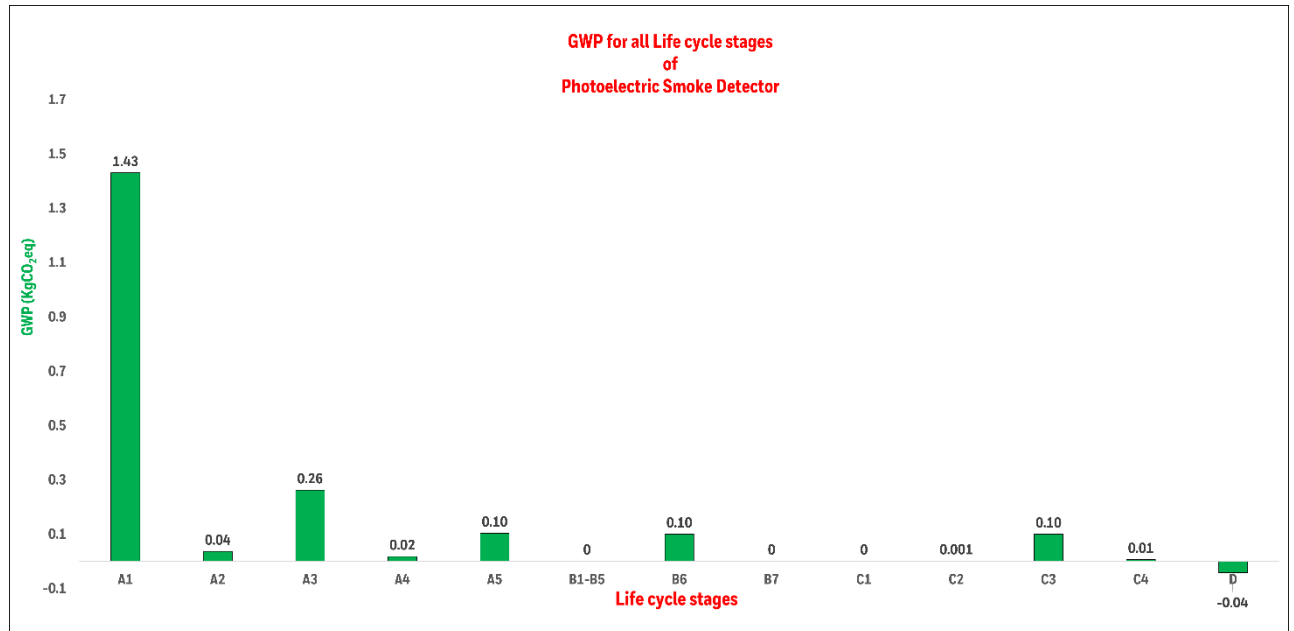


Figure 1 GWP- Total KgCO<sub>2</sub>eq of Detectors through all Life cycle stages of Photoelectric Smoke Detector

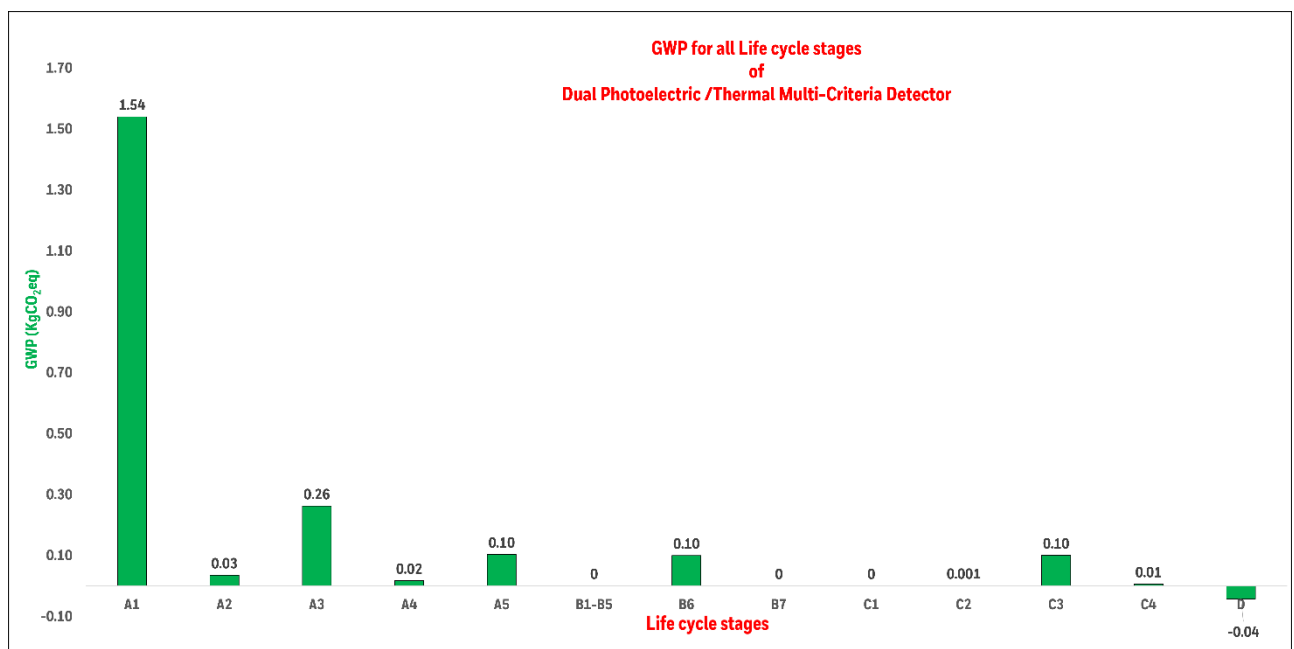


Figure 2 GWP- Total KgCO<sub>2</sub>eq of Detectors through all Life cycle stages of Dual Photoelectric / Thermal Multi-criteria Detector

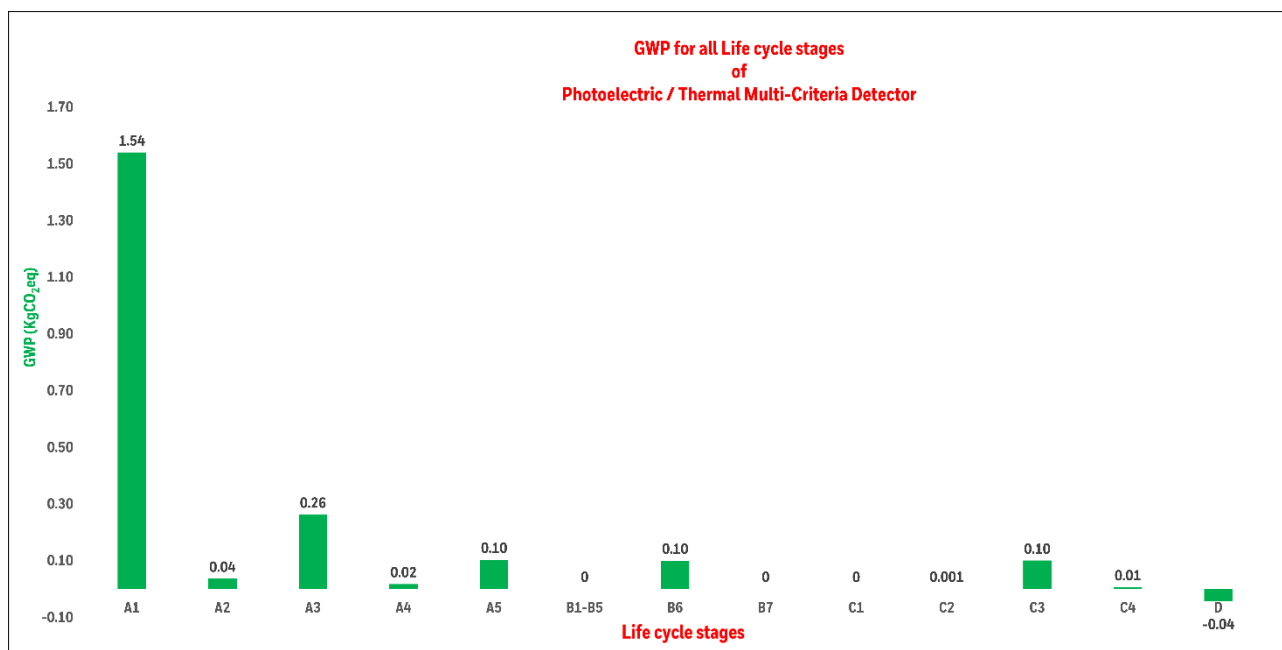


Figure 3 GWP- Total KgCO<sub>2</sub>eq of Detectors through all Life cycle stages of Photoelectric / Thermal Multi-criteria Detector

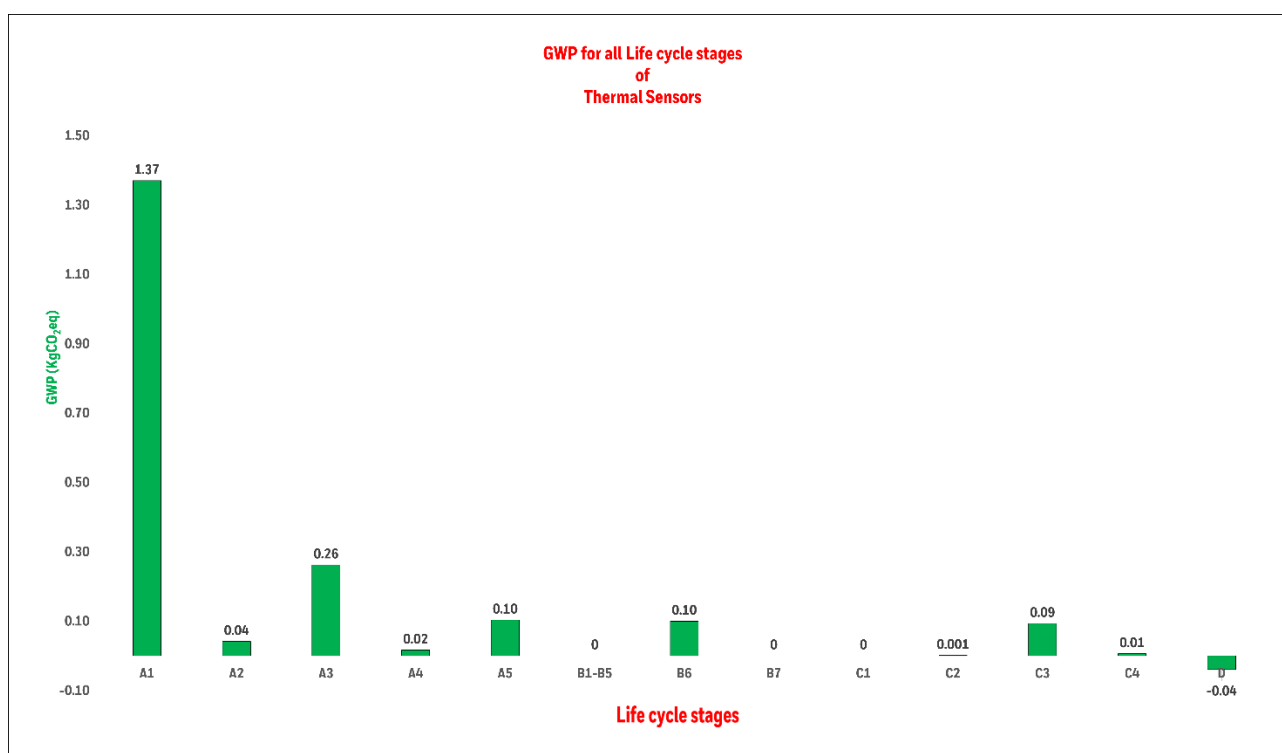


Figure 4 GWP- Total KgCO<sub>2</sub>eq of Detectors through all Life cycle stages of Photoelectric / Thermal Multi-criteria Detector

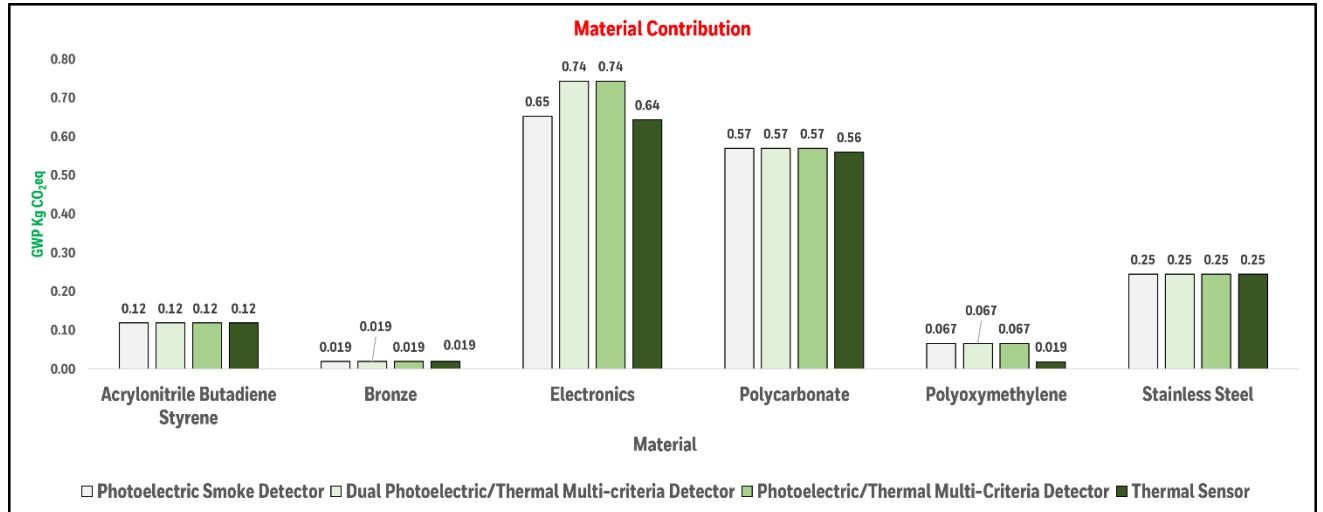


Figure 5 GWP – Total (A1) kg CO<sub>2</sub>eq of materials used in the New S200 Advanced Protocol Detectors

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BS EN 54-7:2001 - Smoke detectors: point detectors using scattered light, transmitted light or ionization

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