LCA

Communication to the agents

Buzzer ESNIE 2CLP211920N1101

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# Introduction

## Quality and environmental management

Our policy of continuous improvement also requires a demanding and responsible work, which has led to the implementation of the UNE-EN-ISO 14006: Environmental management systems Guidelines for incorporating eco-design in our Quality Management System and Environment.

Eco-design is understood as a process integrated within the design and development that aims to reduce environmental impacts and continually to improve the environmental performance of the products, throughout their life cycle from raw material extraction to end of life.

In order to be of benefit to our organization and to ensure that we achieve our environmental objectives, we carry out eco-design as an integral part of the business operations of our organization.



So, in 2007 Asea Brown Boveri, S.A. NIESSEN factory, certify the Environmental Management Design and Development process according to UNE 150301. To subsequently adapt the system to the international standard UNE EN ISO 14006.



**ED-0008/2007**

## Purpose of the study

In this study, the buzzer cover designed by ESNIE has been environmentally analyzed to seek for an improvement, and it has been compared with the buzzer Mylos to check the reduction in its environmental impact.

## Eco-designed product

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| **Representative products** | Frames and mounting grids from the ZENIT ITALY range, the buzzer specifically. |
| **Description of the products** | PC based frames and mounting grids that provide protection to the buzzer ESNIE product. Moreover, the location of its production has been changed, which implicate a change in the packaging and transport of the product. |
| **Functional unit** | The system is consisting of studying the impact for each ensemble of frame and the mounting grid. |

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| --- | --- |
| BEFORE | AFTER |

 

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2



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| --- | --- | --- |
| Part | Name | Material |
| 1 | Cover | PC |
| 2 | Individual packaging | Cardboard |
| 3 | Multiple packaging | Cardboard |

In this product, it has been designed a new tape for the buzzer, which replaced another one that needed more material. Their functionality has not been variated.

In addition, the transport has been delated, previously the component came from Milan (Italy), while the new component is manufactured in the same place where is mounted.

The packaging has been modified as well as the product manufacturing company has changed.

## Raw materials used

As we are studying the impact of the component which is variated, this is the reason why the only raw material that is used is the one it is made up. In this case, the cover of the buzzer is made by Polycarbonate completely.

In the packaging, the raw material of the different cardboards is the same, although ESNIE’s material is recycled in a 92%.

# Considerations of the eco designed products

## Recyclability considerations

- The cardboard packaging is recycled
- The plastics are recyclable, and they include a marking inside (indicating the material they are made of) so they can be disassembled.

## Environmental improvements

- Minimum cardboard for recyclable packaging.

-Use of recycled material.

- Minimize the weight of the component, thereby savings in energy and raw materials in manufacturing processes.

- Use of water-based paints, avoiding the use of solvents harmful to the environment.

- Product’s transportation has been deleted modifying the manufacturing location to the same place where is distributed.

# Impacts

## Methodology and data

For this analysis the software Simapro Flow has been used, with the database Ecoinvent 3.6 Cut-off.
The calculations have been made with the methodologies IPCC GWP 100a and CML-IA baseline. With this methodology is studied the abiotic depletion, the air pollution, the ozone layer depletion, the water pollution, the photochemical oxidation, eutrophication, global warming and the acidification.
It is taken into account the entire lifecycle, which include the manufacturing, transport, use and the end-of-life stages. As we are comparing a modification in an element, in many of the stages (use and end of life) there is not any variation, while there is a modification in the raw materials and the elements used for the transport (vehicle and packaging).
The data has been obtained from the company’s data base SAP and different technical datasheet.

## Environmental impacts

Using the “CML-IA baseline” method, these compulsory indicators are calculated, which explanations are in the *Appendix.*

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| Tapa Zumbador Mylos |
| Impact indicators | **Unit** | **Total** | **Manufacturing** | **Transport** | **Use** | **End of Life** |
| Ozone depletion (OD) | **kg CFC-11 eq.** | **1,110E-09** | 9,874E-12 | 1,351E-09 | 0,00E+00 | -2,514E-10 |
| Photochemical ozone creation (POCP) | **kg C2H4 eq.** | **1,145E-04** | 4,490E-06 | 9,216E-05 | 0,00E+00 | 1,788E-05 |
| Eutrophication (E) | **kg (PO4)3 eq.** | **1,714E-04** | 7,788E-06 | 2,892E-05 | 0,00E+00 | 1,347E-04 |
| Global warming (GW) | **kg CO2 eq.** | **1,196E-01** | 2,594E-02 | 1,121E-02 | 0,00E+00 | 8,241E-02 |
| Depletion of abiotic resources – elements (ADPe) | **kg Sb eq.** | **1,387E-07** | 4,924E-09 | 1,574E-07 | 0,00E+00 | -2,363E-08 |
| Acidification of soil and water (A) | **kg SO2 eq.** | **1,067E-04** | 8,090E-05 | 4,115E-05 | 0,00E+00 | -1,539E-05 |
| Depletion of abiotic resources – fossil fuels (ADPff) | **MJ** | **3,955E-01** | 2,969E-01 | 1,413E-01 | 0,00E+00 | -4,267E-02 |
| Water pollution (WP) | **m3** | **1,036E-01** | 2,836E-03 | 1,873E-02 | 0,00E+00 | 8,204E-02 |
| Air pollution (AP) | **m3** | **3,775E-01** | 1,080E-01 | 2,708E-01 | 0,00E+00 | -1,360E-03 |

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| Tapa Zumbador ESNIE |
| Impact indicators | **Unit** | **Total** | **Manufacturing** | **Transport** | **Use** | **End of Life** |
| Ozone depletion (OD) | **kg CFC-11 eq.** | **2,011E-10** | 9,023E-12 | 4,435E-10 | 0,00E+00 | -2,514E-10 |
| Photochemical ozone creation (POCP) | **kg C2H4 eq.** | **2,323E-05** | 4,103E-06 | 1,241E-06 | 0,00E+00 | 1,788E-05 |
| Eutrophication (E) | **kg (PO4)3 eq.** | **1,550E-04** | 7,117E-06 | 1,318E-05 | 0,00E+00 | 1,347E-04 |
| Global warming (GW) | **kg CO2 eq.** | **1,098E-01** | 2,370E-02 | 3,708E-03 | 0,00E+00 | 8,241E-02 |
| Depletion of abiotic resources – elements (ADPe) | **kg Sb eq.** | **4,928E-08** | 4,499E-09 | 6,841E-08 | 0,00E+00 | -2,363E-08 |
| Acidification of soil and water (A) | **kg SO2 eq.** | **7,769E-05** | 7,393E-05 | 1,916E-05 | 0,00E+00 | -1,539E-05 |
| Depletion of abiotic resources – fossil fuels (ADPff) | **MJ** | **2,727E-01** | 2,713E-01 | 4,405E-02 | 0,00E+00 | -4,267E-02 |
| Water pollution (WP) | **m3** | **9,182E-02** | 2,592E-03 | 7,181E-03 | 0,00E+00 | 8,204E-02 |
| Air pollution (AP) | **m3** | **1,887E-01** | 9,869E-02 | 9,134E-02 | 0,00E+00 | -1,360E-03 |

## Comparative

The graphic shows the changes made and the impact differences. In the manufacturing stage, the only factor of the difference is the mass of the element, its reduction is represented in a proportional way in the impact.

In the case of the transportation, in spite of the improvement in this stage reducing the amount of packaging and avoiding the transport, it is not a clear reduction on the environmental impact. This is due to the lack of information about Mylos’ packaging, apart from the cardboard there is not specified extra items (instructions, labels, spacers, …). In this way it is not possible to estimate the sum of all the impacts. Despite of this, ESNIE’s product generates less contamination that come with the global warming.

# Conclusions

To sum up, we have a positive result overall. As it has been mentioned in the comparative, we can conclude that in the manufacturing stage a reduction in the raw material used means a decrease of the environmental impact.

However, in the transport there is not a so clear relationship. On the one hand, the impact associated to the vehicle is insignificant next to the rest of the factors. On the other hand, the packaging is variable as each product has a different number of cardboards and extra items.

Note: The presentation of these texts’ wrath according to the medium used (web, catalogs, instructions) so it does not always have this format.

 Cecilia de Acha

 Development Responsible

 03/03/2020

Appendix

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| Impact indicators | Description | Unit |
| Global warming (GW) | Indicator of potential global warming caused by emissions to air contributing to the greenhouse effect. Includes fossil and biogenic | kg CO2 eq. |
| Ozone depletion (OD) | Indicator of emissions to air that contribute to the destruction of the ozone layer | kg CFC-11 eq. |
| Acidification of soil and water (A) | Indicator of the potential acidification of soils and water caused by the release of certain gases to the atmosphere | kg SO2 eq. |
| Eutrophication (E) | Indicator of the contribution to eutrophication of water by the enrichment of the aquatic ecosystem with nutritional elements, e.g. industrial or domestic effluents, agriculture, etc. | kg (PO4)3 eq. |
| Photochemical ozone creation (POCP) | Indicator of emissions of gases that affect the creation of photochemical ozone in the lower atmosphere (smog) because of the rays of the sun. | kg C2H4 eq. |
| Depletion of abiotic resources – elements (ADPe) | Indicator of the depletion of natural non-fossil resources | kg Sb eq. |
| Depletion of abiotic resources – fossil fuels (ADPf) | Indicator of the depletion of natural fossil resources | MJ (lower heating Value) |
| Water pollution (WP) | Indicator of the quantity of water necessary to dilute the toxic elements poured into water in all the stages of the product life cycle. | m3 |
| Air pollution (AP) | Indicator of the quantity of air necessary to dilute the toxic elements emitted into the air in all the stages of the product life cycle. | m3 |