

Draft Report on Environmental Assessment of Internal Coach Display

Internal Coach Display

- A graphical LED display
- Matrix on 48 x 192 red dots
- By a typical font size three lines with 20 characters each
- Mechanical dimension: 141 x 555 x 60 mm (HxLxW)
- Weight: Ca. 2,5 kg
- Power consumption: 10W (standby), 20 W (33% LED on)



1 Goal Definition

Task 1.1:

Does the company have an overall environmental policy in which is referred to the environmental impact of its products, and if so please explain?

Focon environmental policy (summary)

- *Development (material phase)*
 - *Choose material and manufacturing processes integrating environmental considerations*
- *Manufacturing*
 - *Manufacturing under safe working conditions with a minimum of impact to the work environment as well as to the environment.*
 - *Minimize the use of substances that might be hazardous to employees.*
- *Application*
 - *The product should have a long and problem-free life span.*
 - *The product should have low life cycle costs.*
 - *The product should have the lowest possible environmental in the use phase.*
- *End-of-life*
 - *It is aimed to the components of the product can be identified, in order to assure an environmentally sound end-of-life treatment.*

Has the company received any enquires from customers (or potential customers) concerning the environmental performance of its products, and if so please explain?

- *Siemens Norm: SN 36350-2, Giftstoffe*
- *LCC/RAM specification according to contract annex 9*

Has there been set up any targets for the environmental performance of products, and if so please explain? This issue might have been dealt with in relation to coping with section 4.3.1.in the ISO 14001 that concerns "Environmental aspects".

No requests for environmental certificates have been expressed from suppliers, but GPV (main subcontractor) holds a ISO 14001 environmental certificate.

What is the general purpose of performing environmental assessment of the particular case-product?

- 1. Assure that the product meets the Focon environmental policy (to be developed further).*
- 2. Assure that the product meets the customer's environmental demands (to be developed further).*
- 3. To make decisions about improvements on the background of an environmental assessment.*
- 4. It is a sales parameter to be able to refer to environmental considerations that have been performed.*

Task 1.2:

What is the goal of performing environmental assessment specifically for the concept design of this case-product, and to whom will the results be communicated?

- To communicate the necessary and desirable design initiatives to the Engineering department*
- To communicate the problematic issues to project- and sales departments.*
- To communicate possible sales parameters to the sales department.*

2 Scope definition

Task 2.1:

Define the functional unit for the case-product as described above!

Quantity	Duration	Qualities
Communicate visual information about the route. To be seen within the length of one coach.	15 hours per day for 20 years. A typical correspond to 25% of the diodes are on	Communicate easy readable information. Good contrast, uniform colour and brightness.

Task 2.2:

Fill out the list below of the most important stakeholders and their relation to the product in terms of environmental impact or expectations to the environmental performance of the product!

Who	Relation
Focon management.	To assure compliance with the environmental policy
Project department	To assure customer requirements are met
Sales department	To assure that the product can outdistance <ol style="list-style-type: none"> 1. Earlier generations of Focon products 2. Competitors products
Subcontractors (Manufacturing)	Assure manufacturing under safe working conditions

3 Inventory analysis

Product Characteristics

Task 3.1:

Read "Important conclusions...." and answer the question:

What can you conclude from this of relevance to the case product?

Three relations are relevant for the case-products:

1. Experiences from several studies show that for EEE products that have their energy consumption based on central power supply, the energy consumption in the use phase is almost an important source to the environmental impact from the life cycle.
2. Many EEE products consume a **considerable amount of energy in standby mode**, and that this holds a great potential for easily obtainable improvement.
4. For products that are integrated in some means of transport like an aeroplane, a train, a ship etc. you must include the energy consumption used to transport the product in the entire life span of the respective means of transport. This contribution to the environmental impact can be quite significant, and **reducing the weight** of the product will release a considerable improvement.

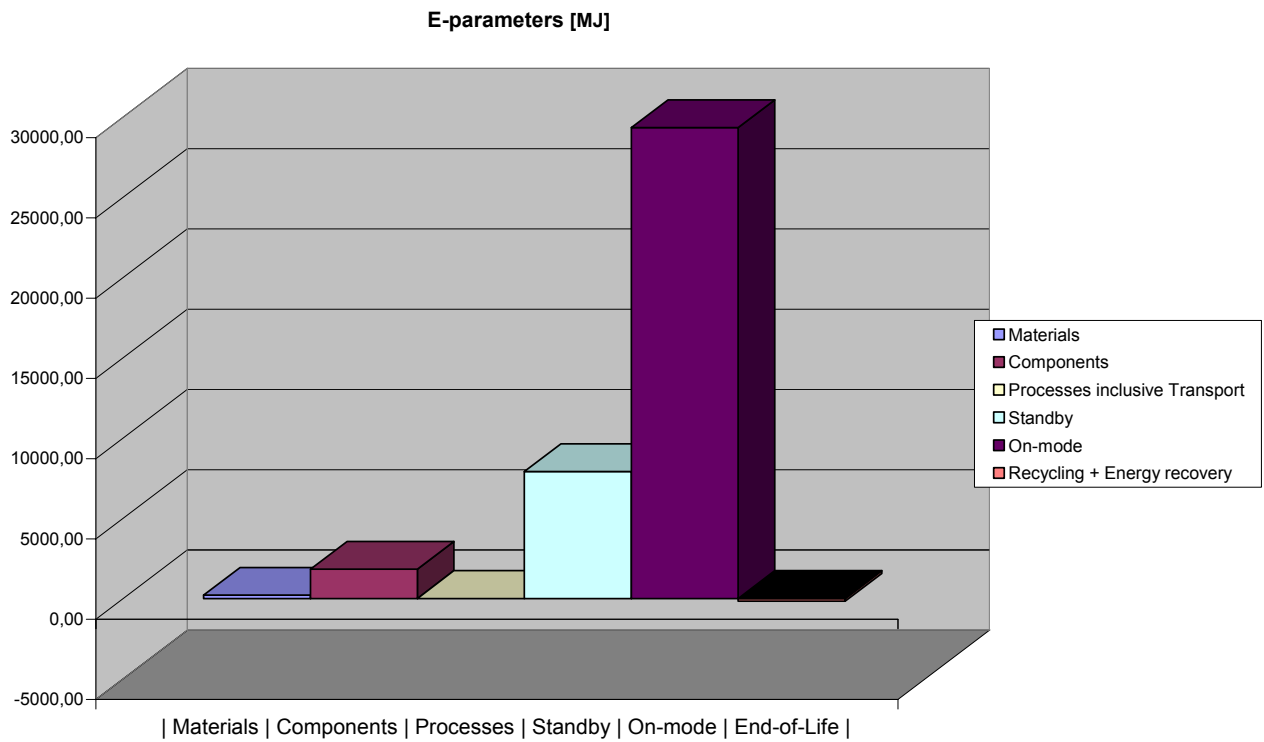
Task 3.2:

Fill out the sheet in "Calculator I" for the case-product. The most important sections are Materials, Components and Energy. Do not spend time with the other sections unless you have easy access to data or have reasons to believe these sections are specifically important to your product characteristics.

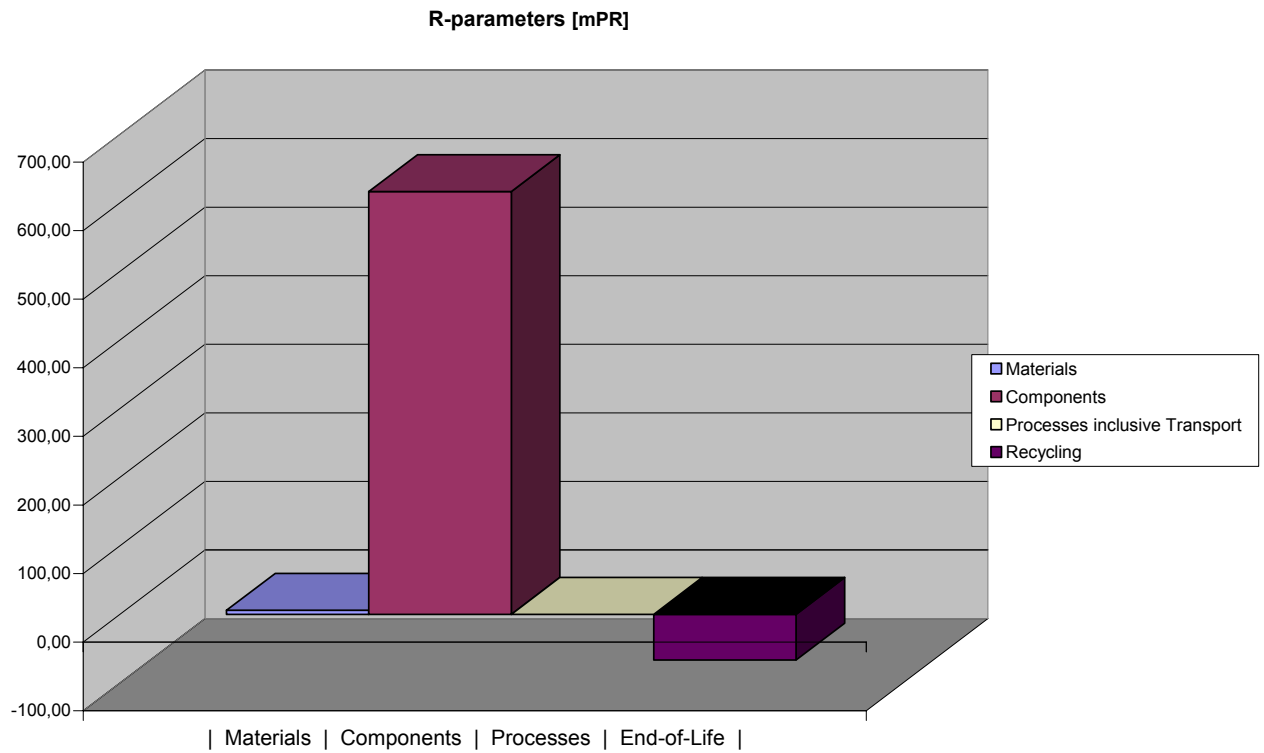
Input to Environmental Calculator I:

- *Production, Materials*
 - *Aluminium:* 1027 g
 - *Brass:* 4 g
 - *Copper:* 14 g
 - *Plastic, PVC:* 3 g
 - *Plastic PC:* 115 g
 - *Plastic, other:* 5 g
 - *Stainless steel:* 362 g
- *Production, Components*
 - *Generic PWA:* 656 g
- *Production, Process & Transport*
 - *Km = 350 km * 5 times per day * 350 days per year * 20 years = 12.250.000 km*
 - *Kg = 2.18*
 - *Train, diesel:* 26.778.500 kgkm
- *Use phase*
 - *Power consumption = 20 W (nominal) * 5 hours per day * 350 days per. year * 20 years = 700 kWh*
 - *Power consumption = 10 W (standby) * 10 hours per day * 350 days per. year * 20 years = 700 kWh*
 - *The system is shut off 9 hours per day*
- *End-of-Life*
 - *Aluminium:* 1027 g
 - *Plastic, PC:* 115 g
 - *Stainless Steel:* 362 g

These values are entered into "Calculator I" and the results from the calculations are represented graphically in the diagrams below.



Results from calculating the primary energy consumption (E-parameter)



Results from calculating the resource consumption (R-parameter)

What can you conclude from this of relevance to the case product?

Partial conclusion:

- *Energy parameter*
 - *Transport (73% of "On-mode" constitutes a very high impact in terms of primary energy consumption (E-parameter). It is therefore a major issue to reduce the weight of the product.*
 - *Electricity consumption ("Standby" and 27% of "On-mode") also accounts for large contributions to primary energy consumption (E-parameter).*

 - *Resource parameter*
 - *Components (PWB) is the outmost contributor to resource consumption (R- parameter).*
 - *Please notify that the LED-board (303g) is represented by an average PWB in this simple calculation. If you enter the real values of this board, the environmental impact will probably be lower.*
- ⇒ *It is important to keep the weight of the board low.*

Task 3.3:

Mention at least 3 possible alternative technologies and rank these in terms of environmental improvement potential in terms of:

- Energy consumption
- Resource consumption
- Use of toxic chemicals

- *TFT*
- *Flip dot*
- *CRC*
- *OLED*
- *Laser technology*
- *Video projector*

Evaluation of competitor's products

Task 3.4:

Compare the 2 most significant competitor products to the case product in terms of:

- Energy consumption
- Resource consumption
- Use of toxic chemicals

Not performed

Market analysis

Task 3.5

Ask your supplier if he/she will be able to supply a PWB in accordance with the specification in the above mentioned proposal!

- It is considered to discuss this with subcontractor (GPV).

Environmental Product Declarations (EPD)

Task 3.6

Check the Det svenske Miljöstyrningsrådets web page for EPDs for products with similar characteristics as the case product.

Not performed

Customer demands

Task 3.7:

Find from the webpage of the Danish EPA (Miljøstyrelsen) purchasing guidelines for a product with similar characteristics as the case-product.

Evaluate if your company/your product would be able to cope with the requirements lined out in the guideline.

Not performed

Legislation

Task 3.8:

Read the WEEE- and RoHS directives and evaluate if this would trigger any ideas for target settings for the product specification.

Not performed

End of life

The End-of-life will not be dealt with in detail at this stage.

4 Impact Assessment

SWOT analysis

Task 4.1:

Use the scheme below to enter the relevant conclusions from the previous sections in the frames.

SWOT screening	Material phase	Manufacturing phase	Use phase	End-of-life
Strength	Al has low weight	GPV has ISO 14001 certificate	Long life span of product	Al and steel are easy to recycle
Weakness	High R-parameter for components		High energy consumption by: <ul style="list-style-type: none"> • Standby • On-mode • Transport 	
Opportunities	Reduce material consumption	Eco-labelled PWB	<ul style="list-style-type: none"> • Reduce Standby • Reduce On-mode • Reduce weight 	
Threats	RoHS-directive			WEEE-directive

After this consider any other relevant input to each box in the matrix.

Finally check if any important conclusion from the previous sections (that might not fit in the matrix) is missing. If so write them down outside the matrix.

Setting up targets and objectives for the product specification

Task 4.2:

Place each of the "hot spots" from Task 4.1 in the matrix below:

Important hot spots used for prioritising the target settings for the product:

	High significance for the environment	Low significance for the environment
High Influence of the company	Energy consumption by: •Standby •On-mode •Transport	
Low Influence of the company	<i>Scarce resources used in the PWB</i>	

To be dealt with:

Focon potentials for environmental improvements to be considered:

- *Compare alternative technologies.*
- *Compare competitors products*
- *Consider the potentials for using eco-labelled PWB.*

References:

ISO 14001:1996 "Environmental management systems - Specification with guidance for use", Sub clause 4.3.1

The Danish Ecolabel web page (in Danish)

<http://www.ecolabel.dk>

European Union Eco-label Homepage

<http://europa.eu.int/comm/environment/ecolabel/index.htm>

Global Ecolabelling Network

<http://www.gen.gr.jp/>

Det svenske Miljöstyvningsrådetets web page

<http://www.environdec.com>

The Danish EPA (Miljøstyrelsen) web site

<http://www.mst.dk/>

WEEE directive

Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE) - Joint declaration of the European Parliament, the Council and the Commission relating to Article 9

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http://europa.eu.int/eur-lex/pri/en/oj/dat/2003/l_037/l_03720030213en00240038.pdf

Amendment to the WEEE directive:

http://europa.eu.int/eur-lex/pri/en/oj/dat/2003/l_345/l_34520031231en01060107.pdf

RoHS directive

Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment

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http://europa.eu.int/eur-lex/pri/en/oj/dat/2003/l_037/l_03720030213en00190023.pdf