ENVIRONMENTAL PRODUCT DECLARATION

CONTACTORS TAL9/12/16 3 & 4 POLES SCREW & RING TONG TERMINALS

ABB France – Product Automation Division
Protection & Control Activity
10, rue Ampère
69685 CHASSIEU CEDEX - FRANCE
Tel : +33 (0)4 72 22 17 22
Fax : +33 (0)4 72 22 19 69

Organisational framework

Manufacturer

ABB France Chassieu Factory
10, rue Ampère
69685 Chassieu Cedex
Tel: +33 (0)4 72 22 17 22
Fax: +33 (0)4 72 22 19 69
Contact: Corinne Maillet

ABB France Control & Protection Activity belongs to the Business unit Control Products, with 3 main sites in France, Germany and Sweden. ABB France belongs to the Products Automation Division.
ABB France Products Automation Division has been certified to ISO9001V2000 since March 2002.

Environmental management

The ISO 14001 international environmental management standard has been implemented at the 3 main sites of the Business Unit Control Products. ABB France Chassieu factory has been certified to ISO14001 since 1998. Life cycle assessment is applied continuously to all new product development.

Product description

AL contactors are mainly used for controlling 3-phases motors and more generally for controlling power circuits up to 690 V ac or 220/440 V dc. AL Range contactors is composed of 2 sizes, follow the voltage. The TAL… version offers a large coil voltage range.

Material for the product is used according to the following table

Type of material	Kg / Product	Kg / KW
Mercury	0	0
Beryllium	0	0
Silver	0.0027	3.56 e-04
Aluminium	0	0
Lead	0	0
Cadmium	0	0
Iron & Steel	0.2448	0.0326
Copper and Copper alloys	0.1361	0.0181
HCFC	0	0
SF6	0	0
Thermoplastics	0.1099	0.0147
Thermosets	0.0135	1.8013 e-03
PBB / PBDE	0	0
PVC	0.0006	8.5667 e-05
Chrome (VI+)	0	0
Antimony Trioxide	0	0
Cardboards	0.0499	0.0067

Environmental performance

The data and calculations are in accordance with the Product Specific Requirement (PSR) for contactors dated June 2002, which specify the following baselines for the LCA calculation.

Functional unit

The functional unit for the LCA is 1 contactor related to the motor maximum power rating AC-3 for 400 V (kW) for this contactor.

System boundaries

The life cycle assessment covers all environmental aspects for extraction, production and transport of raw materials, manufacturing of main parts, assembly of the contactor, transport and use of the product, disposal without dismantling at the end of the product's life. It includes consumption of material and energy resources as well as emissions and waste generation.

Calculations are based upon an average lifetime of 10 years. The accessories switched-on 12 hours per day, 300 days per year.
A French mix of energy and a European mix of energy have been used for the manufacturing phase. A World mix of energy has been used for the usage phase.
For transport of raw materials, we consider a lorry semi-trailer < 40 t, on a distance of 1000 Km.
For transport of products from ABB to the customers, we consider:
- A lorry semi-trailer on a distance of 3500 Km
- An aircraft freighter on a distance of 2500 Km

The LCA study does not include:
- Building, tools and machines including services and maintenance,
- Phones, computers, software and other administrative tools,
- Service and maintenance during the usage,
- Environmental impacts from sales companies,
- Material waste in production which are sent to recycling,
- Recycling after end-of-life.

Resources utilisation

	Manufacturing Phase	Usage Phase	Disposal Phase
Use of non-renewable resources			
Iron (Fe) Kg / KW	3.87 e-03	3.87 e-02	0
Copper (Cu) Kg / KW	0.01	2.40 e-04	0
Silver (Ag) Kg / KW	3.60 e-04	0	0
Nickel (Ni) Kg / KW	5.33 e-05	8.00 e-05	0
Tin (Sn) Kg / KW	2.67 e-05	0	0
Manganese (Mn) Kg / KW	0.90 e-06	4.00 e-05	0
Uranium (U) Kg / KW	0.84 e-06	1.07 e-04	0
Coal Kg / KW	1.21 e-02	5.65	0
Natural gas Kg / KW	4.20 e-03	0.60	0
Crude Oil Kg / KW	5.51 e-03	0.57	0
Use of renewable resources			
Wood Kg / KW	3.73 e-04	0.19	0
Hydro energy MJ / KW	0.11	0	0

Energy consumption and losses

Energy form	Manufacturing Phase	Usage Phase	Disposal Phase
Electrical energy MJ / KW	No data available	76.03	No data available

The average French electricity mix is defined as being 0.5% biomass, 7.1% coal, 1% gas, 12.2 % hydro, 76.5% nuclear, 2.3% oil and 0.4% lignite.
The average European electrical energy is defined as being 13.4% gas, 16.8% hydro, 30.2% nuclear, 7% oil, 19.7% coal, 1.5% biomass, 0.4% wind and 11% lignite.
The average World electrical energy is defined as being 15.3% gas, 18.4% hydro, 17% nuclear, 8.5% oil, 39.4% coal, 1.1% biomass and 0.3% geothermal.

Wastes

Waste during manufacturing phase	Kg / KW
Hazardous waste	2.00 e-04
Landfill waste	9.47 e-04
Waste at disposal phase	**Kg / KW**
Landfill waste	7.49 e-02

During manufacturing phase, metals and parts of thermoplastics are recycling. The other wastes are landfilled or treated (hazardous wastes).

Emissions

Category of impact	Equivalent unit	Manufacturing phase	Usage phase	Total life cycle
Acidification Potential AP	Kmol H+ / KW	0.2538	2.0463	2.3001
Global Warming Potential GWP	Kg CO2 / KW	0.3023	13.4766	13.7789
Eutrophication NP	Kg P / KW	0.0116	0.1604	0.1720
Ozone Depletion Potential ODP	Kg CFC-11 / KW	4.4481 e-07	2.3625 e-06	2.8074 e-06
Photochemical Oxydants Potential POCP	Kg ethylene / KW	4.3331 e-04	0.0026	0.0030

Additional qualifying factors

Recycling and disposal

90 % of materials using for contactors can be recycled, but now, we have no feedback about the rate of recycling at the end of life of our products.

Hazardous material	Component / part / physical position
Mercury	No
Beryllium	No
Lead	No
Cadmium	No
PBB / PBDE	No
PVC	Moving contact carrier
HCFC	No
Chrome (VI+)	No
SF6	No
Antimony Trioxide	No

Usage phase in relation to the total

It must be noted that the environmental impact during the usage phase is the most important one.

Category of impact	Usage in % of total
Acidification Potential AP	88.97
Global Warming Potential GWP	97.81
Eutrophication NP	93.27
Ozone Depletion Potential ODP	84.15
Photochemical Oxydants Potential POCP	85.55

References

LCA report: 06-1-B LCA 1SBL183561RXXXX
PSR 2002: Product-Specific Requirements for Contactors

Glossary

Acidification Potential – AP

Chemical alternation of the environment, resulting in hydrogenous being produced more rapidly than they are dispersed or neutralised. Occurs mainly through fallout of sulphur and nitrogen compounds from combustion processes. Acidification can be harmful to terrestrial and aquatic life.

Global Warming Potentiel – GWP

The index used to translate the level of emissions of various gases into a common measure to compare their contributions to the absorption by the atmosphere of infrared radiation. GWPs are calculated as the absorption that would result from the emission of 1 Kg of a gas to that from emission of 1 Kg of carbon dioxide over 100 years.

Eutrophication – NP

Enrichment of bodies of water by nitrates and phosphates from organic material or surface runoff. This increases the growth of aquatic plants and can produce alga blooms that deoxygenate water and smother other aquatic life.

Ozone Depletion Potential – ODP

The index used to translate the level of emissions of various gases into a common measure to compare their contributions to breakdown of the ozone layer. ODPs are calculated as the change that would result from the emission of 1 Kg of a substance to that from emission of 1 Kg of CFC-11 (a freon).

Photochemical Ozone Creation Potential – POCP

The index used to translate the level of emissions of various gases into a common measure to compare their contributions to the change of ground-level ozone concentration. POCPs are calculated as the change that would result from the emission of 1 Kg of a gas to that of the emission of 1 Kg ethylene.