

Environmental Declaration

Product family MNS
ABB Low Voltage Systems



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ABB Schaltanlagentechnik GmbH, ABB LV Systems AB and ABB Control OY belongs to the Business Area Products & Systems and business unit Low Voltage Systems. The business unit Low Voltage Systems has sites also in, Argentina, Australia, Switzerland, Hong Kong, China, Czech Republic, Denmark, United Arabian Emirates, Estonia, Egypt, France, United Kingdom, Ireland, Italy, Malaysia, Netherlands, Norway, Poland, Kingdom of Saudi Arabia, Singapore, Thailand, Turkey and South Africa.

Environmental management:

The ISO 14001 international environmental management standard has been implemented at all main sites in the business unit. Low Voltage Systems are manufactured at the main sites in Germany, Finland and Swedish, which all have been certified to ISO 14001. Life cycle assessment is applied to all product development.

Product description:

The main function of a switchgear is to switch on, supply and switch of the voltage and at the same time being able off braking all currents distributed to any connected load or equipment. The basic principal is to switch on or of the voltage by using a switching apparatus opening or closing the main distributing circuit. The switchgear shall sustain both the thermal and mechanical constrains appearing during short circuit duration as well as during normal operational conditions.

The most common applications today are Power Distribution, Motor Control Systems, Marshalling and Control Cubicles.

The market for this type of products is increasing.

The ABB MNS switchgear family contents (1998) of Four different designs described below:

MNS, MNS Sprint, MNS Light and MNS Select

MNS for Main Distribution & Motor Control Centers with Horizontal Busbars having a Current carrying capacity up to 6300 amp.

MNS Sprint & MNS Light for Main/Sub-distribution & Motor Control Centers with Horizontal Busbars having a Current carrying capacity up to 2300 amp.

MNS Select for Control Cubicle Applications.

The MNS has been in the market since 1975, the Sprint, Light and Select since 1998.

Material according the table and graph at page 3 is used for the product volume 1998. The plants that manufacture MNS have been certified to the ISO 9001 quality management standard since 1993.

Functional unit

The functional unit for the LCA is manufactured volume in 1998

System boundaries

The Life Cycle Assessment (LCA) is carried out with “Ecolab” software from Nordic port AB, Gothenburg

The LCA covers all environmental aspects for:

- Extraction and production of raw material
- The average lifetime for the switchgears is assumed to be 10 year.
- Switched-on-time assumed to be 365 days per year and 24 hours per day (8760 hours per year). Electricity Europe is used as electricity source for the operation phase
- Electricity Europe is used as electricity source for the manufacturing phase.
- Transports for components and finished products. For finished products we have calculated with lorry 250 km
- End –of-life phase with dismantling and landfill.

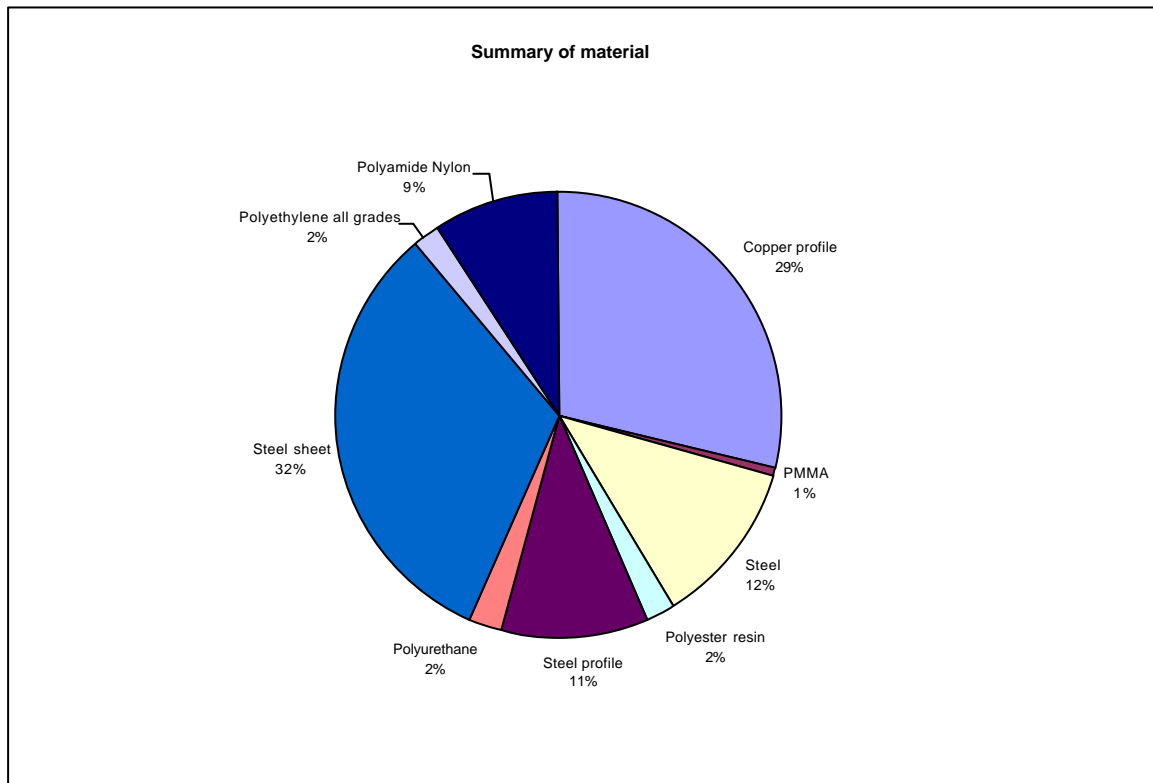
The LCA study does not include:

- The apparatuses in the electrical circuits
- The manufacturing processes at sub suppliers
- Buildings, tools and machines including services and maintenance
- Phones, computers, software and other administrative tools
- Service and maintenance during the usage.
- Environmental impact from Sales Company
- Material waste in production which are sent to recycling.
- Recycling after End-of-life

Summary of Material in tons

Material group	Net weight in tons (Material-components)	Total gross material for production (tons)
Copper profile	1885.0	2073.5
Copper wire	82.2	90.4
Steel	839.4	1024.1
Steel profile	1234.6	1506.2
Steel sheet	2148.1	2620.7
ABS	6.1	6.1
EPDM rubber	93.4	94.3
Epoxy resin	33.0	41.3
PMMA	48.0	48.5
Polyamide Nylon	178.6	180.4
Polycarbonate	0.5	0.5
Polyester resin	47.5	59.3
Polyethylene all grades	41.2	41.6
Polystyrene general purpose	11.6	11.7
Polyurethane	92.4	94.2

Material content of the Core Product line MNS 1998



Allocation unit

The factors for allocation of common environmental aspects during manufacturing are calculated as the share of factory area, machine equipment and personnel in relation to the corresponding value for the whole plant.

Inventory: Use of material resources		
Material		tons
Aluminum	(Al)	20.5
Copper	(Cu)	1985
Iron	(Fe)	4294
Manganese	(Mn)	12.5
Zinc	(Zn)	68

Inventory: Use of energy resources			
Resource		Manufacturing and logistic phase	Usage phase
Coal	(t)	10128	401676
Oil	(t)	2837	42101
Gas	(t)	1443	27773
Uranium	(kg)	233	15468
Hydro power	(MJ)	451963	

Electricity mix

The average European electrical energy is defined as being 10 % gas, 15 % hydro, 36 % nuclear, 10 % oil, 19 % stone coal and 10 % lignite coal.

The use of energy resources in the last table are based on the above.

The classification data for emissions

Environmental Impact	Units (equivalent)	Manu- facture	Logistic s	Use	Decom- missionin g /Recyclin g	Total
1. Global warming	CO2 kg	2002.76	16.76	33780.4 6	653.46	36453.4 4
2. Acidification	SO2 kg	8.88	0.11	211.2	0.029	220.22
3. Abiotic depletion	Silver kg	11.06	0.12	116.41	0.0169	127.62
4. Nutrification	Phosphate kg	0.9258	0.0193	9.0851	0.0046	10.0349
5. Photochemical oxidant formation	Ethylen kg	0.5024	0.0047	7.4775	0.0047	8.1291
6. Ecotoxicity (water)	Polluted water exposed to the toxicologically acceptable limit, m3	0.022	0	0.75	0	0.7707
7. Human toxicity in air	Human body exposed to the toxicologically acceptable limit, kg	13.72	0.14	297.15	0.04	311.06
8. Human toxicity in water	Human body exposed to the toxicologically acceptable limit, kg	0.005	0	0.3175	0	0.3225
9. Ozone depletion	CFC-11 kg	0.0001	0	0.0021	0	0.0022

The values are based upon Classification and characterisation
SECRC/D/2000-03-10

Additional qualifying factors

Recycling and disposal

The main parts of the product can be recycled.
Some parts need to be fragmented to separate
different types of material

Usage phase in relation to the total

It is to be observed that the environmental impact
during the usage phase is the most important. We
also conclude that the impact during the usage
strongly depend on the type of electricity used in
a given geographical region. With European mix
the usage phase stand for more than 90 %. See
the graph on next page.

Relative environmental load caused by use, manufacturing and logistics

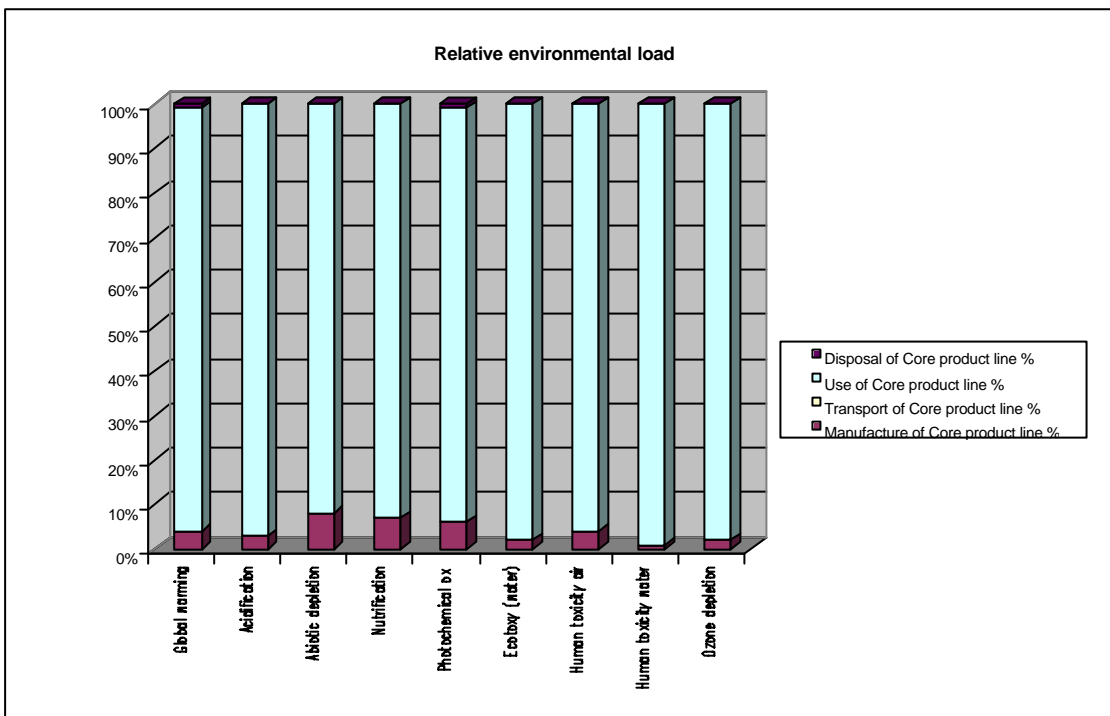


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