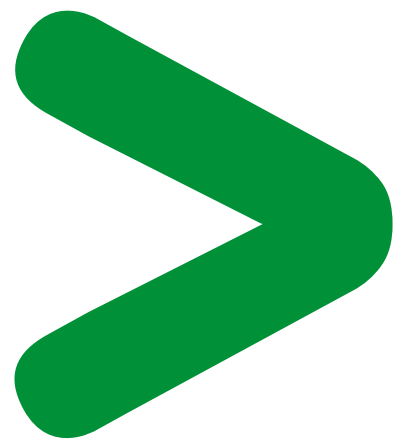


Medium Voltage Distribution

Product Environmental Profile

MCset 17.5kV

LF circuit breaker



Product Environmental Profile - PEP

Product overview

The main function of the MCset 17.5kV product range is to switching and breaking from 1kV to 17,5kV. This range consists of: up to 17,5kV (Ur), 630/4000A (Ir), 25kA/3s (Ik/tk), to 50kA/3s, & 25 to 50kA/1s Internal Arc Withstand with AFLR class, 50/60 Hz.

The representative product used for the analysis is MCset-incomer or feeder cubicle AD2 and AD3 type; with: LF circuit breaker, busbar 1250A, end switchboard, single CT, without: VT and Low Voltage devices.

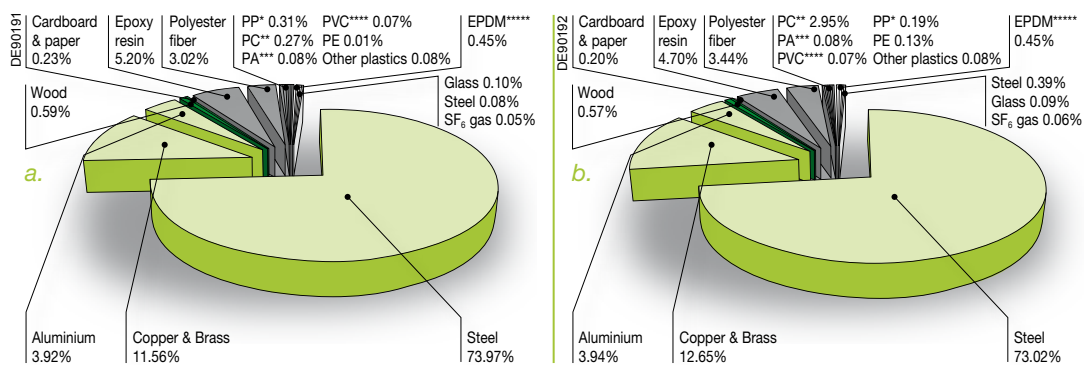
- The environmental impacts of this referenced product are representative of the impacts of the other products of the range which are developed with the similar technology.
- The extrapolation rules are described in the following chapters.
- The environmental analysis was performed in conformity with ISO14040.
- This analysis takes the stages of the life cycle of the product into account.

Constituent materials

The mass of the product range is from 620 kg and 1388 kg no including packaging. It is 921 kg for the MCset-incomer or feeder cubicle AD2; with: LFcircuit breaker, busbar 1250A, end switchboard, single CT, without: VT and Low Voltage devices and 1075 kg for the MCset-incomer or feeder cubicle AD3. The constituent materials are distributed as follows:

MCset

- a. AD2 cubicle
- b. AD3 cubicle



* Polypropylenes / ** Polycarbonates / *** Polyamides / **** Polyvinyl Chlorid / ***** Ethylene Propylene Diene copolymer

Products of this range are designed in conformity with the requirements of the ROHS directive (European Directive 2002/95/EC of 27 January 2003) and do not contain, or in the authorised proportions, lead, mercury, cadmium, chromium hexavalent, flame retardant (polybromo-biphenyles PBB, polybromodiphenylthers PBDE) as mentioned in the Directive.

Manufacturing

The MCset 17.5kV product range is manufactured at a Schneider Electric production site on which an ISO14001 certified environmental management system has been established.

Distribution

The weight and volume of the packaging have been reduced, in compliance with the European Union's packaging directive.

The MCset 17.5kV packaging weight is 32 kg. It consists of cardboard (5kg), wood (25kg), polyethylene (1kg) and steel (1kg). The weight of recycled materials used is 90% of total packaging mass.

The product distribution flows have been optimised by setting up local distribution centres close to the market area.

Use

The products of the MCset 17.5kV range do not generate environmental pollution requiring special precautionary measures (noise, emissions, and so on) in using phase.

- The dissipated power depends on the conditions under which the product is implemented and used.
- This dissipated power spreads out between 27 W and 351 W for the MCset 17.5kV product range.
- This thermal dissipation represents less than 0,002% of the power which passes through the product.

End of life

At end of life, **the products in the MCset 17.5 kV have been optimized to decrease the amount of waste and valorise the components and materials of the product** in the usual end of life treatment process.

- The design and information have been achieved so as components are able to enter the usual end of life treatment processes as appropriate: depollution if recommended, reuse and/or dismantling if recommended so as to increase the recycling performances and shredding for separating the rest of materials.
- The potential of recyclability of the products has been evaluated using the Codde "recyclability and recoverability calculation method" (version V1, 20 Sep. 2008) and published by ADEME (French Agency for Environment and Energy Management).

According this method, the potential recyclability ratio is: 83 %.

- The recommendations to optimize the recycling performance are detailed in the product "End of Life Instructions" of this product range.

Environmental impacts

- The environmental impacts were analysed for the Manufacturing (M) phases, the Distribution (D) and the Utilisation (U) phases.
- This product range is included in the category Energy passing product (assumed lifetime service is 20 years and using scenario: 126W for 100% uptime).
- The EIME (Environmental Impact and Management Explorer) software, version 4.1, and its database, version 10 were used for the life cycle assessment (LCA).
- The calculation has been done on MCset-incomer or feeder cubicle AD2 and AD3 type; with: LFCircuit breaker, busbar 1250A, end switchboard, single CT, without :VT and low voltage devices.
- The electrical power model used is Europe.

Presentation of product environmental impacts

MCset AD2 cubicle						
Indicator	Definition	Unit	Sum	M	D	U
RMD	Raw Material Depletion	Y-1	4.8595 10 ⁻¹²	4.5844 10 ⁻¹²	6.7502 10 ⁻¹⁵	2.683 10 ⁻¹³
ED	Energy Depletion	MJ	3.1463 10 ⁺⁵	7.0023 10 ⁺⁴	4.8573 10 ⁺³	2.3975 10 ⁺⁵
WD	Water Depletion	dm ³	7.4545 10 ⁺⁴	3.6964 10 ⁺⁴	5.072 10 ⁺²	3.7074 10 ⁺⁴
GW	Global Warming	g≈CO ₂	1.6726 10 ⁺⁷	4.1055 10 ⁺⁶	3.7022 10 ⁺⁵	1.2251 10 ⁺⁷
OD	Ozone Depletion	g≈CFC-11	2.233	9.2307 10 ⁻¹	2.5621 10 ⁻¹	1.054
AT	Air Toxicity	m ³	3.6176 10 ⁺⁹	1.1833 10 ⁺⁹	7.3799 10 ⁺⁷	2.3606 10 ⁺⁹
POC	Photochemical Ozone Creation	g≈C ₂ H ₄	5.9974 10 ⁺³	1.4324 10 ⁺³	3.1358 10 ⁺²	4.2515 10 ⁺³
AA	Air Acidification	g≈H ⁺	2.9354 10 ⁺³	9.4559 10 ⁺²	50.948	1.9388 10 ⁺³
WT	Water Toxicity	dm ³	3.8247 10 ⁺⁶	7.9993 10 ⁺⁵	4.66 10 ⁺⁴	2.9782 10 ⁺⁶
WE	Water Eutrophication	g≈PO ₄	1.9398 10 ⁺²	1.5264 10 ⁺²	6.361	34.988
HWP	Hazardous Waste Production	kg	2.174 10 ⁺²	21.955	2.0201 10 ⁻¹	1.9524 10 ⁺²

MCset AD3 cubicle						
Indicator	Definition	Unit	Sum	M	D	U
RMD	Raw Material Depletion	Y-1	6.1658 10 ⁻¹²	5.8897 10 ⁻¹²	7.8871 10 ⁻¹⁵	2.683 10 ⁻¹³
ED	Energy Depletion	MJ	3.245 10 ⁺⁵	7.9086 10 ⁺⁴	5.6633 10 ⁺³	2.3975 10 ⁺⁵
WD	Water Depletion	dm ³	7.9934 10 ⁺⁴	4.2263 10 ⁺⁴	5.9752 10 ⁺²	3.7074 10 ⁺⁴
GW	Global Warming	g≈CO ₂	1.7394 10 ⁺⁷	4.7137 10 ⁺⁶	4.2998 10 ⁺⁵	1.2251 10 ⁺⁷
OD	Ozone Depletion	g≈CFC-11	2.445	1.095	2.966 10 ⁻¹	1.054
AT	Air Toxicity	m ³	3.8559 10 ⁺⁹	1.4091 10 ⁺⁹	8.6221 10 ⁺⁷	2.3606 10 ⁺⁹
POC	Photochemical Ozone Creation	g≈C ₂ H ₄	6.2862 10 ⁺³	1.6711 10 ⁺³	3.6358 10 ⁺²	4.2515 10 ⁺³
AA	Air Acidification	g≈H ⁺	3.1289 10 ⁺³	1.1305 10 ⁺³	59.658	1.9388 10 ⁺³
WT	Water Toxicity	dm ³	3.9417 10 ⁺⁶	9.0933 10 ⁺⁵	5.4133 10 ⁺⁴	2.9782 10 ⁺⁶
WE	Water Eutrophication	g≈PO ₄	2.1003 10 ⁺²	1.6763 10 ⁺²	7.411	34.988
HWP	Hazardous Waste Production	kg	2.209 10 ⁺²	25.411	2.4344 10 ⁻¹	1.9524 10 ⁺²

- *The life cycle analysis shows that the Use phase (U) is the life cycle phase which has the greatest impact on the majority of environmental indicators.*
- *The environmental parameters of this phase have been optimized at the design stage.*
- *The industrialization close to end users enables to reduce transportation. Material have been optimized to reach the electrical and mechanical performances.*
- *Depending on the analysis of environmental impacts, the parameters of other products in this family may be proportional extrapolated by cubicle weight comparison.*

System approach

As the product of the range are designed in accordance with the ROHS Directive (European Directive 2002/95/EC of 27 January 2003), they can be incorporated without any restriction within an assembly or an installation submitted to this Directive.

Please note that the environmental impacts of the product depend on the use and installation conditions of the product. Impacts values given above are only valid within the context specified and cannot be directly used to draw up the environmental assessment of the installation.

Product Environmental Profile - PEP

Glossary

Air Acidification (AA)	The acid substances present in the atmosphere are carried by rain. A high level of acidity in the rain can cause damage to forests. The contribution of acidification is calculated using the acidification potentials of the substances concerned and is expressed in mode equivalent of H ⁺ .
Air Toxicity (AT)	This indicator reflects the incidence on the quality of the air , by taking into account the usually accepted concentrations tolerated for several gases and the quantity released.
Energy Depletion (ED)	This indicator gives the quantity of energy consumed , whether it be from fossil, hydroelectric, nuclear or other sources. This indicator takes into account the energy from the material produced during combustion. It is expressed in MJ.
Global Warming Potential (GWP)	The global warming of the planet is the result of the increase in the greenhouse effect due to the sunlight reflected by the earth's surface being absorbed by certain gases known as "greenhouse-effect" gases. The effect is quantified in gram equivalent of CO ₂ .
Hazardous Waste Production (HWP)	This indicator calculates the quantity of specially treated waste created during all the life cycle phases (manufacturing, distribution and utilization). For example, special industrial waste in the manufacturing phase, waste associated with the production of electrical power, etc. It is expressed in kg.
Ozone Depletion (OD)	This indicator defines the contribution to the phenomenon of the disappearance of the stratospheric ozone layer due to the emission of certain specific gases . The effect is expressed in gram equivalent of CFC-11.
Photochemical Ozone Creation (POC)	This indicator quantifies the contribution to the "smog" phenomenon (the photochemical oxidation of certain gases which generates ozone) and is expressed in gram equivalent of methane (C ₂ H ₄).
Raw Material Depletion (RMD)	This indicator quantifies the consumption of raw materials during the life cycle of the product . It is expressed as the fraction of natural resources that disappear each year, with respect to all the annual reserves of the material.
Water Depletion (WD)	This indicator calculates the volume of water consumed , including drinking water and water from industrial sources. It is expressed in dm ³ .
Water Eutrophication (WE)	This indicator calculates the water eutrophication (enrichment in nutritive elements) of lakes and marine waters by the release of specific substances in the effluents . It is expressed in gram equivalent of PO ₄ ³⁻ , using equivalency in their nitrification potential.
Water Toxicity (WT)	This indicator reflects the incidence on the quality of water , taking into account the usually accepted concentrations tolerated for several substances and the quantity released.



We are committed to safeguarding our planet by «Combining innovation and continuous improvement to meet the new environmental challenges».

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This document is complying with ISO14020 which relates to the general principles of environmental declarations and to the ISO 14025 relating to life-cycle environmental declarations.

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