

Product Environmental Profile

SM6-24 QM & SM6-24 IM Modular Switchboard up to 24 kV - Air Insulated Switchgear with SF6 breaking technology

This range consists of: up to 24kV (Ur), 630/1250A (Ir) 25kA/1s (Ik/tk), and up to 20kA-1s Internal Arc Withstand at 50/60 Hz.



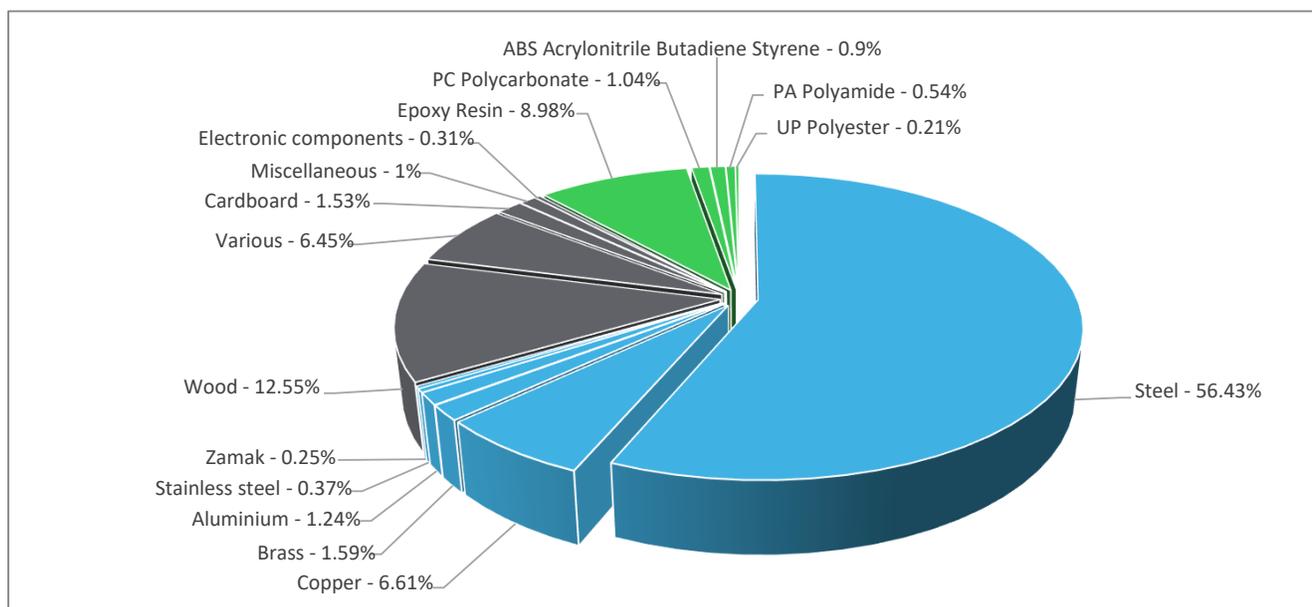
General information

Representative product	SM6-24 QM
Description of the product	The main purpose of the SM6-24 QM is to make and break from 1kV to 24kV. It is combination of a three-pole switch with three fuses provided with strikers, the operation of any striker causing all three poles of the switch to open automatically
Description of the range	This range consists of: up to 24kV (Ur), 630/1250A (Ir) 25kA/1s (Ik/tk), and up to 20kA-1s Internal Arc Withstand at 50/60 Hz. The environmental impacts of this referenced product are representative of the impacts of the other products of the range which are developed with a similar technology.
Functional unit	To make and break from 1kV to 24kV over a service life of 20* years. This protection is ensured in accordance with the following parameters: U = Rated voltage (V) = 24 kV In = Rated current in continuous operation (A) = 630 A Np = Number of poles = 3 Icn = Rated breaking capacity (A) = 25kA for SM6-24 QM and 630A for SM6-24 IM Cd = Tripping curve IP = IP3x for Units in switchboard & IP2X for between compartments in accordance with the standard IEC 60529 IK = IK08 in accordance with the standard IEC 62262

*The product can last for 30 years. But, As per Product Specific Rules (PSR) requirement we used 20 years of Reference Life Time in PEP.

Constituent materials

Reference product mass 150,000 g including the product, its packaging and additional elements and accessories



Plastics	11.7%
Metals	66.5%
Others	21.8%

Substance assessment

Products of this range are designed in conformity with the requirements of the RoHS directive (European Directive 2011/65/EU of 2 January 2013, amended in March 2015, 2015/863/EU and in November 2017, 2017/2102/EU) and do not contain, or only contain in the authorised proportions, lead, mercury, cadmium, hexavalent chromium or flame retardants (polybrominated biphenyls - PBB, polybrominated diphenyl ethers - PBDE), Bis (2-ethylhexyl)phthalate - DEHP, Benzyl butyl phthalate - BBP, Dibutyl phthalate - DBP, Diisobutyl phthalate - DIBP) as mentioned in the Directive.

Details of ROHS and REACH substances information are available on the Schneider-Electric Green Premium website

<http://www2.schneider-electric.com/sites/corporate/en/products-services/green-premium/green-premium.page>

Additional environmental information

The SM6-24 QM presents the following relevant environmental aspects

Manufacturing	Manufactured at a Schneider Electric production site ISO14001 certified
Distribution	Weight and volume of the packaging optimized, based on the European Union's packaging directive Packaging weight is 219,04.4 g, consisting of Wood (86.55%), Cardboard (10.53%), Steel (1.78%), PE Polyethylene (1.10%) and Paper (0.04%) Product distribution optimised by setting up local distribution centres
Installation	The product does not require special installation procedure and requires little to no energy to install. The disposal of the packaging materials are accounted for during the installation phase (including transport to disposal).
Use	The product does not require special maintenance operations.
End of life	End of life optimized to decrease the amount of waste and allow recovery of the product components and materials This product contains SF6 (200g), PCBA (122g) and Cables (268.9 g) that should be separated from the stream of waste so as to optimize end-of-life treatment. The location of these components and other recommendations are given in the End of Life Instruction document which is available on the Schneider-Electric Green Premium website http://www2.schneider-electric.com/sites/corporate/en/products-services/green-premium/green-premium.page Recyclability potential: 73% Based on "ECO'DEEE recyclability and recoverability calculation method" (version V1, 20 Sep. 2008 presented to the French Agency for Environment and Energy Management: ADEME).

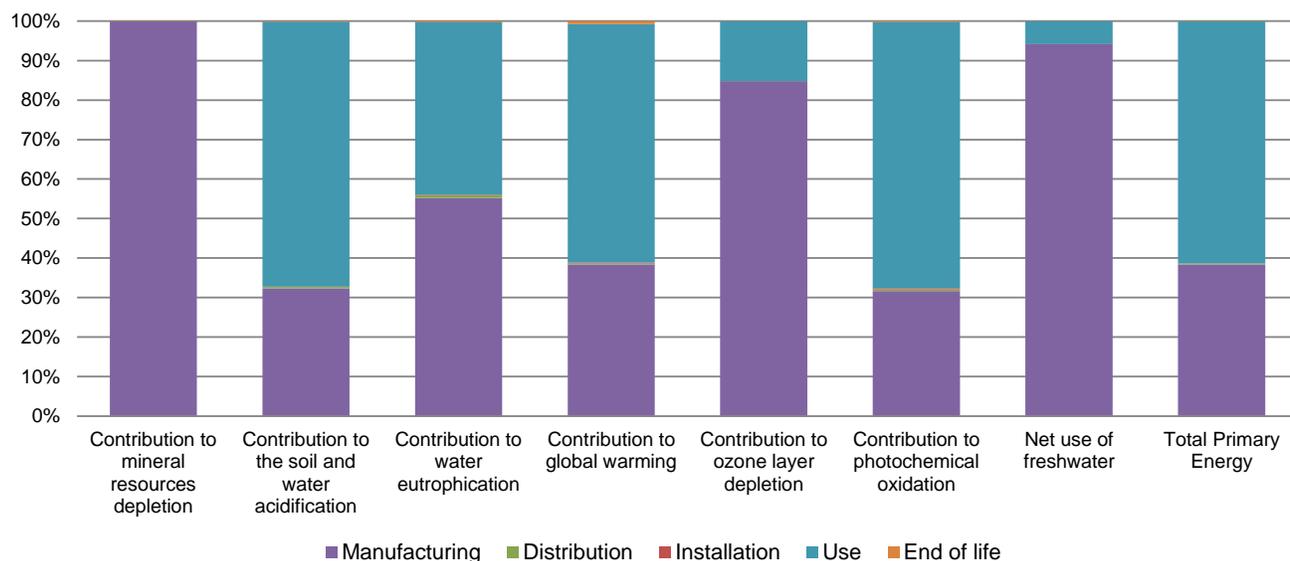
Environmental impacts

Reference life time	20* years			
Product category	Other equipments - Passive product - continuous operation			
Installation elements	No special installation components need during installation phase, but transport of packaging to disposal, and disposal of packaging accounted for during installation.			
Use scenario	Load rate: 30% of In Use time rate: 100% of RLT Power Dissipation at 100% load rate is 268.26 W and at 30%, Load rate is 24.1434 W			
Geographical representativeness	Global			
Technological representativeness	The Modules of Technologies such as material production, manufacturing process and transport technology used in this PEP analysis (LCA-EIME in this case) are similar and representative of the actual type of technologies used to make the product in production.			
Energy model used	Manufacturing	Installation	Use	End of life
	Manufacturing Plant: France	Electricity mix; AC; consumption mix, at consumer; 220V; CN, at consumer; 1kV - 60kV; EU-27, at power plant; AG, at consumer; 127-220V; MA	Electricity mix; AC; consumption mix, at consumer; 220V; CN, at consumer; 1kV - 60kV; EU-27, at power plant; AG, at consumer; 127-220V; MA	Electricity mix; AC; consumption mix, at consumer; 220V; CN, at consumer; 1kV - 60kV; EU-27, at power plant; AG, at consumer; 127-220V; MA

*The product can last for 30 years. But, As per Product Specific Rules (PSR) requirement we used 20 years of Reference Life Time in PEP.

Compulsory indicators (For 20 years)		SM6-24 QM					
Impact indicators	Unit	Total	Manufacturing	Distribution	Installation	Use	End of Life
Contribution to mineral resources depletion	kg Sb eq	4.28E-02	4.27E-02	0*	0*	5.77E-05	0*
Contribution to the soil and water acidification	kg SO ₂ eq	1.39E+01	4.47E+00	5.89E-02	7.38E-03	9.29E+00	2.54E-02
Contribution to water eutrophication	kg PO ₄ ³⁻ eq	2.08E+00	1.15E+00	1.36E-02	3.59E-03	9.07E-01	6.37E-03
Contribution to global warming	kg CO ₂ eq	5.66E+03	2.17E+03	1.29E+01	1.36E+01	3.42E+03	4.28E+01
Contribution to ozone layer depletion	kg CFC11 eq	1.80E-03	1.53E-03	0*	0*	2.75E-04	5.60E-07
Contribution to photochemical oxidation	kg C ₂ H ₄ eq	9.70E-01	3.07E-01	4.21E-03	3.13E-03	6.53E-01	2.70E-03

Resources use	Unit	Total	Manufacturing	Distribution	Installation	Use	End of Life
Net use of freshwater	m3	8.59E+01	8.09E+01	0*	0*	4.97E+00	1.07E-02
Total Primary Energy	MJ	9.11E+04	3.50E+04	1.83E+02	1.58E+01	5.58E+04	1.26E+02



Optional indicators		SM6-24 QM					
Impact indicators	Unit	Total	Manufacturing	Distribution	Installation	Use	End of Life
Contribution to fossil resources depletion	MJ	6.87E+04	2.54E+04	1.81E+02	1.45E+01	4.31E+04	1.01E+02
Contribution to air pollution	m³	4.40E+05	1.70E+05	5.49E+02	3.22E+02	2.68E+05	1.12E+03
Contribution to water pollution	m³	5.29E+05	3.74E+05	2.12E+03	1.60E+02	1.52E+05	1.19E+03
Resources use	Unit	Total	Manufacturing	Distribution	Installation	Use	End of Life
Use of secondary material	kg	2.05E+01	2.05E+01	0*	0*	0*	0*
Total use of renewable primary energy resources	MJ	3.79E+03	3.93E+02	0*	0*	3.39E+03	0*
Total use of non-renewable primary energy resources	MJ	8.74E+04	3.46E+04	1.82E+02	1.55E+01	5.24E+04	1.26E+02
Use of renewable primary energy excluding renewable primary energy used as raw material	MJ	3.49E+03	9.69E+01	0*	0*	3.39E+03	0*
Use of renewable primary energy resources used as raw material	MJ	2.96E+02	2.96E+02	0*	0*	0*	0*
Use of non renewable primary energy excluding non renewable primary energy used as raw material	MJ	8.70E+04	3.42E+04	1.82E+02	1.55E+01	5.24E+04	1.26E+02
Use of non renewable primary energy resources used as raw material	MJ	4.00E+02	4.00E+02	0*	0*	0*	0*
Use of non renewable secondary fuels	MJ	0.00E+00	0*	0*	0*	0*	0*
Use of renewable secondary fuels	MJ	0.00E+00	0*	0*	0*	0*	0*
Waste categories	Unit	Total	Manufacturing	Distribution	Installation	Use	End of Life
Hazardous waste disposed	kg	2.06E+03	1.87E+03	0*	0*	7.69E+01	1.10E+02
Non hazardous waste disposed	kg	4.07E+03	2.43E+02	4.59E-01	1.04E+01	3.82E+03	0*
Radioactive waste disposed	kg	3.31E+00	4.58E-01	0*	3.58E-04	2.85E+00	6.06E-04
Other environmental information	Unit	Total	Manufacturing	Distribution	Installation	Use	End of Life
Materials for recycling	kg	7.72E+01	9.23E+00	0*	5.29E+00	0*	6.27E+01
Components for reuse	kg	0.00E+00	0*	0*	0*	0*	0*
Materials for energy recovery	kg	6.33E-01	0*	0*	0*	0*	6.33E-01
Exported Energy	MJ	8.68E+00	8.16E-01	0*	7.87E+00	0*	0*

* represents less than 0.01% of the total life cycle of the reference flow

Life cycle assessment performed with EIME version EIME v5.9.3, database version 2020-12 in compliance with ISO14044.

The Manufacturing phase is impacting on Indicator of Abiotic depletion (ADPe for EN15804), Ozone layer depletion ODP steady state (ODP for EN15804) and Net use of freshwater. The Manufacturing phase & Use phase are impacting equally on the rest of the Indicators.

According to this environmental analysis, proportionality rules may be used to evaluate the impacts of other products of this range.

The extrapolation rules have been defined as follows: the LCA of all products (SM6-24 QM and SM6-24 IM) have been performed. The impacts results have been compared. The extrapolation factors in the table below are the ratio between the two results for each phase and each indicator.

Compulsory indicators		SM6-24 IM - Extrapolation factors (150000 g with Packaging)					
Impact indicators	Unit	Total	Manufacturing	Distribution	Installation	Use	End of Life
Contribution to mineral resources depletion	kg Sb eq	96.9%	97.0%	100.0%	96.6%	31.1%	107.1%
Contribution to the soil and water acidification	kg SO ₂ eq	54.1%	101.0%	100.0%	95.8%	31.1%	106.4%
Contribution to water eutrophication	kg PO ₄ ³⁻ eq	70.0%	100.1%	100.0%	97.9%	31.1%	110.3%
Contribution to global warming	kg CO ₂ eq	60.1%	101.2%	100.0%	99.5%	33.1%	104.4%
Contribution to ozone layer depletion	kg CFC11 eq	89.4%	99.8%	100.0%	99.4%	31.1%	103.9%
Contribution to photochemical oxidation	kg C ₂ H ₄ eq	54.8%	103.8%	100.0%	99.3%	31.1%	106.3%
Resources use	Unit	Total	Manufacturing	Distribution	Installation	Use	End of Life
Net use of freshwater	m3	94.1%	98.0%	100.0%	99.8%	31.1%	110.5%
Total Primary Energy	MJ	60.4%	106.8%	100.0%	93.9%	31.1%	106.2%

Optional indicators		SM6-24 IM - Extrapolation factors					
Impact indicators	Unit	Total	Manufacturing	Distribution	Installation	Use	End of Life
Contribution to fossil resources depletion	MJ	57.2%	100.9%	100.0%	93.4%	31.1%	106.0%
Contribution to air pollution	m ³	57.3%	98.1%	100.0%	99.1%	31.2%	105.2%
Contribution to water pollution	m ³	79.8%	99.3%	100.0%	92.9%	31.1%	119.2%
Resources use	Unit	Total	Manufacturing	Distribution	Installation	Use	End of Life
Use of secondary material	kg	121.5%	121.5%	N/A	N/A	N/A	N/A
Total use of renewable primary energy resources	MJ	37.7%	94.7%	100.0%	99.5%	31.1%	106.2%
Total use of non-renewable primary energy resources	MJ	61.4%	107.0%	100.0%	93.7%	31.1%	106.2%
Use of renewable primary energy excluding renewable primary energy used as raw material	MJ	33.2%	106.8%	100.0%	99.5%	31.1%	106.2%
Use of renewable primary energy resources used as raw material	MJ	90.8%	90.8%	N/A	N/A	N/A	N/A
Use of non renewable primary energy excluding non renewable primary energy used as raw material	MJ	61.2%	107.1%	100.0%	93.7%	31.1%	106.2%
Use of non renewable primary energy resources used as raw material	MJ	99.0%	99.0%	N/A	N/A	N/A	N/A
Use of non renewable secondary fuels	MJ	N/A	N/A	N/A	N/A	N/A	N/A
Use of renewable secondary fuels	MJ	N/A	N/A	N/A	N/A	N/A	N/A
Waste categories	Unit	Total	Manufacturing	Distribution	Installation	Use	End of Life
Hazardous waste disposed	kg	93.5%	95.8%	N/A	99.9%	31.1%	98.1%
Non hazardous waste disposed	kg	34.1%	79.1%	100.0%	99.9%	31.1%	106.4%
Radioactive waste disposed	kg	40.3%	97.6%	100.0%	99.4%	31.1%	105.7%
Other environmental information	Unit	Total	Manufacturing	Distribution	Installation	Use	End of Life
Materials for recycling	kg	114.7%	100.3%	N/A	74.1%	N/A	120.2%
Components for reuse	kg	N/A	N/A	N/A	N/A	N/A	N/A
Materials for energy recovery	kg	168.0%	102.8%	N/A	N/A	N/A	168.0%
Exported Energy	MJ	100.0%	99.9%	N/A	100.0%	N/A	N/A

Please note that the values given above are only valid within the context specified and cannot be used directly to draw up the environmental assessment of an installation.

