

Motor circuit-breakers **TeSys GV2 ME/P**

Product Environmental Profile



Product Environmental Profile - PEP

Product overview

The purpose of TeSys GV2 motor circuit breakers is to control and protect 0.06 à 22 kW motors, with voltages up to 690 V a.c. and a maximum short-circuit breaking capacity of 50kA.

These products include GV2 M thermal-magnetic and GV2 P magnetic circuit breakers.

This document covers the following generic references for the TeSys GV2 range:

■ GV2ME01 to GV2ME32

■ GV2P01 to GV2P32

The representative product used for the analysis was the thermal-magnetic circuit breaker, reference GV2ME08.

This circuit breaker is representative of the environmental impacts of all the other products in the same range for which similar technologies are used.

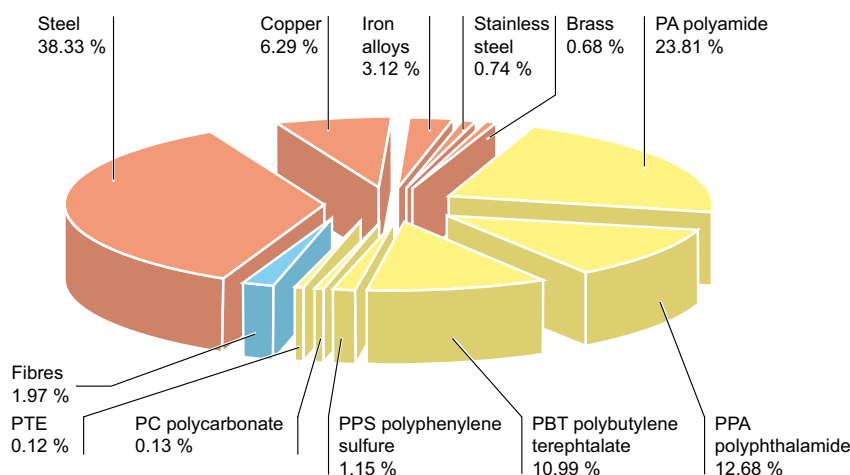
The environmental analysis was performed in conformity with ISO 14040 “Environmental management: Life cycle assessment – Principle and framework”.

This analysis takes the stages in the life cycle of the product into account.

Constituent materials

The mass of the products in the range is from 250 g to 340 g, not including the packaging. It is 250 g for the GV2ME08 analysed.

The constituent materials of this product are distributed as follows:



All possible steps are being taken in our own departments and with suppliers and subcontractors to ensure that the materials used in the composition of the TeSys GV2 range products studied in this document do not contain any substances that are prohibited by current regulations⁽¹⁾ when they are placed on the market.

It does not contain any substance covered by the RoHS directive.

(1) List available on request.

Manufacturing

The TeSys GV2 product range is manufactured at Schneider Electric's production site in Dijon (France) where an ISO 14001 certified environmental management system has been established.

Laser technology is used to mark the products, thus limiting the use of inks.

Distribution

The weight and volume of the packaging have been reduced, in compliance with the European Union's packaging directive, 94/62/EC. The weight of the packing of the GV2ME is 17 g. It is made only of recyclable cardboard.

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

The impact of transporting the products is included in the environmental analysis.

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Utilization

The TeSys GV2 product range does not generate environmental pollution requiring special precautionary measures.

The heat dissipation depends on the conditions under which the product is implemented and operated.

The dissipated power is 7.5 W under the nominal current (Joule effect in the poles and thermomagnetic trip unit). The dissipated energy for a 30 % duty is 2.25Wh per hour.

The referred GV2ME08 power dissipation is much less than one percent of the power of the

motor controlled by this circuit breaker (1.1 kW at 400 V, i.e. 7.5/1100).

Our products are silent and produce no waste material when used.

End of life

At end of life, the TeSys GV2 motor circuit breakers can be either dismantled or crushed to facilitate the recovery of the various constituent materials.

The recycling potential is more than 70 %.

This percentage includes the metallic materials conforming to the RoHS directive and the marked plastics.

Environmental impacts



The EIME (Environmental Impact and Management Explorer) software, version 1.6, and its database, version 5.4, were used for the Life Cycle Assessment (LCA).

The assumed service life of the product is 20 years and its assumed duty ratio is 30 %. The European electrical power model was used.

The analysis focused on the GV2ME08 referenced product from the international catalogue.

The environmental impacts were analysed for the Manufacturing (M) phase, including the processing of raw materials, and for the Distribution (D) and Utilisation (U) phases.

Presentation of product environmental impacts:

Environmental impacts	Unit	For a GV2ME08 motor circuit breaker			
		S = M + D + U	M	D	U
Depletion of natural resources	Y-1	4.76 10 ⁻¹⁵	1.06 10 ⁻¹⁵	2.09 10 ⁻¹⁸	3.70 10 ⁻¹⁵
Energy Depletion	MJ	4.22 10 ³	58.2	1.58	4.16 10 ³
Water depletion	dm ³	5.62 10 ²	20.6	4.92 10 ⁻²	5.41 10 ²
Destruction of the ozone layer	g≈CO ₂	2.64 10 ⁵	3.31 10 ³	1.22 10 ²	2.60 10 ⁵
Atmospheric ozone creation	g≈CFC-11	3.26 10 ⁻²	3.03 10 ⁻⁴	2.61 10 ⁻⁵	3.23 10 ⁻²
Atmospheric ozone creation	g≈C ₂ H ₄	93.7	1.62	1.16 10 ⁻¹	92.0
Air acidification	g≈H ⁺	44.6	4.04 10 ⁻¹	2.53 10 ⁻²	44.2
Hazardous waste production	kg	3.82	7.82 10 ⁻²	1.46 10 ⁻⁵	37.4

This analysis shows that the utilisation phase of the product is the phase that has the greatest impact on the majority of the environmental indicators described above.

The heat dissipation, which is an important parameter, was optimised to reduce these environmental impacts.

The environmental impact values given above are only valid within the context specified.

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System approach

It is important to remember that the product environmental report must take into account the application or installation into which the product is incorporated: the environmental impact values given above are only valid within the context specified.

Glossary

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.

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.

Water Depletion (WD)

This indicator calculates the volume of water consumed, including drinking water and water from industrial sources. It is expressed in dm³.

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 CO₂.

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 (C₂H₄).

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⁺.

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.



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 based on ISO 14020 which relates to the general principles of environmental declarations and the ISO TR 14025 technical report relating to type III environmental declarations.

It was produced according to the instructions in the PEP drafting guide, version 4.

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