

Product Environmental Profile - PEP

Product Overview

The TeSys T product range is a motor management system performing protection, measurement and supervision functions for single-phase and three-phase AC motors at constant speed.

The system consists of:

- a LTMR motor management controller with:
 - built-in current transformers up to 100 A
 - inputs/outputs
 - a communication interface
- a LTME extension module with:
 - additional functions
 - additional inputs.

The product used for the analyse is composed of:

- the motor Management Controller referenced LTMR27PBD covering a current range from 1.35 A to 27 A, and
- the Expansion Module (KE) referenced LTMEV40BD

The environmental impacts of this referenced product are representative of the impacts of the other products of the range which are developed with the same technology.

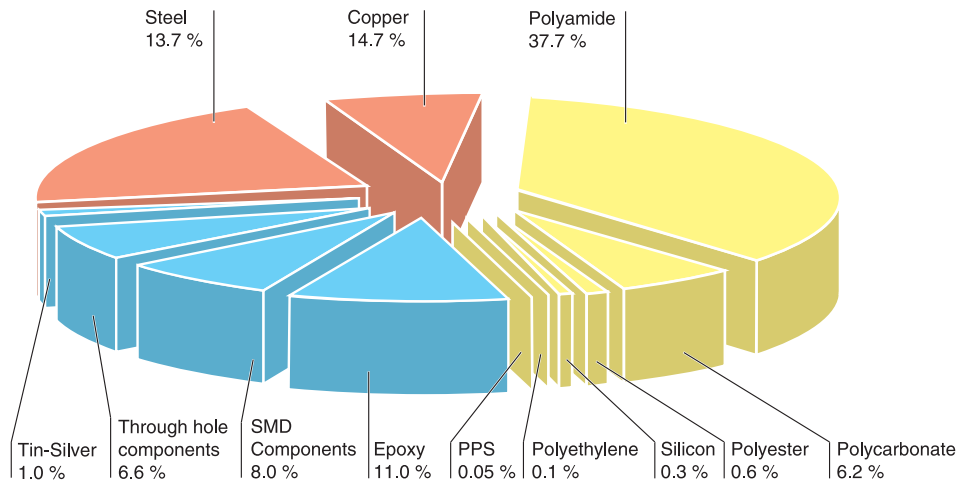
The environmental analysis was performed in conformity with ISO 14040 “Environmental management: Life cycle assessment – Principle and framework”.

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

Constituent materials

The 623 g mass of the analysed TeSys T - 404 g for the Motor Management Controller and 219 g for the Expansion Module is representative of the mass of the range products.

The constituent materials are distributed as follows:



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 (polybromobiphenyles PBB, polybromodiphenylthethers PBDE) as mentioned in the Directive.

Manufacturing

The TeSys T is manufactured at a production site which complies with the regulations governing industrial sites.

Distribution

The weight and volume of the packaging have been reduced, in compliance with the European Union's packaging directive. The total packaging weight of the Motor Management Controller (60 g), the Expansion Module (40 g) and the Instruction Sheets (2 x 20 g) is 140 g. It consists of 63 % of cardboard material and 30 % of paper. The product distribution flows have been optimised by setting up local distribution centres close to the market areas.

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Utilisation

The products of the TeSys T range do not generate environmental pollution requiring special precautionary measures (noise, emissions, and so on).

The 6 W electrical power consumed by the referred product is representative of the maximum power consumption of the TeSys T range.

This consumed power represents less than 1 over 1000 of the total power which passes through this product when controlling a 11 kW motor.

End of life

At end of life, the products of the TeSys T range must be dismantled to facilitate the recovery of the various constituent materials.

The proportion of recyclable material is higher than 90 %. This percentage includes the following materials: metal, marked plastic parts and PCB's which can be dismantled

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 8 years with a utilisation rate of the installation of 70 % and the electrical power model used is the electricity US-Europe model.

The scope of the analysis was limited to:

- the Motor Management Controller referenced LTMR27PBD covering a current range from 1.35 A to 27 A, and
- the Expansion Module referenced LTMEV40BD.

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

Presentation of product environmental impacts

Environmental indicators	Unit	For LTMR27PBD + LTMEV40BD			
		S = M + D + U	M	D	U
Raw Material Depletion	Y-1	2.62 10 ⁻⁹	2.62 10 ⁻⁹	1.58 10 ⁻¹⁶	2.07 10 ⁻¹⁵
Energy consumption	MJ	2.49 10 ³	2.66 10 ²	1.24 10 ²	2.1 10 ³
Water Depletion	dm ³	4.75 10 ²	1.6 10 ²	5.85	3.09 10 ²
Global Warming	g≈CO ₂	1.40 10 ⁵	1.54 10 ⁴	8.98 10 ³	1.15 10 ⁵
Ozone Depletion	g≈CFC-11	1.42 10 ⁻²	2.03 10 ⁻³	2.53 10 ⁻⁴	1.19 10 ⁻²
Photochemical Ozone Creation	g≈C ₂ H ₄	54	6.72	7.64	39.6
Air acidification	g≈H ⁺	21.9	3.03	1.1	17.8
Hazardous waste production	kg	1.8	2.21 10 ⁻¹	2.43 10 ⁻⁴	1.58

The life cycle analysis shows that the Utilisation (U) phase is the life cycle phase which has the greatest impact on the majority of environmental indicators. The environmental parameters of this phase have been optimised at the design stage.

For example, despite much more capabilities in comparison with those of the existing "equivalent" product, the consumption is reduced.

The product also benefits from a mass reduction of 40 % which allows to reduce its impact on environment.

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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.

*N.B.: 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.*

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 (GW)

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 ethylene (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.

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