Product Environmental Profile

Low Voltage Distribution Transformers

15kVA-1000kVA (Copper windings)

Schneider Electric

Product Environmental Profile - PEP

Product overview

The main purpose of the Low Voltage Distribution Transformers is to convert distribution voltage to the application required voltage. Example 480 Delta to 208Y/120.

This range consists of: Energy Efficient Transformers meeting NEMA TP1-2002 Table 4.2, 15kVA to 1000kVA transformers, General Purpose, K-Rated, 150°C, 115°C, or 80°C Rise. Voltage Range of not more than 600 Volts on either the Primary or Secondary.

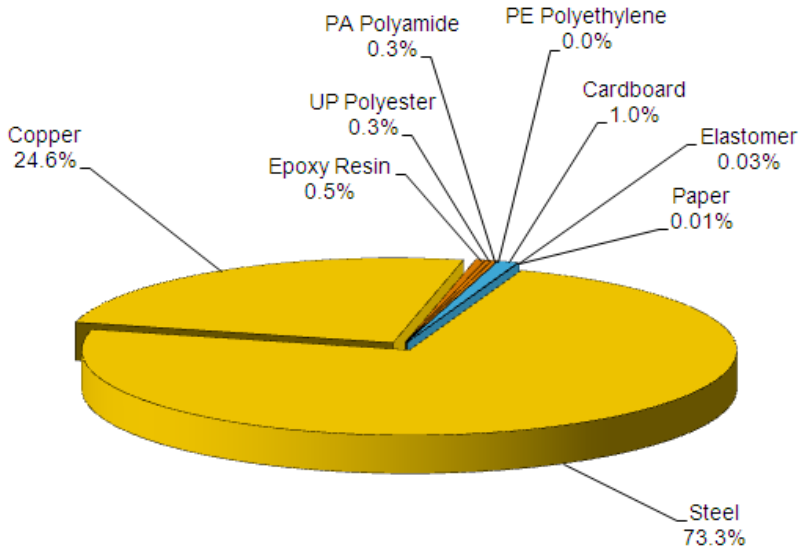
The representative product used for the analysis is the EE75T3HCU, a 75kVA Low Voltage Distribution Transformer utilizing Copper windings with 150°C Temperature Rise.

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.

The environmental analysis was performed in conformity with ISO 14040.

Constituent materials

The mass of the product range is from 245 lbs (111,130 g) to 2,970 lbs (1,347,169 g) including packaging. It is 626 lbs (283,948 g) for the EE75T3HCU. The constituent materials are distributed as follows:



Substance assessment

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 only contain in the authorised proportions, lead, mercury, cadmium, hexavalent chromium or flame retardants (polybrominated biphenyls - PBB, polybrominated diphenyl ethers - PBDE) 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)

Manufacturing

The Low Voltage Distribution Transformer 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 optimized.

The Low Voltage Distribution Transformer packaging weight is 18 lbs (8,164g). It consists of 12 lbs (5,443g) wooden pallet, 6 lbs. (2,750g) cardboard and 0.03 lbs. (16g) paper.

Product Environmental Profile - PEP

Use

The products of the Low Voltage Distribution Transformer range do not generate environmental pollution (noise, emissions) requiring special precautionary measures in standard use.

The dissipated power depends on the conditions under which the product is implemented and used. The dissipated power is between 150 W and 3,900 W at 35% load and 75°C which is the reference point specified in the US Department of Energy's (DOE) 10CFR431 regulation for the Low Voltage Distribution Transformer product range. It is 502 W at the US DOE 35% load and 75°C reference point for the referenced EE75T3HCU Low Voltage Distribution Transformer.

This thermal dissipation represents approximately 2% of the power which passes through the product.

End of life

At end of life, the products in the Low Voltage Distribution Transformer range have been optimized to decrease the amount of waste and allow recovery of the product components and materials.

This product range doesn't need any special end-of-life treatment. According to countries' practices this product can enter the usual end-of-life treatment process.

The recyclability potential of the products has been evaluated using the "ECO DEEE recyclability and recoverability calculation method" (version V1, 20 Sep. 2008 presented to the French Agency for Environment and Energy Management: ADEME).
According to this method, the potential recyclability ratio is: 92%.

As described in the recyclability calculation method this ratio includes only metals and plastics which have proven industrial recycling processes.

Environmental impacts

Life cycle assessment has been performed on the following life cycle phases: Materials and Manufacturing (M), Distribution (D), Installation (I) Use (U), and End of life (E).
Modeling hypothesis and method:
- the calculation was performed on the EE75T3HCU
- product packaging: is included
- installation components: no special components included.
- scenario for the Use phase: this product range is included in the category Energy Passing Product: (assumed service life is 20 years and use scenario is: 35% of the time at an Occupied building load level with 502 W loss and 65% of the time at an Unoccupied building load level with 259 W loss.)
- the geographical representative area for the assessment is United States and the electrical power model used for calculation is American model.

End of life impacts are based on a worst case transport distance to the recycling plant (1000km)

Presentation of the product environmental impacts

Data calculated for product use for a period of 20 years.

Environmental indicators	Unit	For EE75T3HCU					
		S = M + D + I + U + E	M	D	I	U	E
Raw Material Depletion	**Y-1**	$2.64\ 10^{-12}$	$2.02\ 10^{-12}$	$9.37\ 10^{-16}$	0	$6.18\ 10^{-13}$	$3.72\ 10^{-16}$
Energy Depletion	**MJ**	$5.56\ 10^{5}$	$1.14\ 10^{4}$	$6.46\ 10^{2}$	0	$5.44\ 10^{5}$	2.5610^{2}
Water depletion	**dm^3**	$9.03\ 10^{4}$	$1.66\ 10^{4}$	4.76	0	$7.37\ 10^{4}$	1.89
Global Warming	**kg≈CO_2**	$4.27\ 10^{4}$	$8.50\ 10^{2}$	$4.59\ 10^{1}$	0	$4.18\ 10^{4}$	$1.82\ 10^{1}$
Ozone Depletion	**kg≈CFC-11**	$7.95\ 10^{-4}$	$4.01\ 10^{-5}$	$8.69\ 10^{-8}$	0	$7.55\ 10^{-4}$	$3.45\ 10^{-8}$
Air Toxicity	**m^3**	$9.24\ 10^{9}$	$8.09\ 10^{8}$	$1.34\ 10^{7}$	0	$8.41\ 10^{9}$	$5.32\ 10^{+6}$
Photochemical Ozone Creation	**kg≈C_2H_4**	7.74	$1.38\ 10^{-1}$	$1.14\ 10^{-2}$	0	7.59	$4.53\ 10^{-3}$
Air acidification	**kg≈H^+**	7.43	$2.94\ 10^{-1}$	$9.00\ 10^{-3}$	0	7.12	$3.57\ 10^{-3}$
Water Toxicity	**m^3**	$3.39\ 10^{3}$	$2.33\ 10^{2}$	$1.96\ 10^{1}$	0	$3.13\ 10^{3}$	7.78
Water Eutrophication	**kg≈PO_4**	$1.85\ 10^{-1}$	$5.095\ 10^{-2}$	$8.52\ 10^{-5}$	0	$1.33\ 10^{-1}$	$3.38\ 10^{-5}$
Hazardous waste production	**kg**	$9.16\ 10^{2}$	$3.80\ 10^{1}$	$5.67\ 10^{-5}$	0	$8.78\ 10^{2}$	$2.25\ 10^{-5}$

Life cycle assessment has been performed with the EIME software (Environmental Impact and Management Explorer), version 5.1, and with its database version 2013-02.

Product Environmental Profile - PEP

The Use phase is the life cycle phase which has the greatest impact on the majority of environmental indicators.

According to this environmental analysis, proportionality rules may be used to evaluate the impacts of other products of this range: the RMD impact of the products of the family may be proportional extrapolated by the mass of product. The other environmental indicators of the other products in this family may be proportional extrapolated by power dissipation of the product.

System approach

As the products 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 in an assembly or an installation subject to this Directive.
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.

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 dm^3.
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 CO_2.
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.
Air Toxicity (AT)	This indicator represents the air toxicity in a human environment. It takes into account the usually accepted concentrations for several gases in the air and the quantity of gas released over the life cycle. The indication given corresponds to the air volume needed to dilute these gases down to acceptable concentrations.
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 (C_2H_4).
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^+.
Water Toxicity (WT)	This indicator represents the water toxicity. It takes into account the usually accepted concentrations for several substances in water and the quantity of substances released over the life cycle. The indication given corresponds to the water volume needed to dilute these substances down to acceptable concentrations.
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.

PEP achieved with Schneider-Electric TT01 V5 and TT02 V15 procedures in compliance with ISO14040 series standards

PEP established according to PEPecopassport PCR : PEP- PCR-ed 2-EN-2011 12 09 rules

Schneider Electric Industries SAS
35, rue Joseph Monier
CS 30323
F- 92506 Rueil Malmaison Cedex
RCS Nanterre 954 503 439
Capital social 896 313 776 €

www.schneider-electric.com

Published by Schneider Electric

ENVPEP1311011_V1

12-2013