

Environmental Product Declaration PLSES

3-phase induction ODP motors



LEROY-SOMER[™]

Nidec
All for dreams

□ INFORMATION ABOUT THE COMPANY

Leroy-Somer is one of the world leaders in electromechanical and electronic drive systems and the world leader in industrial alternators. A subsidiary of the Nidec Group, Leroy-Somer is a French company with about 7200 employees in 27 production units, including 4850 people in France, and 470 sales and service outlets worldwide. In 2016, the company achieved sales of \$1 Billion.

Leroy-Somer is an international supplier of technologies designed to improve the productivity, quality and efficiency of its customers in numerous industrial sectors. Our products include alternators, motors and drives, devices for electrical distribution and transporting mechanical energy, as well as automated solutions. The main Nidec brands include Control Techniques, Leroy-Somer, US Motors, SSB.

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□ INTRODUCTION

The 2005 European directive established rules relating to the ecodesign of products. This is defined as an essential element in the community's strategy of a preventive approach, which aims to optimise the environmental performance of products while preserving their quality of use.

Leroy-Somer has decided to go further than simply applying the directive, and is implementing more environmentally-friendly processes and manufacturing systems.

□ DESCRIPTION OF THE PLSES 315 LDS PRODUCT

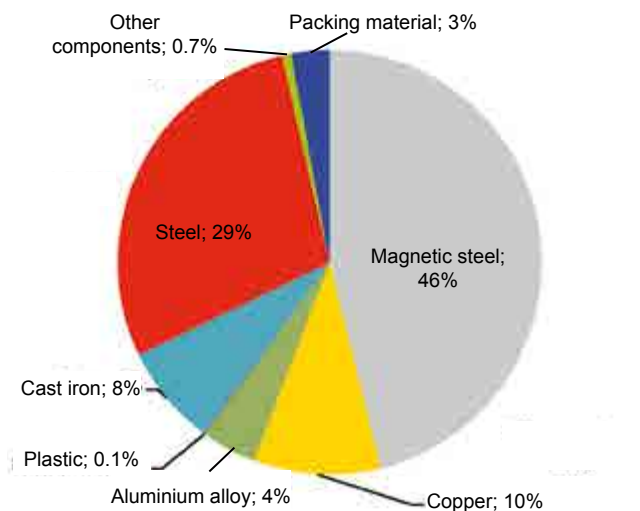
This environmental declaration relates to the IE2 motor PLSES 315 LDS, 250 kW, 4 pole, 400V 50 Hz. The main applications are pumps, fans, compressors (air and refrigeration types), heat exchangers, silos, marine applications, handling, etc.

The motor was chosen as the most representative of the installed base in Europe for powers from 90 up to 900 kW.

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Material	Quantity (kg)	Share of total (%)
Magnetic steel	474.80	46.12%
Copper	99.78	9.69%
Aluminium alloy	43.22	4.20%
Plastic	1.44	0.14%
Cast iron	78.90	7.66%
Steel	294.23	28.58%
Other components	7.23	0.70%
Packing material	30.00	2.91%
Total weight	1029.59	100%



□ LEROY-SOMER'S ENVIRONMENTAL APPROACH

For many years, Leroy-Somer has been committed to a complete environmental approach. On top of ensuring compliance with the various regulations, the company has for a long time made efforts to produce less and less waste and to use the least-polluting components or those that are easiest to recycle.

IE2 motors in the PLSES range are designed and manufactured in accordance with standard IEC 60034-1 and tested in accordance with standard IEC 60034-2-1. They are classified in accordance with standard IEC 60034-30.

Products in the PLSES range are designed and manufactured to conform with the RoHS directive (European Directive 2002/95/EC of 27 January 2003) and the ErP directive (European Directive 2005/32/EC of 06 July 2005 and its revision 2009/125/EC of 21 October 2009 as well as implementing regulation 640/2009 of 22 July 2009).

Leroy-Somer has taken account of the REACH regulation and has set about gathering information from its suppliers to ensure that they too are fulfilling their obligations.

Since 2006, all Leroy-Somer products have been manufactured on sites certified ISO 14001:2004.

□ ENVIRONMENTAL ANALYSIS

This environmental analysis was produced jointly by Leroy Somer and EVEA using E-Dea v3 software. E-Dea is web software based on Simapro 7.3, Ecolvent v2.2.

The methodology used in this declaration conforms to standard IEC/PAS 62545-1 (2008-01).

The information contained in this document complies with the specifications of this standard.

Functional unit:

The environmental analysis functional unit is 1 kW of output power on the shaft.

Scope:

This analysis is conducted over the life cycle, from extraction of the raw materials to their end of life, including the manufacturing processes, all transportation and product use. Materials not included in the model represent less than 0.05% of the total weight of the finished product, including packing materials.

Manufacturing:

The overall cost of the manufacturing processes has been calculated, and the production site consumption has been found for one tonne of manufactured product. The energy mix used is the French energy mix because the motors are manufactured in France.

Benchmark usage scenario:

The calculations are based on annual operation of 4000 hours at rated load and a 15-year service life. The efficiency of the 250 kW motor at 100% load is 95.2%. Of course, efficiency depends on the load, which varies significantly according to the application.

The energy mix used for the usage phase is the European energy mix.

During the product's period of use we recommend that you consult the commissioning and maintenance manual in order to optimise its use.

All transport upstream of suppliers has been taken into account. Upstream transport is an average of all the distribution scenarios worldwide for the motors sold by Leroy-Somer.

□ END OF LIFE

PLSES motors have been designed to reduce the amount of waste produced. To this end, 98% of the components of electric motors can be recycled, although some components need to be separated. For greater objectivity in this modelling, the benefit of recycling and its impacts have not been taken into account where the benefit of recycled material use is allocated to end user. Only end life transportation (30 km) was recorded.

Conversely, the negative impact of end of life of the 2% of non-recyclable materials has been taken into account.

At the end of life, we advise you to contact a salvage company to recycle the various motor components.

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ENVIRONMENTAL IMPACTS

Impact indicators	Motor total	For 1 kWh	Raw materials	Manufacturing process	Transport	Use	End of use
Natural resources depletion (kg Sb eq)	9 930.00	0.1655	0.22%	0.00%	0.01%	99.76%	0.00%
Air acidification potential (kg SO2 eq)	8 640.00	0.1440	0.28%	0.00%	0.01%	99.71%	0.00%
Water eutrophication (kg P eq)	11.60	0.0002	49.85%	0.04%	0.10%	49.89%	0.12%
Global warming potential (t CO2 eq)	1 490.00	0.0249	0.19%	0.00%	0.01%	99.77%	0.03%
Ozone depletion (kg CFC11 eq)	0.08	0.000001	0.24%	0.01%	0.03%	99.72%	0.00%
Photochemical ozone creation (kg NMVOC)	4 690.00	0.0782	0.25%	0.01%	0.02%	99.71%	0.01%
Total water consumption (m3)	160 000.00	2.6724	0.27%	0.00%	0.00%	99.73%	0.00%
Total energy consumption (GJ)	194 000.00	3226.6416	0.02%	0.00%	0.00%	99.97%	0.00%

It should be noted that the environmental impact is much greater during the operational phase than during the manufacturing phase.

CONCLUSION

Comparing the modelling of two generations of motors highlights all the technical and industrial developments achieved by Leroy-Somer to satisfy global markets, which are demanding motors that not only perform better and better, but are also increasingly «green».

Impact indicator	Motor total WZ 14 R 061	Motor total WZ 14217	Difference as a %
Natural resources depletion (kg Sb eq)	9 930.00	10 100.00	-1.7%
Air acidification potential (kg SO2 eq)	8 640.00	8 830.00	-2.2%
Water eutrophication (kg P eq)	11.60	9.98	14.0%
Global warming potential (t CO2 eq)	1 490.00	1 530.00	-2.7%
Ozone depletion (kg CFC11 eq)	0.08	0.08	-2.3%
Photochemical ozone creation (kg NMVOC)	4 690.00	4 790.00	-2.1%
Total water consumption (m3)	160 000.00	164 000.00	-2.5%
Total energy consumption (GJ)	194 000.00	198 000.00	-2.1%

By way of comparison, the saving of 40 T of CO₂, made with the new PLSES motors, is equivalent to CO₂ annual reject of 14 family cars driving yearly 15 000 km each.

■ GLOSSARY

Raw Material Depletion (RMD)

This indicator quantifies the consumption of raw materials during the product life cycle. It is expressed by the fraction of natural resources disappearing each year, related to all the annual reserves of this material.

Global Warming Potential (greenhouse effect) (GWP)

Global warming of the planet is the result of an increase in the greenhouse effect due to absorption of solar radiation reflected off the earth's surface by certain «greenhouse» gases. This effect is quantified in grammes of CO₂ equivalent.

Ozone Depletion (OD)

This indicator represents the contribution to the phenomenon of depletion of the ozone layer due to emissions of certain specific gases. This effect is expressed in grammes of CFC-11 equivalent.

Photochemical Ozone Creation (POC)

This indicator quantifies the contribution to the phenomenon of «smog» (photochemical oxidation of certain ozone-producing gases). This indicator is expressed in grammes of ethylene equivalent (C₂H₄).

Air acidification (AA)

Acid substances present in the atmosphere falls to earth when it rains. A high level of acid rain can lead to forest dieback. The contribution of acidification is calculated by using the acidification potential of substances and is expressed in moles of H⁺ equivalent.

Water Eutrophication (WE)

This indicates what is released as grammes of PO₄³⁻ equivalent - during all the phases of the product life cycle.

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