

Environmental assessment of capacitor aluminum housing



Overview

In this study, the LCA methodology from the ISO14040 standard is used to synchronously evaluate the environmental impact of different AECs in a product family from the manufacturer's perspective. To make the assessment process efficient and convenient for the manufacturers, a parametric LCI model. There are two main goals to conducting the LCA study of the AECs in a product family. The first goal is to quantify the environmental impacts of different AECs among the product family. The production of the AECs has a long industrial chain, including the flow manufacturing processes (anode blank foil fabrication, cathode blank. A series of impact assessments are established and available in the existing LCA software, which transforms the elementary flows into numerical results for several specific environmental impact categories through characterization factors. ReCiPe2016.



Article Content

Comparative Life Cycle Assessment of aluminum electrolytic capacitors

The selection of electrolytic capacitors is mainly based on their reliability. Beside this property, the evaluation of environmental performances of such devices is crucial due to their wide dissemination and utilization of critical raw materials for their production. Starting from the environmental analysis of the stages of selection and supply of raw materials, it is possible to ...

Environmental impact assessment of aluminum electrolytic ...

- A cradle-to-gate life cycle assessment is performed for a capacitor product family. • Fossil depletion, climate change, and terrestrial ecotoxicity are key impact categories. • ...

Capacitor Chemicals Environmental Assessment

A cradle-to-grave life cycle assessment of high-voltage aluminum electrolytic capacitors ... A cradle-to-grave life cycle assessment is performed for high-voltage AECs. • Fossil depletion, climate change, photochemical smog are key impact categories. • Electricity and aluminum ingots are environmental ... learn more

Comparative Life Cycle Assessment of Aluminum Electrolytic Capacitors

The aim of this study is to compare the environmental impact due to the stages of production (from the raw materials supply to the assembly) and end-of-life (recycle or disposal of wastes) of two aluminum electrolytic capacitors, which are characterized by different internal designs but are manufactured by the same producer.

Environmental impact assessment of aluminum electrolytic capacitors ...

Aluminum electrolytic capacitors (AECs) are a type of indispensable electronic components in modern electronic and electrical products. They are designed and manufactured by a series of product specifications to meet the requirements of a variety of application scenarios. Efficient assessment of the potential environmental impact on AECs with different specification ...

Aluminum electrolytic capacitors

Polarity Make sure that polar capacitors are connected with the right polarity. 1 "Basic construction of aluminum electrolytic capacitors" Reverse voltage Voltages of opposite polarity should be prevented by connecting a diode. 3.1.6 "Reverse voltage" Mounting position of screw-terminal capacitors capacitors capacitor. B43647 °

Comparative Life Cycle Assessment of aluminum electrolytic ...

Comparative Life Cycle Assessment of aluminum electrolytic capacitors Chiara Moletti¹, Marco Freschi, Luca Primavesi², Giovanni Dotelli¹ ¹ Department of Chemistry, Materials and Chemical Engineering "Giulio Natta", Politecnico di Milano, Piazza Leonardo da Vinci 32, 20133 Milano, Italy ² Itelcond s.r.l., Via C. R. Darwin 19, 20019 Settimo Milanese (Milano), Italy

Environmental impact assessment of aluminum electrolytic capacitors ...

Abdennadher K, Venet P, Rojat G, Retif JM, Rosset C (2010) A real-time predictive-maintenance system of aluminum electrolytic capacitors used in uninterrupted power supplies.

A cradle-to-grave life cycle assessment of high-voltage aluminum ...

A cradle-to-grave life cycle assessment of high-voltage aluminum electrolytic capacitors in China

Environmental impact assessment of aluminum electrolytic ...

A model of the environmental effect on capacitance stability with temperature and frequency in Polymer Tantalum capacitors is proposed based on electrical characterization of ...

Life cycle assessment and environmental profile evaluations ...

High volumetric efficiency capacitors are found in all smart electronic devices, providing important applications within circuits, including flexible filter options, power storage and sensing, ...

Environmental assessment requirements for capacitor aluminum ...

A decision support tool known as the Supply Chain Environmental Assessment Tool (SCEnAT) developed by Koh et al. integrates both process-LCA and EIO LCA and is employed to ...

Comparative Life Cycle Assessment of Aluminum Electrolytic Capacitors

Capacitors are one of the most common passive components and several types of capacitors are nowadays produced worldwide, like array capacitors (ACs), aluminum electrolytic capacitors (AECs), aluminum organic polymer capacitors (AOPCs), ceramic capacitors (CCs), multilayer ceramic capacitors (MLCCs), tantalum electrolytic capacitors (TECs), and ...

Microstructure and Recrystallization Behavior of Heating Rate ...

After analyzing the background of capacitor aluminum foil, and based on the research status, the primary focus of this paper is to examine how the grain size, microstructure, and recrystallization behavior of aluminum foil are impacted by cold forming, temperature, and heating rate. ... Zhu W., Huang J. Environmental impact assessment of China ...

A cradle-to-grave life cycle assessment of high-voltage aluminum ...

The electricity used (798,545 kWh per 100,000 capacitors) and the raw material aluminum ingots (5130 kg per 100,000 capacitors) are the environmental hotspots for high ...

A cradle-to-grave life cycle assessment of high-voltage aluminum ...

Aluminum electrolytic capacitors (AECs) are widely used in electric circuits with various functions of filtering, power storage, decoupling, and circuit smoothing. High-voltage AECs can meet the requirements of high-voltage circuit applications, but they also aggravate the energy and environmental burden on capacitor production and use.

Environmental impact assessment of aluminum electrolytic ...

The impact assessment method, ReCiPe2016 (midpoint, hierarchist perspective), was used to quantitatively calculate the potential environmental impacts of the AECs. Based on the ...

Comparative Life Cycle Assessment of Aluminum Electrolytic ...

The aim of this study is to compare the environmental impact due to the stages of production (from the raw materials supply to the assembly) and end-of-life (recycle or disposal ...

Life cycle assessment and environmental profile evaluations of high ...

Life cycle assessment and environmental profile evaluations of high volumetric efficiency capacitors. Author links open overlay panel Lucy Smith a, Taofeeq Ibn ... Environmental friendly technology for aluminum electrolytic capacitors recycling from waste printed circuit boards. Journal of Hazardous Materials, Volume 326, 2017, pp. 1-9. Jianbo ...

Comparative Life Cycle Assessment of Aluminum Electrolytic Capacitors

The trends of the GWP indicator resulting for the estimated lifetime of the two products are plotted in Figure 5. EP1,2 is the emission due to the production of the one capacitor of Type 1 and one of Type B at the beginning (t_0) of the estimated service life (t_2); E2 is the climate change due to the operation of Type 2 device, it corresponds to the emissions of the ...

Environmental impact assessment of aluminum electrolytic capacitors ...

Environmental impact assessment of aluminum electrolytic capacitors in a product family from the manufacturer's perspective Purpose. Aluminum electrolytic capacitors (AECs) are a type of indispensable electronic components in modern electronic and electrical products. They are designed and manufactured by a series of product specifications to ...

A cradle-to-grave life cycle assessment of high-voltage aluminum ...

The electricity used (798,545 kWh per 100,000 capacitors) and the raw material aluminum ingots (5130 kg per 100,000 capacitors) are the environmental hotspots for high-voltage AECs' life cycle, which account for 94.1% of fossil consumption, 94.7% of greenhouse gas emission, and 94.9% of photochemical smog. It is of great significance to ...

A cradle-to-grave life cycle assessment of high-voltage aluminum ...

DOI: 10.1016/j.jclepro.2022.133244 Corpus ID: 251239690; A cradle-to-grave life cycle assessment of high-voltage aluminum electrolytic capacitors in China @article{Zhang2022ACL, title={A cradle-to-grave life cycle assessment of high-voltage aluminum electrolytic capacitors in China}, author={Cheng Zhang and Junfeng Jing and Liu Yun and Yurong Zheng and Haihong ...

(PDF) Comparison of Environmental Life Cycle Analysis of Aluminum ...

The environmental impact of the re-manufactured aluminium alloy (LM6) street lamp has been analysed. The results have been compared to the new housing lamp made of aluminium alloy (Al Si12Cu1{Fe}).

Life cycle assessment and environmental profile evaluations of ...

The electricity used (798,545 kWh per 100,000 capacitors) and the raw material aluminum ingots (5130 kg per 100,000 capacitors) are the environmental hotspots for high-voltage AECs' life cycle ...

Aluminum Electrolytic Capacitors

The finish of aluminum electrolytic capacitors is assessed in compliance with TDK Electronics finish specifications. For more detailed specification refer to the "General technical information"

Environmental impact assessment of aluminum ...

The electricity used (798,545 kWh per 100,000 capacitors) and the raw material aluminum ingots (5130 kg per 100,000 capacitors) are the environmental hotspots for high-voltage AECs' life...

Environmental impact assessment of China's primary aluminum ...

Based on life-cycle assessment, the inventory analysis, data collection, and environmental impact assessment for China's aluminum production have been conducted, such as the 2019 LCI survey global ...

Life cycle assessment and environmental profile evaluations of ...

A decision support tool known as the Supply Chain Environmental Assessment Tool (SCEnAT) developed by Koh et al. integrates both process-LCA and EIO LCA and is employed to compute the environmental profile of the capacitors under consideration. The framework of the tool is based on five steps namely: supply chain mapping, carbon ...

A comparative LCA study on aluminum electrolytic capacitors: ...

Four categories of capacitor products with different dielectrics dominate the capacitor market: ceramic capacitors, aluminum electrolytic capacitors (AECs), film capacitors, and tantalum capacitors (Industry Information Network, 2020). Among them, AECs, with the characteristics of large capacitance and low cost, occupy more than 30% of the ...

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For more information, pricing, or custom solutions, please contact us:

Website: <https://www.creperielamauvaisegraine.fr>

Email: sales@creperielamauvaisegraine.fr

Phone: +33 6 48 37 91 02

Address: 12 Rue de la Paix, 75002 Paris, France

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