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EPOXY EUROPE

NEWSLETTER

EUROPEAN MOBILITY AND THE EU GREEN DEAL

Epoxy based material solutions enabling next generation e-mobility



Epoxy based Externally Excited Synchronous Motors (EESM) are an alternative to motors relying on difficult to source raw materials (rare earths).

The arrival of Electric Vehicles (EVs) has brought with it an array of lifecycle analyses estimating CO₂ emissions of battery and charging as compared to conventional cars. A comprehensive and up-to-date analysis^{1,2} indicates that, in the worse-case scenario, EVs would achieve a 20% CO₂ emission

reduction as compared to their diesel / gasoline counterparts, while in the best-case scenario this reduction would amount to 80%. Within such a context, the epoxy-based materials solutions of the present innovation program enable exceptionally performing, reliable, high voltage and high-power density motors.

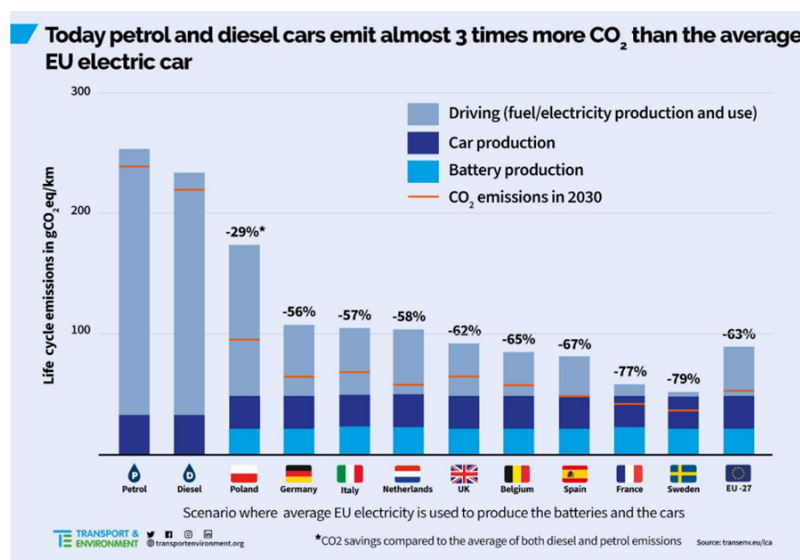


Fig. 1 Life cycle emission assessment of electric cars vs conventional counterparts in EU.¹

While reducing both CO₂ and NO_x emissions is a key driver for the governments to promote Electric Vehicles across Europe, there are also other considerations to take into account within the e-mobility context, such as the sustainability of raw material supplies (see Fig. 1). As a dominant technology, currently the highest power density motors are based on a permanent magnet that requires rare-earth metals (e.g., neodymium and dysprosium) as raw materials. In February 2022, the EU Commission identified a list of raw materials (such as rare earths) in the most sensitive economic areas ("ecosystems") where the EU can be considered highly dependent on imports from third countries.³ Further, mining and refinement of rare earths is expected to have a negative environmental impact. Consequently, vehicle manufacturers are showing increasing interest in magnet-less Externally Excited Synchronous Motors (EESM). This innovative concept would eliminate the dependencies of raw materials while

ensuring sustainability. In this regard, potting technology can enable mechanical fixation of rotor windings allowing for a higher integration density and higher rotor speed realised by induction to ultimately increase power density of the EESM. Moreover, heat conductivity of the filled epoxy based potting material in addition to its crack resistance can substantially prolong the motor lifetime reducing therefore waste and cost due to repair and replacement.

As consumer demand and environmental regulations drive more widespread adoption of electrical vehicles, manufacturers around the world are investing in development of advanced electric motors with higher voltage and power density. This is however technically challenged by the risk of electrical losses in operation that limits motor's reliability and lifetime. The innovative electrical insulating material solutions developed by some of the Epoxy Europe's members enable the production of reliable, efficient, high power density motors.

The recently developed materials consist of the following groups of epoxy-based materials according to their application in the electric motor and manufacturing process: **Rotor potting, Stator potting** and **Impregnation system**.

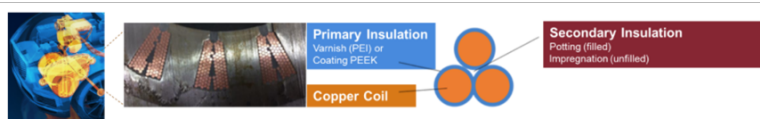


Fig. 2 (a) Schematic representation of insulating materials in the electric powertrain, (b) illustration of different product types. [E-Motor: Stator Encapsulation | Huntsman Transportation \(huntsman-transportation.com\)](https://www.huntsman-transportation.com)

REFERENCES:

1. How clean are electric cars? T&E's analysis of electric car lifecycle CO₂ emissions. (2020).

<https://www.transportenvironment.org/wp->

content/uploads/2020/04/TEs-EV-life-cycle-analysis-LCA.pdf

2. Hoekstra, A. (n.d.). *Comparing the lifetime greenhouse gas emissions of electric cars with the emissions of cars using gasoline or diesel*. Retrieved November 7, 2021, from https://www.aveve.org/wp-content/uploads/2020/09/englisch_Studie-EAuto-versus-Verbrenner_CO2.pdf

3. (2022). Europa.eu.
<https://ec.europa.eu/docsroom/documents/48878>

EPOXIES IN HOUSEHOLD APPLICATIONS.

HOME IS WHERE EPOXIES ARE!



Home is where the heart is. But did you know your home is where epoxies are? Many modern conveniences that we take for granted in our everyday lives wouldn't have been possible without epoxies.

Epoxy powder coatings are extensively used in household appliances like refrigerators, washing machines and tumble dryers to protect them from abrasion and potential damage from impact. Epoxies

shield appliances against harsh chemicals and detergents used for cleaning purposes extending their shelf life and keeping them looking new for a long period of time. They also play a key role in safeguarding appliances from food acids and water sewage, protecting them from corrosion and reducing their wear and tear. This is made possible thanks to epoxy's ability to form a three-dimensional network with pigments and additives of the appliances.

But that's not all! Epoxies coatings are one of the most cost-effective ways of protecting water pipes and tanks from damage and corrosion. Epoxy resins' chlorine and microbe resistant properties make them ideal for use in drinking water pipes. They are also a popular flooring solution as they are easy to install and do not require waste intensive custom cutting. Epoxy floors are also more durable and need to be replaced less frequently. They also make for a safer flooring solution as thanks to their anti-slip texture epoxy floors minimises chances of slip and fall accidents.

Epoxies are a smart building material choice too. Due to their thermal insulation properties, they help reduce the carbon offset of buildings. Construction products like composite polymers made with epoxy resins are more energy efficient and offer thermal insulation, reducing movement of heat and vapour in concrete and thus, deformation humidity and mould.

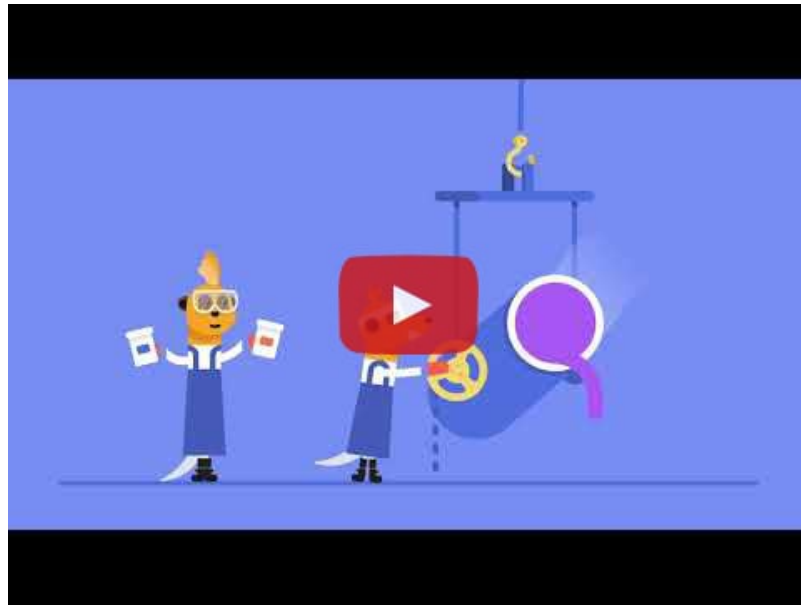
Learn more about applications of epoxies in households.

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SAFE HANDLING OF EPOXIES

Epoxies are used in a variety of applications but they must be treated before use. Following safety guidelines is important for ensuring safe and smooth handling of epoxies.

Epoxy Europe illustrates the necessary steps to ensure safe handling of epoxy resins with this fun tutorial. Check it out!



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