

PRESS RELEASE

EEC presents at 2016 Energy Conversion Congress and Expo (ECCE)

Landisville, PA (September 27, 2016) – On Sept 22, 2016, Dr. Melania Jasinski, Manager of Process Engineering, participated in a special session of IEEE- Energy Conversion Congress and Expo held in Milwaukee, WI. The special session Moving Forward the Electrical Machines – The Industrial Approach (<http://www.ieee-ecce.org/2016/conference/special-sessions/>) had two parts and included talks from industry experts on various aspects and approaches in developing, prototyping and moving into mass production of brushless permanent magnet machines (BPM) as well as of the well-established induction motors. The challenges in automotive, aviation and other industries, in building large BPM machines, the selection criteria of the permanent magnet materials, industrial production of these electrical machines, were illustrated in this special session. Dr. Jasinski's presentation was *Rare Earth Based Permanent Magnets for Electric Machines: Material Selection, Failure Risks and Design Considerations*.

Rare Earth Based Permanent Magnets for Electric Machines: Material Selection, Failure Risks and Design Considerations

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Abstract: Once a magnetic circuit is designed and the required magnetic hysteresis parameters formulated, the first important step is choosing the right permanent magnet grade(s). The material selection needs to be done taking into consideration all characteristics of the application environment such as temperature variation, corrosion-related risks, dimensions and tolerances. Thus, issues related to the magnets' thermal stability, coefficient of thermal expansion, coating quality and thickness, overall dimensional tolerance, may return the design engineers to the drawing board to possibly revise the requirements for the magnetic properties. Even the size of the magnets, in particular if very small, and surface quality achieved after aggressive machining, may lower the magnetic properties below those reported in the catalogue curves for larger size test samples. A less than optimal material selection will result in a more expensive machine construction and operation, e.g. complicated power electronics, sophisticated thermal management, limited choices for the mechanical containment, magnet segmentation to address the eddy current losses, etc. In this presentation we will discuss a series of examples of good and less-optimal choices of Nd-Fe-B and Sm-Co permanent magnet grades in electric machine applications, along with the associated cost variation and failure risks.



Specialists in Rare Earth Magnets and Magnet Systems

Dr. Jasinski (Manager of Process Engineering, EEC) and Dr. Hao Huang (Technology Chief - Electrical Power, GE Aviation) at the Special Session "Moving Forward the Electrical Machines – The Industrial Approach", IEEE- ECCE, Milwaukee, September 18-22, 2016.

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