
Efficient thermal management of a vehicle – a bonded neo approach

There are many macro-trends which impact the design priorities of automotive OEM's and their respective suppliers. One such trend, of course, is the importance placed on optimizing a vehicle's environmental performance whether that is measured by increased fuel efficiency of internal combustion engine (ICE) and hybrid-electric vehicles (HEV) or by extension of battery life in electric vehicles (EV).

Managing temperatures generated by combustion and electrical components in a vehicle is one way to address this trend. As an example, studies have shown that if temperatures can be managed effectively, OEM's can save approximately 3% of fuel consumption in an internal combustion engine vehicle.

Bonded neo magnetic materials lend themselves to various applications in automotive thermal management systems, and Magnequench has worked with several companies on these solutions generally.

For powertrains that include an internal combustion engine, bonded neo (MQ1™) magnets are often utilized in active grill shutter actuators. The superior magnetic properties of bonded neo magnets allow for smaller actuators, which provides additional options when mounting the actuator onto the grill.

Additionally, bonded neo is employed in electric cooling pumps not only for ICE but also for HEV's and EV's. Compared with sintered neo magnets, MQ1™ magnets do not contain heavy rare earth elements or cobalt, which both have relatively volatile prices.

Moreover, near net shape manufacturing of a MQ1™ magnet results in an improved effective material use because of inherently lower scrap rates. This is beneficial not only for cost control but also for environmental considerations. Finally, with isotropic bonded neo magnets, cooling pumps with brushless DC motors can be designed with a higher

number of magnetic poles (>4) on the magnet and with tailored magnetization profiles which enable lower body noise and vibration.

These various advantages are best leveraged by taking them into consideration at the earliest design concept phases. As we work with companies throughout these supply chains, our technical teams are able to hasten the time to market for optimized applications. Our materials science teams can identify the best performing, lowest cost magnetic materials and then quickly relay the magnetic material characteristics to our motor design experts, who then optimize the magnet designs and magnetization profiles for the applications.

Ultimately, these efforts play a key part in helping reduce fuel consumption and improve battery life.

Please let us know how we can support you in your design and magnetic needs.

About Us:

Magnequench is the industry leader in bonded neo magnetic powders, magnets and their application.

Please visit our website:

www.magnequench.com

Please contact us:

sales@magnequench.com