

These gaskets can handle the heat

DRIVING FORCE

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Technology very seldom comes with simple solutions.

Automakers are continu-

ally working to reduce emissions and make vehicles more fuel-efficient, but it comes at a cost.

These improved combustion systems generate more heat than many traditional exhaust gaskets can handle.

"As these temperatures grow, the traditional materials simply don't work," says Jim Zwick, global direc-

tor of technology for automotive supplier Federal-Mogul.

"This results in massive exhaust leaks."

Expanded graphite gaskets burn up in these higher temperatures, Zwick says, while stainless steel gaskets lose their strength and don't seal tightly.

In extreme cases, the

weakened steel gasket can even eventually crack under the strain.

The solution is high temperature alloy (HTA) materials, made of different types of metals and chemical compositions that are less likely to be affected by the heat.

These materials can still do their job when tempera-

tures reach as high as 1,000 degrees Celsius — more than twice what most conventional gasket material can tolerate.

Federal-Mogul also produces high temperature coatings, and in some applications, the HTA gasket is taken a step further with an additional coat of this material.

"The coating gives the ability to micro-seal, which is important for emissions legislation," Zwick says. "Where there is a joint, the two edges will seal better, to a zero leakage rate potential."

HTA technology was initially used in heavy-duty diesel engines, which were subject to increasingly strict emissions legislation.

Improvements to the emission control systems to meet these standards resulted in more complex structures and an increased number of joints where the components fit together.

Since every joint has the potential to leak, especially as the vehicle gets older and vehicle movement takes its toll, HTA gaskets

Talking gaskets

Automobiles contain hundreds of gaskets, in just about any place where two surfaces meet and liquid or gas could possibly leak out, since it's almost impossible to perfectly machine the metal surfaces to fit tightly enough.

and coatings were used to help solve the problem.

HTA technology is now playing an increasing role in everyday consumer vehicles, since many automakers are now using turbochargers to coax more power out of smaller, more fuel-efficient engines.

These create a more complex system with more joints, as well as extra exhaust heat inherent to turbocharged systems.

"In many applications, the exhaust flange temperatures are almost twice as hot as they were before," Zwick says.

"This coating technology minimizes the ability for the gasket to fail."

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