Chemical Gasketing Update

FLANGE SEALING: SILICONE

In 1908, when Henry Ford changed the one piece block to a combination of a head and block, only one question needed to be answered. How do you seal the two pieces? The industry is still trying to answer this same question.

Of course, today we are concerned with sealing many more components, and in many cases, we are sealing dissimilar metals together, such as aluminum and cast iron.

Gasketing takes three forms: hard, such as head gaskets; soft, such as paper; and chemical, such as RTV silicones and anaerobics.

Virtually 100 percent of all cars produced use anaerobic (chemicals that cure in the absence of air) gasketing. Anaerobics are used primarily on machined surfaces. When cured, this gasket is invisible and some mechanics might assume that a gasket wasn't used. If you suspect an anaerobic gasket was used, simply scrape the flange. If an anaerobic is present, a powder will appear. Use an anaerobic to re-gasket this area.

Use of RTV silicones (liquid rubber that cures with atmospheric moisture) is approaching 40%, and has been in use since the early '70s. RTVs are usually found on stamped metal flanges such as valve covers or oil pans.

OE manufacturers, both foreign and domestic, have chosen chemical gasketing due to its ease of application and relative design flexibility. This is the one-size-fits-all philosophy.

There have been many technological changes in RTVs over the last few years. These changes were necessary to allow the gasket to work effectively on the advanced computer controlled engines.

The first change was to a low-volatile formula which reduced the amount of volatile silicas. Volatile silicas can clog engine sensors and cause the computer to richen the fuel mixture. Secondly, the temperature range was increased to meet the demands of the hotter-running four cylinder engines. Finally, the adhesion was improved to ensure a leak-free seal. This has a side benefit for the aftermarket users in that some manufacturers of RTVs have guaranteed their product not to leak.

Today there are only a handful of areas where chemical gasketing can't be used, for example, gaskets continuously exposed to gasoline or places where temperatures exceed 700 degrees F for extended periods. Technology of chemical gasketing is still in its infancy. It's only a matter of time before these barriers are broken.

More importantly though, are the engine design changes that are currently being developed. There are foreign and domestic engine manufacturers that are testing plastic composite design engines. These design changes could lead to a new breed of chemical sealing. A single zerk fitting, into which you could insert a sealing chemical that would seal the entire engine, is technically possible. Pre-applied, oil- or water-activated component seals are another possibility.

Chemical sealing is an inherent part of your future. Imagine an entire gasket inventory consisting of one or two tubes of sealer! This is a very real possibility and chemical sealing rests on the cutting edge of technology.

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