

# The real cost of a rail application gasket or seal is not just its price!

It certainly is an understatement to say that the design, development, and eventual tender and sale of passenger rail cars ranks among the most cost competitive products in the world, says Ken Kozicki of the Rogers Corporation

Designers, engineers and supply chain managers are under extreme pressure to deliver high-quality, high-performing, and very long-lasting products to the market. Meeting cost budgets is made possible by ingenuity, technology, and strategic manufacturing and marketing.

As with any purchasing decision, the price of any one rail car component or module has a cost-value relationship. And more often than not, there is a significant amount of emphasis and evaluation placed upon the selection of the materials used within the more prominent features of the interiors.

This includes composite materials for side wall and ceiling liners, seat cushion foams and upholstery, and flooring structures, to name a few.

In addition, specialty materials are also specified in combination with highly sophisticated HVAC and control system hardware.

Buyers and sellers will negotiate the integrity and different levels of performance among the choices (and prices) available – balancing budget with cost and value.

However, what is frequently ignored is the hidden value and importance of the multitude of



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gaskets and seals that protect, preserve and actually integrate the various interior systems and modules together.

While one of the main functions of a gasket or seal is to keep moisture or water from leaking into an undesired place, there are also many other considerations that should go into gasket selection. A great deal of engineering effort is spent determining vibration isolation and damping, acoustic blocking and absorption, as well as contribution to EMI/RFI protection and conformance to flame, smoke and toxicity requirements.

The cost of a gasket is driven mainly by the selection of the material that will be used for fabrication. And being that

the full range of a gasket's importance is often unknown, the materials for gaskets have occasionally been identified as a potential cost-cutting initiative. This is where one must fully appreciate that the cost of a gasket is much more than its price. Depending on its application, a specific sealing strip could be the main vibration isolator between two expensive wall panels. Should the sealing strip be fabricated from a less expensive material, it will most likely have a shorter life.

The life of a strip or gasket is determined by many characteristics. One is its ability to not take a "compression set," to experience a permanent decrease in thickness over time. Another is its "degradation of force deflection" over time,

which relates to a material's resultant force when in compression. In this example, a decline in the vibration isolation performance capabilities could allow for the wall panels to fatigue at a much quicker rate than design intent. This could result in many scenarios such as a noisier and more uncomfortable ride, displeasing passengers – or potentially opening up the need to replace failing wall panels earlier than according to the MRO budget.

There are other and more critical examples, such as the protection of controls equipment in each car of an EMU train or the requirement to meet a BS 6853 Category 1a or NFF 16-101 M1F1 FST standard. In any of these hypothetical situations, the cost of the seal or gasket can be extrapolated into multiples of the price.

Today, there are countless train builds that have embraced the need for high-performing, long-life materials for seal and gasket design. Solutions designed from silicone materials are either in final design or in service with many high-profile projects, including the many CHR (China 380 km high speed rail) projects, the Sydney, Australia PPP project, as well as leading designs throughout Europe.

BISCO Silicones from Rogers Corporation, which offer a portfolio of materials specific to the rail industry, offer application-specific solutions to meet all objectives, and can assist in determining the full cost impact that a poorly designed gasket or specified material could have.