

Why Leather

There are compelling reasons why the leather seal has hung around in its present form since the 1930s.

by
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The very first hub seal for trucks was a hat-shaped leather ring crimped into a steel assembly. Those were the years of The Great Depression, *The Great Gatsby*, the Dust Bowl and wheels with wooden spokes. You've seen them on TV's *Walton's Mountain*.



When synthetic rubber came into use at the end of the decade, engineers incorporated hat-shaped rubber rings into a clamped assembly. In time, synthetic rubber seals evolved into the bonded, elastomeric technology we term "modern". These worked well on Route 66, and, with improvements, they continue to deliver acceptable performance on the interstate, and wherever roads are paved and the climate is temperate.

In the Yukon and points north, where temperatures routinely drop below -50°F and ice is a structural material, elastomeric seals can shatter like glass at the first turn of the wheel. In the Amazon jungle, in the Siberian summer tundra and on the lumber trails of the far Northwestern US and Canada, where axle-deep mud is the norm, rubber and Teflon seals dissolve just hours before the wheels fall off. Leather still shines in applications that demand tolerance for extreme cold and gritty contamination.

The material we call leather, for which no high-tech substitute currently exists, is mechanical grade cattle hide impregnated with a polysulfide elastomer, sometimes called Thiokol, a trade name. The details of this process are a closely guarded secret. The result is a sealing material that remains flexible to -65°F, is compatible with all wheel end lubricants, absorbs particulate contaminants like a sponge and tolerates rough running surfaces without excessive wear or static leakage.

Leather does have limitations, however. Like Teflon, leather is pricey. It generates more heat than conventional rubber seals. That is why designs usually include a tight fit between sealing ring and the axle, for a generous heat sink. Most importantly, leather has a sustained working temperature limit of only 190°F for maximum life. That is a major stumbling block in high-speed over-the-road applications on newer vehicles, many of which include high power density drive lines and aerodynamic fairings that rob axles of cooling flow. (By the way, Triseal does offer a complete line of elastomeric hub oil seals specifically designed for such high-speed cross-country use.)

When "flexible neutronium", or some such *Star Trek* thing makes its appearance on the heavy-duty stage, leather seals will probably, finally, make their exit. We hope it's soon. We intend to be first. Until then, taking care of business for the trucking industry means being there with the only material that does the job in vocations that freeze, sweat and get dirty. Leather.