Background

Proprietary Ownership
Tafcan Consulting Ltd.

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Zafety Lug Lock® is a Registered Trademark and Patent Pending of Tafcan Consulting Limited

Product Development
Zafety Lug Lock® was designed, developed and is manufactured exclusively in North America
Design engineered plastic formulated to withstand extreme changes in temperature. The standard formulation is designed to withstand continuous operating temperatures from -40 degrees Centigrade (-40°F) to +100 degrees Centigrade (+212°F) with transient temperature spikes up to +120 degrees Centigrade (+248°F) giving it a total transient operating temperature range of 140 degrees Centigrade or 252 degrees Fahrenheit.
The high temperature formulation is designed to withstand continuous operating temperatures from -40 degrees Centigrade (-40°F) to +160 degrees Centigrade (+320°F) with transient temperature spikes up to +232 degrees Centigrade (+450°F) giving it a total transient operating temperature range of 200 degrees Centigrade or 360 degrees Fahrenheit.

This product has been in a continuous phase of development for the last 3 years. The goal was to develop a unit that would lock the lug nuts and that would be superior to anything on the market today. The initial criteria are listed below and the product meets all of these specifications.

A product that had sufficient strength to be installed on a lug nut and sufficient elastic retention to keep it in place under the tremendous Centrifugal forces that it would be subjected to on a spinning wheel rim.

The product had to retain its strength and elasticity at temperatures of -40 degrees Centigrade (-40°F).

The product had to be fully functional at transient temperatures as high as +120 degrees Centigrade (+248°F).

The product had to retain its physical characteristics including color, properties and surface texture for at least 5 years.

The product had to be reusable. The goal was to make the product so it could be installed it up to 10 times without causing damage to the product.

The product had to install manually with someone's fingertips to ensure secondary tooling would not be required.

The product had to have sufficient rigidity and tensile strength to prevent a lug nut from turning within it once it was installed.

The product needed to be inert or resistant to the chemicals it might be exposed to in use and these included.

Road salt Hydraulic fluid, Locktite, Liquid calcium chloride, Transmission fluid ,Diesel fuel Windshield washer, alcohols ,Radiator fluid ,Gasoline, Iron oxides, Ethanol alcohol.

Working with a design and SLA manufacturer it took six (6) iterations of material mixes to develop the correct retention, flexural modulus and diameters required to meet the retention requirements for the standard product. A prototype mold was built to experiment with a range of actual production materials; i.e. a production material that would mimic the thermoset urethane results experienced with the SLA's. More than 18 different engineering resins were tested along with mixes of these different products. The final product is blended with products from three different companies to get the exact set of properties required (no supplier could meet all of the criteria within one of their products). The final product has taken the best characteristics of the three to make a proprietary blend of a specialty engineering resin. Nothing similar to this can be purchased from any resin company. As the need for high temperature units was identified, for very specific applications in the field (vehicles requiring frequent stops – generating high temperatures in the wheel hubs), a second engineered plastic mix

was developed to meet the operating temperature requirements of -40 degrees Centigrade (-40°C) to +160 degrees Centigrade (+320°F) with transient temperature spikes up to +232 degrees Centigrade (+450°F).
Each of the raw materials used has a long history of specialty applications in the field, typically in the automotive industry.
The final results were two extremely durable product types that probably will last for at least a decade in normal usage. It is exceptionally elastic and can be removed and reinstalled multiple times. The standard part can operate in continuous temperatures ranging from -40 degrees to +100 degrees Centigrade with transient temperature spikes up to +120 degrees Centigrade, and the high temperature part can operate in continuous temperatures ranging from -40 degrees to +160 degrees Centigrade with transient temperature spikes up to as +232 degrees Centigrade while retaining their physical properties.

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