Dear Members,

Did you know that formaldehyde helps to make your life safer every day? This month we will look at a small application with a big benefit for society: the safety belts system. It is well acknowledged that the single most important safety feature in all modern cars remains our safety belt. Although its principle is simple, the system contains a highly complex engineering mechanism, which relies heavily on polyacetal, an engineering thermoplastic resin made of formaldehyde. This newsletter explains the concrete benefits of polyacetal resins in this safety application.

A bridge between metal and plastics

Since their commercial introduction in the late 1950’s, polyacetal resins have been used in a multitude of applications ranging from medical devices to automotive parts. Because of their reduced weight, robustness and affordability, polyacetal resins have replaced many metal parts in cars. Their unique physical properties deliver the highest strength and greatest long-term wear resistance among all unfilled polymer materials, as well excellent thermal stability and low friction properties. Finally, because of their high dimensional stability, polyacetal resins can be moulded to produce high precision, complex parts.

An important contributor to our safety

Perhaps the most visible application of polyacetal in car seat belts is in the iconic red release button.

However, the heart of the system is the retractor mechanism. When the very first 3-point safety belt systems were introduced in the late 1950’s, the ratchet wheel of the retractor mechanism was made of metal, making for noisy operation. However, the exceptionally good low friction properties of polyacetal resins offered an early opportunity to substitute metal, eliminating the rattling sounds and unnecessary noise, as well as giving obvious light-weighting advantages.
When it comes to road safety, reliability is the key word. Even at very low speeds, the stress on the mechanism is huge, particularly in case of frontal impact. Today, polyacetal resins are the only polymers that can resist the repeated impact tests, under extreme temperature conditions, required by vehicle specifications.

**Concrete societal benefits**

While quantifying benefits is always difficult, in this case the statistics are straightforward. The European Transport Safety Council (ETSC) estimates that the 3-point safety belt has prevented one million deaths globally since its introduction in 1959 by Volvo. It is good to know that formaldehyde-based resins contribute in such an important way to this success story.

**Phil Hope**  
**Secretary General**