

In today's global world, one of the most important aspect for the companies is to deliver goods or services within required quality. Especially for the automotive industry manufacturers it is more than only quality but also crucial to comply with the standards which are guideline for those. Autoliv is already in leading position within the market but in order to keep that competitiveness, even for that kind of big manufacturers, the key for the success on that is to look for continuous improvement. Changes and improvements are always painful process. Once it is done, not only the production but also all other departments like logistics, planning, sales, research and development would benefit from this change. To sustain the business of the company, changes which benefit technical and financial wise, are crucial.

The aim of this thesis is to find more effective, efficient and sustainable substitute plastic raw material for the seat belt component so called crash locking tongues by testing and analyzing possible convenient alternative materials. In order to meet with the automotive industry standards and quality requirements, companies have to use right material. The company has encountered with few obstacles that keep them away to continue using existing serial material Ultramid 8253HS due to restricted substances as well as existing material being expensive and not efficient according to some test results in the past and during analysis for this thesis.

Plastic material impact to automotive industry is quite noticeable. While choosing alternative possible materials, company has to be careful in terms of chemical composition as well as cost of the grades since the it will have big effect on the future business and savings. Seven different materials PA6 have been chosen to be tested and for analysis, they all have been tested according to design authority determined tests which comply with different customer related specifications as well as automotive industry requirements. Testing processes can be split into two sections as first and second screening phase.

Based on the first screening results all grades have passed all tests except thermal shock test and this test has been identified as determinative point for second screening phase. Only Ultramid B3L and Akulon F223-D grades have passed this test. After the second screening testing, it was still not clear which material to prefer. Therefore, special thermal test has been created and performed. The goal with this test is to define the environmental breaking point. The grade which broke first Akulon F223-D has been excluded. It is important for the plastic to be durable for climatic variations. Based on the results given and according to improved test method as well as overall comparison, Ultramid B3L would be best choice as substitute material for the company.