

Improved Haptics leading to Painting Elimination

By Tata AutoComp Systems | Category: Implemented Innovations

Improved Haptics was achieved in existing tool to match customer styling requirements. This involved introduction of short glass fiber - Polypropylene as a replacement to engineering plastic grade and exhibit low gloss in granite black. This led to elimination of paint in Tiago Nacelle Upper and Lower and significant cost reduction. Selection and development of material grade from aesthetic and functionality requirement was critical for project success. Virtual analyses like fill flow and CAE was done followed by physical validation at sub system level, and then vehicle level. First time Global Implementation of the grade was achieved.



The Context



The Nacelle cover was made of engineering plastic which served functional requirements, but not aesthetic requirements



Painting was introduced as a secondary process solution to achieve aesthetic requirements like gloss levels and uniform look in vehicle interiors

Substantial process and financial costs, which triggered a need to look for a better material and a single process point solution.



The Innovation

Enhanced haptics was achieved in the existing system to match customer styling requirements without secondary processes. This involved introduction of a novel, soft touch material - Polypropylene as a replacement to engineering plastic material. The secondary process of painting was eliminated as a result, which led to significant cost reduction. Selection and development of material grade was critical for the project's success from the aesthetic and functional perspectives. Modifications were made in the tool and feed system, based on insights from numerical simulation. Validation at sub system and vehicle levels were thus achieved. This is the first time that a global implementation of this material grade was successfully executed through a cross functional team from TML and TACO. The innovation has been implemented in the Nacelle Assembly of Tata Tiago and Tigor.



Overcoming Challenges

Challenge #1

Retention of aesthetic properties, while eliminating painting process. By introducing short glass fiber-filled PP in place of engineering plastics, the part cost of painting was eliminated completely. This resulted in introducing this material as a global change for the first time.

Challenge #2

Selection of specific material to suit existing tool requirement was a major hurdle. Sub assembly level tests like heat ageing, environmental test, serviceability, weathering, raw material, etc were conducted before the material was chosen and certified as suitable.

Challenge #3

Vehicle fitment trials were undertaken and engineering tolerances were defined. Multiple tool trials and suitable gate modifications were completed. Part texture replication and gloss levels were closely monitored and achieved through injection molding and tool temperature control processes.

Impact
of the
Innovation

cost saved per vehicle

₹444

cost saved annually

₹50 mn