A Development of Pre-verification Process for Interior Parts BSR

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BSR issues are a big part of customer field claims in interior parts, and are continuously raised in IQS/VDS, which is a quality index that affects customer vehicle purchases. Therefore, BSR improvement is highlighted as an important task. Particularly, as noise reduction technology of existing gasoline/diesel vehicles is improved and eco-friendly vehicles such as electric vehicles/hybrid vehicles are developed, the importance of improving BSR is increasing.

The existing BSR improvement method is a method of establishing improvement measures after a problem occurs, which reduces vehicle profitability by increasing vehicle cost and involving mold modification. Therefore, this paper established a process for verifying BSR in the preceding stage based on the basic technology.

Since 2017, the basic technology of structural characteristics analysis of friction map manufacturing/contact parts between interior materials has been internalized. Based on this, research on 1) Contact Point Analysis (CPA) Automation Technique Development, 2) SNRD Analysis Technique was conducted.(Fig.1)

1) Contact Point Analysis is a technique that can predict risks and derive improvement plans through 3D data analysis from the perspective of abnormal sound performance for "contact and proximity parts" that can cause abnormal sound in the vehicle. Contact point analysis has the drawback that M/H requirements for BASE data work are excessive and that it is a technique based on expert know-how. This paper developed CPA automated analysis tools that improved these drawbacks, and strengthened design standards by establishing design guides and establishing standard cross-section standards.

2) The SNRN analysis technique established the criteria for determining Squeak and Rattle noises to perform the analysis including the material characteristics and structure characteristics, thereby increasing the reliability of the analysis. In addition, the static mode/excitation mode verification method was developed to enable the diversification of the verification mode.

Preliminary verification is being strengthened as simulation and analysis technologies are developed in vehicle development. Based on this trend, CPA automation tools and SNRD advanced analysis methods have been established to establish a pre-verification process related to BSR performance.
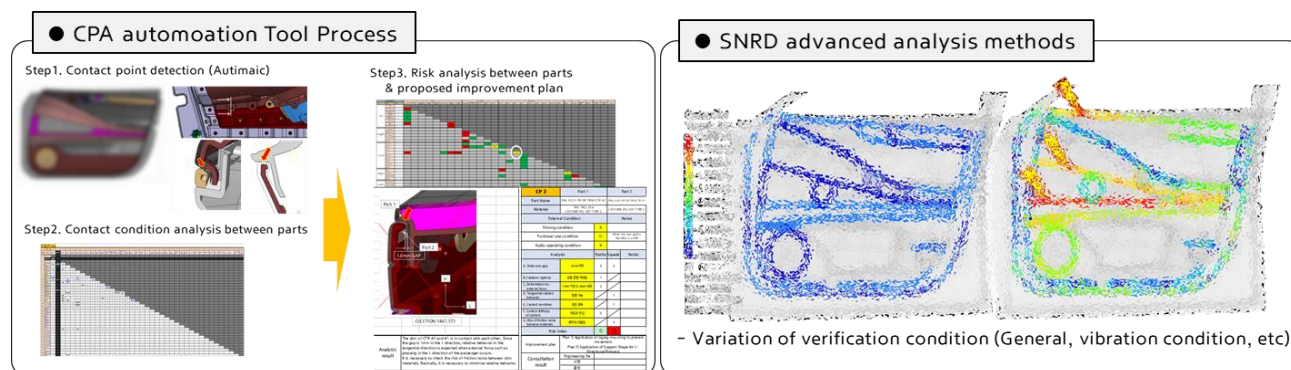
Fig.1 CPA automation tool & SNRD analysis method