

HIII-5F Low Speed Thorax Test Corridor: Change of Hysteresis Requirement

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Humanetics has had limited success producing HIII-5th female ribs that pass the SAE J2878 low speed thorax impact test. Passing rib sets have been rare and on the edge of the hysteresis corridor. Currently Humanetics has halted sales of rib sets certified to the J2878 low speed test.

Background

The Euro NCAP test protocol specifies that HIII-5th female rib sets are certified to both the NHTSA part 572 high speed thorax impact test and the SAE J2878 low speed corridors.

In recent years, the challenge to Euro NCAP rib certification has been to pass the hysteresis specification in the low speed (3.00 m/s) thorax test as specified in J2878. An investigation into the low speed test on the HIII-5th female indicated that the problem was with the damping material used in the construction of the ribs. Damping material is adhered to the inner portion of the steel ribs to produce the correct force deflection characteristics.

It was learned that the supplier for Humanetics damping material had to reformulate because some of the original raw materials used in the construction were no longer available due to environmental restrictions. This change in formula affected the hysteresis characteristics, effectively shifting the test results higher and out of the specified corridor. Other rib manufacturers have reported a similar issue.

The reformulation of the material did not affect other parameters like peak force and deflection. In similar dummies where this material is used (ex. HIII-50th) no issues are found in any of the parameters.

Solution

On April 15th, 2016, the SAE Dummy Testing Committee voted to increase the corridor width for the hysteresis specification in J2878. The solution will increase it to +/- 10% of the mean (which is a typical corridor width) and shift the corridor higher using the current top end as the new middle (see table below). This change will reflect the reality of current test results and will also account for damping material variation in the future.

Low Speed Hysteresis Corridors	
Current SAE J2878 Specification	65 - 72 %
Change	65 - 79 %

Current Status

Although not yet published in J2878, Humanetics is now offering HIII-5th female rib sets certified to the low speed thorax impact test using the new hysteresis corridor.

Euro NCAP Provision

On April 1, 2016, Euro NCAP released a directive to all of its accredited laboratories that it will allow the use of dummies meeting the new hysteresis corridor until SAE's change has been published in the updated standard.