Optimised Martindale specimen holder by imat-uve leads to more reliable results of the abrasion test according to DIN EN ISO 12947

The Martindale test apparatus is used for various textile surface testing such as abrasion resistance, Velcro test and pilling tendency. However, the test procedure or rather the comparability of the results showed some problems.
The Martindale tests are almost checked in every specification of the automotive manufacturer. The DIN EN ISO 12947 refers to the determination of abrasion resistance of fabrics by the Martindale method. That includes the determination of specimen breakdown and mass loss, as well as the assessment of appearance change.
Regardless of the Martindale apparatus' year of manufacture, the repeatability of the test result should be on the first place.

Weakness of the previous specimen holder
The repeatability and thus the precision of the method DIN EN ISO 12947 and the modified Velcro test on automotive upholstery fabrics with different measuring points and repeated tests, has been criticised for a long time by the experts of the VDA working group; as the Martindale specimen holder component was linked together through manual bolting. It became evident that specimens have been fixed differently onto the Martindale specimen holder depending on the examiner. Thus, torsion of the specimen might occur in the specimen holder and a different tight calotte formation which leads to a non-repeatability of the test results.
Further the Velcro test, the Velcro hooklets of the lower bottom of the Martindale specimen holder face different directions because of the torsion. Hereby non-comparable damage symptoms will be created.

Aim: The optimisation of the specimen holder
In the last 5 years, imat-uve has been working continuously to optimise the specimen holder of the Martindale abrasion test device. At the 55th Man-Made Fibers Congress in Dornbirn, the modified specimen holder has been revealed to the public with the lecture "Advantages of the new Martindale specimen holder in the examination of textile fabrics" by Christoph Bücken and Hannah Luise Dettmer (imat-uve), in collaboration with the company James Heal.

The new design of the Martindale sample holder minimises operator-dependent influences during preparation and clamping of the specimen or the Velcro which before negatively effected the repeatability of tests with the conventional sample holder. By means of a new specimen holder, the torsion of a specimen at Martindale should be equalised. The new specimen holder possesses now a clap mechanism so that the fixation of the specimen is taken place through putting a defined force over the specimen holder head. Further a multi axial spring is inserted that a reproducible force can be applied on the specimen. In accordance with the VDA working group textile, this construction will included into the ISO 12947-2 for textile abrasion test and ensure a repeatability of the test results. Through a revised pressure mechanism these negative factors on the accuracy are now drastically reduced and the precision of repeatability is improved well below ten percent. imat-uve was able to gain James Heal, a manufacturer of textile test devices from Great Britain, as a partner in the production and sales of the new specimen holder.

About imat-uve
The imat-uve group gmbh is an innovative design and engineering company and has positioned itself as a strategic partner of the international automotive industries. Headquartered in Mönchengladbach, Germany, the company now has further subsidiaries in Germany, China, USA and South Africa, that all work in accordance to the high quality requirements of DIN EN ISO 17025, VDA 6.2. and ISO 9001. The services support the entire value creation process from the idea to the finished part or product. This includes the design, development and testing of materials, components and systems. imat-uve supports the identification of future needs of road users in terms of design, ergonomics and comfort. At the same time market research identifies technical needs and analyses the impact of innovative solutions on consumers.

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