



Materials Never Lie

MATERIAL VARIANCE DISCOVERED BY FTIR

An Acuren client, a manufacturer of transportation devices, began to notice severe degradation of the floor mats of one of their products. This degradation appeared to occur only in newer batches of floor mats, older batches were unaffected.

Acuren received a set of samples (new exemplar and failed) from an old and new batch of mats for inspection. A difference in the color of the floor mats was observed. The older floor mats that did not show severe degradation were black, which indicated that carbon black was added as a UV-protectant. The newer mats showing degradation were light-grey, which indicated the absence of carbon black filler. This was confirmed by the customer.

FTIR spectroscopy performed by Acuren revealed a second difference between the two mats: the newer floor mats were made of polyisoprene rubber, whereas the older floor mats were made of styrene butadiene (SBR) rubber. Not surprisingly, the polyisoprene mats without carbon black filler showed higher oxidation damage (FTIR peak at 1730 cm^{-1}) than the carbon black filled SBR.

The client was unaware that their vendor switched the material of the floor mats from SBR to polyisoprene. With Acuren's report in hand, they were able to approach the supplier to revert to the old established formulation for the floor mats.

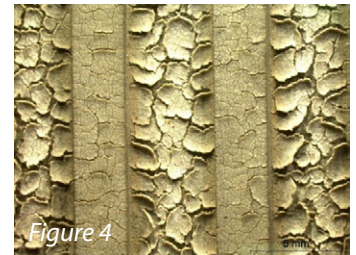
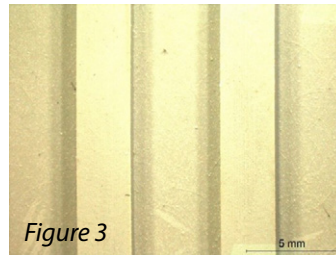
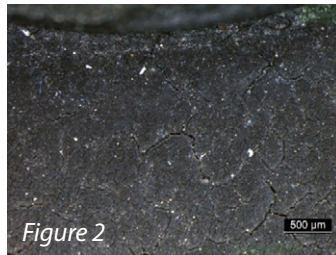
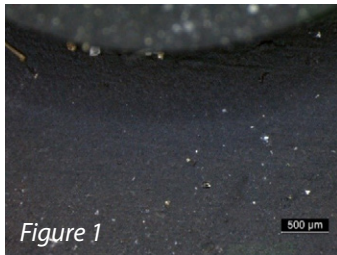
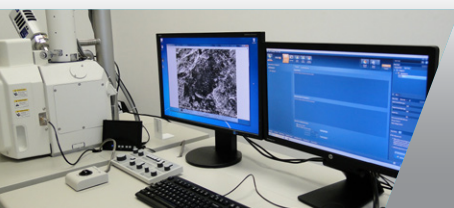


Figure 1: Exemplar of an old batch of floor mats. Figure 2: Used floor mat from an old batch. Figure 3: Exemplar of a new batch of floor mats. Figure 4: Used floor mat from a new batch. The used mats from a new batch showed severe degradation.

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