

HOW DO THE HOLES GET INTO THE AIRBAG?

TASK

In the development phase of new airbag modules in particular, damage to the airbag can be observed in some cases after firing tests. In order to make optimizations, it is necessary to know the cause of such damage.

SOLUTION

In such cases, Analytik Service Obernbuurg GmbH uses a combination of light microscopy and scanning electron microscopy (SEM). While light microscopy allows large and small defects to be found quickly, the SEM images show the morphology of the threads in detail. These often allow conclusions to be drawn about the cause and type of damage.

Industries

Automotive supplier

Analysis goals

Damage analysis

Materials

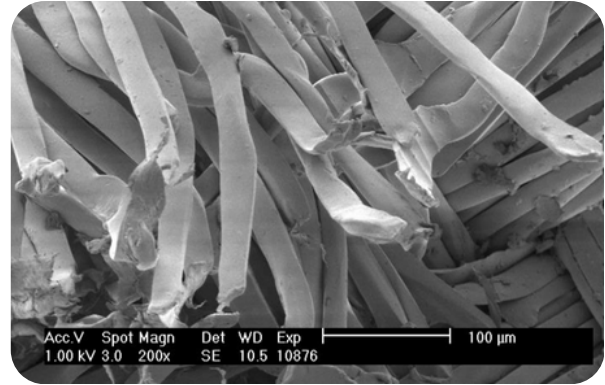
Fabric

Analysis methods

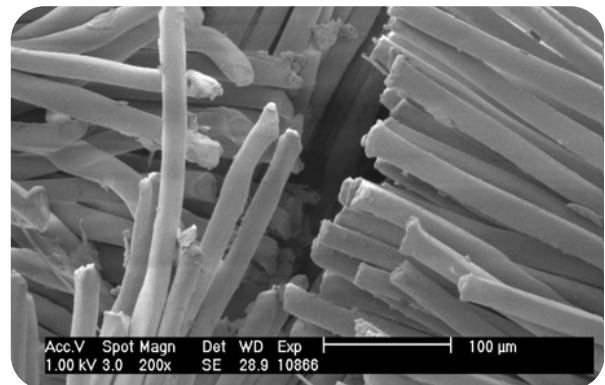
Light microscopy
Scanning electron
microscopy



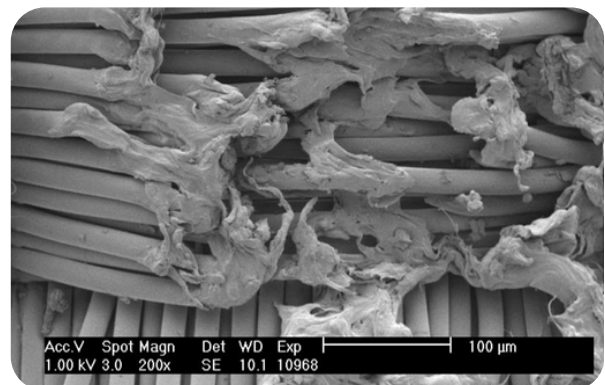
Here, the threads were flattened at the edge of the defect and in many cases even cut. The damage pattern indicates strong mechanical effects and can clearly be attributed to the manufacturing or assembly process. Consequently, in such cases it is necessary to check at which point in the process the fabric is subjected to high forces.



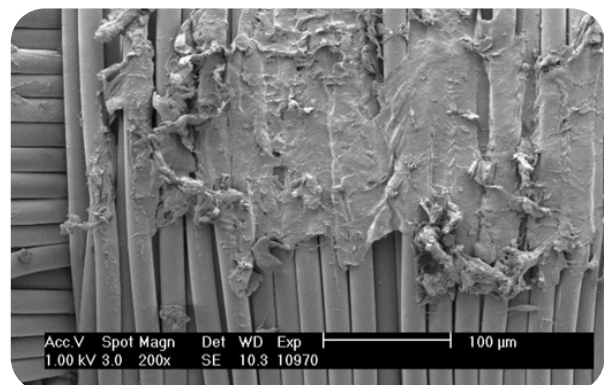
The filament ends of this defect are cut smoothly, with all filaments having the same length. The defect was caused by a sharp cut. The manufacturing process must therefore be checked for sharp-edged components.



This damage pattern in the vicinity of a fault indicates thermal-mechanical contact, such as occurs with high friction and high speed. Design changes to the module are often necessary to prevent such damage.



This damage pattern is only a 'harmless' build-up due to contact with the polymer cap. There was hardly any damage to the filaments, so the function of the airbag is not impaired.



AIRBAG DAMAGE ANALYSIS

ADVANTAGES

Scanning electron microscopy provides high-resolution images with a high depth of field. With the many years of experience that Analytik Service Obernbuurg has in the fiber sector, the various damage patterns can usually be directly assigned to their causes. Elemental analysis in the SEM can provide additional information. The results obtained in this way often allow conclusions to be drawn from which solutions can be derived to prevent future faults.

