

# VIMEC APPLIED VISION TECHNOLOGY

leading in glass inspection  
and monitoring solutions

Glass inspection and monitoring

More than 25 years' experience and activities in the glass packaging sector is just one of the strong points of the company in this article – Vimec Applied Vision Technology. In this article, Vimec gives us insight in the possibility to detect residual stress in pharmaceutical glass packaging with its in-line inspection capabilities.

**V**imec Applied Vision Technology is dedicated to designing, building and validating visual inspection systems and monitoring solutions for the worldwide industry of pharmaceutical glass packaging. The hardware and software are developed in house, which enables to raise product and process quality to the highest level.

Vimec supplies dimensional, cosmetic and print inspection systems for ampoules, cartridges, syringes and vials. The product portfolio also contains handling solutions for pharmaceutical glass packaging like conveyors and end-of-line packaging systems. In this way, Vimec is the partner for quality control as well as handling and monitoring solutions.

Vimec has a unique and in-depth knowledge of high-end glass production and stringent quality control, including GAMP validation as a key asset. Vimec strives for continuous improvement with its highly qualified and trained experts who promote active knowledge sharing within the multi-disciplinary organization.

### 'ONE OF A KIND TECHNOLOGIES'

Vimec has been active worldwide for more than 25 years and is proud member of the 'One of A Kind Technologies' group since 2014. Located in tech-city Eindhoven, The Netherlands, the group contributes to a safer and more sustainable world with smart vision solutions for the pharmaceutical, agriculture and food market segments. Besides Vimec, the group holds the companies Smart Vision Center, Beltech and Crux Agribotics as well.

### STRESS IN GLASS

Residual stress in pharmaceutical glass packaging increases the

risk of delamination and breaking of the glass. To limit this residual stress in glass, the products go through an annealing lehr during the production process. During this annealing process, the vial is heated at a controlled temperature to decrease the residual stress inside the glass.

### QUALITY INSPECTION

Vimec offers with its residual stress in glass inspection the possibility to detect the remaining stress that is inside the glass after the annealing process. Our in-line solution ensures that every glass product is monitored. The stress in glass measurement is available as a stand-alone in-line system or as an additional functionality to several existing inspection systems.

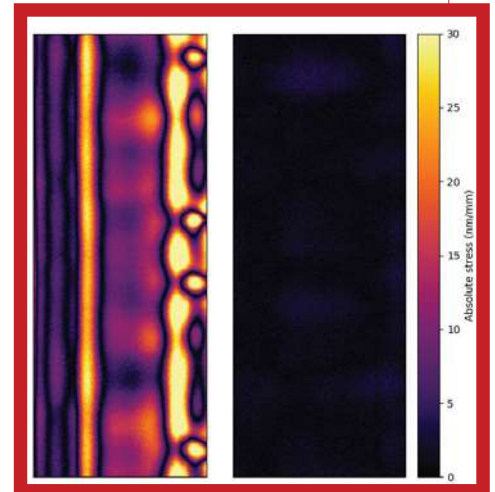
With our in-line inspection system, Vimec introduces a big advantage over the sample tests that are typically being performed, where only a few vials per timeslot are being inspected. The Vimec inspection system reduces the risk to pack vials that have a high level of remaining stress, while it is also more time efficient for the operators.

### WAY OF WORKING

The residual stress in glass will be inspected by an optical camera set-up, a diffuse light source and multiple optical filters. These filters make the inspection system sensitive to optical retardation in the glass, which is directly caused by residual stress.

The optical set-up inspects the body of the vial. By rotating the vial while continuously taking images, a full inspection of the vial is being performed.

As visible from the first image, vials typically contain high levels of stress before they undergo the annealing process. The stress will decrease when the vial is heated in the annealing lehr, as can be seen in the second image. When



the image is darker, the presence of stress in glass is lower.

### MEASUREMENTS:

The following methods are available in the Vimec VCenter software to identify and measure stress in the vials:

- Maximum stress level
- Axial uniformity. The stress level is averaged in the circumferential direction of the vial. The axial variation of this average is used to detect 'bands of stress'.
- Average stress level ■



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