



1 Black rubber coated metal gaskets

## MASC-DISQ

### GASKET INSPECTION SYSTEMS FOR QUALITY CONTROL

#### Gasket quality control

The image processing system DISQ has been developed for the surface inspection of metal gaskets. DISQ is able to detect defects of (coated) gaskets on the basis of digital camera images, classifying these according to geometry, cause, and size.

#### Product properties

- easy adaptation to specific requirements, such as different gasket shapes or coatings
- classification according to several defect classes (scratches, indentations, blisters, etc.)
- statistical documentation, e. g., for the determination and analysis of defect trends
- feedback within the production process
- user-friendly interface

#### Service of the Fraunhofer ITWM

- delivery and installation of the control system
- adaptation to customer-based requirements
- evaluation records for the substantiation of production quality
- set-up of the desired defect classes
- communication between control system and production process
- system maintenance
- adaptation to new requirements

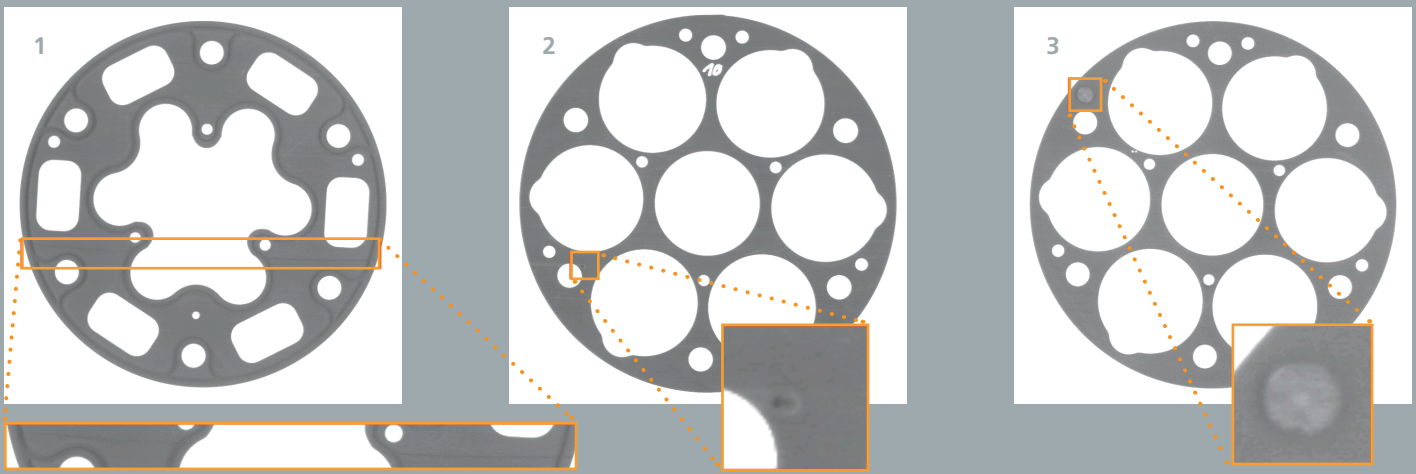
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**1-3** Scratch, blister, and dent as defect examples; the gaskets are represented at a scale of approximately 1:2.

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## MASC-DISQ: Application

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### Image acquisition

The method consists of several steps observing the top and bottom side of each gasket. Due to the partly very complex shape of the gaskets, which, e. g., show holes and embossments, the method works with samples of the same shape serving as reference for a go-part. After the image acquisition of the part to be inspected, the relevant image section has to be found.

### Image registration

In the next step, the image of the gasket to be examined is adjusted to the reference image with respect to displacement as well as rotation, in order to allow for a comparison with the reference parts. In such a way, boundaries and structures are to be recognized as far as possible, so that they are not accounted for during defect detection.

### Defect detection

Different methods have been implemented for different types of defects (mainly with respect to their size) in order to bring them out in the best possible way and to allow for a comparison with the reference part. When the comparison is concluded, the relevant positions are marked and can be displayed graphically. The examined gaskets are sorted with respect to go and no-go parts, and detected defects are classified. Finally, type and frequency of the occurring defects are documented statistically.

### Teach-in

If the respective reference parts are available, a fast and automatic learning of new types of gaskets with a similar surface structure is also possible.