



# Particle- / hall monitoring

**Cleanliness control** includes not only the technical cleanliness of components (VDA 19.1) but also **production and assembly cleanliness** (VDA 19.2). Contamination through airborne particles can occur during the assembly, storage and transport of work pieces.

**To determine** these effects and **assess the risk** particle traps are placed at relevant locations in the assembly environment or in processing areas. The dhs-Cleanalyzer Scan<sup>®</sup> evaluates the contaminated particle traps. The following key figures are determined: number and size of the particles, types (metal/non-metal) and the cleanliness/sedimentation number (Illig value) according to VDA 19.2.

## Installation features for particle traps

### Hall monitoring

For hall monitoring the particle traps are placed in a specific pattern within the assembly hall.

### Characterising particle sources

The particle traps are placed at particle-relevant locations, such as storage areas, assembly stations, transport routes, double door systems, packing stations in component production.

### How the particle traps work

- Before it is activated, the adhesive layer is covered with a protective foil
- Homogeneous, white adhesive pad absorbs sedimenting particles and fixes them



## Particle trap product description

- Contains fixing option and inscription card that can be removed without a trace
- Lid can be closed after deactivation
- Positioning recommendation: 7-10 days

## Information in the overview

- **Simple operation** with automatic sequences in managed routines, quick and flexible (= easy to learn)
- **Immediate results check**, direct display of discovered particles by means of a particle gallery
- **6-times sampling** of the particle traps and evaluation in one step
- Determination of the **Illig value (sedimentation number)**
- **Particle typing**, e.g. metal/non-metal, fibres, size, number, etc.

## dhs-Cleanalyzer® Scan – 6-times sampling

The particles fixed to the adhesive pad can be analysed with the dhs-Cleanalyzer® Scan immediately after sampling.

The system consists of a **high-quality flatbed scanner** in combination with the residual dirt analysis software from dhs – including anodised aluminium plate with suitable cut-out to **insert six particle traps**.

### Evaluation/typing of the particle traps

- Number and size of the particles from a defined particle size
- Split into metallic shiny/not shiny particles and fibres
- **Cleanliness/sedimentation number** (Illig value) according to VDA 19.2

### Illig value according to VDA 19.2

The dhs-Cleanalyzer software automatically determines the Illig value. The analysis result (particle size distribution) with the individual particle size classes is multiplied by a weight factor and the weighted particle numbers are added up.

The higher weighting of the larger particles takes account of the growing harm potential. The total is standardised to an area of 1000 cm<sup>2</sup> in relation to a measuring time of 1 h.

This makes the standardised results easier to document and compare between different areas and/or factories.

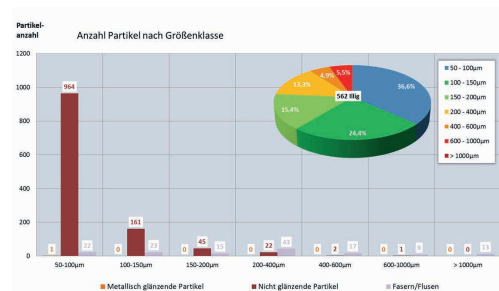
## Examples of sedimentation number limit values:

Residual dirt laboratory: < 50

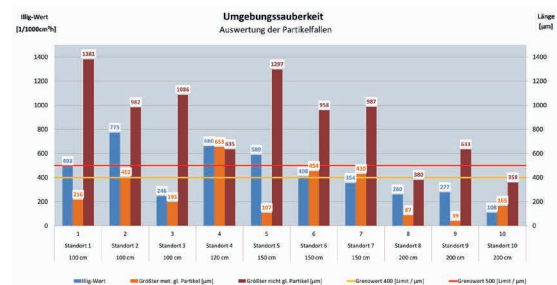
Clean room: < 200

Engine assembly: < 400

In terms of numbers, the maximum permitted particle size according to the component specification is equal to the maximum permitted sedimentation number for environment cleanliness for component production (usual procedure).



Evaluation example: Number of particles by size class



Evaluation example: Environment cleanliness with 10 particle trap locations

## Complete report at the end of the workflow

All images, data, analysis values and statistics can be exported to the dhs Image Data Base® with a mouse click for long-term archiving and reporting.

Among other things, the dhs service package includes an annual device service and calibration as well as software updates.

In collaboration with:



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