CleanControlling®

# Procedure using Particel-Traps to determine environmental cleanliness

Laboratory for Technical Cleanliness
PARTICLES IN FOCUS

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# Design of a Particle-Trap

Sticky Pad, Ø 47mm,

Analyzed Surface
12,6 cm²

Homogeneously, white or black, non shiny, without preloading optional with blank-value-certificate

Fastener

Guarantees good adhesion and can easily be removed without residues

Labeling- and note card

Sedimenting particles stick to the analysing surface

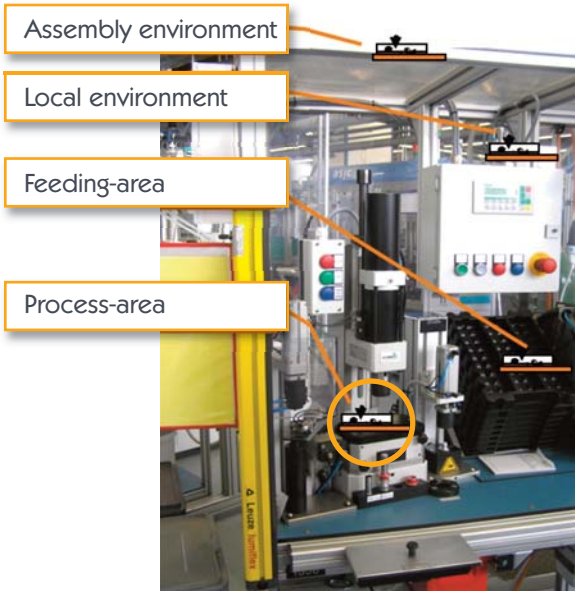
Cover to close the Particel-Trap after deactivation

Protection film for activation

# Placement of Particle-Traps

Horizontal mounting

- At particle relevant places with reference to the parts
- In different heights for example 30cm, 1m, 2m
- According to the layout of the area



# Placing and activating Particle-Traps

→ See our YOUTUBE-Clip
Use the QR-Code or
https://www.youtube.com/watch?v=6l1_lvZSwIo

## Comment to the placement of Particle-Traps

- Cleaning of the defined area
  (using a wet fabric; don`t generate particle-spreading)
- Labeling the card
  (don`t forget date and time of activation)
- Installation of the Particle-Trap. If necessary use
  mounting angle or stand!
- Store cover in a clean plastic bag until deactivation
- Remove protection film
- Take a picture of the Particle-Trap
  in the activated status
- Take another picture of the Particle-Trap
  with the environment

# Duration of activation

- Examination time of the Particle-Trap is 7-10 days
- Shorter examination times are possible and useful in some cases (Please keep in mind the blank-value-criterion)
- It is recommended to check all Particle-Traps after 3 days of activation
- Documentation of particularities during examination time (Production figures, modifications, changes in process)
- If the analyzed surface of the Particle-Trap gets grey there is a risk that it won`t be able to analyze due to occupancy
- Particle-Traps with finger prints or damages should be exchanged with new ones

# Deactivating and analyzing Particle-Traps

→ See our YOUTUBE-Clip
Use the QR-Code or
https://www.youtube.com/watch?v=22o23YwVMvc

## Comment to deactivation of Particle-Traps

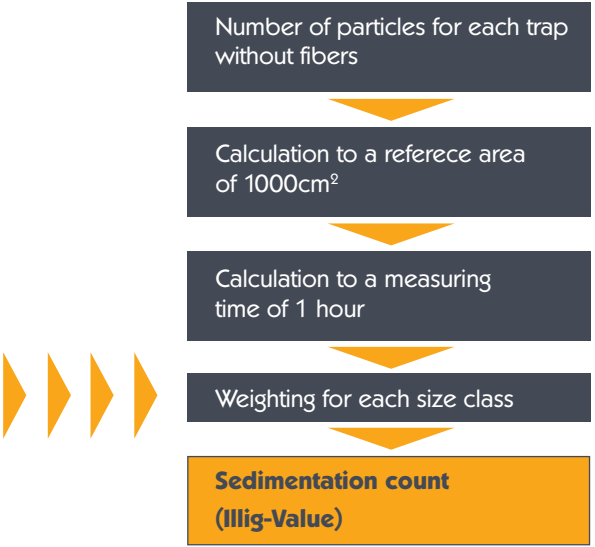
- Close Particle-Trap with the cover
- Document date and time of deactivation on the card
- Make sure that the cover cannot remove unintentionally

## Comment to Analysis of Particle-Traps

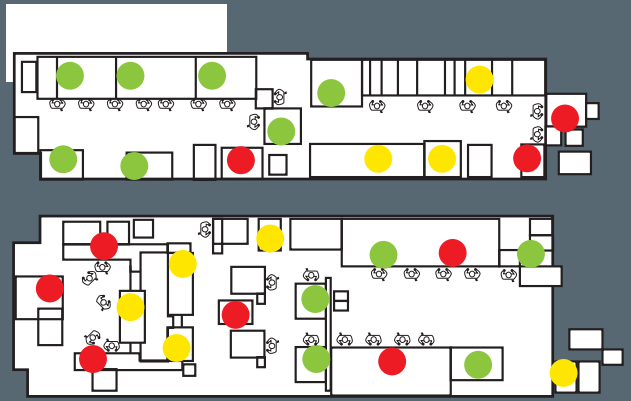
- Microscopic analysis
- Calculation of the Illig-Value and documentation of the biggest particles and the particle distribution
- Assessment of the unexpected results and definition of measures
- Determine confirmation analysis

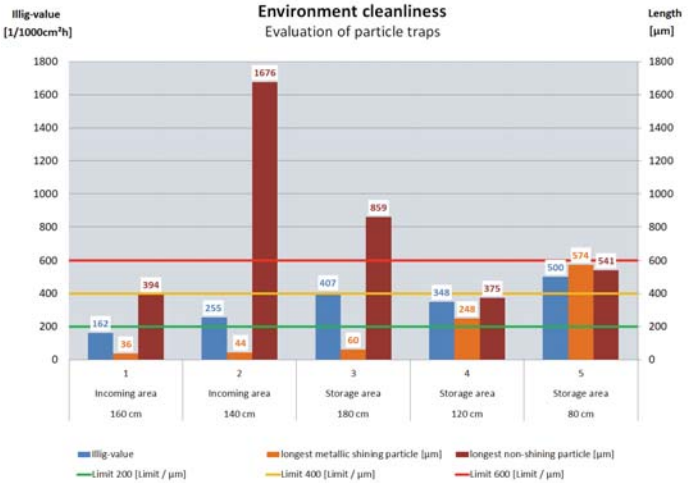
# Calculation of the sedimentation count or ILLIG-Value for each Particle-Trap according VDA 19 Part 2

| Particle size [µm] | Weighting factor |
|---|---|
| 5 ≤ x ‹ 15 | 0 |
| 15 ≤ x ‹ 25 | 0 |
| 25 ≤ x ‹ 50 | 0 |
| 50 ≤ x ‹ 100 | 1 |
| 100 ≤ x ‹ 150 | 4 |
| 150 ≤ x ‹ 200 | 9 |
| 200 ≤ x ‹ 400 | 16 |
| 400 ≤ x ‹ 600 | 64 |
| 600 ≤ x ‹ 1000 | 144 |
| 1000 ≤ x | 400 |



# Presentation of the Particle-Traps (ILLIG-VALUE) according the layout





# CCC-CODE (COMPONENT CLEANLINESS CODE)

| Size Class (Größenklasse) | Particle size [µm] |
|---|---|
| B | 5 ≤ x ‹ 15 |
| C | 15 ≤ x ‹ 25 |
| D | 25 ≤ x ‹ 50 |
| E | 50 ≤ x ‹ 100 |
| F | 100 ≤ x ‹ 150 |
| G | 150 ≤ x ‹ 200 |
| H | 200 ≤ x ‹ 400 |
| I | 400 ≤ x ‹ 600 |
| J | 600 ≤ x ‹ 1000 |
| K | 1000 ≤ x ‹ 1500 |
| L | 1500 ≤ x ‹ 2000 |
| M | 2000 ≤ x ‹ 3000 |
| N | 3000 ≤ x |

Examples: CCC = A(D15/E12/F12/G12/H-I4/J0)
CCC = A(E12/F12/GI9/G12/I0/K00)
CCC = N(E9000/F-G5000/H-I1500/J50/K10)

| Contamination Level (Konzentrationsklasse) | Number of particles (per 100 $cm^3$ or 1000 $cm^2$) |
|---|---|
| 00 | 0 |
| 0 | 1 |
| 1 | 2 |
| 2 | 4 |
| 3 | 8 |
| 4 | 16 |
| 5 | 32 |
| 6 | 64 |
| 7 | 130 |
| 8 | 250 |
| 9 | 500 |
| 10 | 1000 |
| 11 | 2000 |
| 12 | 4000 |
| 13 | 8000 |
| 14 | 16000 |
| 15 | 32000 |
| 16 | 64000 |
| 17 | 130000 |
| 18 | 250000 |
| 19 | 500000 |
| 20 | 1000000 |

## Example of CCC-Code

**CCC = A(B20/C18/D16/E12/F12/G12/H8/I0/J00/K00)**

- Contamination Level
- Size Class
- A = (Area) in reference to a component surface of 1000 $cm^2$
  V = (Volume) in reference to the wetted volume of 100 $cm^3$
  N = in reference to the one component -› Number of particles is directly expressed
- **CCC = Component Cleanliness Code**

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