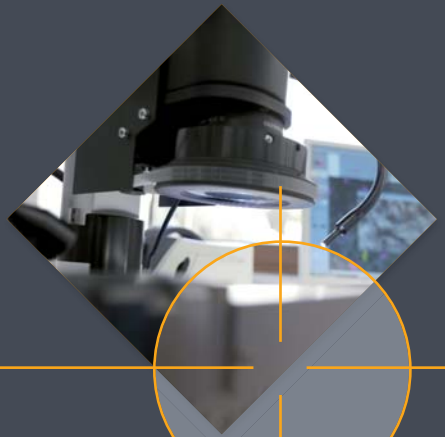
Procedure using Particel-Traps to determine environmental cleanliness



CleanControlling®

Laboratory for Technical Cleanliness
PARTICLES IN FOCUS

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Instruction

Design of a Particle-Trap

Sedimenting particles stick to the analysing surface

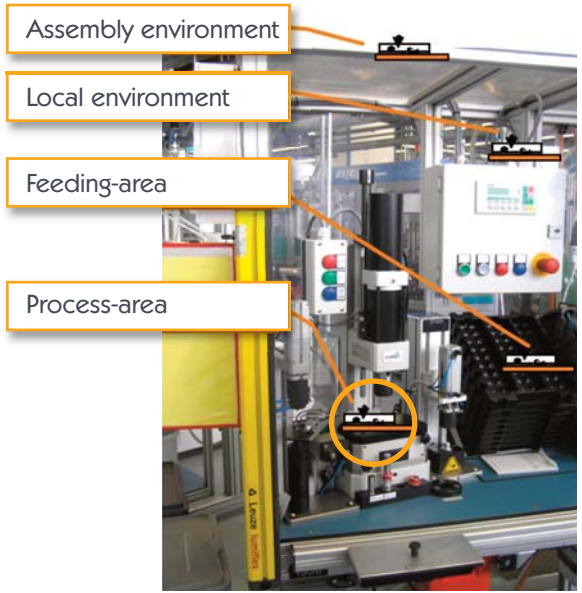
Cover to close the Particel-Trap after deactivation

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

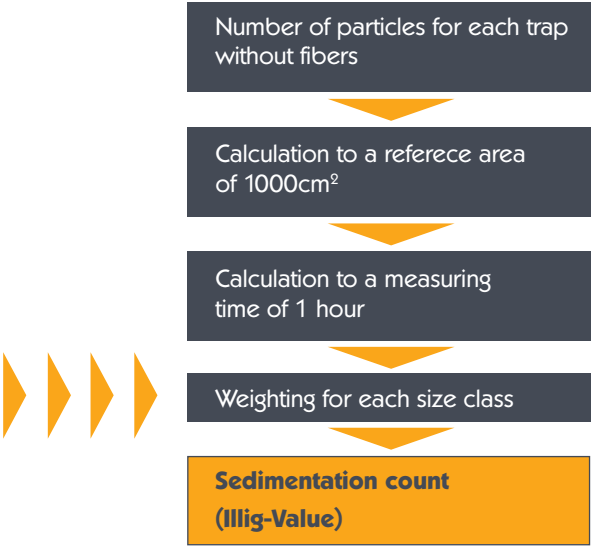
- Close Particle-Trap with the cover
- Document date and time of deactivation on the card
- Make sure that the cover cannot remove unintentionally

Comment to Analysis of Particle-Traps

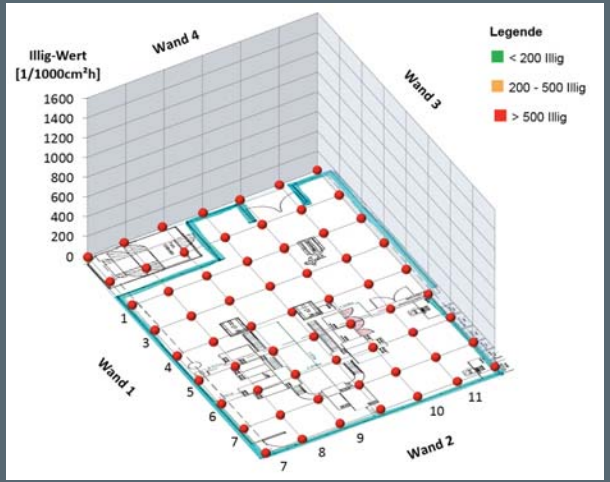
- Microscopic analysis
- Calculation of the Illig-Value and documentation of the biggest particles and the particle distribution
- Assessment of the unexpected results and definition of measures
- Determine confirmation analysis

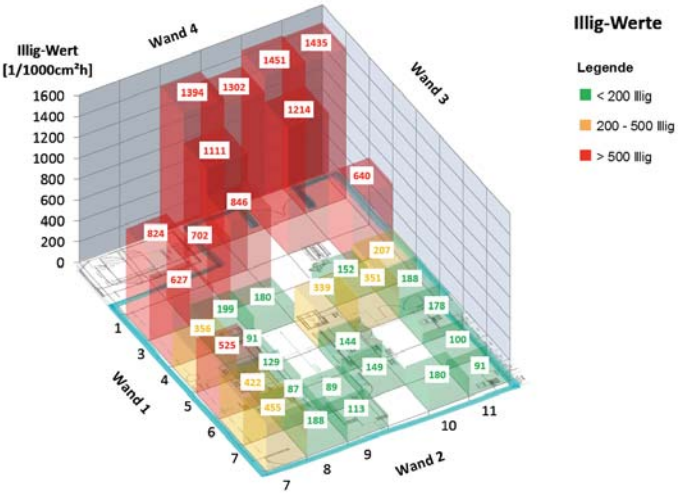
Calculation of the sedimentation count or ILLIG-Value for each Particle-Trap according VDA 19 Part 2

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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