# Technical Cleanliness according to VDA19.1

## 清洁度分析根据 VDA19.1

| **Description of Sample 样品描述** | | | |
|---|---|---|---|
| Component: 零件 | | Sample No.: 样品号 | |
| Component No.: 零件号 | | Date of Extraction: 制样日期 | |
| Tested Area: 测试区域 | | Date of Anaylsis: 分析日期 | |
| Surface [cm²]: 表面积 | 99.21 | Examiner: 检测员 | |
| Customer: 客户 | | | |

| **Extraction & Gravimetry 制样和称重** | | | |
|---|---|---|---|
| Extraction Method: 制样方式 | 喷洗 | Parts on Filter: 滤膜上零件数量 | 2 |
| Liquid: 溶剂 | HAKU | Filter Type: 滤膜类型 | |
| Amount [ml]: 溶剂量 | 18.5 | Weight [mg]: 重量 | |

| **Microscopic Analysis 显微镜分析** | | | |
|---|---|---|---|
| Scale: 比例尺 | 5.9 µm/Pxl | Evaluated Ø [mm]: 分析直径 | 44 |
| Filter occupancy [%]: 滤膜覆盖率 | 0.63 | allowed Occupancy: 可用覆盖率 | 1,5 % (Cellulose), 3 % (Mesh) |

| | | | | | |
|---|---|---|---|---|---|
| Largest metallic particle 最大金属颗粒 | Length 长 [µm]: | 396 | Width[1] 宽[µm]: | 117 |
| Largest nonmetallic particle[2] 最大非金属颗粒 | Length 长 [µm]: | 1238 | Width[1] 宽[µm]: | 346 |

| | | | | |
|---|---|---|---|---|
| Stretched length of longest fiber 最长纤维拉伸长度 | $L_{str}$ [µm]: | 1909 | Total 总长[mm] | 12.3 |

| **Specification per 1000cm²: 金属颗粒要求汇总** | | | | |
|---|---|---|---|---|
| | 100-200[um] | 200-600[um] | 600-1000[um] | >1000[um] |
| | 1400 | 1000 | 30 | 0 |
| Total[1] 总数 | 1421.2 | 292.3 | 20.2 | 10.1 |
| Metallic 金属 | 110.9 | 15.1 | 0.0 | 0.0 |

| Length 长 [µm] | Code 编码 | per Filter Membrane 每滤膜 | | per Part/Component 每部件/零件 | | per 1000 cm² 每 1000 cm² | |
|---|---|---|---|---|---|---|---|
| | | Total 总数[2] | Metallic 金属 | Total 总数[2] | Metallic 金属 | Total 总数[2] | Metallic 金属 |
| **Detailed results 详细结果:** | | | | | | | |
| > 3000 | N | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2000...3000 | M | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1500...2000 | L | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1000...1500 | $K_L$ | 2 | 0 | 1.0 | 0.0 | 10.1 | 0.0 |
| 800… 1000 | J | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 600… 800 | | 4 | 0 | 2.0 | 0.0 | 20.2 | 0.0 |
| 400… 600 | I | 7 | 0 | 3.5 | 0.0 | 35.3 | 0.0 |
| 200…400 | H | 51 | 3 | 25.5 | 1.5 | 257.0 | 15.1 |
| 150…200 | G | 63 | 2 | 31.5 | 1.0 | 317.5 | 10.1 |
| 100...150 | F | 219 | 20 | 109.5 | 10.0 | 1103.7 | 100.8 |
| 50...100 | E | 896 | 55 | 448.0 | 27.5 | 4515.7 | 277.2 |
| 25...50 | D | 1896 | 64 | 948.0 | 32.0 | 9555.5 | 322.5 |
| 15...25 | C | 3112 | 33 | 1556.0 | 16.5 | 15683.9 | 166.3 |
| 5...15 | B | 14422 | 15 | 7211.0 | 7.5 | 72684.2 | 75.6 |

| **CCC (Component Cleanliness Code 零件清洁度编码):** |
|---|
| Total[2] = A(E13/F11/G9/H9/I6/J5/K-N4) |
| **Remarks 备注:(结论)** |
| 合格 |

[1]The widths of particles in this report are always measured as the orthogonal cut.本报告中颗粒的宽度只是用正交宽度。

[2] Particles without fibers; Fibercriterion: nonmetallic, Ratio $L_{str}$ / Area-Incircle > Fib_StrInC_Criand Ar20Fib_maxInC_Critµm.颗粒 50，拉伸长度 / 最大内切圆直径> 20 并且 最大内切圆直径 ≤50 µm.

**Images 图像**:



Largest metallic particle 最长金属颗粒
396 µm x 117 µm



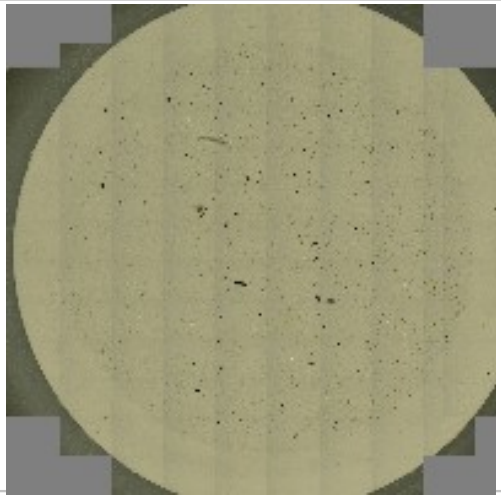
Second largest metallic particle 第二大金属颗粒
370 µm x 26 µm



Largest nonmetallic[2] particle 最大非金属颗粒
1238 µm x 346 µm



Second largest nonmetallic[2] particle 第二大非金属颗粒
1021 µm x 375 µm



Membrane Overview 滤膜概况
0.63 % Occupancy at Ø = 44 mm



Longest Fiber 最长纤维
$Feret_{max}$ = 1213 µm / $L_{str}$ = 1909 µm