

## Technical Cleanliness according to ISO 16232:2018

Description of Sample			
Component:	Test Parts	Sample No.:	1
Component No.:	1234	Date of Extraction:	2/7/2023
Tested Area:	Outside	Date of Analysis:	2/10/2023
Surface [cm <sup>2</sup> ]:	100	Examiner:	WK
Customer:	PTL		

Extraction & Gravimetry			
Extraction Method:	Rinse	Parts on Filter:	1
Liquid:	Water	Filter Type:	Nylon
Amount [ml]:	250	Weight [mg]:	125

Microscopic Analysis			
Scale:	1.5 µm/Pxl	Evaluated Ø [mm]:	44
Filter occupancy [%]:	0.00	allowed Occupancy:	1,5 % (Cellulose), 3 % (Nylon)

Largest metallic particle	Length [µm]:	62	Width <sup>1</sup> [µm]:	41
Largest nonmetallic particle <sup>2</sup>	Length [µm]:	109	Width <sup>1</sup> [µm]:	11
Stretched length of longest fiber	L <sub>str</sub> [µm]:	949	Total [mm]:	2.0

Length [µm]	Code	per Filter Membrane		per Part/Component		per 1000 cm <sup>2</sup>	
		Total <sup>2</sup>	Metallic	Total <sup>2</sup>	Metallic	Total <sup>2</sup>	Metallic

Summary:							
> 600	J-N	0	0	0.0	0.0	0.0	0.0
100...600	F-I	1	0	1.0	0.0	10.0	0.0
15...100	C-E	80	30	80.0	30.0	800.0	300.0

Detailed results:							
> 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	0	0	0.0	0.0	0.0	0.0
600...1000	J	0	0	0.0	0.0	0.0	0.0
400...600	I	0	0	0.0	0.0	0.0	0.0
200...400	H	0	0	0.0	0.0	0.0	0.0
150...200	G	0	0	0.0	0.0	0.0	0.0
100...150	F	1	0	1.0	0.0	10.0	0.0
50...100	E	6	2	6.0	2.0	60.0	20.0
25...50	D	34	17	34.0	17.0	340.0	170.0
15...25	C	40	11	40.0	11.0	400.0	110.0
5...15	B	234	42	234.0	42.0	2340.0	420.0

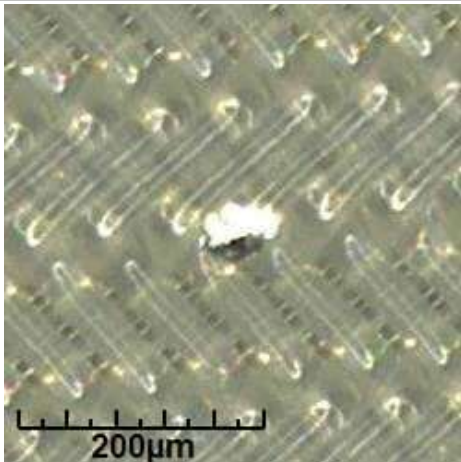
CCC (Component Cleanliness Code):
Total <sup>2</sup> = A(E6/F4/G00/H00/I00/J00/K-N00)

Remarks:
Example report from JOMESA HFD Feb 2023

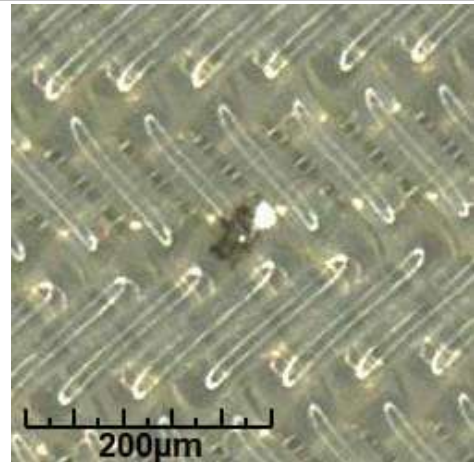
<sup>1</sup> The widths of particles in this report are always measured as the orthogonal cut.

<sup>2</sup> Particles without fibers; Fiber criterion: nonmetallic, Ratio L<sub>str</sub> / Area-Incircle > 20 and Area-Incircle ≤ 50 µm.

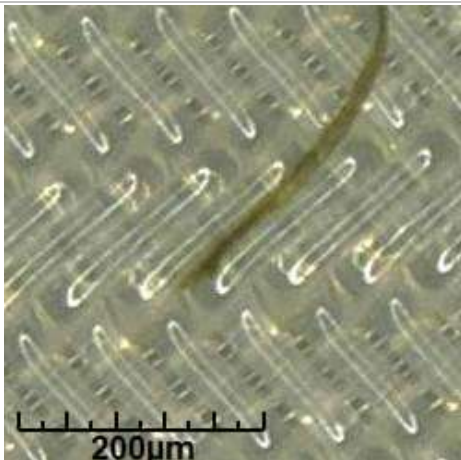
Images:



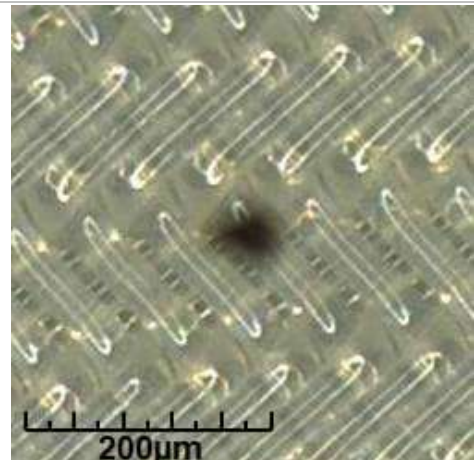
Largest metallic particle  
 $62\ \mu\text{m} \times 41\ \mu\text{m}$



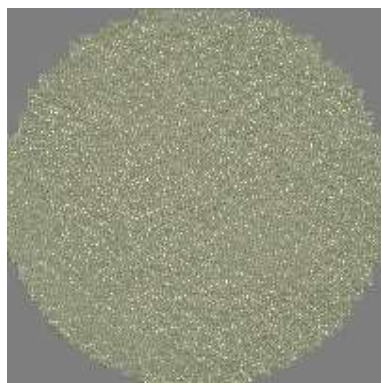
Second largest metallic particle  
 $61\ \mu\text{m} \times 35\ \mu\text{m}$



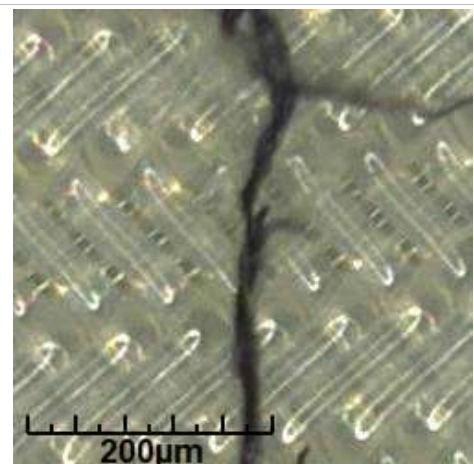
Largest nonmetallic<sup>2</sup> particle  
 $109\ \mu\text{m} \times 11\ \mu\text{m}$



Second largest nonmetallic<sup>2</sup> particle  
 $57\ \mu\text{m} \times 38\ \mu\text{m}$



Membrane Overview  
 0.00 % Occupancy at  $\varnothing = 44\ \text{mm}$



Longest Fiber  
 $\text{Feret}_{\text{max}} = 599\ \mu\text{m} / L_{\text{str}} = 949\ \mu\text{m}$