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Analysis of flow sensors according SEMI F 40 / F 57

10/21/2009 / ATU-Job-ID: # 0910 066 / analyst: M. Reutz, R. Braitmayer

1. Subject / Sample description

Chemically precleaned flowsensors should be analysed according SEMI F40/F57.

Tab.1: Sample name and sample parameters

Sample description	Sample number	Surface area [cm ²]	Test Method
100 – 30308 Levil Flow Sensor LFS-20-Z, 0-20 lpm, Z-Shape	0910 066 – 1	84	Leachable TOC Leachable Inorganics Leachable Anions
100 – 30312 Levil Flow Sensor LFS-80-Z, 0-80 lpm, Z-Shape	0910 066 – 2	202	Leachable TOC Leachable Inorganics Leachable Anions

2. Preparation

The preparation was carried out in class 1 cleanbenches, located in class 1000 cleanrooms, in accordance to SEMI F40/F57. The flowsensor tubes were filled with ATU ultrapure water and closed with precleaned caps. All metal, reactive silica and anion impurity levels in the used UPW were measured below 100 ppt (parts per trillion). The conductivity was 18,2 megohm-cm, and the TOC level was at 2 ppb. The used nitric acid (HNO₃) had ULSI quality.

Tab.2: preparation parameters

Test Method	Container-material	Soaking solution	Soaking parameters
Leachable TOC	PFA	UPW	7 days at 85°C
Leachable Anions	PFA	UPW	7 days at 85°C
Leachable Inorganics	PFA	UPW	7 days at 85°C

For the method-blank determination, two containers of test fluid are handled in the same manner.

3. Analysis

3.1 Leachable TOC

The analysis is done with thinfilm UV-oxidation, using NIST reference and traceable standards for calibration.

3.2 Leachable Anions

The analysis is done with preconcentration ion chromatography [PC-IC / Dionex], using NIST reference and traceable standards for calibration.

3.3 Leachable Inorganics

The analysis is done with inductively coupled plasma-mass spectrometry [ICP-MS Agilent 7500 cs], using an external calibration with NIST reference and traceable standards. All blank-, standard- and sample solutions were in the same matrix .

4. Analysis results

ATU sample #		0910 066-1	0910 066-2		
Parameter		100-30308 LeviFlowSensor LFS-20-Z, 0-20 lpm	100-30312 LeviFlowSensor LFS-80-Z 0-80 lpm	DL	Spec.
Aluminium	Al	1,2	0,24	0,1	10
Barium	Ba	1,1	0,87	0,1	15
Boron	B	0,65	<	0,5	10
Calcium	Ca	8,6	4,6	0,3	30
Chrome	Cr	<	<	0,05	1
Copper	Cu	0,73	<	0,1	15
Iron	Fe	0,44	0,22	0,1	5
Lead	Pb	0,19	0,62	0,05	1
Lithium	Li	<	<	0,1	2
Magnesium	Mg	0,25	0,13	0,1	5
Mangane	Mn	0,52	<	0,1	5
Nickel	Ni	0,34	0,29	0,05	1
Pottasium	K	1,6	0,87	0,1	15
Sodium	Na	4,3	1,1	0,1	15
Strontium	Sr	0,04	0,02	0,01	0,5
Zinc	Zn	2,9	1,9	0,1	10
Fluoride	F ⁻	<	<	100	60 000
Chloride	Cl ⁻	51	66	10	3 000
Bromide	Br ⁻	<	<	10	100
Nitrate	NO ₃ ⁻	<	<	10	100
Nitrit	NO ₂ ⁻	18	<	10	100
Phosphate	PO ₄ ³⁻	<	<	20	300
Sulfate	SO ₄ ²⁻	<	<	20	300
TOC		160	206	100	60 000

The results written in red are off Spec. RL = reproted limit

With best regards



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The present results refer exclusively to the samples examined here.
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