



EPA's Filter Media Procurement & Acceptance Testing Program

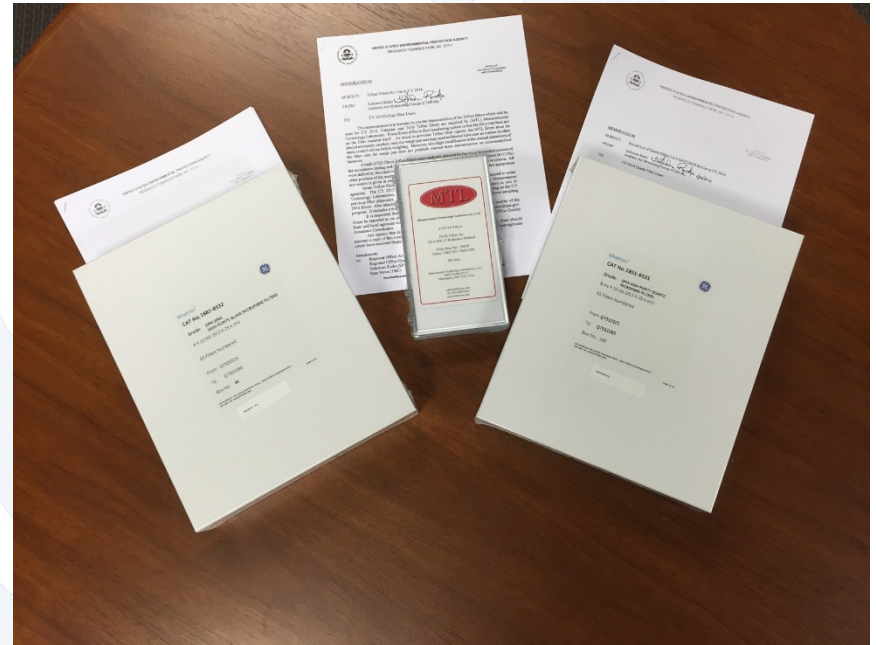
National Ambient Air Monitoring Conference

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Overview

- Provide background on ambient methods using glass, quartz, and polytetrafluoroethylene (PTFE) filters
- Outline filter procurement, acceptance testing, and distribution process
- Review acceptance testing methods and acceptance criteria
- Highlight challenges of the program

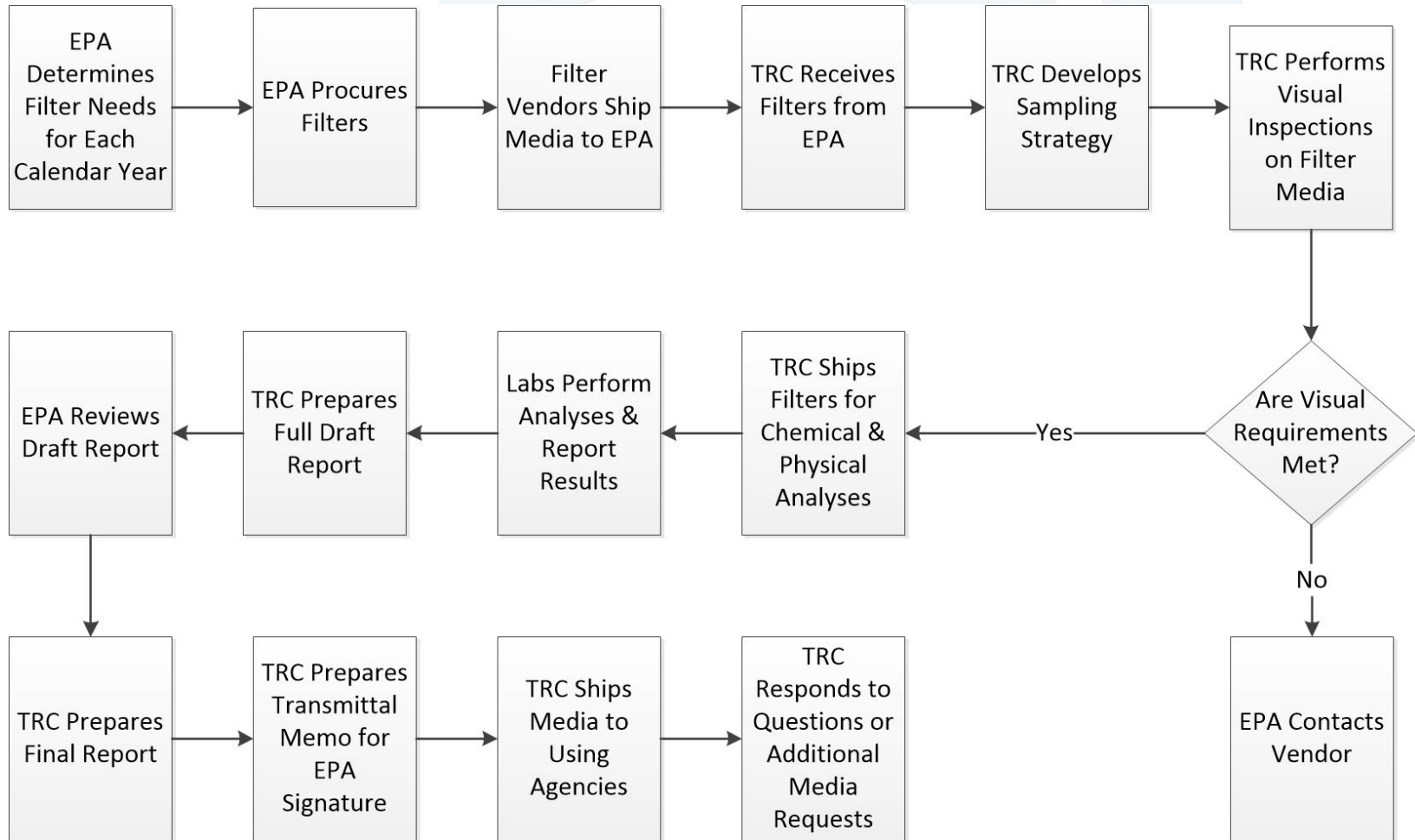


Filter Based Ambient Measurement Methods

Appendix ¹	Analyte	Filter Media Types
B	Total Suspended Particulate (TSP)	Glass (Quartz)
G	Lead (Pb) in TSP	Glass, Quartz, PTFE
J	PM ₁₀	PTFE
L	PM _{2.5}	PTFE
O	PM _{10-2.5}	PTFE
Q	Pb in PM ₁₀	PTFE

¹Appendix to 40 CFR Part 50

Filter Acceptance Program Work Flow



Glass & Quartz Acceptance Requirements

Characteristic	No. of Filters	Test Method	Maximum	Minimum
Width	50	Ruler, 1/16"	8" + 1/16"	8" - 1/16"
Length	50	Ruler, 1/16"	10" + 1/16"	10" - 1/16"
Thickness	75	ASTM D645-97	0.60 mm	0.30 mm
Brittleness	50	Brittleness	No crack longer than 1"	
Tensile Strength	75	ASTM D828-97	None	500 gf/20mm
Flow Rate	75	EPA Flow Rate Test	1.8 m ³ /min	1.34 m ³ /min
Visual - Defects	375 (Glass) 475 (Quartz)	EPA Visual Test	20%	None
Visual – Rejects	375 (Glass) 475 (Quartz)	EPA Visual Test	5%	Note
Retention	50	ASTM D2986-95a	None	99.95%
Lead Content	50	RTI FEM EQL- 0510-91	No filter may lose more than 15 µg of lead	

PTFE Filter Acceptance Requirements ^(1/3)

Characteristic	No. of Filters	Test Method	Maximum	Minimum
Reinforcing Ring, OD	50	Micrometer	46.45 mm	45.95 mm
Reinforcing Ring, Width	50	Micrometer	3.68 mm	3.17 mm
Reinforcing Ring, Thickness	50	Micrometer	0.42 mm	0.34 mm
ΔP @ 16.7 L/min	50	ASTM D2986-95A	30 cm H ₂ O	
Collection Efficiency	50	ASTM D2986-71	99.7% 0.3 μm diameter particle retention	
Container Numbering	All Selected	Visual	No Defect Permitted	

PTFE Filter Acceptance Requirements ^(2/3)

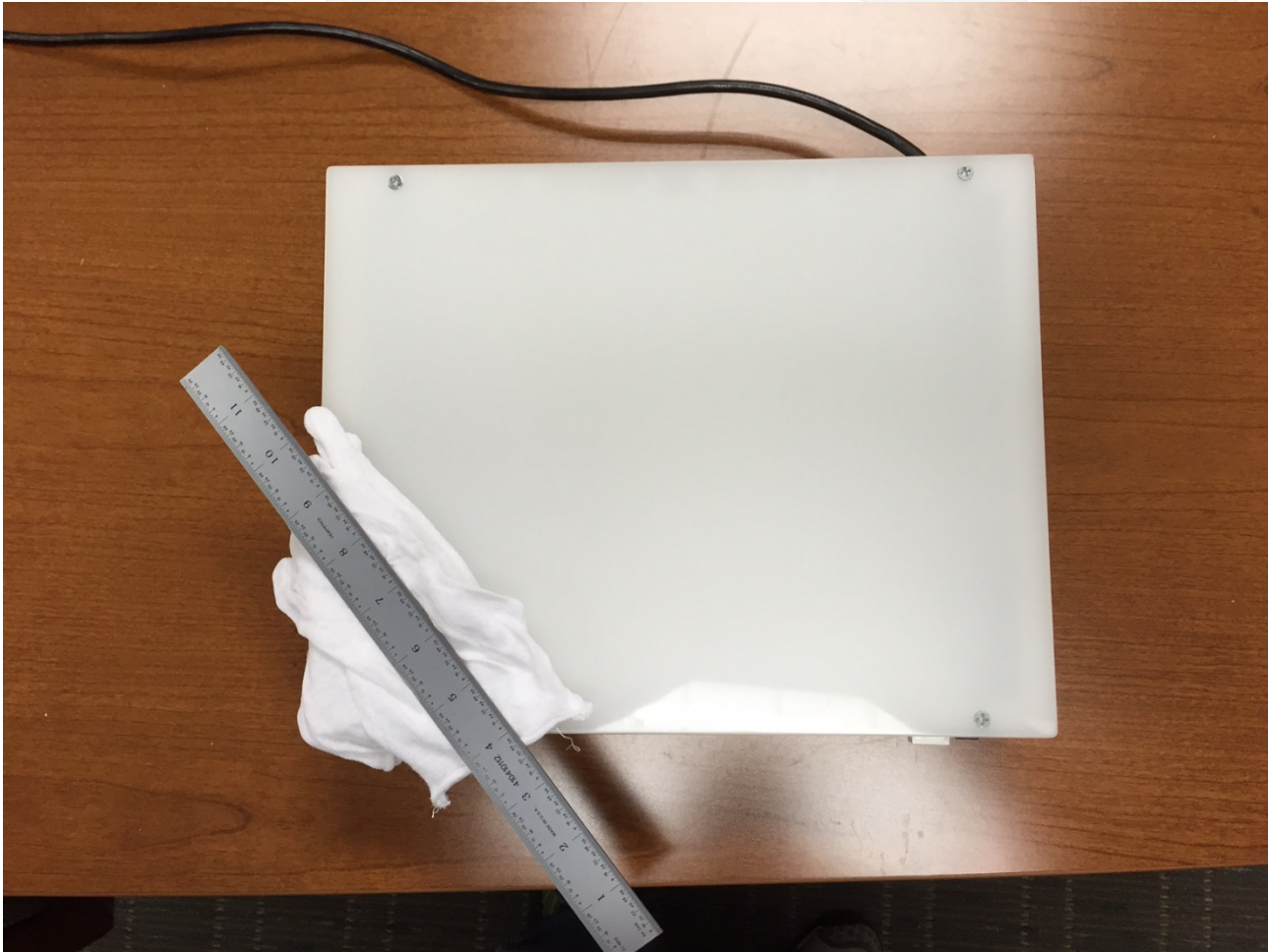
Characteristic	Acceptance Criteria
Moisture Pick Up	Maximum of 10 µg
Filter Weight Stability	Filter weight loss of less than 20 µg
Loose Surface Particles	Change in weight of less than 20 µg
Temperature Stability	Change in weight of less than 20 µg
Alkalinity	Less than 25 µEQ/g
Trace Metals	Varies with each of the 34 target metals, Pb is 4.8 ng/cm ²

All test performed on 50 Filters using the procedures set forth in 40 CFR 50, App L

PTFE Filter Acceptance Requirements (3/3)

Visual Characteristic	Acceptance Criteria
Pinhole	Maximum of 10% Defective Filters Maximum of 5% Reject Filters
Separation of Ring	
Chaff or Flashing	
Loose Material	
Discoloration	
Filter Non-Uniformity	
Other	
All test performed on 525 filters	

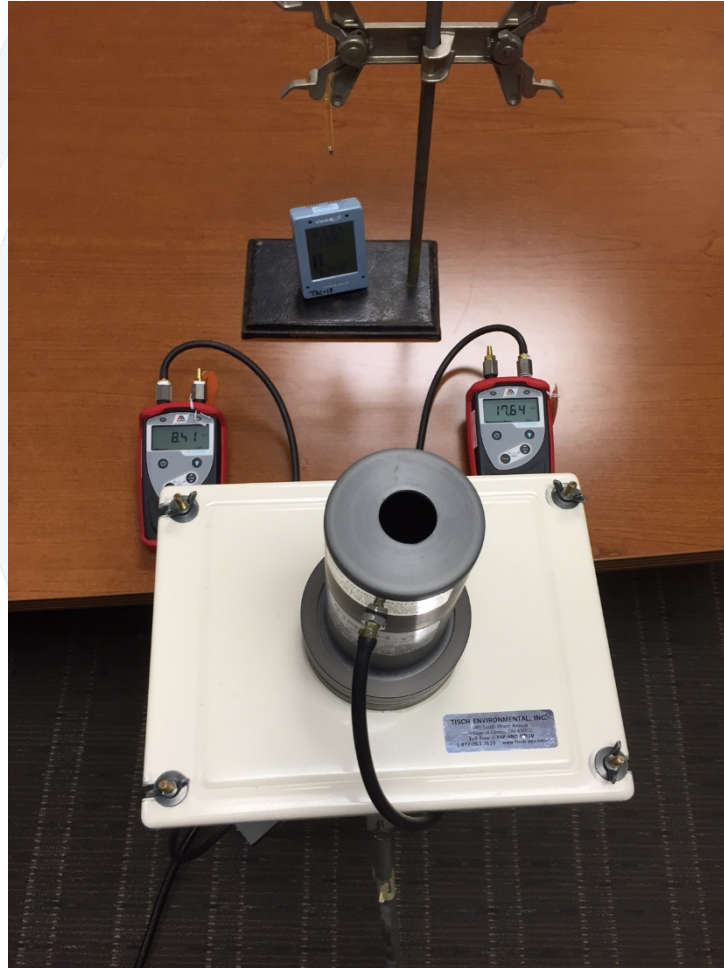
Lightbox for Visual Inspections (1/2)



Lightbox for Visual Inspections (2/2)



Flow Rate Test Assembly



Filter Acceptance Test Program Challenges

1. Limited number of filter media providers
2. Long production cycle for media
3. 75 Day performance window
4. Old ASTM Methods – Not actively updated
5. Limited number of labs to support analysis
6. Overcoming subjectivity in visual measurements

Thank you

Questions?

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