

Update on Development of PS-18 HCl Performance Specification

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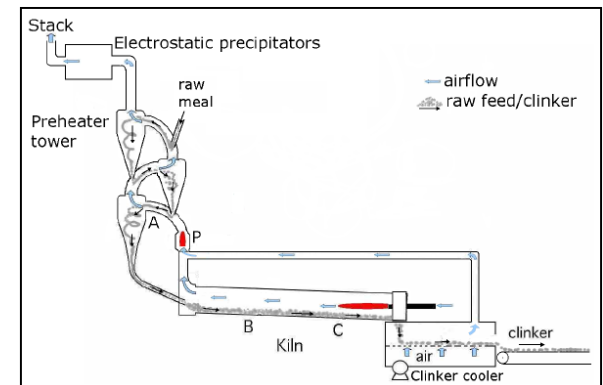


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Background

The Need for a Performance Specification

- Portland Cement MACT
 - PS-15 (FTIR)
 - ~3 ppmv Limit
(9/9/2010)
- MATS Rule (existing units)
 - PS-15 (FTIR)
 - $\sim 2 \times 10^{-3}$ lb/MMBtu Limit
(~1ppm) (12/16/2011)



<http://www.understanding-cement.com/kiln.htm>



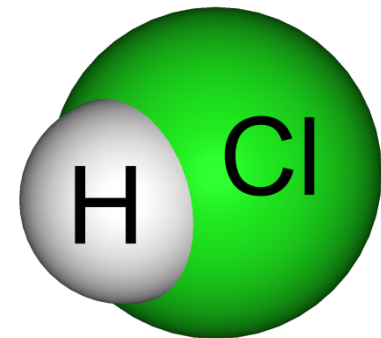
Performance Specification Goal/Vision

➤ Goal

- Technology Neutral
 - ✓ Not limited by the type of measurement technology
 - ✓ Not limited to extractive sampling
- Not limited by reference method bias or sensitivity



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HCI Performance Specification Process

- Stakeholder Involvement
 - Conference Calls
 - ✓ Instrument Vendors
 - ✓ Source Test Firms
 - ✓ Potentially Affected Facilities
 - ✓ Gas Vendors
 - ✓ Regulatory Authorities



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Typical Vendor Applications

Technology Base	Extractive or Cross Stack	Matrix Wet or Dry	Vendor Estimated Detection Limit (ppm)
FTIR (0.4 to 8 wave number resolution)	Extractive	Hot Wet	0.1 to 0.2
GFC - multicomponent	Extractive	Hot Wet	0.2
CRDS	Extractive -Low Pressure-	Dilution - Wet	0.2
TDL	Cross Stack or extractive	Insitu or hot/wet	0.2



Second Draft HCI CEMS Performance Specification PS-18

➤ Summary of Requirements

- Interference Test;
- Limit of Detection (LOD) Determination;
- Response Time Test;
- Calibration Error Test;
- Calibration Drift Test and
- Relative Accuracy Test
 - Comparison w/ RM
 - Stratification Test
 - Optional Dynamic Spiking Test



Requirements ADDED from First Draft

➤ *Interference Test*

Potential Interferent Gas ¹	Approximate Concentration (balance N ₂)
CO ₂	15% ± 1% CO ₂
CO	100 ± 20 ppm
CH ₂ O	
CH ₄	100 ± 20 ppm
NO ₂	250 ± 50 ppm
SO ₂	200 ± 20 ppm
O ₂	3% ± 1% O ₂
H ₂ O	10% ± 1% H ₂ O
Nitrogen	Balance



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Photo Courtesy of Wikipedia

Clarified from First Draft

➤ *Limit of Detection (LOD) Determination*

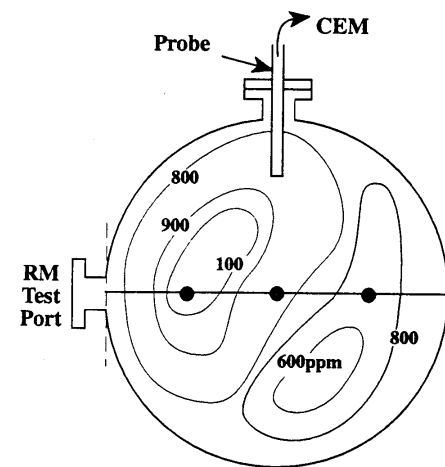
- Include interference compounds
- In Field or in Lab determination allowed
- Extractive through the probe spiking required
- Integrated path system calibration cell spiking allowed
- Standard deviation of seven (7) low level spike replicates
 - ✓ LOD as 3 times the standard deviation of these measurements.



Clarified from First Draft

➤ *Sampling Point Selection*

- Using the Reference Method
 - ✓ Traversing with reference method
 - ❖ Measuring HCl, or
 - ❖ Substituting SO₂, or
 - ❖ Substituting O₂, CO₂, CO or NO_x



Demonstrated QA Initially and Periodically

Optional Dynamic Spiking.

- Spiking Gas Requirements
 - NIST Traceable
 - ✓ Currently being evaluated
 - ❖ Compressed Gas,
 - ❖ Humidified Compressed Gas and
 - ❖ Liquid Evaporative Gas



Requirements Being Moved to Guidance Document

- *Gas Standards Guidance (In progress)*
 - Humidified Gas Standard Preparation
 - Liquid Evaporative Gas Standard Preparation



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Stakeholder Field Studies

➤ *EPRI TDL CEM Lab Report is Available*

- *EPA ORD Pilot Combustor Studies for Extractive Monitors*
✓ *Ongoing - 9/2012 - 3/2013 (Jeff Ryan)*
- *Limited Distribution Holcim field test including*
✓ *Extractive and integrated path HCl CEMS - 12/2012*



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Path to Complete the PS-18

- Draft HCI PS (18) is under development and is not yet proposed for promulgation
 - Latest Draft distributed in October 2012
 - *Address Comments from 2nd Draft Review*
 - Confirming zero and calibration check approach for integrated path monitors
 - Completion of Appendix F ongoing QA/QC Procedure

- Evaluate Draft PS-18 Field data HCI PS by January/February 2013

- *Distribution of the 3rd Draft to Stakeholders*
Late January 2013



Target Dates to Complete the PS-18

- Final Draft of PS – 18 and Appendix F
- Resolve final comments from Stakeholders Feb. – Mar. 2013
- Submit Proposal Package
 - Anticipated proposal target is June 2013
 - Respond to Public Comments July – December 2013
- Anticipated promulgation June – September 2014



After the Break ORD Laboratory Support to PS-18

Jeff Ryan



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