

Assessing FTIR Equivalence for Stack Emission Monitoring

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Stack Emission Monitoring

- Emissions from stacks have to be monitored to ensure they are within legal limits, as specified in the Industrial Emissions Directive
- Different species have their own standard that specifies the method and equipment to use – Standard Reference Method (SRM)

Measurand	SRM	Technique
HCl	EN1911:2010	Wet chemistry
Dust/particulates	EN 13284-1:2002	Manual gravimetric method
O ₂	EN 14789:2005	Paramagnetism
NO _x	EN 14792:2005	Chemi-luminescence
CO	EN 15058:2006	Non-dispersive infrared spectrometry
SO ₂	EN 14791:2005	Wet chemistry
H ₂ O	EN 14790:2005	Wet chemistry

Stack emission monitoring without the SRM

- The local competent authority can allow operators to measure stack gases with alternative methods (AM)
- In order to qualify as an AM the approach has to prove it is equivalent to the SRM
- EN 14793:2005 *Stationary source emission – Intralaboratory validation procedure for an alternative method compared to a reference method* provides the required method to demonstrate this

FTIR as an AM for stack emission monitoring

- NPL was tasked by the Environment Agency (competent authority in England) to undertake testing in NPL's Stack Simulator Facility to assess the equivalence of FTIR to the SRMs of H₂O, CO, NO, SO₂ and HCl
- The Stack Simulator Facility was used to generate a series of complex gas mixtures spanning several types of industrial process including typical interferences (e.g. water vapour)
- All test mixtures were produced under typical stack conditions (high temperatures, high humidity, acid gas matrix etc.)
- NPL was able to show equivalence for all species, testing in accordance with CEN/TS 14793

FTIR adoption work

- NPL feeding the equivalence work into CEN/TC264/WG36 Measurement of stack gas emissions using FTIR instruments
- Equivalence data will be included as an ‘informative’ annex, showing what is possible with FTIR
- Evidence will assist local competent authorities to make decisions about permitting the use of FTIR for certain applications