

MONITORING CERTIFICATION SCHEME (MCERTS) FOR ENVIRONMENTAL DUSTTRAK™



Sira MC160316/00
Sira MC160317/00
Sira MC160318/00



Introduction

Many countries have strict laws to regulate emissions released into the air, land and water, in an effort to protect the environment and human health. Businesses creating emissions that are released into the environment must comply with these laws. The emissions monitoring instruments used by businesses to comply must meet certain quality requirements. The United Kingdom's environmental agency Monitoring Certification Scheme (MCERTS) is based on International and European emissions standards and is the framework for these quality requirements. MCERTS is also used for approving instruments, people and laboratories that will be responsible for monitoring emissions released into air, land and water in the UK. Having an MCERTS certification provides the Environmental Agency with confidence that the instrument chosen can accurately monitor the environmental emissions.

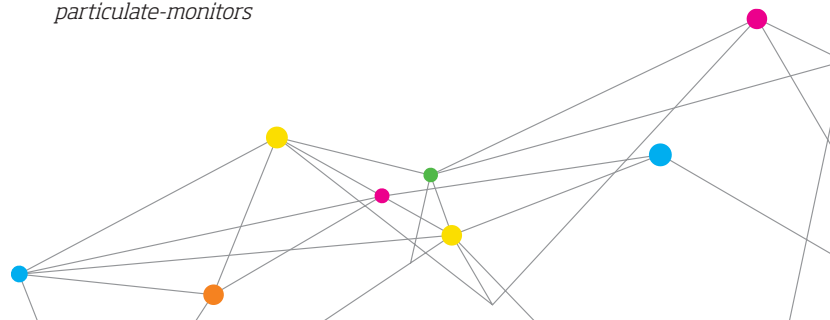
TSI Incorporated, a global leader in aerosol instrumentation, obtained compliance for its instruments approved for monitoring air emissions in the United Kingdom. There are many different MCERTS performance standards an instrument can be approved for. TSI's Environmental DustTrak™ Aerosol Monitor is certified to meet the MCERTS

Performance Standard for Indicative Ambient Particulate Monitors. Indicative dust monitors are defined as being able to measure ambient dust on a qualitative or quantitative basis. These instruments must be able to continuously monitor ambient pollutant concentrations on-site, while automatically producing results. The instruments' operation can be based on non-gravimetric analysis, such as light scattering and/or other optical or non-optical principles, or a gravimetric technique. Performance characteristic assessments are based on field performance against a reference method, measurement uncertainty, constancy of sample volumetric flow, among others.

Particulate matter size fractions specific to the MCERTS indicative performance standard are PM10 and PM2.5, both of which TSI's Environmental DustTrak instruments are certified to monitor. For qualitative measurements, the instrument can rely on factory calibration only. For quantitative measurements, the instrument must provide data with an uncertainty of +/- 50%. For further understanding, please reference the specific standard on the governmental agencies website: <https://www.gov.uk/government/publications/mcerts-performance-standard-for-indicative-ambient-particulate-monitors>



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FOR ENVIRONMENTAL DUSTTRAK™

Testing

Environmental DustTrak conformity testing was completed by Bureau Veritas, an accredited business located in the United Kingdom. Specific Environmental DustTrak models tested include an EDTPM2.5M with a PM2.5 impactor measuring PM2.5, an EDTPM10M with a PM10 impactor measuring PM10, and the EDTDRXM measuring both PM10 and PM2.5 size fractions simultaneously. The Environmental DustTrak field data was then compared to the data measured by European Reference Method Samplers, identified as PM10 and PM 2.5 SEQ 47/50 manufactured by Sven Leckel GmbH, that were monitoring particulate matter alongside of the Environmental DustTrak instruments. Testing was conducted during the time period of March 3rd to June 14th, 2016 in Southwest London. The instruments produced 15 minute average concentrations, and these data points were averaged to 24 hour averages. After testing was completed, the results were submitted for certification against the MCERTS Performance Standard for Indicative Ambient Particulate Monitors. Each Environmental DustTrak instrument that will be shipped to customers will have an additional label indicating that it qualifies as an MCERTS certified product. The certification number and certified range are shown on the right.



Results

The indicative performance standard states that the highest expanded uncertainty estimate (W_{CM}) should be below 50%. For reference, the W_{CM} value is indicated on each of the charts shown on the right. Each Environmental DustTrak instrument was tested with factory pre-set calibration factors of 1. Photometric Conversion Factors (PCF) were obtained by using the orthogonal regression method from the comparison made between the Environmental DustTrak data (PCF = 1) and the reference method data. Calculated PCF values were then applied to the data for final comparison with the reference method. The PCF values used for each instrument are indicated in the chart titles. These PCF values will be pre-set at the factory prior to shipment of MCERTS products.



TSI's EDTPM2.5M, EDTPM10M and EDTDRXM were compared against European Reference Method Samplers, identified as PM10 and PM2.5 SEQ 47/50 manufactured by Sven Leckel GmbH.

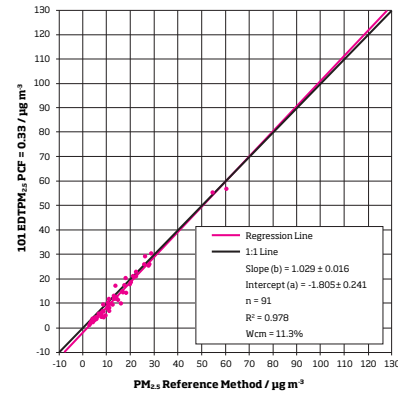


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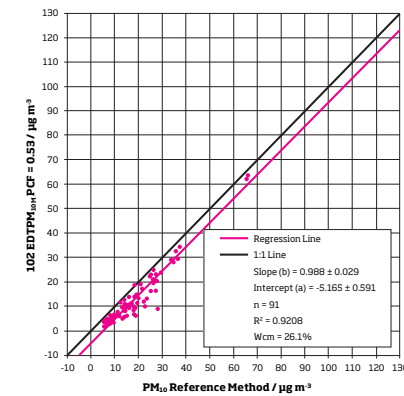
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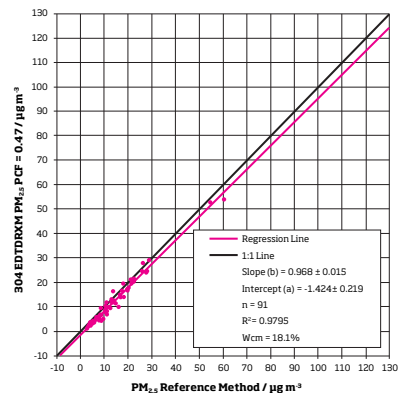
TSI's Environmental DustTrak Aerosol Monitors vs. SEQ47/50 Reference Method



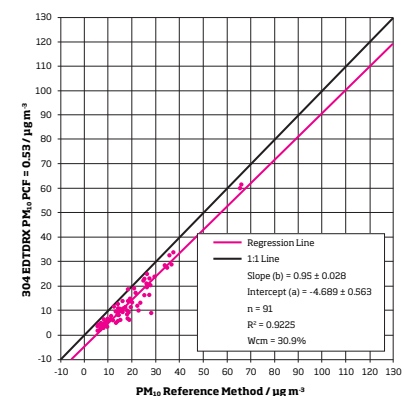
EDTPM2.5M
EDTPM2.5M (PCF = 0.33) versus the PM2.5 SEQ 47/50 Reference Method - Comparison of 24 hour averages



EDTPM10M
EDTPM10M (PCF = 0.53) versus the PM10 SEQ 47/50 Reference Method - Comparison of 24 hour averages



EDTDRXM PM2.5
EDTDRXM (PCF=0.47) versus the PM2.5 SEQ 47/50 Reference Method - Comparison of 24 hour averages



EDTDRXM PM10
EDTDRXM (PCF=0.53) versus the PM10 SEQ 47/50 Reference Method - Comparison of 24 hour averages