

Certifications

In 1997, the patented AMESA® system successfully passed a Type Performance Test carried out by TÜV Rheinland (No: 936/808017A 12.8.1997) according to the EU notified minimum requirements for long-term sampling systems (EU notification 97/26/D).

Therefore AMESA® was published in the German Joint Ministerial Gazette (GMBI, 13 January 1998, page 10) issued by the Federal Ministry of the Environment, Conservation and Reactor Safety (BMU).

In 2002, AMESA® obtained the TÜV Approval according to the TUVdotCom regulations (TUVdotCom-ID: 0011005400, type approval no. 936/805017B).

In addition to the performance test, such an approval is subject to an annual TÜV auditors inspection, thus ensuring that the actual AMESA® systems produced conform to the minimum requirements set for long-term sampling systems.

In October 2005, after a 3-month field trial and laboratory tests, AMESA® received the MCERTS-certification (no. Sira MC 050064/00), based on the "MCERTS Performance Standards and Test procedures for Automatic Isokinetic Samplers Version 2".

All measurement devices part of AMESA®, which are needed to assure a correct sampling, (volume measurement, isokinetic control, temperature and pressure measurement etc.) were very intensively tested during the TÜV and MCERT tests, thus ensuring a perfect calculation of the average dioxin concentration over the sampling time.

The most relevant tests are those related to the adsorption characteristics of the system (e.g. possible break-through of dioxins through the cartridge, possible losses of dioxins in the sampling line and condensate etc.), which are exclusively performed in the more stringent TÜV type performance test.

Up to now (2007) AMESA® is the only instrument on the market for long-term sampling of dioxins, having successfully passed such a Type Performance and which was published in the GMBI.



Continuous dioxin/furan emission monitoring by long-term sampling

The only long-term sampling system for dioxins with both TÜV and MCERT approvals



Sampling unit



Control cabinet

AMLEIT remote control

AMLEIT system allows the remote control of AMESA units by modem or serial link

- Simultaneous control of 1 up to 4 AMESA units per location
- Detailed display of operating conditions, status, errors, configuration data and diagnosis
- Operates under Windows™ 95, 98, 2000 or XP



General window



Synoptic window



Status window

Major fields of application

- Municipal waste incinerators
- Hazardous waste incinerators
- Hospital waste incinerators
- Power plants
- Biomass-fired power plants
- Cement kilns
- Metallurgic plants
- Pulp and paper mills
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Exclusive features

- Modified cooled-probe method, with adsorption on XAD-II
- Collection of condensate not required
- TÜV approved and type performance tested by TÜV Rheinland
- Certified by MCERT (UK)
- Fully automatic isokinetic sampling from 6 hours up to 6 weeks (4 weeks type performance tested)
- Validated against method EN 1948
- US EPA method 23A compliant (option)
- Suitable for all U-POPs listed in the Stockholm convention
- Optional upgrade for sampling of other micro-pollutants (e.g. heavy metals or mercury)

Principle of operation

The AMESA® system, approved in 1997 by TÜV Rheinland (Germany) is designed for the long-term sampling of dioxins (PCDD), furans (PCDF) and other Persistent Organic Pollutants (POPs).

Traditionally, the monitoring of PCDD/Fs is achieved by taking 1 – 3 short-term samples per year (each of 6 hours).

By permanent sampling over a period of up to 4 weeks, AMESA® ensures continuous documentation of dioxins/furans emission for each single sample, thus ensuring that fluctuations in plant operation and in the composition of the fuel are well recorded.

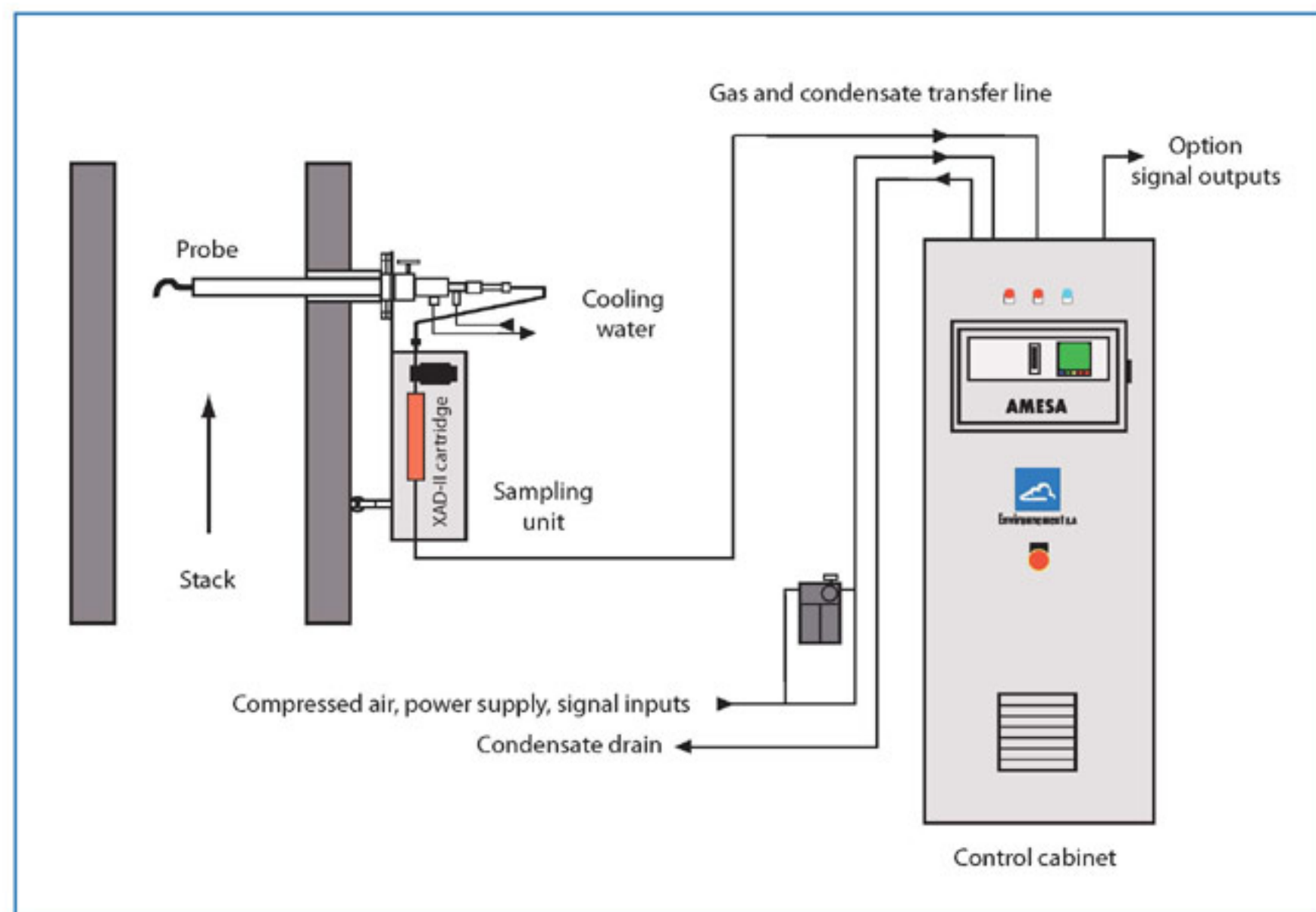
A cooled probe (<50°C) is used to extract a part of the flue gas isokinetically from the stack. Dioxins and furans which are combined in the gas, the dust and the condensate of the flue gas are adsorbed in a specific cartridge filled with XAD-2 and quartz-wool.

An automatic leakage test is performed before and after the sampling cycle to validate the non-contamination of the adsorbing cartridge.

After adsorption, the measured gas is pumped through a flexible tube to the control cabinet, where the gas is cooled down (<5°C) to completely remove the condensate. The isokinetic extraction is controlled continuously as a function of the flue gas velocity, temperature and pressure, by use of a thermal mass flowmeter and a frequency controlled pump.

The dried measured gas flow is determined by means of a dual calibrated gas meter and a thermal mass flowmeter.

AMESA® operates fully automatically and all necessary data are stored internally and on a removable SRAM card. Both the XAD-2 cartridge and the SRAM card are to be sent to a specialized laboratory for further analysis of PCDD/PCDF.



Technical characteristics

General data

- Measuring range (dioxin & furan): ... 0.0001-10 ng I-TEQ / m³ (TÜV approved 0-0.2 ng I-TEQ / m³)
- Sampling interval: from 6 hours up to 6 weeks (TÜV approved 4 weeks)
- Flue gas temperature: up to 70°C without cooling up to 400°C with cooling
- Max dust concentration in the flue gas: 50 mg/ m³
- Flue gas velocity: from 1 up to 30 m/s
- Operating temperature (control cabinet): +5 to +40°C (optional air conditioner for temperatures over +40°C)
- Max relative humidity (control cabinet): 50%
- Isokinetic control cycle: 1 sec
- Velocity measurement accuracy: ± 1% of measuring range
- Volume measurement accuracy: ... ± 1.5% of measuring range

Sampling probe

- Length: from 350 up to 2000 mm
- Probe shaft diameter: 60 mm
- Free probe tip diameter: 4, 5 or 6 mm
- Stack mounting: DN 100 flange (other flanges upon request)
- Material: titanium (glass as an option)

Sampling unit

- Standard unit dimensions: ... 650x450x250 mm (HxWxD)
- Overbox dimensions: 1150x650x500 mm (HxWxD) (waterproof enclosure for outdoor installation)
- Adsorbant cartridge: XAD-2

Control cabinet

- Dimensions: 2000x800x650 mm (HxWxD)
- Weight: approx. 250 kg

Utilities

- Compressed air: 3 to 7 bars, dry, oil free
- Compressed air connection: 8x1 or 6x1 mm hose
- Cooling water: 0.5 to 5 l/min (accord. to fume temperature) (absolutely essential for fume temperature >70°C Optional closed loop cooler if tap water not available)
- Water connection: 1/2" hose (inlet & return)
- Power supply: ... 230 VAC, 50 Hz (option 115V,50/60Hz)
- Power consumption: approx 1.1 kW
- Fuse: 16A

Inputs / Outputs

- Digital outputs: status (monitoring mode, fault, error)
- Digital inputs: furnace off, maintenance
- Analog inputs (optional) : ...O₂, CO₂, gas velocity, static pressure etc

Disposal

- Flue gas recycling: 8x1 mm hose
- Condensate drain: 8x1mm hose
- Condensate quantity: approx 3 l/day (depending on flue gas moisture content)



XAD-2 cartridge