

ANNEX IV U.K.

Activity-specific monitoring methodologies related to installations (Article 20(2))

16. **Determination of nitrous oxide (N₂O) emissions from nitric acid, adipic acid, caprolactam, glyoxal and glyoxylic acid production as listed in Annex I to Directive 2003/87/EC** U.K.

B. *Determination of N₂O emissions* U.K.

B.3. *Determination of flue gas flow* U.K.

The operator shall use the methods for monitoring flue gas flow set out in Article 43(5) of this Regulation for measuring the flue gas flow for N₂O emissions monitoring. For nitric acid production, the operator shall apply the method in accordance with point (a) of Article 43(5) unless it is technically not feasible. In that case and upon approval by the competent authority, the operator shall apply an alternative method, including by a mass balance methodology based on significant parameters such as ammonia input load, or determination of flow by continuous emissions flow measurement.

The flue gas flow shall be calculated in accordance with the following formula:

$$V_{\text{flue gas flow}} [\text{Nm}^3/\text{h}] = V_{\text{air}} * (1 - O_{2,\text{air}})/(1 - O_{2,\text{flue gas}})$$

Where:

V_{air}	=	Total input air flow in Nm ³ /h at standard conditions;
$O_{2,\text{air}}$	=	Volume fraction of O ₂ in dry air [= 0,2095];
$O_{2,\text{flue gas}}$	=	Volume fraction of O ₂ in the flue gas.

The V_{air} shall be calculated as the sum of all air flows entering the nitric acid production unit.

The operator shall apply the following formula, unless stated otherwise in its monitoring plan:

$$V_{\text{air}} = V_{\text{prim}} + V_{\text{sec}} + V_{\text{seal}}$$

Where:

V_{prim}	=	Primary input air flow in Nm ³ /h at standard conditions;
V_{sec}	=	Secondary input air flow in Nm ³ /h at standard conditions;
V_{seal}	=	Seal input air flow in Nm ³ /h at standard conditions.

The operator shall determine V_{prim} by continuous flow measurement before the mixing with ammonia takes place. The operator shall determine V_{sec} by continuous flow measurement, including where the measurement is before the heat recovery unit. For V_{seal} the operator shall consider the purged airflow within the nitric acid production process.

For input air streams accounting for cumulatively less than 2,5 % of the total air flow, the competent authority may accept estimation methods for the determination of that air flow rate proposed by the operator based on industry best practices.

The operator shall provide evidence through measurements under normal operating conditions that the flue gas flow measured is sufficiently homogeneous to allow for the proposed measurement method. Where non-homogeneous flow is confirmed through these measurements, the operator shall take that into account when determining appropriate monitoring methods and when calculating the uncertainty in the N₂O emissions.

Changes to legislation: There are currently no known outstanding effects for the Commission Regulation (EU) No 601/2012 (repealed), Division B.3.. (See end of Document for details)

The operator shall adjust all measurements to a dry gas basis and report them consistently.

Changes to legislation:

There are currently no known outstanding effects for the Commission Regulation (EU) No 601/2012 (repealed), Division B.3..