

# **SYSTEM ROTAMIX™**

## **Utvärdering av ny SNCR inblandningsteknik vid avfallspanna hos Uppsala Energi**

**Evaluation of a new SNCR intermixing technique applied  
on a waste incinerator at Uppsala Energy**

## **SLUTRAPPORT**

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## SUMMARY

A good intermixing of reductants in the exhaust gas is essential for good combustion and high NO<sub>x</sub> reduction. Good intermixing cuts down on the levels of reducing chemicals required for NO<sub>x</sub> reduction. Conventional SNCR is built on intermixing of reductants through a series of lances which are mounted to cover several cross sectional areas of the furnace.

System ROTAMIX™ is a technique based on premixing the SNCR chemicals with air before entering the furnace by rotation. As a consequence, fewer numbers of mixing nozzles are needed. As a result; The investment cost can be kept down. Also the creation of unwanted byproducts are reduced. The reason for this is that a homogeneous mixture of gases inside the furnace results in more even temperature distribution through the cross-section of the furnace. Increasing the effectiveness of the reductants, so reducing the levels of chemicals required and so reducing the unwanted by-products.

Furthermore;

- System ROTAMIX reduces levels of NO<sub>x</sub> by a further 50% over existing SNCR technology system.
- An increase in efficiency carried by needed lower levels of excess air.
- The actual levels of NO<sub>x</sub> are down to as low as 120-125 mg/MJ without the need for any addition reducing chemical with Rotating Over Fire Air (ROFA).

Summary of studied cases, Block 4, UEAB. Case 1, 2 and 3 are selected from representative old data.

Cases	NO <sub>x</sub> mg/MJ	NH <sub>3</sub> ppm wg After E.P.	NH <sub>3</sub> mg/Nm <sup>3</sup> dg Before E.P. 1)	N <sub>2</sub> O ppm dg	O <sub>2</sub> % wg	CO mg/Nm <sup>3</sup> 10% CO <sub>2</sub>	Furnace temp. °C
1. Before any NO <sub>x</sub> red. has been made	200	-	-	-	9	40-50	1100
2. SNCR without any primary technique has been applied	150	< 2	-	-	9	25	1050
3. SNCR with applied primary technique	90-105	< 3	-	-	9	30	970
4. ROFA	120-130	< 2	< 1,0	< 7	7	40	970
5. ROFA + RFG	120-125	< 2,0	< 1,0	< 5	7	30	970
6. ROTAMIX + RFG	45-55	2 - 6	< 3 a 10	< 15	7-8	25-45	970
6b ROTAMIX + RFG	30-35	< 10	-	-	7-8	25-45	970

1) Note. Reliability could be discussed

**Keywords:** Air pollution control, Nitrogen oxides, System Rotamix, New SNCR intermixing technique, Waste incinerator