Ammonia Gas Disposer ReNOx

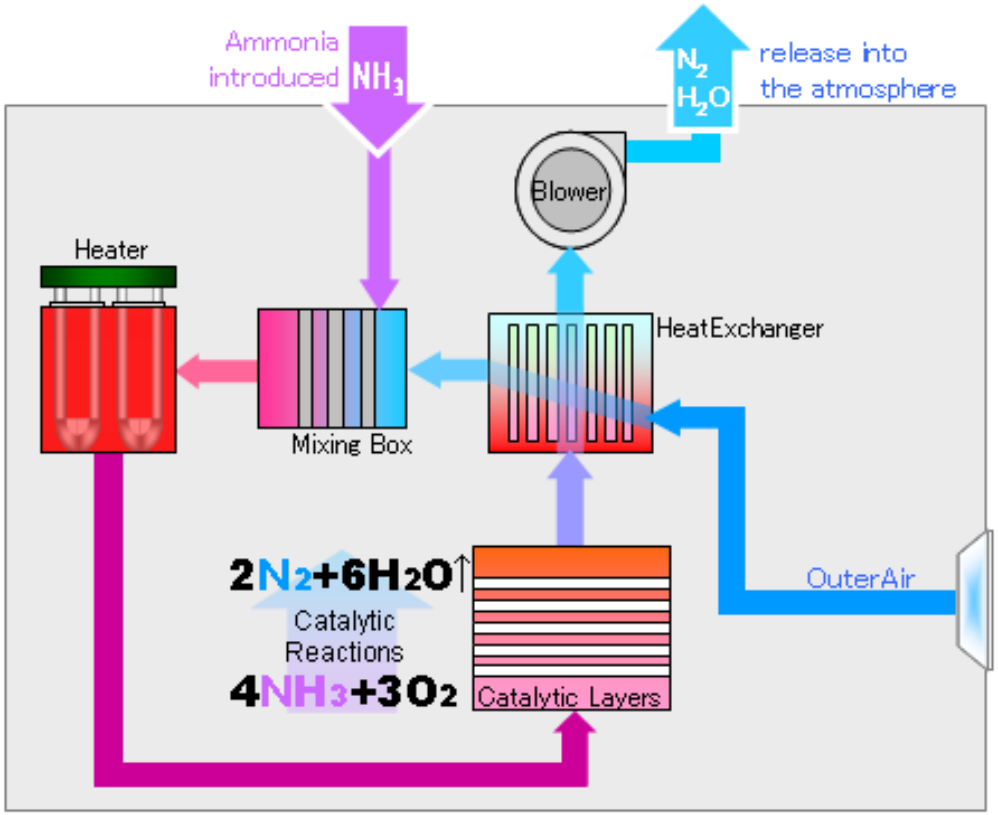
High efficiency gas disposer perfect for laboratory use

Gaseous exhaust cleaning system ReNOx

*** High efficiency in treating highly concentrative Ammonia gas. Plenty of dissociation heat obtained from highly concentrative Ammonia gas makes it possible almost to cut off outer heat supply during operations.**
*** The System has superior destructive abilities for various bad odor components. Over 99% of smelly gases can be decomposed and are released as odorless air.**
*** Amines such as hexamethylenetetramine can be decomposed. Our system is also good to decompose Ammonia gases containing Hydrogen, so is applicable to MOCVD.**

- Convert Ammonia to harmless Nitrogen
  $4NH_3+3O_2 \rightarrow 2N_2+6H_2O$
  Can be released directly to atmosphere.
- 1.8% Ammonia to be safely decomposed.
  Small foot print, Low energy consumption
- Simultaneous treatment of Hydrogen containing gases are also possible.
- No secondary products. clean gas emission
- High efficiency and high performances. SV.16000h-1
- High durability against thermal and mechanical shock.
- Superior performance on bad odor reduction.

Flow Chart of Ammonia Gas Treatment (Catalytic Burning Method)



1) Taking outer air and heating it through heat exchanger.
2) Gases containing Ammonia introduced to box and mixed with heated air.
3) Mixed gas heated up to temperatures of initiation for catalyst reaction.
4) During passing through catalytic layers, Ammonia and Oxygen reacted on catalytic surface to produce Nitrogen and water vapor. (Catalytic Burning Method)
5) Produced dissociation heat of Ammonia heating outer air at heat exchanger.
6) Nitrogen and water, after cooling, exhausted into air.

Performance and Efficiency of Dirty Gas Purification

***Gas Treatment Example : Ammonia**

Unit : ppm (Volume)

	Inlet	Exhaust
Ammonia	16000	below 0.1
Nitrogen Oxide	0	below 50

***Gas Treatment Example : MOCVD**

Unit : ppm (Volume)

	Inlet	Exhaust
Hydrogen	10000	below 0.1
Nitrogen Oxide	0	below 50

Performance and Efficiency of Odor Deodorization

***Example 1 : sewage composts**

Unit : ppm (Volume)

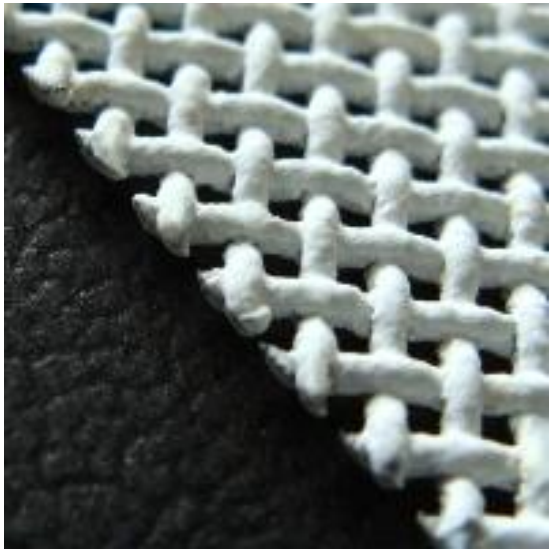
Kind of gases	Inlet	Outlet
Ammonia	150	below 0.1
Methyl Mercaptan	1.3	below 0.0001
Methyl Sulfide	0.85	0.0001
Trimethylamine	2.3	below 0.0005
Nitrogen Oxide	9.4	10.0

***Example 2 : animal deposits**

Unit : ppm (Volume)

Kind of gases	Inlet	Outlet
Ammonia	14	1.2
Methyl Mercaptan	2.10	0.0049
Methyl Sulfide	53	0.29
Concentration of Odor (Japanese standard)	170,000	55

TITERIX
Catalyst used in ReNOx



Characteristics

ReNOx catalyst(TITERIX) is completely different from commonly known catalysts such as precious metal monolith, pellets etc for every points of view: Structure, Active Components and Superiorities of Effect in actual use etc.

ReNOx catalyst is easy for handling, having Superior Strength and Durability against thermal and mechanical shocks.

Nitrogen compounds frequently used in processing Electronics Parts Production, such as Ammonia, badly smelling Amines etc. should not be exhausted both gaseous nor aqueous phase as itself. ReNOx catalyst are especially suitable for make it harmless as N2, processing with high efficiency and energy saving.
No conventional technologies or systems could be competed for ReNOx.

Catalytic Burning Method
Equation of Chemical Reaction

Ammonia gas burning (reaction with oxygen)

$$4NH_3+3O_2$$

Finally, dissociated to Nitrogen(N_2) and water vapor, released to air.

$$2N_2+6H_2O$$

* NOx, as it is one of the environmental toxic matters which causes pollution of acid rain, over nutrition for forests and rivers.
* N_2, a component over 70% of air, is not toxic at all.

Performance Data - ReNOx

Ammonia

	Before	After
Ammonia	16,000ppm	>0.1ppm
NOx	0	>50ppm

MOCVD

	Before	After
Hydrogen	10,000ppm	>0.1ppm
NOx	0	>50ppm

Sludge odor

	Before	After
Ammonia	150ppm	>0.1ppm
CH_3SH	1.3ppm	>0.0001ppm
$(CH_3)_2S$	0.85ppm	0.0001ppm
$N(CH_3)_3$	2.3ppm	>0.0005ppm
NOx	9	10

Septic/Spoiled odor

	Before	After
Ammonia	14ppm	1.2ppm
CH_3SH	2.10ppm	0.0049ppm
H_2S	53ppm	0.29ppm
odor concentration	170,000ppm	55ppm

Performance comparison : Ammonia gas approx. 7kg/hour

	ReNOx	Conventional system
Outer air for dilution	10Nm³/min	20Nm³/min
Reactive heat generation	165˚C increase	87˚C increase
Energy for heating needed	1kw	21kw

Performance Data - TITERIX

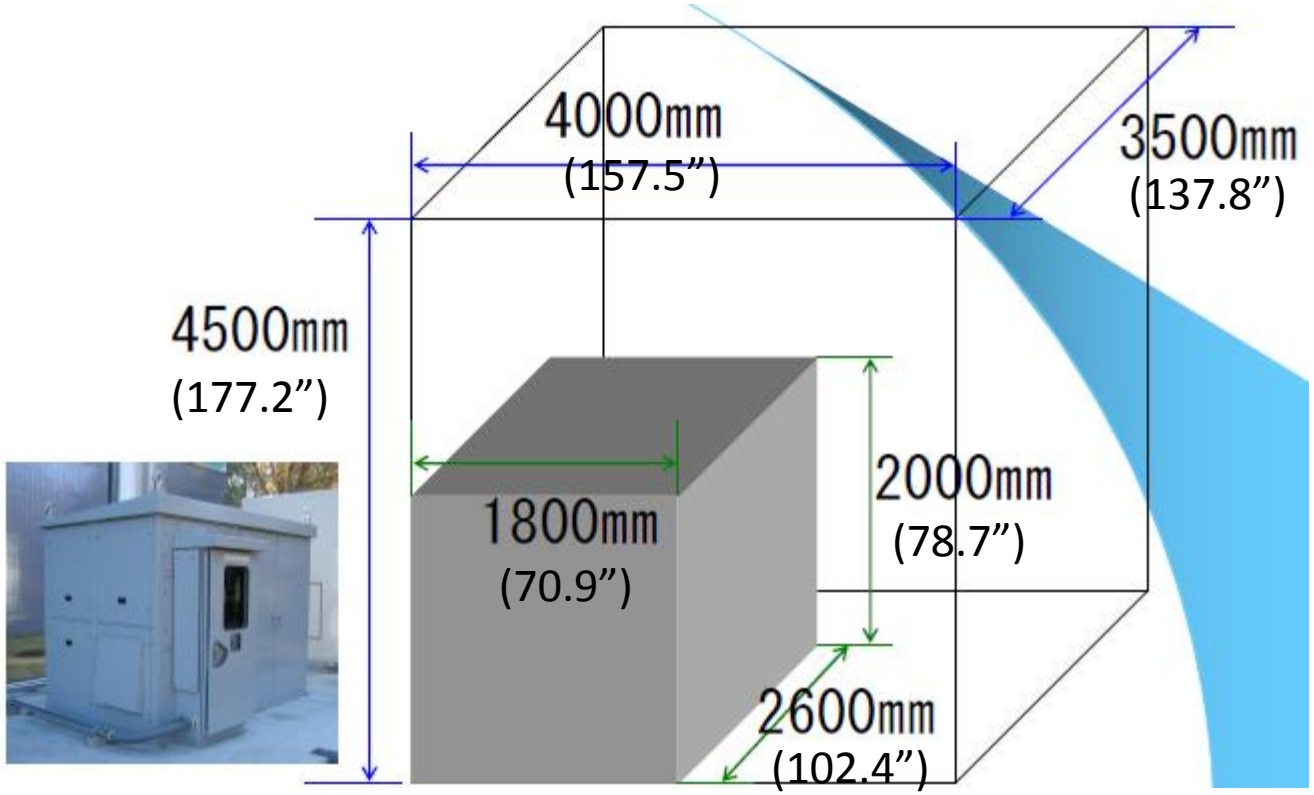
Catalyst performance

	TITELIX
SV value *	16,000h^{-1}
Reaction temperature	350˚C
Max. operation temperature (Thermal endurance)	550˚C
Max. operating concentration (Normal processing concentration)	18,000ppm (15,000ppm)
Deodorizing ability	Ref. to ReNOx
Carcinogen	None

Catalyst performance comparison

	TITERIX	Conventional
Catalyst form	**Wire mesh**	Honeycomb
SV Value	**12,000-16,000h-1**	5,000h-1
Capacity	**3.8L/Nm3**	12.0L/Nm3
Reaction temp.	**350℃**	350℃
Max. operating temp.	**550℃**	450℃
General disposal concentration	**15,000ppm**	8,000ppm

An example of ReNOx foot print



For NH_3 7.5kg/hour (10Nm^3/min)

Power usage comparison

	ReNox	Conventional
Max. concentration	**18,000ppm**	10,000ppm
Max. dilution air supply	**20m³/min**	40Nm³/min
Heater power consumption	**2kw**	46kw
Fan power consumption	**11kw**	22kw

Contact information

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