

PROPOSAL

Supply
of the
Environmental Treatment Equipment
for the
oooo Ltd.



Purchaser:	oooo LTD.
Address:	oooo, KOREA
Inquiry ref No.:	
Contractor:	ENCOCO Inc.
Address:	AnSung, KOREA
Offer No:	EN-Q-7060702
Date:	7th ooo 2007

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1. BASIS OF THE QUOTATION

(주)ooooo(herein after Purchaser)의 제안요청(dated 29th ooo, 2007)에 따라 (주)엔코코는 해당제품의 상세한 설명과 함께 본 견적을 제출합니다.

Main parameters

PCB Etch공정에서 사용하는 CF₄가 산소와 결합하여 HF와 냄새를 유발하는데, HF를 제거하기 위하여 Wet Type의 Scrubber를 사용할 경우 순환된 재생액이 산성으로 변하게 되고 이 재생액을 Drain 시킬 때 pH를 중성으로 방출하기 위하여 NaOH를 사용한다.

이와 같이 PCB Etch공정 중 배출되는 HF를 처리하기 위한 장치가 요구되며, 각 가스의 반응식은 다음과 같다.

Gas	TVL (ppm)	IDLH (ppm)	Gas Reaction	Remark
CHF ₃	3		CHF ₃ + O ₂ -> CO ₂ + HF + F ₂	Burning
CF ₄			CF ₄ + O ₂ -> CO ₂ + 2F ₂	Drying
HF	3	20		Wetting

HF Efficiency: More 95% in case of scrubber units with wetting type

Equipment Condition

Type : Wet type scrubber

Vent gas flow rate : 400 slm

Inlet condition

- Static pressure : 200 mmAq

- Temp. : 40°C

2. SCOPE OF SUPPLY

2.1. Requirement of the scrubber

- 1 x 400 slm Wet type scrubber (the scrubber includes 1 pcs circulation pump, 1 pcs drain so total 2 pcs of pump)

The cabinet unit contains a scrubber with absorbers and spray systems. The scrubbers will be settled up on utility room

The scrubber connects a NaOH dosing system with a NaOH mixing-dosing tank and/or a drain pump. The dosing system is optionally.

2.2. Description of the technology

Water is injected into the inside of the inner and outer cylinders via spray nozzles on the top of the chamber. The inner space of the wet chamber is filled with round absorbers. Absorbers are designed to maximize the contact area with water and flow gases and make the gases flow smooth simultaneously. Gases enter the center of the wet chamber through the top, flow down through absorbers to the bottom, u-turn into the inside of the outer cylinder of the wet chamber, goes to the top through absorbers and finally go out of the scrubber via the upside of the outer cylinder. During the travel the gases are dissolved in or reacts with water. Some chemisorbers, which are placed in the upside of the outer cylinder, finally treat the remained gases.

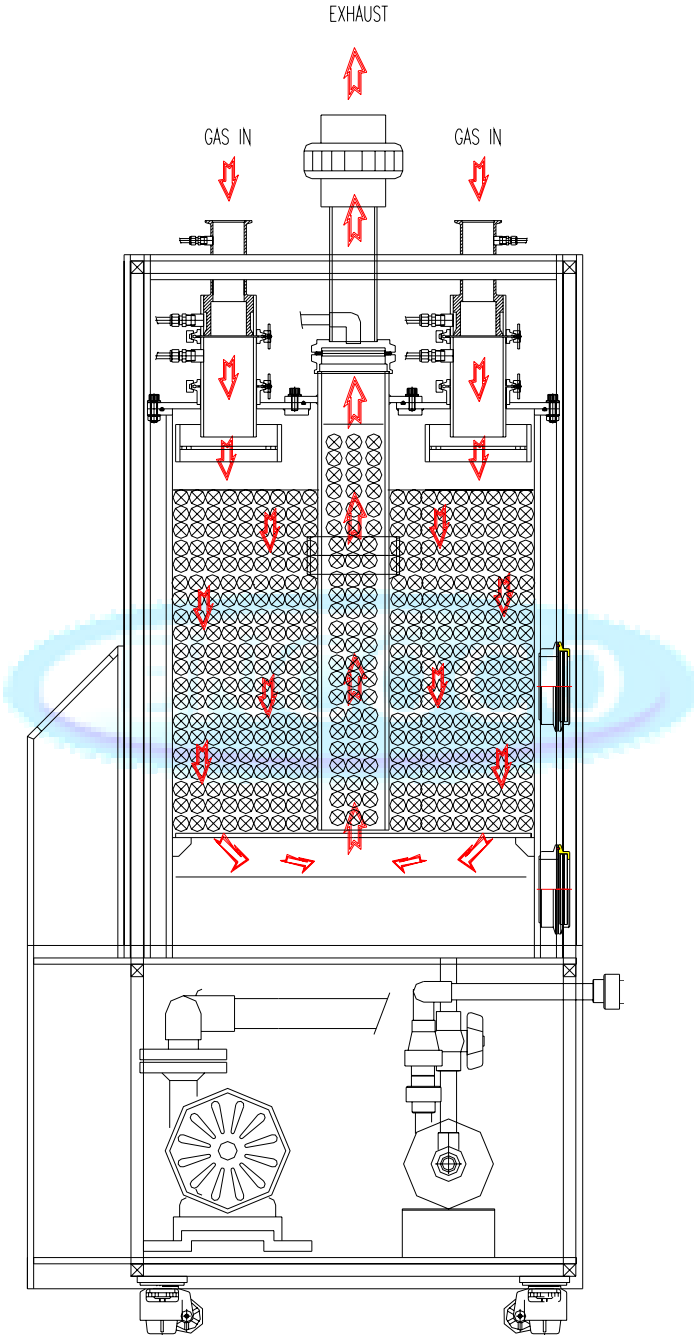
Waste water and powders that result from a reaction with water will accumulate at the bottom of the chamber and be drained from the chamber to the facility acid waste water system. If the facility drain elevation is too high, a power drain pump operates.

After exiting the wet chamber the gas stream exhausts to the facility scrubbed exhaust system. The exhaust gases are not hazardous but must be exhausted to a scrubbed system to avoid an atmospheric release of a hazardous material in the event the scrubber fails or is inadvertently shut down.

The coaxial cylinders of the wet chamber are weak in the thermal shock. Gases that are nonflammable or not explosive are treated by water in the wet chamber before being exhausted to the facility system

** Refer to figure 1 on next page*

* Figure 1



2.3. Detailed Scope of supply

2.3.1. Scrubbers

Type:	Wet type
Material:	PVC
Dimension:	735 mm(W)×882 mm(D)×1950 mm(H)
Weight:	200 kg(Normal), 270 kg(Operating)
Gas temperature:	40 °C
Capacity:	400 slm
Power:	220 V 3 Phase 15A
Inlet:	NW 50, 4 ports
Outlet:	76mm

** Refer to figure 2 on next page*

2.3.2. NaOH mixing-dosing tanks (Option)

Material:	Polypropylene
Dimension:	
Volume:	5000 liter

2.3.3. Waste gas fan for scrubber (Option)

2.3.4. Waste Gas ductwork (Option)

2.3.5. Feed water pipework (Option)

2.3.6. Civil works

Out of our scope of supply.

2.3.7. Documentation

We will supply the documentation for operation.

2.3.8. Test works

Costs of energies required for test (run cost, feed water, electricity, chemicals) are not included in our quotation.

*Figure 2



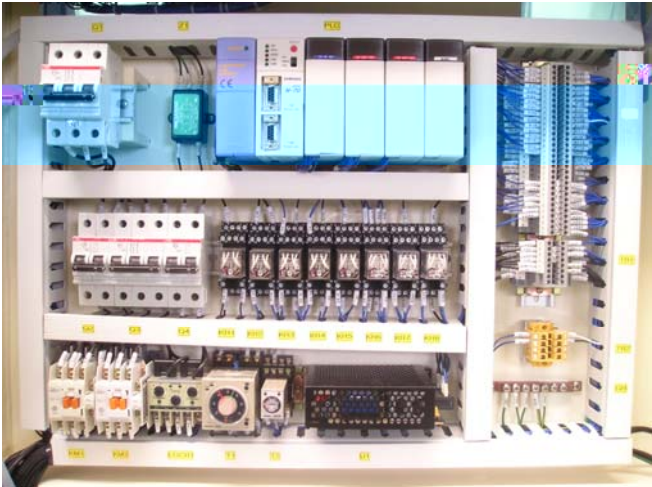
Inlet/Outlet



Pressure Meter



Level meter



PLC Controller

2.4. Limits to connection points

2.4.1. Waste gas connection

The limit of waste gas connection is flanged. To this flange the Purchaser shall connect.

2.4.2. Chemical supply

The storage tank for the chemical (NaOH) needs for the operation of the scrubbers will be supplied the by Purchaser. The quality of the basic (NaOH) should shall fulfil the criteria of the Purchaser.

2.4.3. Utilities

All utility works are excluded from our scope of supply.

2.4.4. Noise protection

All noise protections are excluded from our scope of supply

2.4.5. Safety Feature

The scrubber is furnished with warning labels.

** Refer to figure 3 on next page*

2.5. Exclusions

The following items are excluded from our scope of supply:

- Waste gas blowers for scrubber
- All civil works
- Sump and drain system
- Water treatment system
- Fuel, water, treated water, chemicals for tests, commissioning and training
- Environmental monitoring system
- Continuously treated gas measurement system
- All works which connected to scope of Purchaser
- All cost of visits of factory test for Purchaser
- Anything other, what was not specifically in this list, but not in our Scope of Supply

* Figure 3



3. QUOTATION PRICE

3.1. Quotation Price

The unit price of the Scope of Supply is:

₩ 00,000,000 + VAT

in words, (00000000만원) excluding VAT, more 5 units applicable purchased and such figure consists of.

3.2. Validity

Our quotations remain valid for date 30th of 0000 2007.

4. COMMERCIAL CONDITIONS

The commercial conditions contract agreements will fully discussing with Purchaser.

5. DELIVERY DEADLINES

Delivery deadline of the scrubbers is 31st of 0000 2007 if the contract agreement signed not later than 30th 0000 2007.

6. CONTACT

On behalf of the company and with regard to the present proposal the following persons are authorised to provide information and run negotiations, respectively.

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7th 0000 2007.

J. L. Park
Sales Manager
0000 Co., Ltd

D. W. Kim
Sales and Contracting director
ENCOCO Inc.

7. ATTACHMENTS

- 7.1. Flow Diagram**
- 7.2. 403W Catalogue**
- 7.3. Quotation Sheet**



Attachment 1: Flow Diagram

