

RIE DRY ETCHING SYSTEM for FAILURE ANALYSIS **SYSTEM**

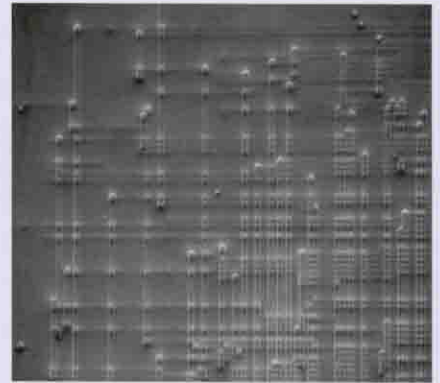
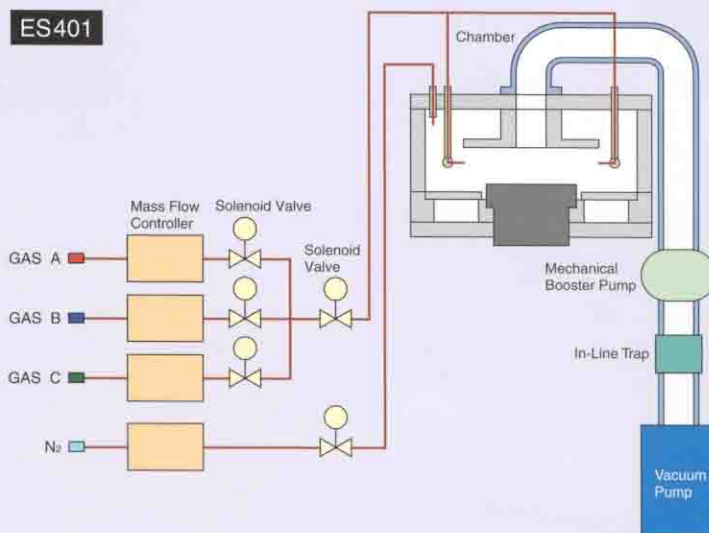
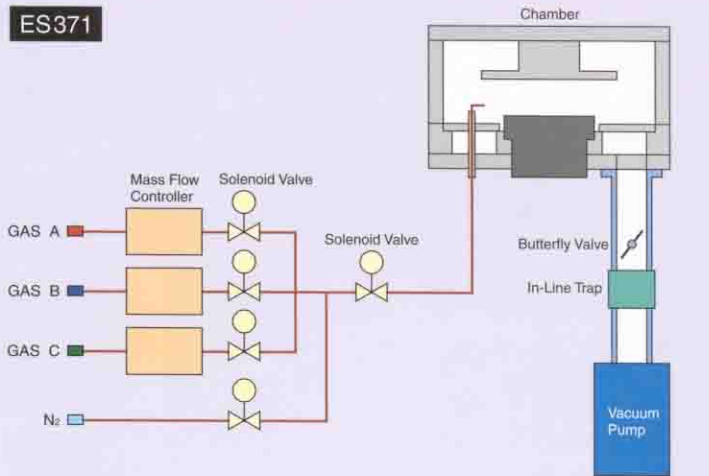


- ES371** DRY ETCHING SYSTEM for Multi-layered IC/LSI
- ES401** DRY ETCHING SYSTEM for WAFER
- ES301** DRY ETCHING SYSTEM for IC/LSI

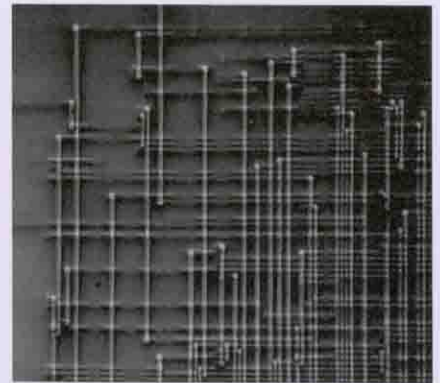
NSC's DRY ETCHING SYSTEM "RIE Series" supports advanced failure analysis on IC/LSI.

Year by year, multi-layerization has been advanced with design technology on IC/LSI. The more technology has been proceeded, the more failure mode on IC/LSI has become complicated. Although limited information can be obtained through decapsulation, removing passivation layers can proceed futher failure analysis. NSC's RIE Series were developed to meet these needs, and released as unique and original Dry Etching Systems.

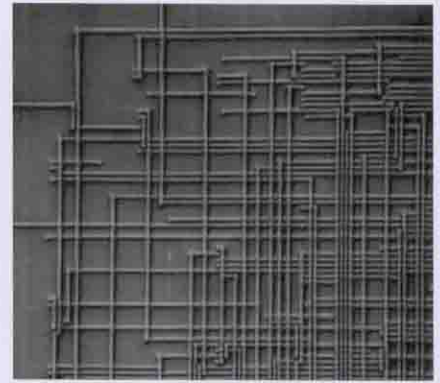
ES Series has 3 kinds of Dry Etching System for various purposes and specimens ; ES371 is for high aspect ratio in anisotropic etching mode for multi-layered IC/LSI, ES401 meets 8 inches wafer dry etching, and ES301 realizes easy operation and excellent reproducibility.



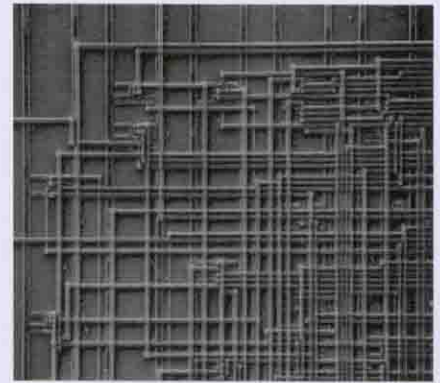
Before etching



Top metal exposed



2nd metal exposed



1st metal exposed

ES371

High aspect ratio in Anisotropic Etching Mode for multi-layered IC/LSI

DRY ETCHING SYSTEM for Multi-layered IC/LSI

ES371 is a Dry Etching System designed for multi-layered IC/LSI. This exclusive machine for failure analysis has many suitable functions such as high aspect ratio in anisotropic etching mode, 98 recipes memory function and so on.



ES371 Main Body

● Anisotropic etching for multi-layered IC/LSI

ES371 is an exclusive machine for failure analysis enabling to realize high aspect ratio in anisotropic etching. Isotropic etching is also available by adjusting pressure and etching gas flow.

● Memory function and Program function

ES371 can save 98 etching recipes to do dry etching on various kinds of specimens. Also any 2 recipes can be done sequentially as a program function to remove 2 different layers sequentially.

● Automatic easy operation by Main Body Controller

Etching conditions can be inputted digitally on an operation panel of Main Body, and all the performance can be done automatically.

● Temperature control by air cooled peltier elements

Temperature of a specimen stage is controlled by air cooled peltier elements to realize excellent reproducibility on dry etching. Air cooled peltier elements eliminate any trouble such as water leak or dew condensation.

● Vacuum Pumping Unit is available

Vacuum Pumping Unit (Option) exclusively for ES371 use is available. This compact unit has Vacuum Pump, In-Line Trap and Oil Filtration.



ES371+Vacuum Pumping Unit

ES401

8 inches wafer dry etching is available

DRY ETCHING SYSTEM for WAFER

ES401 is a Dry Etching System designed mainly for wafers. This exclusive machine for failure analysis has many suitable functions such as a wide range of vacuum pressure to realize isotropic and anisotropic etching modes, 96 recipes memory function and so on. Also realizes stable etching rate and excellent uniformity.



● Both isotropic and anisotropic etching modes are available

ES401 has a wide range of vacuum pressure to realize both isotropic and anisotropic etching modes. High aspect ratio in anisotropic etching mode is suitable to do dry etching on multi-layered specimens.

● Stable etching rate and Excellent uniformity

Stable etching rate realizing with adopting temperature control of a specimen stage by water cooled peltier elements and high precise vacuum control by an inverter. Furthermore, a unique gas porous delivery system realizes excellent uniformity on etched specimen.

● Large stage enables dry etching up to 8 inches wafer

Diameter of specimen stage is $\phi 230\text{mm}$. 8 inches wafer can be put on the stage as it is for etching.

● Operator friendly design

Etching conditions such as gas flow rate and vacuum pressure can be inputted digitally on an operation panel. These etching recipes can be saved up to 96 kinds, and any one of them can be called out easily. Also as another easy operating functions, this system has a switching chamber by air cylinder with just pressing a button, automatic matching method by microcontroller and so on.

● Dry etching on package devices or bare chips are available

With a special adapter for package device (option), ES401 can etch not only wafer but also package devices or bare chips.

● Waiting time until producing vacuum status inside chamber is very quick

In combination with Oil Rotary Pump & Mechanical Booster Pump, ES401 can realize very short waiting time for next etching. This point is very important for failure analysis engineer doing dry etching successively by trial and error.

● Dry Pump (Option) is also available instead of Oil Rotary Pump



ES301

Easy operation and excellent reproducibility

DRY ETCHING SYSTEM for IC/LSI

ES301 is a Dry Etching System for removing passivation layers with easy operation. After decapsulation, removing passivation layers are necessary for proceeding to further steps on failure analysis such as SEM observation or probing.



ES301 Main Body

● Stable etching rate and excellent reproducibility

ES301 always realizes stable etching rate because of temperature control function on a specimen stage, and original specimen setting system on the stage, accordingly, a specimen is hard to receive heat damage during etching. Therefore anyone can remove passivation layers easily and surely, with this ES301 only setting etching conditions on the operation panel, and can go into the further steps on failure analysis such as SEM observation or probing.

● Very quick vacuum status production

Vacuum Pumping Unit (Option) having Mechanical Booster Pump and Rotary Pump built-in produces vacuum status inside the chamber very quickly (approx. 30sec).

● Temperature control by air cooled peltier elements

Temperature of a specimen stage is controlled by air cooled peltier elements to realize excellent reproducibility on dry etching. Air cooled peltier elements eliminate any trouble such as water leak or dew condensation.

● Automatic easy operation by Main Body Controller

Etching conditions such as gas flow rate, etching time, RF power, stage temperature can be inputted digitally on an operation panel, and ES301 starts to produce desired vacuum status inside the chamber with its automatic matching method. Therefore, after confirming etching recipe and setting a specimen, etching can be done automatically.



ES301+Vacuum Pumping Unit

Specifications

Product name	RIE System		
Model	ES301	ES371	ES401
Dimensions (mm)	W600×H1119×D500	W640×H1168×D750	W900×H1048×D800
Weight	Approx. 120kg	Approx. 125kg	Approx. 230kg
Power source	AC100V 50/60Hz 18A	AC100V 50/60Hz 5A AC200V 3phases 50/60Hz 8A	AC200V 3phases 50/60Hz 22A
RF power	5~120W	20~150W	100~400W
High frequency power	13.56MHz		
Stage size	φ 60mm	φ 100mm	φ 230mm
Usable vacuum range	80mTorr~2Torr	80~800mTorr	0.03~0.8Torr
Usable etching gas	Choose 3 types out of CF ₄ , O ₂ , CHF ₃ , SF ₆ , N ₂		
Gas flow control method	Mass flow meter	Automatic control by Mass flow controller	
Stage temperature	30~70°C		
Etching time	1sec~99min59sec	0~99.9min	
Programming	2 steps		
Stored recipes	—	98 recipes	96 recipes
Vacuum Pump	Oil Rotary Pump and Mechanical Booster Pump	Oil Rotary Pump	Oil Rotary Pump and Mechanical Booster Pump
Accessories	Oil Filtration		
	Oil Mist Separator	In-line trap	
Option	—	Oil Mist Trap	

- * Dimensions of ES301 and ES371 including vacuum pumping unit.
- * Vacuum oil, filter elements and o-rings are consumables.
- * Vacuum Pumping Unit in case of ES301 and ES371 is an option.
- * If you use vacuum pump on hand, please contact us for more information.
- * Gas cylinder box is an option.
- * Price is not included freight, installation fee and tax.
- * 12-months warranty including parts. Excludes consumable items.
- * Specifications are subject to change without notice for improvement.



NIPPON SCIENTIFIC CO., LTD.

1-28-6, Toshincho Itabashi-Ku, Tokyo 174-0074 Japan
TEL 81-33958-1411 FAX 81-33958-1412

Singapore Branch

128, Joo Seng Road, #02-01, DP Computers Building,
Singapore 368356
TEL 65-7444776, FAX 65-7444786

<http://www.nscnet.co.jp>



SESA, Inc.

1700 Wyatt Drive
Suite 11
Santa Clara, CA 95054
Tel: 408.988.5816
Fax: 408.988.5817
WWW.SESA.COM