

## Outgas Analysis for Wafer Industries

### Contaminants Analysis of on Silicon Wafer Surface

A wafer is put on the wafer carrier. The wafer together with the carrier are inserted between the metal C-ring and the lower heater. The wafer is then strongly sealed by a c-ring as shown in Fig. 18. So that, the wafer is heated by the both heater, then the outgas from the wafer is trapped into the PAT.

8" Bare wafers were completely cleaned by SPM and APM. The wafer was then left in the 4 kinds of the commercial carrier boxes made in American one and Japanese two companies for 7 days at room temperature in order to do the qualitative and quantitative analysis.

Figure 19-22 show the contaminants chromatograms.

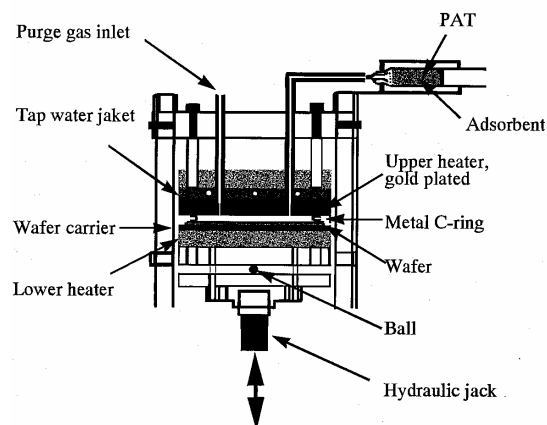


Fig.18 Cross section view of the parts of Model SW-8

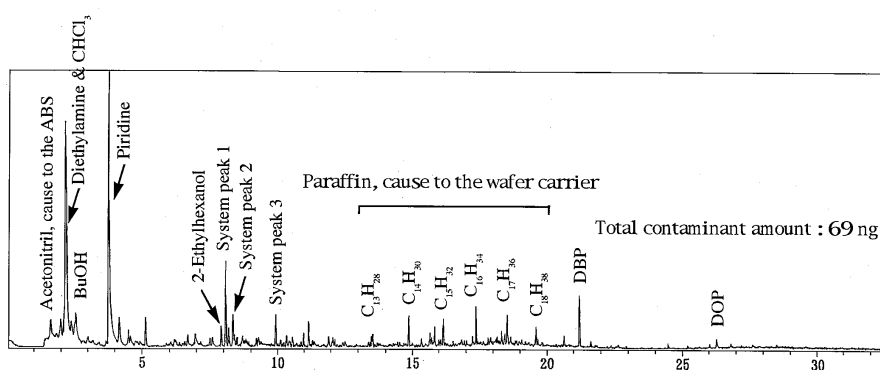


Fig. 19 Contaminants chromatogram obtained from the wafer which was left 7 days in the carrier box A-1

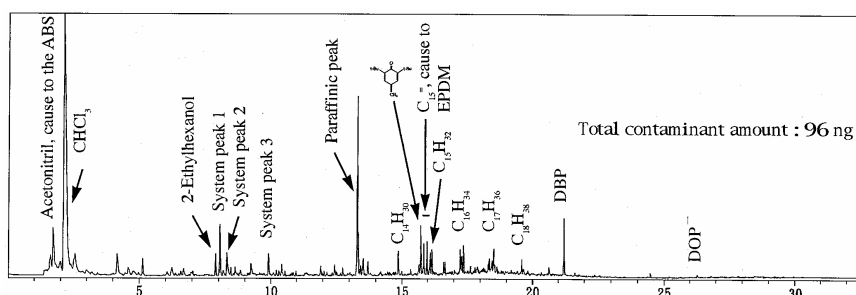


Fig. 20 Contaminants chromatogram obtained from the wafer which was left 7 days in the carrier box A-2

### Analytical condition

Sampling area : 6" diameter.

Thermal extraction temp. : 250 for 30 min.

Adsorbent : Tenax GR, 2.5 g for PAT, Glass wool for SAT at -60

Column : DB-5ms 0.25 mm x 30 m. Flow rate : 1ml/min. Column temp. : 40 (3 min)-280 , 10 /min.

Instrumems : SW-8, JHS-100A-GC/MS, Split ratio : 1/10

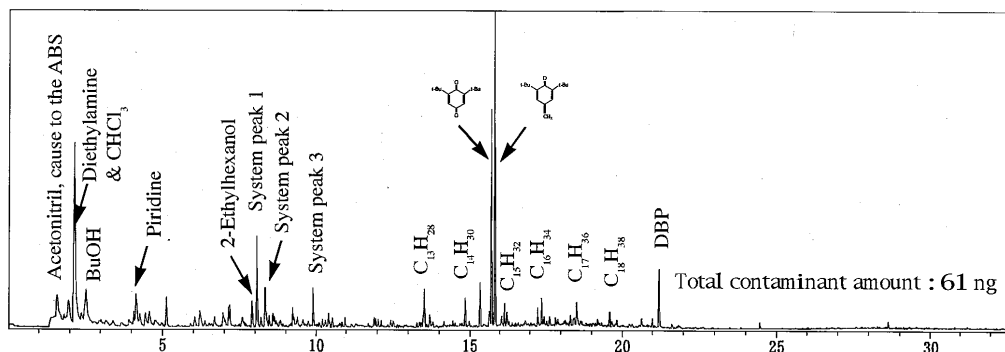


Fig. 21 Contaminants chromatogram obtained from the wafer which was left 7 days in the carrier box B

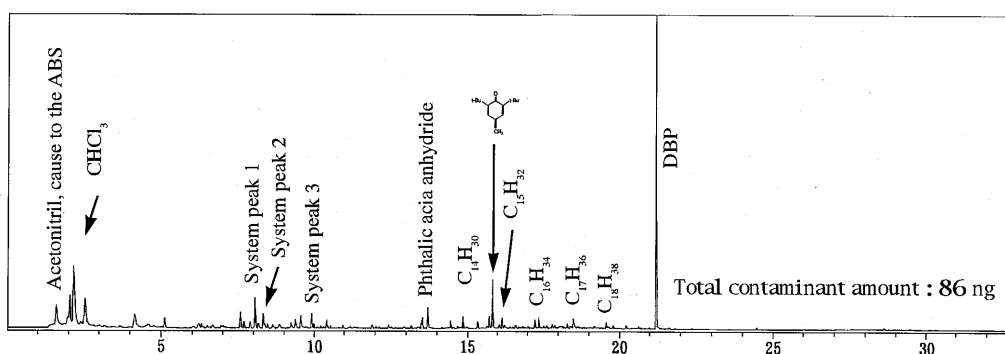


Fig. 22 Contaminants chromatogram obtained from the wafer which was left 7 days in the carrier box C

### Analytical condition

Sampling area : 6" diameter

Thermal extraction temp. : 250 for 30 min.

Adsorbent : Tenax GR, 2.5 g for PAT, Glass wool for SAT at -60 .

Column : DB-5ms 0.25 mm x 30 m. Flow rate : 1ml/min. Column temp. : 40 (3 min)-280 , 10 /min .

Instruments : SW-8 ,JHS-100A-GC/MS. Split ratio : 1/10

As a results, total contaminants amount, typical contaminant, are listed in the table as follow :

Origin	Wafer No	Characteristics contaminants	Total contaminants amount
USA	A-1	Dimethylamine, pyridine	69 ng
USA	A-2	Paraffin	96 ng
Japan	B	Dimethylamine, decomposed compounds from BHT	61 ng
Japan	C	DBP	86 ng