



High Density Radical Source LS4000 Series

Remarkable features of LS4000

- ☀ High density radical generation by ICP (Inductively-Coupled Plasma)
- ☀ High-speed matching using (~ms) by PLL(Phase-Locked Loop) control
- ☀ Wide range plasma generation region. 5Pa~500Pa
- ☀ Light & Compact
 - One-Body: ~30kg, 400x415x255mm
 - Separated : Power Supply : 21kg
Plasma Head : 17kg



LS4000-Separate

Main Applications

- ⊕ Photo-resist stripping or organic removal by High density O-radical or H-Radical
- ⊕ CVD Chamber cleaning by NF_3 remote plasma
- ⊕ Texturing for Si PV cell by H_2 remote plasma
- ⊕ High speed multi step process
ex. ALD(Atomic Layer Deposition)
- ⊕ Others Light Etch, Oxidation& Nitridation



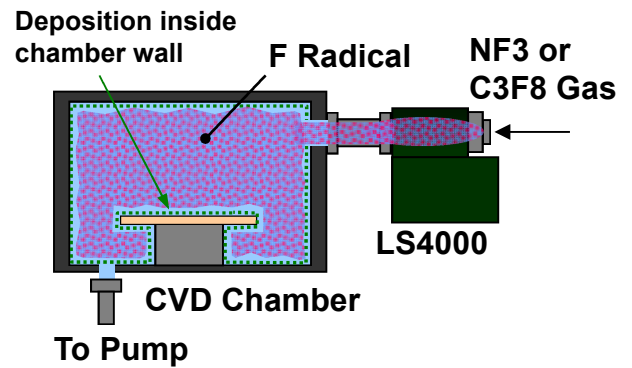
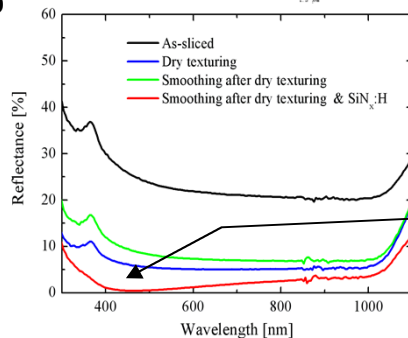
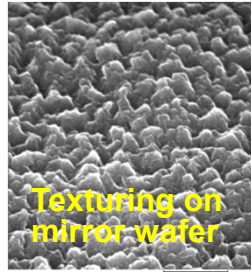
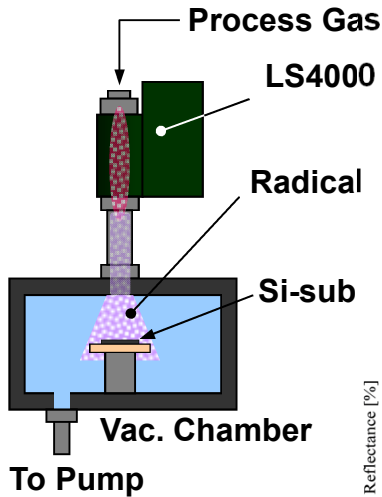
LS4000-Integrated

Process Application

| Process | PR strip | PR strip | Oxide Removal | Chamber Cleaning | Nitridation | Si etching | Si Texturing |
|---------|---------------|-----------------------------------|-------------------------------------|------------------|--------------|----------------------------|----------------|
| Gas | O_2 | H_2 | $\text{H}_2/\text{NH}_3/\text{H}_2$ | NF_3 | N_2 | SF_6, CF_4 | H_2 |
| Radical | O^* | H^* | $\text{NH}^*?$ | F^* | N^* | F^* | H^* |
| product | CO_2 | $\text{CH}_4, \text{H}_2\text{O}$ | $(\text{NH}_3)_4\text{SiF}_6$ | SiF_4 | - | SiF_4 | SiH_4 |

Example; LS4000 Remote plasma process

Radical Process (Dry Texture)



CVD Chamber Cleaning

Textured by H₂ Radical
"0" Refraction was achieved

Spec. of LS4000

| LS4000 Integrated | | |
|----------------------------|------------------------|---------------------------|
| Maz. Power | 4000W | |
| Frequency | 2MHz | Frequency matching system |
| Power Control | Analog signal 0~10V | |
| Material of Discharge tube | Ceramics or Quartz | |
| Size, Weight | 400x412x254mm, ~30kg | |
| Electricity | 1φ200V, 4.8kVA | |
| Cooling water | 5~30°C, >3.0L/min | Fitting 1/4NPT |
| Piping | NW80 (claw clamp type) | |
| Consumable | O-ring, Discharge tube | |



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