

# Tepla 300



## Contents

- [1 Introduction](#)
- [2 Equipement description](#)
- [3 Standard processes](#)
- [4 How to use the system](#)
- [5 Allowed materials](#)
- [6 Forbidden processes](#)

### To be read first:

Materials that deteriorate easily upon exposure to oxygen (**Ag, Cu, Cr, Fe, ...**) should not be processed in this machine!

This equipment is **NOT** micro-electronic compatible. For micro-electronic compatibility, please use [Oxford PRS900 \(zone 2\)](#).

Processes that have not been tested are: isotropic etching of glass, ceramic, SiO<sub>2</sub>, Si<sub>3</sub>N<sub>4</sub>, Si.

## I. Introduction ↑

The Tepla 300 uses high frequency plasma. Main applications are:

Photo Resist (PR) stripping.

Wafers surface cleaning before subsequent processes.

Enhancement of hydrophilic behavior of plastics surfaces.

## II. Equipement description ↗



1/2



Quartz primary vacuum chamber (dimension: Dint. 245 mm x Prof. 380 mm)  
Plasma frequency: 2.45 GHz  
Plasma power: 200 to 1000 W  
Gas : O<sub>2</sub> and CF<sub>4</sub> (max. flow 500 ml/min)  
Quartz holders for 25 wafers from 75 mm to 100 mm

## III. Standard processes ↗

### Resist strip

Positive resists etch rate = 350 nm/min depending on the number of wafers to be processed in the batch.

Search

| Program<br>↕ | Gas 1 (O <sub>2</sub> ,<br>↕ ml/min) | Gas 2 (CF <sub>4</sub> ,<br>↕ ml/min) | Power<br>↕ (W) | Time<br>(mm:ss)<br>↕ | EPD (0,<br>↕ 1, 2) | Remarks                                   |
|--------------|--------------------------------------|---------------------------------------|----------------|----------------------|--------------------|-------------------------------------------|
| 01           | 400                                  | 0                                     | 500            | 01:00                | 1                  | 1 min over-etch after end point detection |
| 02           | 400                                  | 0                                     | 500            | 00:30                | 0                  |                                           |
| 03           | 400                                  | 0                                     | 500            | 01:00                | 0                  |                                           |
| 04           | 400                                  | 0                                     | 500            | 04:00                | 0                  |                                           |

| Program<br>⬇ | Gas 1 (O2,<br>⬇ ml/min) | Gas 2 (CF4,<br>⬇ ml/min) | Power<br>⬇ (W) | Time<br>⬇ (mm:ss) | EPD (0,<br>⬇ 1, 2) | Remarks                   |
|--------------|-------------------------|--------------------------|----------------|-------------------|--------------------|---------------------------|
| 06           | 400                     | 0                        | 500            | 10:00             | 0                  |                           |
| 08           | 400                     | 0                        | 500            | 20:00             | 0                  |                           |
| 07           | 500                     | 0                        | 1000           | 30:00             | 0                  | Strip for 25 wafers batch |

## Si<sub>3</sub>N<sub>4</sub> strip

Si<sub>3</sub>N<sub>4</sub> etch rate= 230nm/min depending on the number of wafers to be processed in the batch.

Uniformity: 16%

Selectivity to SiO<sub>2</sub>: 3.5

Selectivity to resist: < 1 !

| Program<br>⬇ | Gas 1 (O2,<br>⬇ ml/min) | Gas 2 (CF4,<br>⬇ ml/min) | Power<br>⬇ (W) | Time<br>⬇ (mm:ss) | EPD (0, 1,<br>⬇ 2) | Remarks<br>⬇ |
|--------------|-------------------------|--------------------------|----------------|-------------------|--------------------|--------------|
| 21           | 35                      | 200                      | 400            | 00:30             | 0                  |              |
| 22           | 35                      | 200                      | 400            | 00:50             | 0                  |              |
| 23           | 35                      | 200                      | 400            | 01:20             | 0                  |              |

## Surface activation

| Program<br>⬇ | Gas 1 (O2,<br>⬇ ml/min) | Gas 2 (CF4,<br>⬇ ml/min) | Power<br>⬇ (W) | Time<br>⬇ (mm:ss) | EPD (0, 1,<br>⬇ 2) | Remarks<br>⬇ |
|--------------|-------------------------|--------------------------|----------------|-------------------|--------------------|--------------|
| 10           | 400                     | 0                        | 1000           | 01:00             | 0                  |              |
| 11           | 400                     | 0                        | 1000           | 00:30             | 0                  |              |
| 12           | 400                     | 0                        | 1000           | 00:15             | 0                  |              |
| 13           | 400                     | 0                        | 750            | 01:00             | 0                  |              |
| 14           | 400                     | 0                        | 750            | 00:30             | 0                  |              |
| 15           | 400                     | 0                        | 750            | 00:15             | 0                  |              |
| 16           | 400                     | 0                        | 600            | 01:00             | 0                  |              |
| 17           | 400                     | 0                        | 600            | 00:30             | 0                  |              |
| 18           | 400                     | 0                        | 600            | 00:15             | 0                  |              |
| 25           | 200                     | 0                        | 100            | 00:10             | 0                  |              |
| 26           | 400                     | 0                        | 500            | 00:45             | 0                  |              |
| 27           | 400                     | 0                        | 500            | 00:30             | 0                  |              |
| 28           | 400                     | 0                        | 500            | 00:15             | 0                  |              |
| 29           | 400                     | 0                        | 500            | 00:10             | 0                  |              |
| 30           | 400                     | 0                        | 500            | 00:05             | 0                  |              |
| 35           | 400                     | 0                        | 350            | 01:00             | 0                  |              |
| 36           | 400                     | 0                        | 350            | 00:45             | 0                  |              |
| 37           | 400                     | 0                        | 350            | 00:30             | 0                  |              |
| 38           | 400                     | 0                        | 350            | 00:15             | 0                  |              |
| 39           | 400                     | 0                        | 350            | 00:10             | 0                  |              |
| 40           | 400                     | 0                        | 350            | 00:05             | 0                  |              |
| 41           | 400                     | 0                        | 150            | 00:10             | 0                  |              |
| 42           | 400                     | 0                        | 200            | 10:00             | 0                  |              |
| 43           | 400                     | 0                        | 200            | 00:30             | 0                  |              |
| 44           | 400                     | 0                        | 200            | 00:15             | 0                  |              |
| 45           | 400                     | 0                        | 200            | 00:10             | 0                  |              |

| Program<br>⬇ | Gas 1 (O <sub>2</sub> ,<br>⬇ ml/min) | Gas 2 (CF <sub>4</sub> ,<br>⬇ ml/min) | Power<br>⬇ (W) | Time<br>⬇ (mm:ss) | EPD (0, 1,<br>⬇ 2) | Remarks<br>⬇ |
|--------------|--------------------------------------|---------------------------------------|----------------|-------------------|--------------------|--------------|
|--------------|--------------------------------------|---------------------------------------|----------------|-------------------|--------------------|--------------|

## IV. How to use the system ↗.

The substrates are processed following this procedure:

- 1 Login on the Tepla plasma stripper on zone 11 computer.
- 2 Activate the rectangular green “I” button on the machine
- 3 The machine is on stand-by mode (“Idle” mode). Kill this mode by pressing the “abort” button
- 4 Prepare the quartz carrier: CAUTION, it is very fragile! Use the fork to delicately manipulate the carrier.  
Reminder: Materials that deteriorate easily upon exposure to oxygen (Ag, Cu, Cr, Fe, ...) should not be processed in this machine!
- 5 Select the program: press “enter”, use the arrows to make your choice in the menu and press “enter” to validate
  - 6 programs 1 to 8 : resist
  - 7 programs 21 to 23: Si<sub>3</sub>N<sub>4</sub>
  - 8 programs 10 to 18 and 25 to 46: surface activation
- 9 Start the process by pressing “run” (close the door to start the pumping). You can stop the process at anytime by pressing “abort”
- 10 The chamber returns automatically at atmospheric pressure
- 11 Take back the quartz carrier (CAUTION, it is hot: delicately use the fork) and your substrates
- 12 Check the cleanliness of the chamber
- 13 Put the equipment in stand-by mode: press “enter”, use the arrows to select “idle mode” and press “enter” (close the door to start the pumping)
- 14 Perform Tepla logout on zone 11 computer

## V. Allowed materials ↗.

**Wafers:** Si, glass, Pyrex, without metallic layers if possible.

**Plastics foils:** Caution, special holder and limited power (material fusion)

## VI. Forbidden processes ↗.

Processes that use the following equipments:

### Zone 3

- All equipments of 3.

### Zone 4

- Deposition at temperature higher than room temperature in SPIDER

These processes must use the Oxford PRS900 (zone 2).

STS Multiplex ICP

Alcatel AMS 200 SE

SPTS APS

Oxford PRS900

**Tepla 300**

Tepla GiGAbatch

TEL Unity Me

SPTS Rapier

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