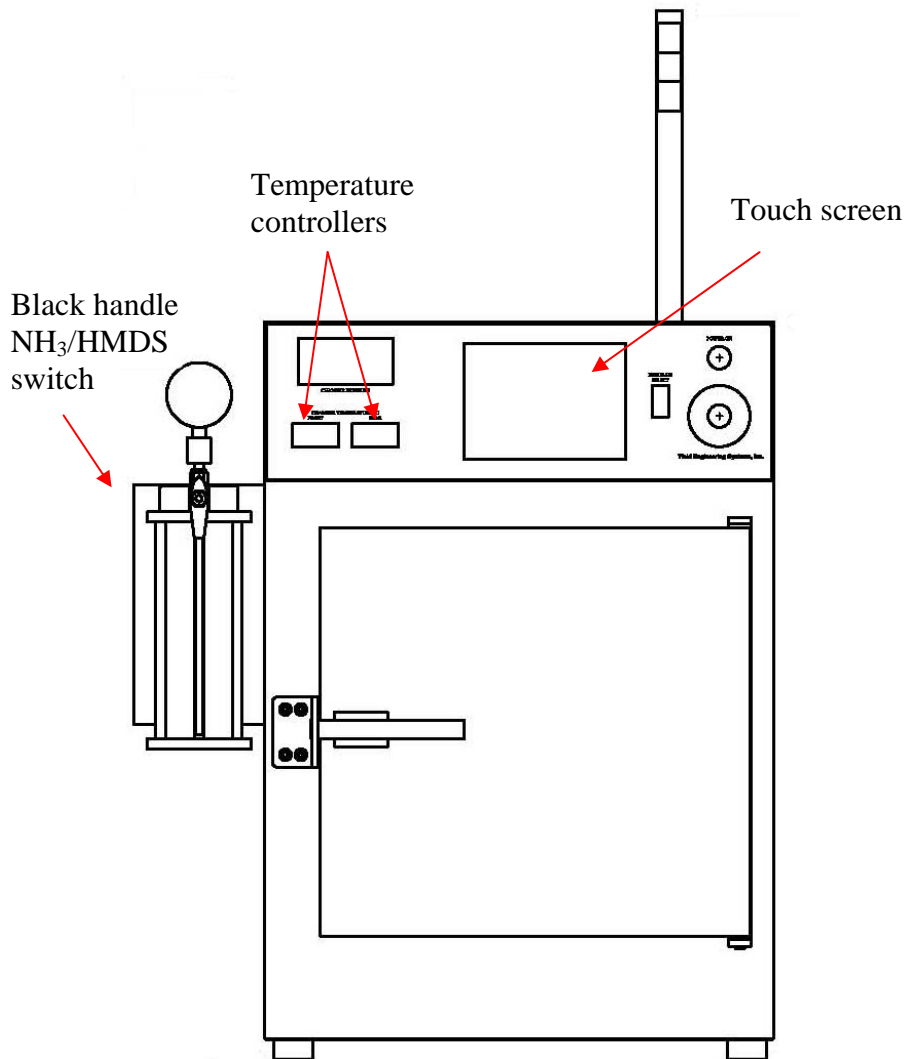


## Operating instructions Image reversal oven

YES-310 TA image reversal oven consists from chamber, temperature controller, and gas controller units. Using touch screen user can select recipe: (0)-chamber venting (1)-HMDS priming, (2)-image reversal process, (3)-vacuum baking. Processes pressure and time are preprogrammed, thus users only have to change chamber temperature and select appropriate (see instruction below) chemicals: HMDS or ammonia.



## ***HMDS Prime Process Outline***

Adjust temperature of front and rear heaters to 150 C, the system must be allowed to stabilize at the process temperatures.

Switch black handle on the left side of the oven to "HMDS".

Press "Enter Recipe Number" on touch screen.

Press "0-Enter-Done"

Press "Start". Chamber will be vented.

Open chamber and load your sample.

Press "Enter Recipe Number" on touch screen.

Press "1-Enter-Done".

Press "Start".

The HMDS prime process starts with chamber cycle purges. The chamber is evacuated and refilled with nitrogen several times to remove water vapor and oxygen.

Water vapor is removed to provide a clean dry surface for optimum HMDS adhesion.

During the cycle purges, chamber pressure is reduced below the vapor pressure of water at room temperature to promote complete dehydration of the surface.

Oxygen is removed from the oven atmosphere for safety. HMDS vapor is highly combustible. The removal of oxygen is a safety precaution to ensure that combustion does not occur.

After the cycle purges are complete, the chamber is evacuated to a pressure below the vapor pressure of HMDS at room temperature. The vapor valve is then opened to allow the HMDS to boil and for the vapor to pass from the flask to the chamber. The vapor valve remains open for the process duration.

After the product has been exposed to the HMDS vapor for 5 min, the chamber is once again cycle purged to remove all HMDS vapor. After the cycle purges, the chamber is vented to atmospheric pressure with nitrogen so that the door can be opened.

Total cycle time for the process is approximately 31 minutes.

### ***Image Reversal Prime Process Outline***

Adjust temperature of front and rear heaters to 90 C, the system must be allowed to stabilize at the process temperatures.

Switch black handle on the left side of the oven to “NH<sub>3</sub>”.

Press “Enter Recipe Number” on touch screen.

Press “0-Enter-Done”

Press “Start”. Chamber will be vented.

Open chamber and load your sample.

Press “Enter Recipe Number” on touch screen.

Press “2-Enter-Done”.

Press “Start”.

The image reversal process starts with chamber cycle purges. The chamber is evacuated and refilled with heated nitrogen several times to remove water vapor from the product and the chamber.

Water vapor is removed to prevent formation of ammonium hydroxide solution on the surface of the wafer during image reversal. During the cycle purges, chamber pressure is reduced below the vapor pressure of water at room temperature to promote complete dehydration of the surface.

After the cycle purges are complete, the chamber is filled to a pressure below atmosphere with ammonia gas. The process valve is then shut and the product is allowed to bake in ammonia for the process duration. The chamber pressure remains below atmosphere in order to prevent leakage of ammonia through the chamber door seal.

After the product has been exposed to the ammonia gas for 45 min, the chamber is once again cycle purged to remove all ammonia gas. After the cycle purges, the chamber is vented to atmospheric pressure with nitrogen so that the door can be opened.

Total cycle time for the process is approximately 89 minutes.

## ***Vacuum Bake Process Outline***

Adjust temperature of front and rear heaters to desired temperature (20-150C), the system must be allowed to stabilize at the process temperatures.

Press "Enter Recipe Number" on touch screen.

Press "0-Enter-Done"

Press "Start". Chamber will be vented.

Open chamber and load your sample.

Press "Enter Recipe Number" on touch screen.

Press "3-Enter-Done".

Press "Start".

The vacuum bake process starts with chamber cycle purges. The chamber is evacuated and refilled with nitrogen several times to remove water vapor and oxygen.

After the cycle purges are complete, the chamber is evacuated to a low process pressure and then is refilled with nitrogen to a high process pressure. If chamber pressure rises to a set point level during a long vacuum bake, the chamber is evacuated to the low process pressure and refilled to the high process pressure.

After the product has been baked for 30 min, the chamber is once again cycle purged.

After the cycle purges, the chamber is vented to atmospheric pressure with nitrogen so that the door can be opened.

Total cycle time for the process is approximately 45 minutes