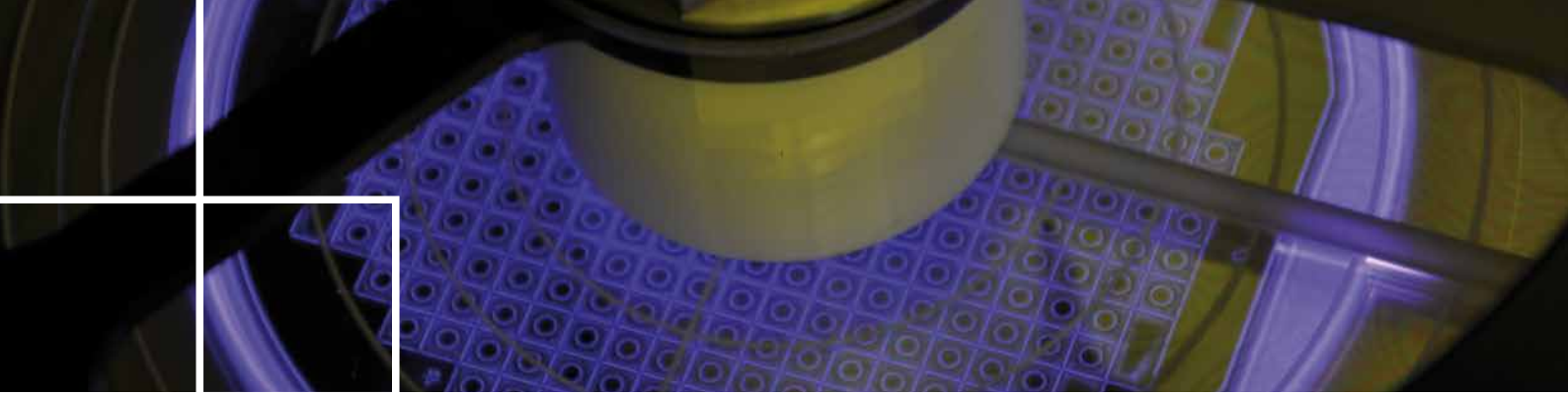


SELECTIVE PLASMA ACTIVATION TOOLKIT

# SUSS SELECT

## PLASMA TREATMENT FOR SELECTIVE SURFACE MODIFICATION

**Plasma pre-treatments are used worldwide for surface activation in many different wafer and direct bonding applications. Other than commonly known plasma activation techniques where the full wafer area gets exposed to the plasma, SELECT enables controlled local surface activation or functional layer deposition on pre-selected wafer areas. This provides new design and manufacturing options especially for MEMS applications, such as microfludic channels for BioMEMS manufacturing or direct wafer bonding, as well as for other applications like electroless plating or 3D integration self assembly.**

The SELECT method and tooling have been developed by SUSS MicroTec and Fraunhofer IST in a joint development project.
The SELECT toolkit relies on a dielectric-barrier discharge and uses a thin glass substrate (dielectric barrier) with a transparent conductive coating on the backside as electrode, which allows a direct view on the process chamber and enables perfect control of the plasma treatment. The toolkit comprises dedicated SELECT components such as an electrode frame adapter, an electrode holder or a plasma chuck. SELECT is delivered with an external supply rack for a High Voltage (HV) generator and process gas supply.

SELECT is applicable for wafers with and without topography. In the first case the wafer is plasma treated either in the cavities or on the elevated structures, which is controlled by the gap setting between the electrode and the substrate. The second method offers the treatment of substrates without topography, emplyoing a patterned electrode (plasma printing).

### HIGHLIGHTS

+ Enables to further streamline production processes and reduce overall cost per wafer
+ Usage of atmospheric plasma instead of expensive vacuum technology when activating thin oxide layers
+ Cost-effective multi system solution in one tool (in combination with a MA/BA Gen4 Pro)

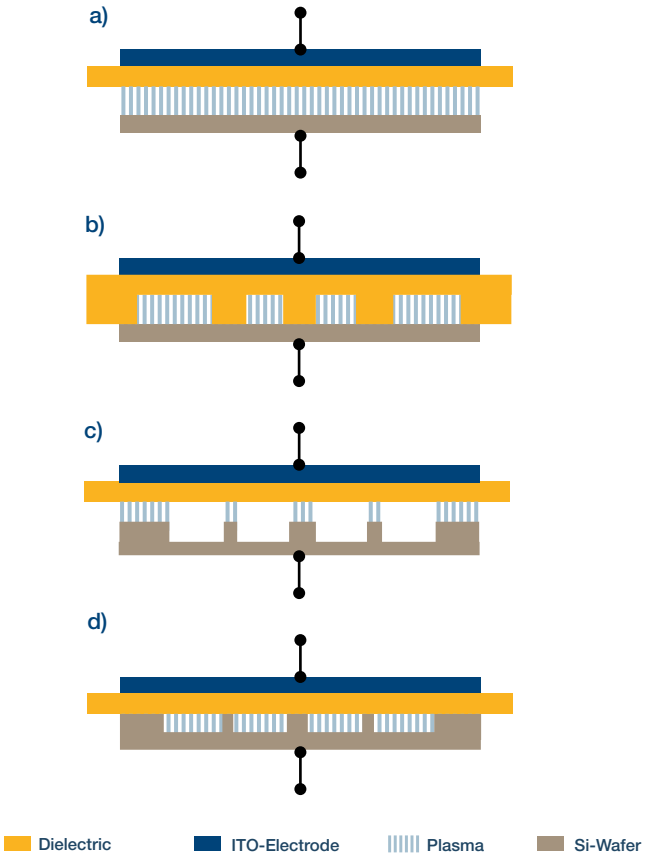
The SUSS MicroTec SELECT toolkit for selective and full wafer surface treatment is available for the SUSS MA/BA Gen4 *Pro* Mask/Bond Aligner and the BA8 Gen4 *Pro* Bond Aligner.

SELECTIVE PLASMA ACTIVATION TOOLKIT

# SUSS SELECT

## TECHNICAL DATA

The SELECT process starts with the loading of the electrode. The substrate is then brought in proximity to the electrode to create a process chamber, which gets purged with gas before an AC voltage is applied to ignite the plasma.




*Different methods of plasma treatment with the SELECT toolkit:*
*a) full area, b) selective via structured electrode, c) selective on upper level of substrate, d) selective in cavities/trenches of the substrate.*

| GENERAL | |
|---|---|
| **SELECT Toolkit Components** | + electrode frame adapter<br>+ electrode holder<br>+ HV cable with customized pressure contact<br>+ plasma chuck<br>+ electrodes<br>+ external support rack with process gas supply and HV generator<br>+ software |
| **Plasma Treatment** | full area and selective |
| **Change of Surface Properties** | + Hydrophilic<br>+ Hydrophobic<br>+ Oxidation<br>+ Reduction<br>+ Deposition |
| **AC-Voltage** | max. 20 $kV_{PP}$ |
| **Frequency** | 24 - 35 kHz |
| **Power** | 1,5 $W/cm^2$ |
| **Gas Pressure** | ambient |
| **Process Gas Control** | 2 MFC |
| **Flow Rate** | 1 - 5 slm |
| **Typical Process Time** | 30 - 40 sec |
| **Wafer Size** | pieces up to 8" |
| **Available as Upgrade for** | MA/BA Gen4 *Pro*, BA8 Gen4 *Pro* |

*Data, design and specification depend on individual process conditions and can vary according to equipment configurations. Not all specifications may be valid simultaneously. Illustrations, photos and specifications in this brochure are not legally binding. SUSS MicroTec reserves the right to change machine specifications without prior notice.*

Developed in cooperation with

Fraunhofer IST

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