CLAIMS

1. A deposition method comprising:

introducing a precursor into a processing region of a semiconductor processing chamber via a faceplate of the semiconductor processing chamber;

flowing an oxygen-containing precursor into the semiconductor processing chamber from beneath a pedestal of the semiconductor processing chamber, wherein the pedestal supports a substrate, and wherein the substrate defines a trench in a surface of the substrate;

forming a first plasma of the precursor in the processing region of the semiconductor processing chamber;

depositing a first oxide film within the trench;

forming a second plasma in the processing region;

etching the first oxide film, while flowing the oxygen-containing precursor;

passivating the etched first oxide film;

re-forming the first plasma in the processing region; and

depositing a second oxide film over the etched first oxide film.

2. The deposition method of claim 1, wherein flowing the oxygen-containing precursor into the semiconductor processing chamber comprises flowing oxygen into the semiconductor processing chamber at a flow rate of at least 5 slm.

3. The deposition method of claim 1, wherein the first plasma is a capacitively coupled plasma, and wherein the first plasma is struck between the pedestal and the faceplate of the semiconductor processing chamber.

4. The deposition method of claim 1, wherein the second plasma is a capacitively coupled plasma, and wherein the second plasma is struck between the pedestal and the faceplate.

5. The deposition method of claim 1,

wherein forming the second plasma in the processing region comprises:

purging the semiconductor processing chamber; and

introducing an etchant gas into the processing region; and

wherein the second plasma is formed of the etchant gas in the processing region.

6. The deposition method of claim 5, wherein the etchant gas comprises a fluorine-containing gas.

7. The deposition method of claim 1, wherein the precursor comprises silane.