Claims: What is claimed is:

1. A method, performed in connection with bevel etching of a substrate, for improving bevel etch repeatability among substrates, said substrate including a bevel edge, the method comprising:

providing ~~an optical arrangement~~, using a first light source, first light in a direction parallel to a top surface of said substrate for illuminating said bevel edge;

obtaining a side profile image of said bevel edge during said illuminating said bevel edge;

ascertaining, using said side profile image of said bevel edge, at least one bevel edge characteristic of ~~a~~ said bevel edge ~~of said substrate~~;

deriving at least one compensation factor from said at least one bevel edge characteristic, said at least one compensation factor pertaining to an adjustment in a bevel etch process parameter; and

performing said bevel etching utilizing said at least one compensation factor.

2. The method of claim 1 wherein said ~~optical arrangement~~ obtaining includes using a camera disposed co-planar~~ly~~ with said substrate and directed tangentially at said bevel edge to obtain ~~a~~ said side profile image of said ~~substrate~~ bevel edge, said bevel edge being disposed between said camera and said first light source.

3. The method of claim 2 wherein said at least one bevel edge characteristic is a fill-factor, the method further comprising dividing a substrate area in a rectangular frame associated with said side profile image of said bevel edge by a total area of said rectangular frame associated with said side profile image of said bevel edge to calculate said fill-factor.

4. The method of claim 1 wherein said bevel etch process parameter is one of a bevel etch time, bevel etch chemistry, inter-electrode gap, RF power, RF frequency and chamber pressure.

~~5. The method of claim 1 wherein said optical arrangement includes a laser light source and an array of sensors configured to detect a reflected beam from said laser light source that reflects off said bevel edge.~~

~~6. The method of claim 1 wherein said optical arrangement includes a camera, a light source, and at least one mirror, wherein said camera is disposed at an angle relative to a substrate plane of said substrate.~~

~~7. The method of claim 1 further comprising obtaining a bevel edge thickness using said optical arrangement.~~

~~8. Apparatus for improving bevel etch repeatability among substrates, comprising:~~

~~an optical arrangement disposed to ascertain at least one bevel edge characteristic of a bevel edge of a substrate;~~

~~logic module for deriving at least one compensation factor from said at least one bevel edge characteristic, said at least one compensation factor pertaining to an adjustment in a bevel etch process parameter; and~~

~~a plasma processing chamber for performing said bevel etching utilizing said at least one compensation factor.~~

~~9. The apparatus of claim 8 wherein said optical arrangement includes a camera disposed co-planarly with said substrate and directed tangentially at said bevel edge to obtain a side profile image of said substrate.~~

~~10. The apparatus of claim 9 wherein said at least one bevel edge characteristic is a fill-factor.~~

~~11. The apparatus of claim 8 wherein said bevel etch process parameter is one of a bevel etch time, bevel etch chemistry, inter-electrode gap, RF power, RF frequency and chamber pressure.~~

~~12. The apparatus of claim 8 wherein said optical arrangement includes a laser light source and an array of sensors configured to detect a reflected beam from said laser light source that reflects off said bevel edge.~~

~~13. The apparatus of claim 8 wherein said optical arrangement includes a camera, a light source, and at least one mirror, wherein said camera is disposed at an angle relative to a substrate plane of said substrate.~~

~~14. The apparatus of claim 8 further comprising obtaining a bevel edge thickness using said optical arrangement.~~

5. The method of claim 1 further comprising using one or more mirrors to reflect an illuminated side profile of said bevel edge, said one or more mirrors being separate from said substrate, wherein said obtaining includes using a camera disposed above said substrate to obtain a reflected side profile image of said illuminated side profile reflected by at least one of said one or more mirrors.

6. The method of claim 5 further comprising turning off a second light source during said obtaining.

7. The method of claim 5 wherein said one or more mirrors include at least three mirrors.

~~15~~8. A method, performed in connection with bevel etching of a substrate, for improving bevel etch repeatability among substrates, said substrate including a bevel edge, the method comprising:

providing ~~an optical arrangement~~, using a first light source, first light in a direction parallel to a top surface of said substrate for illuminating said bevel edge;

obtaining a side profile image of said bevel edge during said illuminating said bevel edge,

ascertaining, using said side profile image of said bevel edge, at least one bevel edge characteristic of ~~a~~ said bevel edge ~~of said substrate~~, said at least one bevel edge characteristic including a bevel edge thickness that is measured at a predefined distance from an edge of said substrate;

deriving at least one compensation factor from said at least one bevel edge characteristic, said at least one compensation factor pertaining to an adjustment in a bevel etch process parameter; and

performing said bevel etching utilizing said at least one compensation factor.

~~16. The method of claim 15 wherein said optical arrangement includes a camera disposed co-planarly with said substrate and directed tangentially at said bevel edge to obtain a side profile image of said substrate.~~

~~17. The method of claim 16 wherein said at least one bevel edge characteristic is a fill-factor.~~

~~18. The method of claim 15 wherein said bevel etch process parameter is one of a bevel etch time, bevel etch chemistry, inter-electrode electrode gap, RF power, RF frequency and chamber pressure.~~

~~19. The method of claim 15 wherein said optical arrangement includes a laser light source and an array of sensors configured to detect a reflected beam from said laser light source that reflects off said bevel edge.~~

~~20. The method of claim 15 wherein said optical arrangement includes a camera, a light source, and at least one mirror, wherein said camera is disposed at an angle relative to a substrate plane of said substrate.~~

9. The method of claim 8 wherein said obtaining includes using a camera disposed coplanar with said substrate and directed tangentially at said bevel edge to obtain said side profile image of said bevel edge, said bevel edge being disposed between said camera and

said first light source.

10. The method of claim 9 wherein said at least one bevel edge characteristic is a fill-factor, the method further comprising dividing a substrate area in a rectangular frame associated with said side profile image of said bevel edge by a total area of said rectangular frame associated with said side profile image of said bevel edge to calculate said fill-factor.

11. The method of claim 8 wherein said bevel etch process parameter is one of a bevel etch time, bevel etch chemistry, inter-electrode electrode gap, RF power, RF frequency and chamber pressure.

12. The method of claim 8 further comprising using one or more mirrors to reflect an illuminated side profile of said bevel edge, said one or more mirrors being separate from said substrate, wherein said obtaining includes using a camera disposed above said substrate to obtain a reflected side profile image of said illuminated side profile reflected by at least one of said one or more mirrors.

13. The method of claim 12 further comprising turning off a second light source during said obtaining.

14. The method of claim 5 further comprising:

turning off said first light source to turn off said first light;

providing, using a second light source, second light to a semi-transparent mirror, wherein said one or more mirrors include said semi-transparent mirror;

using said semi-transparent mirror to reflect said second light for illuminating a top surface of said bevel edge.

15. The method of claim 14 wherein said semi-transparent mirror is disposed between said camera and said bevel edge.

16. The method of claim 1 further comprising:

turning off said first light source to turn off said first light;

providing, using a second light source, second light to a semi-transparent mirror;

using said semi-transparent mirror to reflect said second light for illuminating a top surface of said bevel edge.

17. The method of claim 16 further comprising inspecting said top surface of said bevel edge using at least a camera disposed above said semi-transparent mirror, said semi-transparent mirror being disposed between said camera and said bevel edge.

18. The method of claim 16 further comprising obtaining an image of said top surface of said bevel edge using at least a camera disposed above said semi-transparent mirror, said

semi-transparent mirror being disposed between said camera and said bevel edge.

19. The method of claim 16 further comprising determining an etch distance after etching said bevel edge, said determining includes using at least a camera disposed above said semi-transparent mirror, said semi-transparent mirror being disposed between said camera and said bevel edge.

20. The method of claim 16 wherein said second light is parallel to said top surface of said substrate.