PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT:	Smith	CONFIRMATION NO.:	1022
APPLICATION NO.:	13/964,938	GROUP NO.:	2881
FILING DATE:	August 12, 2013	EXAMINER :	McCormack, Jason L.
TITLE:	High Brightness Laser-Driven Light Source		

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AND RESPONSE

Madam:

This paper is submitted in response to the non-final Office Action mailed from the PTO on February 27, 2015. Applicant submits herewith a fee for the terminal disclaimer. If any additional fees are due upon submission of this paper, the Commissioner is hereby authorized to charge them to Attorney's Deposit Account No. 50-3081.

Applicant respectfully requests entry of this Preliminary Amendment, in which:

Amendments to the Claims begin on page 2, and

Applicant's **Remarks** begin on page 7.

Amendments to the Claims

Please amend the claims as follows, in compliance with 37 C.F.R. § 1.121(c). This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of the Claims:

1. (Previously presented) A method for illuminating features of a semiconductor wafer, comprising:

ionizing a gas within a sealed pressurized plasma chamber having an operating pressure of at least 10 atmospheres;

providing substantially continuous laser energy having a wavelength range of up to about 2000 nm through a region of material of the sealed pressurized chamber that is transparent to the substantially continuous laser energy to the ionized gas to sustain a plasma within the sealed pressurized plasma chamber to produce plasma-generated light having wavelengths greater than 50 nm; and

illuminating the wafer with plasma-generated light having wavelengths greater than 50 nm that exits the sealed pressurized chamber.

2. (Original) The method of claim 1, further comprising using the plasma-generated light to measure the features of the wafer.

3. (Previously presented) The method of claim 1, wherein a magnitude of the brightness of the light does not vary by more than 90% during operation.

4. (Previously presented) The method of claim 1, further comprising using an optical element to deliver the plasma-generated light from the pressurized plasma chamber to a wafer inspection system.

5. (Canceled)

6. (Canceled)

7. (Canceled)

8. (Previously presented) The method of claim 1, wherein the laser source comprises a continuous wave (CW) laser.

9. (Original) The method of claim 1, wherein the plasma-generated light comprises ultraviolet light.

10-12. (Canceled)

13. (Currently amended) A laser driven light source comprising:

a sealed pressurized plasma chamber having an ignition source for ionizing a gas within the chamber and a sapphire window for maintaining a pressure therein;

a laser for providing at least substantially continuous energy through the sapphire window to the ionized gas within the pressurized plasma chamber to sustain a plasma and produce plasma-generated light having wavelengths greater than 50 nm, the pressure of the plasma chamber during operation is greater than 10 atmospheres~~; and~~

~~a means for allowing~~, wherein the sapphire window allows the plasma-generated light to exit the pressurized chamber ~~the plasma-generated light to exit the pressurized plasma chamber~~.

14. (Previously presented) The laser-driven light source of claim 13, wherein the pressurized plasma chamber contains one or more of a noble gas, Xe, Ar, Ne, or Kr.

15. (Previously presented) The laser-driven light source of claim 13, wherein the ignition source comprises or includes an electrode, an ultraviolet ignition source, a capacitive ignition source, an inductive ignition source, an RF ignition source, a microwave ignition source, a flash

lamp, a pulsed laser, a pulsed lamp or the laser.

16. (Previously presented) The laser-driven light source of claim 15, wherein the laser source comprises a continuous wave (CW) laser.

17. (Previously presented) The laser-driven light source of claim 13, wherein the laser comprises at least one laser selected from the group consisting of an IR laser, a diode laser, a fiber laser, an ytterbium laser, a CO_2 laser, a YAG laser, and a gas discharge laser.

18. (Previously presented) The laser-driven light source of claim 13, further comprising at least one optical element to focus and modify a property of the energy of the laser, the property selected from the group consisting of diameter, direction, divergence, convergence, orientation, and wavelength.

19. (Previously presented) The laser-driven light source of claim 13, further comprising at least one optical element to modify a property of the plasma-generated light emitted by the ionized gas as the plasma- generated light is delivered to the tool.

20. (Previously presented) The laser-driven light source of claim 13, wherein the tool is selected from the group consisting of a wafer inspection tool, a microscope, a metrology tool, and a lithography tool.

21-25. (Canceled)

26. (Previously presented) A method for producing light comprising:

ionizing with an ignition source a gas within a pressurized plasma chamber, the pressure of the plasma chamber during operation is greater than 10 atmospheres;

providing (i) laser energy having a wavelength range up to about 2000 nm and (ii) energy from the ignition source to the ionized gas within the pressurized plasma chamber to generate or sustain a plasma in the chamber to produce a plasma-generated light having wavelengths greater than 50 nm; and directing the plasma-generated light

out of the pressurized plasma chamber through a transparent region of the pressurized plasma chamber.

27. (Previously presented) The method of claim 26 further comprising providing sufficient energy from the ignition source to the plasma to maintain a desired temperature of the plasma chamber or to maintain a desired pressure of gas or vapor within the plasma chamber.

28. (Previously presented) The method of claim 26 further comprising operating the ignition source during operation of the laser.

29-30. (Canceled)

31. (Previously presented) The method of claim 1 wherein the pressure of the plasma chamber during operation is greater than 10 atmospheres.

32. (Previously presented) A light source, comprising:

a sealed pressurized chamber comprising a window and a curved reflective surface, the pressurized chamber having an operating pressure greater than atmospheric pressure;

an ignition source for ionizing a gas within the pressurized chamber;

at least one laser external to the pressurized chamber for providing electromagnetic energy to produce a plasma that generates plasma-generated light having wavelengths greater than 50 nm; and

a curved reflective surface receiving at least a portion of the plasma-generated light emitted by the plasma and reflecting the plasma-generated light toward the window, wherein the emitted light and laser energy pass through the window.

33. (Previously presented) The light source of claim 32, wherein the pressurized chamber has a pressure of at least 10 atmospheres during operation.

34. (Previously presented) The light source of claim 32 wherein the ignition source is at least one of an RF ignition source, or electrodes within the pressurized chamber, the electrodes located on opposite sides of the plasma [8/8].

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