Claims:

1. A processing system having an endpoint detection system, comprising:

a process chamber having internal surfaces requiring periodic cleaning due to processes performed in the process chamber; and

an endpoint detection system comprising:

a light detector positioned to detect light reflected off of a first internal surface of the process chamber; and

a controller coupled to the light detector and configured to determine an endpoint of a cleaning process based upon the detected reflected light.

2. The apparatus of claim 1, further comprising:

a light source positioned to shine light on the first internal surface.

3. The apparatus of claim 2, wherein the light source comprises a laser, a light emitting diode (LED), or a lamp.

4. The apparatus of claim 2, wherein the light source comprises ambient light.

5. The apparatus of claim 2, wherein the light source emits a single wavelength of light.

6. The apparatus of claim 2, wherein the light source emits a plurality of wavelengths of light.

7. The apparatus of claim 2, wherein the process chamber comprises a quartz lid, and wherein the light source is disposed outside of the process chamber and shines light on the first internal surface at a wavelength that passes through quartz.

8. The apparatus of claim 1, wherein the light detector comprises one or more of a photodiode or a camera.

9. The apparatus of any of claims 1-8, wherein the light detector is positioned to detect light reflected off of either a lid of the process chamber, or a liner of the process chamber.

10. The apparatus of any of claims 1-8, further comprising:

a plurality of light sources and light detectors configured to measure the thickness of the coating of deposited material and the cleanliness of the internal surfaces at different locations.

11. A method of monitoring a process being performed in a process chamber, comprising:

performing a cleaning process in a process chamber to remove material deposited on one or more internal surfaces of the process chamber resultant from processes performed within the process chamber;

shining a light on a first internal surface being cleaned;

detecting the light reflected off of the first internal surface; and

terminating the cleaning process based upon the detected light.

12. The method of claim 11, wherein the light comprises light from one or more of a laser, a light emitting diode (LED), a lamp, or ambient light shining on the first process chamber surface, and wherein detecting the light comprises:

using a light detector comprising one or more of a photodiode or a camera to detect the light reflected off of the first internal surface.

13. The method of any of claims 11-12, wherein shining the light on the first internal surface being cleaned further comprises:

shining the light onto the first internal surface in a region where a relatively high percentage of deposited materials are deposited.

14. The method of any of claims 11-12, wherein detecting the light comprises detecting either or both of an interference pattern resultant from the light reflecting

off of the first internal surface, or an intensity of the light reflecting off of the first internal surface.

15. A computer readable medium, having instructions stored thereon that, when executed, cause a method of monitoring a process being performed in a process chamber to be performed, the method as described in any of claims 11-14.

CLAIMS

1. A processing apparatus having an endpoint detection system, comprising:

a process chamber having internal surfaces requiring periodic cleaning due to processes performed in the process chamber; and

an endpoint detection system comprising:

a light detector positioned to detect light reflected off of a material deposited on a first internal surface of the process chamber, wherein the reflected light does not traverse an internal volume of the process chamber; and

a controller coupled to the light detector and configured to determine an endpoint of a cleaning process based upon an interference pattern of the detected reflected light.

2. The apparatus of claim 1, further comprising:

a light source positioned to shine light on the first internal surface.

3. The apparatus of claim 2, wherein the light source comprises a laser, a light emitting diode (LED), or a lamp.

4. The apparatus of claim 2, wherein the light source comprises ambient light.

5. The apparatus of claim 2, wherein the light source emits a single wavelength of light.

6. The apparatus of claim 2, wherein the light source emits a plurality of wavelengths of light.

7. The apparatus of claim 2, wherein the process chamber comprises a quartz lid, and wherein the light source is disposed outside of the process chamber and shines light on the first internal surface at a wavelength that passes through quartz.

8. The apparatus of claim 1, wherein the light detector comprises one or more of a photodiode or a camera.

9. The apparatus of claim 1, wherein the light detector is positioned to detect light reflected off of a lid of the process chamber.

10. The apparatus of claim 1, further comprising:

a plurality of light sources and light detectors configured to measure a thickness of a coating of deposited material and cleanliness of the internal surfaces at different locations.

11. A processing apparatus having an endpoint detection system, comprising:

a process chamber having internal surfaces requiring periodic cleaning due to processes performed in the process chamber;

a lid included in an upper portion of the process chamber and comprising one of the internal surfaces of the process chamber requiring periodic cleaning; and

an endpoint detection system comprising:

a light detector disposed above the lid and positioned to detect light reflected off of a material deposited on an internal surface of the lid, wherein the reflected light does not traverse an internal process chamber volume; and

a controller coupled to the light detector and configured to determine an endpoint of a cleaning process based upon the detected reflected light.

12. The apparatus of claim 11, wherein the lid is made from quartz.

13. The apparatus of claim 12, further comprising a light source disposed above the lid that emits light at a wavelength that passes through quartz.

14. The apparatus of claim 13, wherein the light source comprises a laser, a light emitting diode (LED), or a lamp.

15. The apparatus of claim 13, wherein the light source provides light to a portion of the lid to determine the endpoint of cleaning for the portion.

16. The apparatus of claim 11, wherein the lid is dome shaped, reverse-curve shaped, or flat shaped.

17. A processing apparatus having an endpoint detection system, comprising:

a process chamber having internal surfaces requiring periodic cleaning due to processes performed in the process chamber; and

an endpoint detection system comprising:

a light detector positioned to detect light reflected off of a material deposited on an internal surface and light reflected off a corresponding external surface of a component of the process chamber; and

a controller coupled to the light detector and configured to determine an endpoint of a cleaning process based upon the detected reflected light.

18. The apparatus of claim 17, wherein a light source provides light to a portion of the component of the process chamber to determine the endpoint of cleaning for the portion.

19. The apparatus of claim 18, wherein the light source comprises a laser, a light emitting diode (LED), or a lamp.

20. The apparatus of claim 2, wherein the light source shines light to a portion of the internal surface to determine the endpoint of cleaning for the portion.