WHAT IS CLAIMED IS:

1. A laser processing apparatus for performing processing by irradiating with a laser beam, the laser processing apparatus comprising:

a chuck table configured to hold a wafer;

a laser beam irradiating unit configured to apply the laser beam to a boundary portion between a device region and a peripheral surplus region of the wafer held by the chuck table; and

a moving mechanism configured to move the chuck table and the laser beam irradiating unit relative to each other,

the laser beam irradiating unit including

a laser oscillator configured to oscillate a laser,

a condenser configured to condense the laser beam emitted from the laser oscillator, and

a plasma light detector configured to detect plasma light emitted from a region subjected to the processing by application of the laser beam, wherein

the wafer includes the device region having a plurality of devices demarcated by a plurality of intersecting planned dividing lines and formed on a top surface of the wafer and the peripheral surplus region

surrounding the device region,

the laser oscillator is electrically connected to a control unit, and

the control unit identifies a kind of material of the region subjected to processing by application of the laser beam on a basis of the plasma light detected by the plasma light detector.

2. The laser processing apparatus according to claim 1, further comprising:

a beam splitter disposed between the condenser and the laser oscillator, and configured to branch the plasma light and guide the plasma light to a branch path, wherein

the plasma light detector is disposed on the branch path.

3. The laser processing apparatus according to claim 1, wherein

the top surface or an undersurface of the wafer is coated with a metallic film, and the laser beam irradiating unit further includes power setting means for setting power of the laser beam by selecting a kind of material.

4. The laser processing apparatus according to claim 3, wherein

the laser beam irradiating unit further includes error issuing means for issuing an error when the kind of material identified on the basis of the plasma light detected by the plasma light detector and the kind of material selected by the power setting means are different from each other.

5. The laser processing apparatus according to claim 4, wherein

the error issuing means is electrically connected to the control unit, and

the error issuing means comprises

a monitor that displays an error message;

a speaker that emits a warning sound associated with the error; or

a warning lamp that illuminates or blinks in a case of the error.

6. The laser processing apparatus according to claim 3, wherein

an attenuator is electrically connected to the control unit, and

the control unit is configured to adjust the power of the laser beam to an appropriate value corresponding to the material by controlling the attenuator when the kind of material identified on the basis of the plasma

light detected by the plasma light detector and the kind of material selected by the power setting means are different from each other.

7. The laser processing apparatus according to claim 6, wherein

the control unit stores, in advance, a table depicting relation between the wavelength of the plasma light, the material of the region subjected to laser processing, and the power of the laser beam; and

the appropriate value of the power of the laser beam adjusted to by the control unit comprises a value depicted in the table.

8. The laser processing apparatus according to claim 1, wherein

a recessed portion is formed on an undersurface part corresponding to the device region of the wafer and a ring-shaped reinforcing portion formed in a projecting shape on an undersurface part corresponding to the peripheral surplus region of the wafer, and a base of the ring-shaped reinforcing portion is irradiated with the laser beam.

9. The laser processing apparatus according to claim 1, wherein

the laser beam irradiating unit stops applying the

laser beam when the plasma light detector ceases to detect the plasma light.

10. The laser processing apparatus according to claim 8, wherein the laser processing apparatus further comprises a reinforcing portion removing unit that cuts and removes the ring-shaped reinforcing portion from the wafer.