

WHAT IS CLAIMED IS:

1. A dechuck control method of dechucking
a processed object electrostatically attracted to an
5 electrostatic chuck provided in a plasma processing
apparatus, the method comprising:

dechucking the processed object by lifting
the processed object with a supporting mechanism,
the dechucking being performed while applying a
10 given voltage to an electrode of the electrostatic
chuck and while a plasma is not generated in the
plasma processing apparatus.

2. The method according to claim 1,
15 wherein the dechucking further comprises:

checking whether or not a value in
accordance with remaining charge in the
electrostatic chuck is not more than a predetermined
threshold, while applying the given voltage to the
20 electrode of the electrostatic chuck, and

determining that the processed object can
be dechucked, in accordance with a result of the
checking.

25 3. The method according to claim 2,
further comprising:

calculating a magnitude of the given
voltage applied to the electrode of the
electrostatic chuck, in accordance with a result of
30 the determining.

4. The method according to claim 2 or 3,
wherein the value in accordance with remaining

charge in the electrostatic chuck is a torque applied to the supporting mechanism when the processed object is to be lifted.

5 5. The method according to claim 2 or 3,
wherein the value in accordance with remaining
charge in the electrostatic chuck is a magnitude of
current flowing between the electrode and a DC power
source connected to the electrode.

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6. The method according to any one of
claims 2 to 5, further comprising:

changing the given voltage applied to the
electrode of the electrostatic chuck gradually, in a
15 case in which the value in accordance with remaining
charge in the electrostatic chuck is more than the
predetermined threshold as the result of the
checking, and

repeating the checking and the changing
20 until the value in accordance with remaining charge
in the electrostatic chuck becomes not more than the
predetermined threshold.

7. The method according to claim 6,
25 wherein the given voltage applied to the electrode
of the electrostatic chuck is calculated by
referring to a storage unit storing a relationship
between the given voltage applied to the electrode
of the electrostatic chuck and a number of times of
30 the repeating.

8. The method according to claim 7,
wherein, for each instance of the changing, the

given voltage applied to the electrode of the electrostatic chuck is incremented or decremented by a predetermined value.

5 9. The method according to claim 7 or 8, further comprising:

 performing maintenance of the plasma processing apparatus for processing the processed object attracted to the electrostatic chuck
10 electrostatically, in a case in which the number of times of the repeating exceeds a predetermined limit value.

 10. A plasma processing apparatus
15 comprising:

 an electrostatic chuck configured to attract a processed object electrostatically;
 a DC power source applying a voltage to an electrode of the electrostatic chuck; and
20 a control unit configured to dechuck the processed object by lifting the processed object with a supporting mechanism, while applying a given voltage to the electrode of the electrostatic chuck and while a plasma is not generated in the plasma
25 processing apparatus.

 11. The plasma processing apparatus according to claim 10, wherein the control unit is configured

30 to perform a check as to whether or not a value in accordance with remaining charge in the electrostatic chuck is not more than a predetermined threshold, while applying the given voltage to the

electrode of the electrostatic chuck, and
to perform a determination that the
processed object can be dechucked, in accordance
with a result of the check.

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12. The plasma processing apparatus
according to claim 11,
wherein the control unit is configured to calculate
a magnitude of the given voltage applied to the
10 electrode of the electrostatic chuck, in accordance
with a result of the determination.