

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

referring to a storage unit storing a
plurality of recipes each including information
15 representing a relationship between the given
voltage and a number of repetitions that are
predetermined depending on process conditions, to
select a recipe from among the plurality of recipes
that fits a process condition under which the
20 processed object is processed; and

determining a value of the given voltage
depending on the number of repetitions of the
dechucking of the processed object.

25 2. The method according to claim 1,
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
30 threshold, while applying the given voltage to the
electrode of the electrostatic chuck, and

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

checking.

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

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

10 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.

15 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
20 source connected to the electrode.

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

25 changing the given voltage applied to the
electrode of the electrostatic chuck gradually, in a
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

30 repeating the checking and the changing
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 1,
wherein, for each instance of the changing, the
5 given voltage applied to the electrode of the
electrostatic chuck is incremented or decremented by
a predetermined value.

8. The method according to claim 7,
10 further comprising:
performing maintenance of the plasma
processing apparatus for processing the processed
object attracted to the electrostatic chuck
electrostatically, in a case in which the number of
15 times of the repeating exceeds a predetermined limit
value.

9. A plasma processing apparatus operable
according to the method of any one of claims 1 to 8,
20 the plasma processing apparatus 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;
25 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
30 processing apparatus; and
a storage unit storing a plurality of recipes
each including information representing a
relationship between the given voltage and a number

of repetitions that are predetermined depending on process conditions.

10. The plasma processing apparatus
5 according to claim 9, wherein the control unit is configured

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