WHAT IS CLAIMED IS:

1. A substrate cooling unit for cooling a substrate processed at a high temperature, the substrate cooling unit comprising:

a housing having a space therein;

a cooling plate supporting the substrate within the housing, the cooling plate having a cooling passage therein through which a cooling fluid flows; and

a cooling gas supply part supplying a cooling gas into the housing,

wherein the cooling gas supply part further comprises:

a cooling gas storage;

a cooling gas supply line having a front end connected to the housing and a rear end connected to the cooling gas storage to supply the cooling gas stored in the cooling gas storage into the housing; and

a diffuser disposed on the front end of the cooling gas supply line to multidirectionally diffuse the cooling gas supplied into the housing,

wherein the diffuser has a rod shape and apertures for spraying the cooling gas in a surface thereof and is disposed above the cooling plate.

2. A substrate cooling unit for cooling a substrate processed at a high temperature, the substrate cooling unit comprising:

a housing having a space therein;

a cooling plate supporting the substrate within the housing, the cooling plate having a cooling passage therein through which a cooling fluid flows; and

a cooling gas supply part supplying a cooling gas into the housing,

wherein the cooling gas supply part further comprises:

a cooling gas storage;

a cooling gas supply line having a front end connected to the housing and a rear end connected to the cooling gas storage to supply the cooling gas stored in the cooling gas storage into the housing; and

a diffuser disposed on the front end of the cooling gas supply line to multidirectionally diffuse the cooling gas supplied into the housing,

wherein the housing comprises:

a bottom wall disposed under the cooling plate, the bottom wall having first exhaust holes through which a gas in the housing is exhausted to the outside; and

sidewalls disposed at one side of the cooling plate, the sidewall having second exhaust holes through which the gas in the housing is exhaust to the outside,

wherein each of the second exhaust holes has a height less than that of the cooling plate.

3. A substrate cooling unit for cooling a substrate processed at a high temperature, the substrate cooling unit comprising:

a housing having a space therein;

a cooling plate supporting the substrate within the housing, the cooling plate having a cooling passage therein through which a cooling fluid flows; and

a cooling gas supply part supplying a cooling gas into the housing,

wherein a plurality of gas supply holes for supplying the cooling gas to a bottom surface of the substrate are defined in the cooling plate, and

the cooling gas supply part comprises:

a buffer member disposed under the cooling plate, the buffer member having a buffer space connected to the gas supply holes; and

a cooling gas supply line for supplying the cooling gas into the buffer space.

4. The substrate cooling unit of claim 3, wherein exhaust holes for exhausting the cooling gas are defined in an upper wall of the housing facing the cooling plate.

5. The substrate cooling unit of claim 3 or 4, further comprising elevation pins respectively disposed within elevation holes defined in the cooling plate, the

elevation pins being elevated along the elevation holes to unload the substrate from the cooling plate,

wherein the housing has an opened bottom surface facing a top surface of the cooling plate and a lower end placed on upper ends of the elevation pins.

6. The substrate cooling unit of claim 5, wherein a top surface of each of the elevation pins has a flat surface on which the lower end of the housing is placed and an inclined surface extending from the flat surface and inclined downward to have a height gradually decreasing toward an end thereof, thereby supporting a side portion of the substrate.

7. A substrate treating facility comprising:

a load port;

an equipment front end module;

a load lock chamber; and

a process treatment chamber,

wherein the load port, the equipment front end module, the load lock chamber, and the process treatment chamber are sequentially disposed in a line,

the equipment front end module comprises a transfer robot for transferring a substrate between the load port and the load lock chamber,

the process treatment chamber comprises a process chamber in which the substrate is heated and a carrying chamber comprising a carrying robot for transferring the substrate between the process chamber and the load lock chamber, and

the load lock chamber comprises:

a first housing providing a space in which the substrate heated in the process chamber stands by before the substrate is transferred into the equipment front end module;

a first cooling plate supporting the substrate in the first housing, the first cooling plate having a cooling passage through which a cooling fluid flows therein; and

a first cooling gas supply part supplying a cooling gas into the first housing,

wherein the first cooling gas supply part comprises:

a cooling gas supply line having a front end connected to the first housing and a rear end connected to the cooling gas storage, the cooling gas supply line supplying the cooling gas stored in the cooling gas storage into the first housing; and

a diffuser disposed on the front end of the gas supply line to multidirectionally diffuse the cooling gas supplied into the first housing,

wherein the first housing comprises:

a bottom wall disposed under the first cooling plate, the bottom wall having first exhaust holes through which a gas within the first housing is exhausted to the outside; and

sidewalls disposed on a side of the first cooling plate, the sidewall having second exhaust holes through which the gas within the first housing is exhaust to the outside,

wherein each of the second exhaust holes has a height less than that of the first cooling plate.

8. A substrate treating facility comprising:

a load port;

an equipment front end module;

a load lock chamber; and

a process treatment chamber,

wherein the load port, the equipment front end module, the load lock chamber, and the process treatment chamber are sequentially disposed in a line,

the equipment front end module comprises a transfer robot for transferring a substrate between the load port and the load lock chamber,

the process treatment chamber comprises a process chamber in which the substrate is heated and a carrying chamber comprising a carrying robot for transferring the substrate between the process chamber and the load lock chamber, and

the load lock chamber comprises:

a first housing providing a space in which the substrate heated in the process chamber stands by before the substrate is transferred into the equipment front end module;

a first cooling plate supporting the substrate in the first housing, the first cooling plate having a cooling passage through which a cooling fluid flows therein; and

a first cooling gas supply part supplying a cooling gas into the first housing,

wherein a plurality of gas supply holes for supplying the cooling gas onto a bottom surface of the substrate are defined in the first cooling plate, and

the cooling gas supply part comprises:

a buffer member disposed under the first cooling plate, the buffer member having a buffer space connected to the gas supply holes; and

a cooling gas supply line for supplying the cooling gas into the buffer space.

9. A substrate treating facility comprising:

a load port;

an equipment front end module;

a load lock chamber; and

a process treatment chamber,

wherein the load port, the equipment front end module, the load lock chamber, and the process treatment chamber are sequentially disposed in a line,

the equipment front end module comprises a transfer robot for transferring a substrate between the load port and the load lock chamber,

the process treatment chamber comprises a process chamber in which the substrate is heated and a carrying chamber comprising a carrying robot for transferring the substrate between the process chamber and the load lock chamber, and

the load lock chamber comprises:

a first housing providing a space in which the substrate heated in the process chamber stands by before the substrate is transferred into the equipment front end module;

a first cooling plate supporting the substrate in the first housing, the first cooling plate having a cooling passage through which a cooling fluid flows therein; and

a first cooling gas supply part supplying a cooling gas into the first housing,

further comprising elevation pins respectively disposed within elevation holes defined in the first cooling plate, the elevation pins being elevated along the elevation holes to unload the substrate from the cooling plate,

wherein the first housing has an opened bottom surface facing a top surface of the first cooling plate and a lower end placed on upper ends of the elevation pins.

10. The substrate treating facility of any one of claims 7 to 9, wherein the load lock chamber further comprises:

a second housing disposed on a side of the first housing, the second housing providing a space in which the substrate heated in the process chamber stands by before the substrate is transferred into the equipment front end module;

a second cooling plate supporting the substrate in the second housing, the second cooling plate having a cooling passage through which the cooling fluid flows therein; and

a second cooling gas supply part supplying the cooling gas into the second housing.

11. The substrate treating facility of claim 10, wherein the load lock chamber further comprises:

a third housing disposed below the first housing to provide a space in which the substrate transferred from the equipment front end module into the process treatment chamber stands by; and

a fourth housing disposed below the second housing to provide a space in which the substrate transferred form the equipment front end module into the process treatment chamber stands by.

WHAT IS CLAIMED IS:

1. A substrate cooling unit for cooling a substrate processed at a high temperature, the substrate cooling unit comprising:

a housing having a space therein;

a cooling plate supporting the substrate within the housing, the cooling plate having a cooling passage therein through which a cooling fluid flows; and

a cooling gas supply part supplying a cooling gas into the housing.

2. The substrate cooling unit of claim 1, wherein the cooling gas supply part further comprises:

a cooling gas storage;

a cooling gas supply line having a front end connected to the housing and a rear end connected to the cooling gas storage to supply the cooling gas stored in the cooling gas storage into the housing; and

a diffuser disposed on the front end of the cooling gas supply line to multidirectionally diffuse the cooling gas supplied into the housing.

3. The substrate cooling unit of claim 2, wherein a hole is defined in an upper wall of the housing facing the cooling plate, and

the diffuser has a plate shape having a surface in which apertures for spraying the cooling gas are defined, the diffuser being inserted into the hole.

4. The substrate cooling unit of claim 2, wherein the diffuser has a rod shape and apertures for spraying the cooling gas in a surface thereof and is disposed above the cooling plate.

5. The substrate cooling unit of claim 2, wherein the housing comprises:

a bottom wall disposed under the cooling plate, the bottom wall having first exhaust holes through which a gas in the housing is exhausted to the outside; and

sidewalls disposed at one side of the cooling plate, the sidewall having second exhaust holes through which the gas in the housing is exhaust to the outside,

wherein each of the second exhaust holes has a height less than that of the cooling plate.

6. The substrate cooling unit of claim 1, wherein a plurality of gas supply holes for supplying the cooling gas to a bottom surface of the substrate are defined in the cooling plate, and

the cooling gas supply part comprises:

a buffer member disposed under the cooling plate, the buffer member having a buffer space connected to the gas supply holes; and

a cooling gas supply line for supplying the cooling gas into the buffer space.

7. The substrate cooling unit of claim 6, wherein exhaust holes for exhausting the cooling gas are defined in an upper wall of the housing facing the cooling plate.

8. The substrate cooling unit of claim 6 or 7, further comprising elevation pins respectively disposed within elevation holes defined in the cooling plate, the elevation pins being elevated along the elevation holes to unload the substrate from the cooling plate,

wherein the housing has an opened bottom surface facing a top surface of the cooling plate and a lower end placed on upper ends of the elevation pins.

9. The substrate cooling unit of claim 8, wherein a top surface of each of the elevation pins has a flat surface on which the lower end of the housing is placed and an inclined surface extending from the flat surface and inclined downward to have a height gradually decreasing toward an end thereof, thereby supporting a side portion of the substrate.

10. A substrate treating facility comprising:

a load port;

an equipment front end module;

a load lock chamber; and

a process treatment chamber,

wherein the load port, the equipment front end module, the load lock chamber, and the process treatment chamber are sequentially disposed in a line,

the equipment front end module comprises a transfer robot for transferring a substrate between the load port and the load lock chamber,

the process treatment chamber comprises a process chamber in which the substrate is heated and a carrying chamber comprising a carrying robot for transferring the substrate between the process chamber and the load lock chamber, and

the load lock chamber comprises:

a first housing providing a space in which the substrate heated in the process chamber stands by before the substrate is transferred into the equipment front end module;

a first cooling plate supporting the substrate in the first housing, the first cooling plate having a cooling passage through which a cooling fluid flows therein; and

a first cooling gas supply part supplying a cooling gas into the first housing.

11. The substrate treating facility of claim 10, wherein the load lock chamber further comprises:

a second housing disposed on a side of the first housing, the second housing providing a space in which the substrate heated in the process chamber stands by before the substrate is transferred into the equipment front end module;

a second cooling plate supporting the substrate in the second housing, the second cooling plate having a cooling passage through which the cooling fluid flows therein; and

a second cooling gas supply part supplying the cooling gas into the second housing.

12. The substrate treating facility of claim 11, wherein the load lock chamber further comprises:

a third housing disposed below the first housing to provide a space in which the substrate transferred from the equipment front end module into the process treatment chamber stands by; and

a fourth housing disposed below the second housing to provide a space in which the substrate transferred form the equipment front end module into the process treatment chamber stands by.

13. The substrate treating facility of any one of claims 10 to 12, wherein the first cooling gas supply part comprises:

a cooling gas supply line having a front end connected to the first housing and a rear end connected to the cooling gas storage, the cooling gas supply line supplying the cooling gas stored in the cooling gas storage into the first housing; and

a diffuser disposed on the front end of the gas supply line to multidirectionally diffuse the cooling gas supplied into the first housing.

14. The substrate treating facility of claim 13, wherein the first housing comprises:

a bottom wall disposed under the first cooling plate, the bottom wall having first exhaust holes through which a gas within the first housing is exhausted to the outside; and

sidewalls disposed on a side of the first cooling plate, the sidewall having second exhaust holes through which the gas within the first housing is exhaust to the outside,

wherein each of the second exhaust holes has a height less than that of the first cooling plate.

15. The substrate treating facility of any one of claims 10 to 12, wherein a plurality of gas supply holes for supplying the cooling gas onto a bottom surface of the substrate are defined in the first cooling plate, and

the cooling gas supply part comprises:

a buffer member disposed under the first cooling plate, the buffer member having a buffer space connected to the gas supply holes; and

a cooling gas supply line for supplying the cooling gas into the buffer space.

16. The substrate treating facility of any one of claims 10 to 12, further comprising elevation pins respectively disposed within elevation holes defined in the first cooling plate, the elevation pins being elevated along the elevation holes to unload the substrate from the cooling plate,

wherein the first housing has an opened bottom surface facing a top surface of the first cooling plate and a lower end placed on upper ends of the elevation pins.