WHAT IS CLAIMED IS:

【Claim 1】

A method of detecting an arc in a semiconductor device, the method comprising:

performing a processing process for a substrate processing and collecting data according to the processing process, wherein the processing process has parameters;

separating the collected data by setting sections;

obtaining an average value and a standard deviation of the data separated for each section;

setting an upper limit and a lower limit for detecting the arc using the average value and the standard deviation, and

wherein the step of separating the collected data by setting sections comprise separating the collected data except for data in a dead time period after a start of the processing process and before an end of the processing process.

【Claim 2】

The method of claim 1, wherein in the step of setting the upper limit and the lower limit for the arc detection using the average value and the standard deviation, the upper limit is set by adding

integer multiples of the standard deviation to the average value, and the lower limit is set by subtracting integer multiples of the standard deviation from the average value.

【Claim 3】

The method of claim 1, wherein the step of separating the collected data by setting sections comprises separating the collected data based on a number of data.

【Claim 4】

The method according to any one of claims 1 to 3, further comprising determining that an arc has occurred when a detected signal exceeds the upper or lower limits.

【Claim 5】

The method of claim 4, wherein the step of setting the upper limit and the lower limit for the arc detection using the average value and the standard deviation comprises setting the upper and the lower limit differently for each parameter in the processing process.

【Claim 6】

A computer-readable recording medium storing a program for executing the method of claim 5.

【Claim 7】

A system capable of detecting an arc generated in a semiconductor device, the system comprising:

a data collection unit for collecting a result of processing a substrate for processing a substrate; and an arc detection unit for detecting the arc using an average value and a standard deviation for each section based on the data collected by the data collection unit,

wherein the arc detection unit comprises a data separation unit for separating the data collected by the data collection unit for each section; and

wherein the data separation unit separates the collected data except for data in a dead time period after a start of a processing process and before an end of the processing process, and the processing process has parameters.

【Claim 8】

The system of claim 7, wherein the arc detection unit comprises:

a calculation unit for calculating an average value and a standard deviation of the data separated for each section in the data separation unit;

a reference setting unit for setting an upper limit and a lower limit for arc detection by applying a value calculated by the calculation unit; and

a determination unit for determining that an arc has occurred when a detected signal exceeds the reference value set by the reference setting unit.

【Claim 9】

The system of claim 7, wherein the reference setting unit sets the upper limit by adding integer multiples of the standard deviation to the average value, and sets the lower limit by subtracting an integer multiples of the standard deviation from the average value.

【Claim 10】

The system of claim 9, wherein the reference setting unit sets an upper limit and a lower limit differently for each parameter in the processing process.

【Claim 11】

An arc detection system comprising a processor and a memory storing program code executable by the processor, the processor executing:

performing a processing process for a substrate processing and collecting data according to the processing process, wherein the processing process has parameters;

separating the collected data by setting sections;

obtaining an average value and a standard deviation of the data separated for each section;

setting an upper limit and a lower limit for detecting an arc using the average value and the standard deviation; and

wherein the step of separating the collected data by setting sections comprise separating the collected data except for data in a dead time period after a start of the processing process and before an end of the processing process.

【Claim 12】

The system of claim 11, wherein the processor sets the upper limit by adding integer multiples of the standard deviation to the average value and sets the lower limit by subtracting integer multiples of the standard deviation from the average value as the lower limit.

【Claim 13】

The system of claim 11, wherein the processor separates the collected data by setting sections based on a number of data.

【Claim 14】

The system according to any one of claims 11 to 13, wherein the processor determines that an arc has occurred when a detected signal exceeds the upper limit or the lower limit.

【Claim 15】

The system of claim 14, wherein the processor sets the upper and lower limits differently for each parameter in the processing process.