temperature in these areas of the wafer or chuck is always substantially identical and substantially corresponds to the target temperature.

However, a regulation or control as described in the process is expensive to implement. In addition, areas of the chuck or wafer in which no functional tests are carried out are continuously temperature-controlled, wherein the temperature in these areas substantially has little or no influence on the functional tests though.

It is therefore an object of the present invention to provide a method for temperature control or regulation as well as a temperature control device and a wafer test system for simplified, advantageous temperature control of a chuck or wafer.

This object is achieved by the subject matters of the independent claims. Advantageous embodiments are subject of the subclaims.

Summary

A first aspect of the present disclosure relates to a method for controlling or regulating the temperature of a chuck for a wafer, comprising the steps of: detecting the position of a test means for testing a wafer; determining the respective spatial distances between the test means and a plurality of temperature-measuring means for measuring a temperature of the chuck or a wafer mounted or clamped by the chuck; selecting at least one temperature-measuring means among the plurality of temperature-measuring means as a reference temperature-measuring means; controlling or regulating the temperature of the chuck based on the temperature(s) of the chuck or wafer measured by the selected reference temperature-measuring means.

In particular, such a method enables a simplified and advantageous temperature control of a chuck or wafer, since the temperature control of the entire chuck takes place substantially uniformly, for example by controlling all means for temperature control of the chuck. Thus, the method has low requirements in terms of process handling and/or the control or regulation electronics. In addition, there is no unnecessary heating and/or cooling of areas of the chuck or wafer that are insignificant for the functional tests carried out.

$$Tdiff = | T(t) - Tavg | = | T(t) - (T1+T2+T3+ ... +TX)/X |.$$

Preferably, the temperature change per time Tgrad is compared within a certain time period t1:

$$Tgrad = | (T(x) - T(x+t1))/t1 |.$$

In this way, that temperature-measuring means that detects the greatest temperature drop or the greatest temperature increase within a time period t1 can preferably be selected as the reference temperature-measuring means. The time period t1 is preferably less than about 5 seconds, more preferably less than about 1 second.

Particularly preferably, the spatial distance between the test means and a temperature-measuring means is determined based on vector coordinates. Here, the positions of the test means and the temperature-measuring means are preferably projected into a coordinate system and the connection vectors and further their amounts (lengths) are calculated in order to determine the respective distances between the test means and the temperature-measuring means. To determine the distance, 2D and/or 3D coordinates of the test means and the temperature-measuring means can be used, the 2D coordinates of the test means and/or the temperature-measuring means preferably relating to a plane parallel to the wafer surface. The exemplary, preferred determination of the distances based on vector coordinates is described in more detail in the detailed description of the figures.

A second aspect of the invention relates to a temperature control device for temperature control of a chuck and/or of a wafer positioned or clamped by the chuck, comprising: a first communication interface for communicating with a chuck, the first communication interface being suitable for transmitting electrical signals; a control unit in connection with the first communication interface for: receiving electrical signals from a plurality of temperature-measuring means for measuring the temperature of the chuck or wafer; selecting one of the temperature-measuring means as a reference temperature-measuring means; controlling or regulating the temperature of the chuck based on the temperature(s) of the chuck or wafer measured by the selected reference temperature-measuring means.

Preferably, the temperature control device is further suitable for selecting the temperature-measuring means that has the smallest spatial distance from a test means for testing the wafer as the reference temperature-measuring means.

Further preferably, the control unit of the temperature control device is suitable for selecting the temperature-measuring means that has the greatest amount of a temperature difference Tdiff and/or temperature change per time Tgrad as the reference temperature-measuring means, provided that the determined spatial distances of two or more temperature-measuring means are within a certain tolerance T± and/or are substantially the same size.

Particularly preferably, the temperature control device further comprises:

a second communication interface for supplying and/or draining a temperature control medium for controlling the temperature of the chuck into or out of the chuck; and/or

a third communication interface for communicating with at least one electrothermal converter for controlling the temperature of the chuck.

A third aspect relates to a wafer test system for testing a wafer, comprising: a chuck for mounting or clamping and temperature control of a wafer, comprising a plurality of temperature-measuring means for measuring a temperature of the chuck and/or of a wafer mounted or clamped by the chuck; at least one test means for testing the wafer; a position detection means for detecting the position of the test means in relation to the chuck or wafer; a temperature control device described in the second aspect.

In the following, individual embodiments for solving the object will be described by way of example with reference to the figures. Some of the individual embodiments described have features that are not absolutely necessary in order to carry out the claimed subject matter, but which provide desired properties in certain applications. Thus, embodiments that do not include all the features of the embodiments described below shall also be considered to be disclosed as falling under the technical teaching described. Furthermore, in order to avoid unnecessary repetition, certain features will only be mentioned in relation to individual embodiments described below. It should be