DESCRIPTION OF PROCESSES AND CALCULATION OF PARAMETERS OF THE ELECTRODES WHEN THEY ARE OPENING

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The variation of the actual contact area of contact between the electrodes when they are closing the substantially dependent on a number of parameters that are not always amenable to precise definition (geometry, position and surface properties of the electrodes, the actual speed difference of individual points, pressure distribution between the zones of contact and others).

The purpose of research - analysis and characterization factors in opening contacts and calculation of parameters of electrodes.

Materials and methods of research. When the calculations associated with the processes of opening electrodes, assume that the contact area with the correct and simple geometric form and - elastic and plastic deformation. The movement of the electrodes relative to each other is generally considered progressive in the direction perpendicular to the plane of the contact surface, the electrode material is considered solid or plastic, and the surface clean.

But even under these conditions when possible momentary break contact, the electrical resistance between them will vary just as quickly, as this changes the mechanism of current flow - instead of metal occurs tunneling conductance, and further, if the relevant conditions, between the electrodes there is a discharge.

Instant contact gap does not mean corresponding gap between the conduction electrodes. This transition process depends on the speed of opening the electrodes and the parameters of the circle. According occur and increase resistance between the electrodes, resulting in infringement set in a closed state, warm treatment, overheat entire contact surface and its plots on which there is actual contact between electrodes. As a result of heating the contact zones and the entire surface, changing the elastic properties of the material.

The relative size of the contact area of change is slow at first, but in the end the process of removing deformation becomes more sharp. Due to increasing resistance by reducing the contact area under the influence of current in these areas the temperature will rise, with particularly sharp rise in temperature up to the melting point, thermal explosion and evaporation is observed at the end of the process of opening.

If it is not possible to neglect the thermal effect of the current, we have the following extreme cases:

- When the electrodes do not change their position relative to each other (ie remain stationary during the process of heating under current).

- When the electrodes relative to each other can move perpendicular to the contact area under the influence of internal forces that arise due to thermal expansion.

In these cases, actual changes in the nature area of contact will depend on the amount of cooking zones at the electrode and temperature of heating. At the critical temperature where melting occurs contact conditions of contact taking a new character.

If the electrodes still, the heating of some of its volume before the melting will cause thermal expansion, resulting arise between the electrodes extra strength. Contact area will be determined by the total influence of external pressure forces and additional internal power disconnection electrodes.

Where the electrodes under the influence of additional internal forces can move freely, the contact surface for heating may vary due to changes in the characteristics of the material and increase the radius of the contact area is virtually negligible.

If the heat of fusion is accompanied by some amount, the molten material gouge and it will be filled in the gap adjacent to the contact zone surface. If the electrodes were previously compressed action of external force, the molten material gouge not only by changing the amount of material during melting, but also due to deformation of the electrode.

If we consider that in the process of melting is removing strain and thus there is an additional extrusion liquid metal, then, assuming that the amount of molten volume more strain on the spherical segment electrode surface, we get the equation for determining the convergence electrodes.

Features of formation of the contact area with the participation, on the one hand, the melting and the other - the convergence of the surfaces of the electrodes by removing the strain can lead to some unexpected consequences if possible expansion of the contact area due to displacement of liquid metal from the area of nitial contact between the electrodes, it will cause a natural decrease in current density and, consequently, the capacity allocated in the contact zone.

The displaced liquid metal spreads on the solid surface electrode has a temperature, the less the further it is from the zone of initial contact, it will solidify starting from the periphery. Then, as the power released per unit contact area is reduced, will start hardening and the rest of the electrode.

Conclusions

When closing the electrodes can be created conditions for the forced heating contact areas, as their character depends on many factors and mathematical expression of such processes may have some errors.

Evaluation of variables that determine the occurrence of such processes always require some assumptions and determine the possibility of their practical application.