CLAIMS

1. Method for controlling the coolant temperature of an electric motor of a drive device of a rotor of a centrifuge, preferably of a separator with a vertical axis of rotation, in particular during execution of a centrifugal separation of a suspension into at least two different product phases; wherein the rotor has at least one rotatable drum, and wherein the drive device has an electric motor which directly or indirectly rotates the rotor, and wherein the drive device further has an apparatus for supplying the electric motor with a coolant, which comprises a control apparatus, **characterized by** at least the following steps of:
   a) providing the centrifuge with the drive device;
   b) driving the rotor with the electric motor, in particular during the centrifugal separation of a suspension into at least two different product phases, and
   c) controlled cooling of the electric motor at least during step b) for a limited cooling phase in cooling cycles interrupted by breaks.

2. Method according to claim 1, characterized in that the length of a respective cooling phase is determined by the control apparatus taking into account one or more measured values.

3. Method according to claim 2, characterized in that the length of a respective cooling phase is determined by the control apparatus taking into account one or more measured temperature values.

4. Method according to claim 1, characterized in that the cooling cycles of step c) comprise the following sub-steps of:
   c1) opening an opening valve of the coolant supply system to generate a flow of coolant through a cooling fluid system of the electric motor , which has at least a coolant supply line and a coolant discharge line (102) as well as a motor coolant passage;
   c2) measuring an instantaneous temperature of the coolant T_{inst} after a predetermined time t_{meas} has elapsed at the coolant discharge line by a temperature measuring device and transmission of the measured value of the instantaneous temperature of the coolant T_{inst} to a control apparatus , wherein the predetermined time t_{meas} is determined as a function of a length of the coolant discharge line between the electric motor and the temperature measuring device;

c3) comparing the measured value of the instantaneous temperature of the coolant T_{inst} with an upper limit value of the coolant temperature T_{limit};

c4) calculating a time t_{cool} by the control apparatus as a function of the instantaneous temperature of the coolant T_{inst}, during which the opening valve also remains open;

c5) closing the opening valve after the specified time t_{meas} and the time t_{cool} have elapsed for a cycle pause time t_{pause};

whereupon the method steps c1) to c5) are run through again in the manner of a program loop after the cycle pause time t_{pause} has elapsed until the electric motor stops operating.

5. Method according to claim 4, **characterized in that** in step c5) the opening valve is closed immediately after the time period t_{meas} if the instantaneous coolant temperature T_{inst} is below an upper predetermined limit value of the coolant temperature T_{limit}.

6. Method according to claim 4, **characterized in that** the opening valve remains open for a further time t_{cool} when the instantaneous coolant temperature T_{inst} is above the upper predetermined limit value of the coolant temperature T_{limit}.

7. Method according to one of the preceding claims, **characterized in that** a correlation table of the measured values of T_{inst} and t_{cool} is determined experimentally, resulting in a centrifuge or coolant supply system-specific characteristic curve which represents the relationship between T_{inst} and t_{cool}, so that the coolant temperature control is designed as a characteristic curve control.

8. Method according to one of claims 1 to 7, **characterized in that** a PID controller is used as the control apparatus.

9. Method according to one of the preceding claims, **characterized in that** the control apparatus is supplied in step c) with one or more measured values of the instantaneous coolant temperature T_{inst}, and preferably additionally with one or more measured values of the ambient temperature and one or more instantaneous motor load characteristic values, whereupon the control apparatus uses these measured values to determine a cooling time t_{cool} according to an algorithm, wherein if the coolant temperature does not change in a desired direction after several subsequent cooling cycles, the algorithm is adapted by the control

apparatus until the coolant temperature adjusts to the value T_{limit}.

10. Method according to one of the preceding claims, **characterized in that** the coolant supply system is designed according to the principle of a closed coolant circuit.

11. Method according to claim 10, **characterized in that** the coolant is pumped in the circuit with the aid of a pump and cooled with a heat exchanger and the required cooling capacity is supplied to the heat exchanger via a refrigeration circuit.

12. Method according to one of claims 1 to 9, **characterized in that** the coolant is taken from a storage tank and, after flowing through the electric motor and absorbing heat, is pumped back into the storage tank.

13. Method according to claim 12, **characterized in that** the heat absorbed by the coolant is released again to the surroundings of the storage tank by convection via a wall of the storage tank.

14. Method according to one of claims 12 to 13, **characterized in that** coolant which is too hot can be discharged from the storage tank via a first line and cold coolant can be fed into the storage tank via a second line.