Abstract: temperature calibration has been carried out on series of resistors made of RuO2 of SMD type in the bath of normal and superfluid helium in temperatures at 1.4 - 4.2 K with reference thermometer of saturated vapor pressure. Measured temperature dependence of electrical resistance of resistors was analyzed using the exponential function and Chebychev's polynomials. It was established an optimum calibration for the use of resistors as thermometers.