

This work concerns the characterization of the thermodynamic behavior of the superalloy Airsist 215 (PN 3601669-7) containing cobalt. Such superalloys are used in aeronautical construction, in the hot parts of the turbine. They are frequently used for the production of the paddles. The parts in service are subjected to dynamic solicitations and thermal fluctuations over the course of time. They are responsible for modification and degradation of material properties. This can lead to the appearance of cracks and, in the long term, to the rupture of these parts. In this paper, a preliminary physical study is made on the appearance of the cracks, followed by experiments using shocks at ambient temperature and under a heating situation which simulates combustion. It is found that these dynamic loads have a significant impact on the development of the cracks that appear on the segments of the turbine nozzle. The study is devoted to the elastic shock of Hertz-Boussinesq extended to viscoelastic bodies by direct convolution of Riemann-Stieltjes. The interest resides in the local convolution and the distribution of stresses in the contact zone. The shock excitation method includes a deduced force in the load and disload phases. This force is an impulse which approaches a Dirac function. The sample can be modeled approximately by a system of one degree of freedom for natural frequency, damping and transfer function. The spectral response of the specified shock allows calculation of the damping. Every point of this spectrum gives the response for the linear system of the transfer function. Then, viscoelastic shock parameters are deduced