

Analysis of dynamic stresses during acceleration and deceleration of a conveyor belt (Maxwell Element Model)

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Abstract. This paper presents a solution to the equation of longitudinal vibrations in a conveyor belt, the material of which corresponds to the Maxwell elastic element model. The method of consecutive approximations was used to solve the wave equation. The boundary and initial conditions are recorded taking into account the mechanical characteristics of the phased rotor induction motor, which determine the relationship between the tractive torque and the rotational speed of the phased rotor induction motor. The propagation of dynamic stresses along the conveyor belt is analyzed. An estimate of the magnitude of the stresses in the belt is presented as a function of the characteristic time of the acceleration process. The urgency of the problem is associated with the high cost of the conveyor belt in comparison with the cost of the conveyor, the damage of which can be caused by dynamic stresses, the values of which exceed the maximum permissible value.

Keywords: dynamic stress, conveyor belt, asynchronous electric engine.

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