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Research on the influence of the technical conditions of a homogenizer pump on the quality of the process of pressure homogenization

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**abstract** The research presented in this paper refers to the role of the technical condition of the plunger pump's working units vis-a-vis the quality of homogenized emulsion. Technical condition was determined 'on line' by analysing the measured value of the signal of homogenization pressure. This signal contains among other things some information about the condition of the plunger pump's valve unit. The process quality was determined by the process affecting value changes of the dispersion phase characteristic dimension. The particle size was measured using a microscope. The influence of the pump's working condition estimates on a homogenized product's quality was researched by a correlation regression analysis. As a result of that procedure a strong stochastic relationship between the product quality and the values of the chosen estimates of the pump's technical condition was found. Among many factors of major importance influencing product quality, the mean value of homogenization pressure is not alone; the energy distribution observed in the signal's amplitude spectrum also is of considerable importance. Exponential regression models were obtained for the relationships investigated.

**keywords** homogenization, monitoring