

**REMOVAL OF RESIDUAL
STRESSES IN AIRCRAFT
STRUCTURAL ELEMENTS BY
PROCESSING PULSATING
SUBSONIC GAS FLOWS**

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It seems promising to use non-deformational methods for controlling residual stresses in aircraft structural elements, such as exposure to pulsating subsonic air flows (gas-pulse processing)

The research was carried out on an installation that is a gas-jet generator of the Gavro whistle type with a cylindrical axisymmetric resonator. The resonator was located vertically and on top of it was mounted, using a threaded connection, a cylindrical calming chamber, designed to ensure

an even distribution of the gas flow velocity across the entire cross section. Above the calming chamber were placed products intended for processing with a pulsating gas stream.

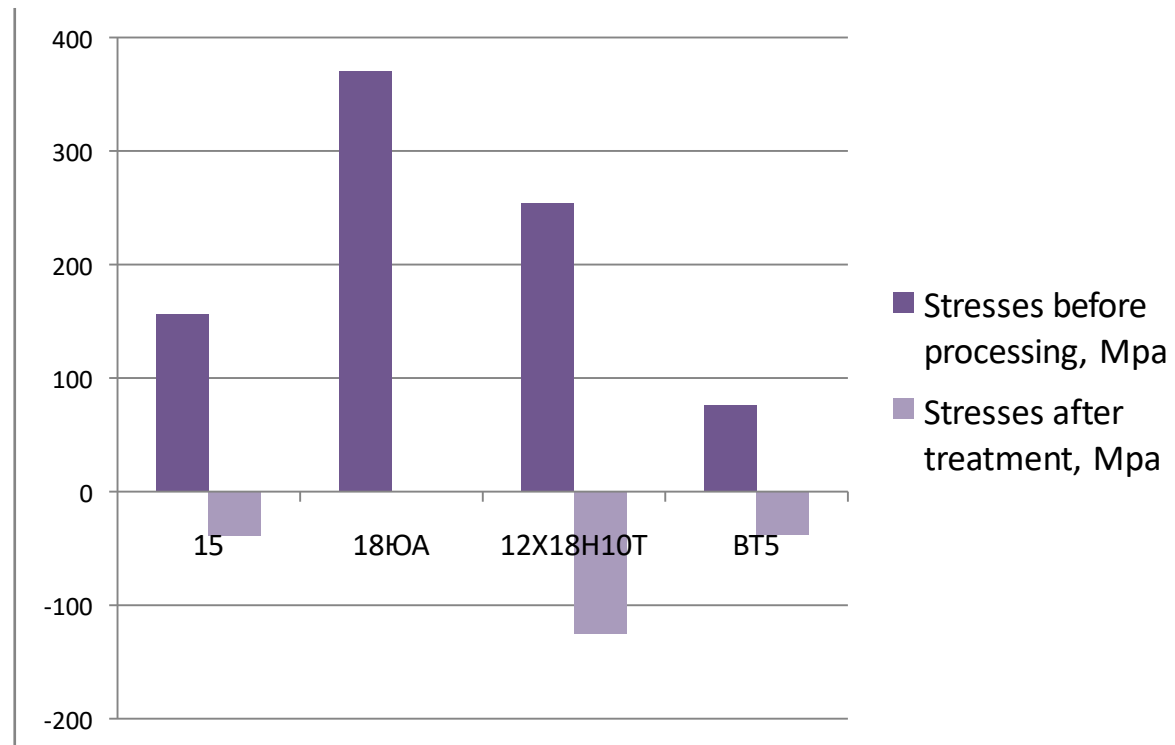


Fig. 1. The level of tangential residual stresses on the surface of metal ring products before and after gas pulse processing

$\sigma_{residua}$

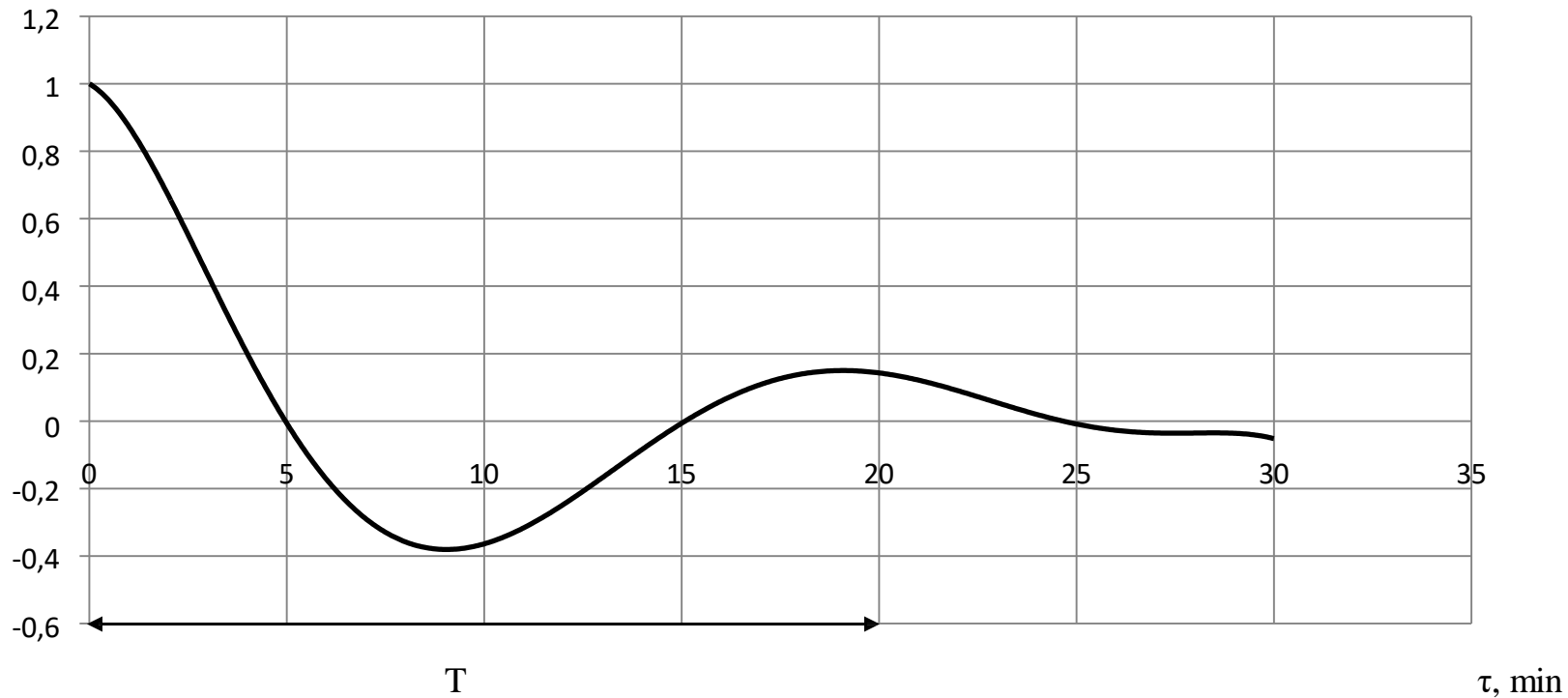


Fig. 2. Dependence of the ratio of residual stress values to their initial value on the duration of treatment with a pulsating subsonic gas stream

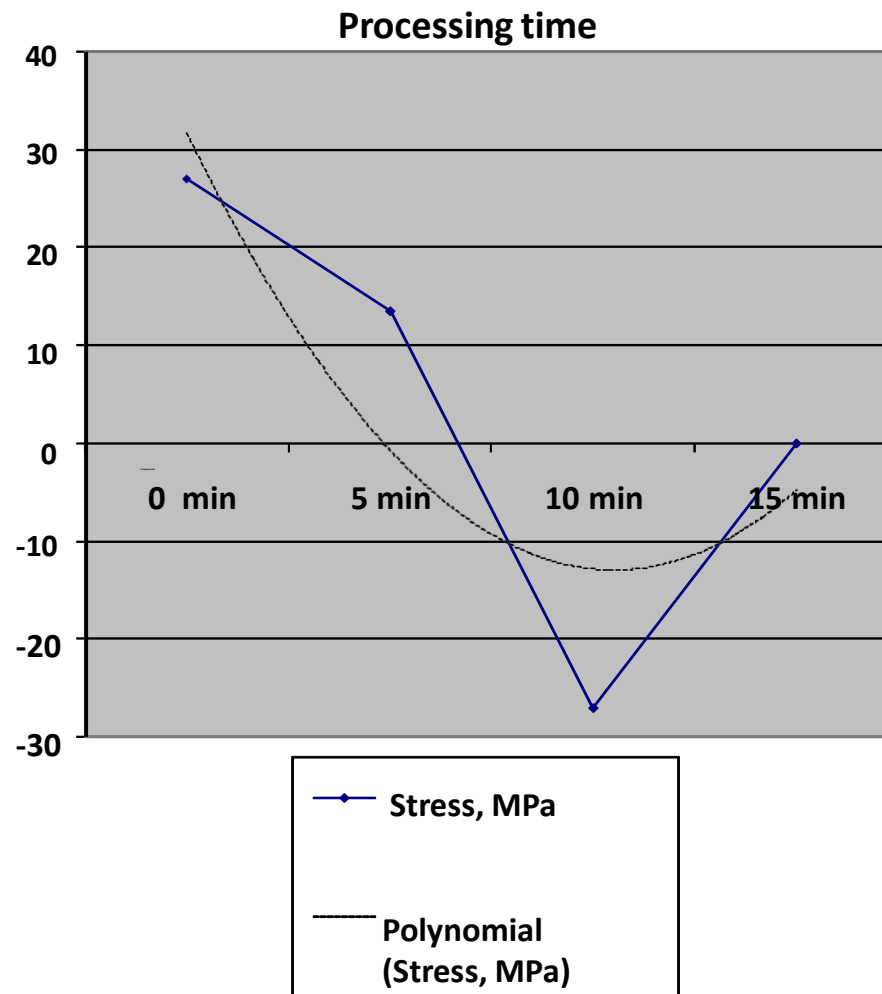


Fig. 3. The level of tangential residual stresses on the surface of the rolling bearing rings made of steel IIIX15 depending on the duration of gas pulse processing

The results of the study showed that the use of pulsating subsonic air flows is promising for controlling residual stresses in the metal elements of the aircraft structure .