INFLUENCE OF THE CONTACT AND COMPACTING PRESSURES ON THE QUALITY OF THE FRICTION WELDED JOINT

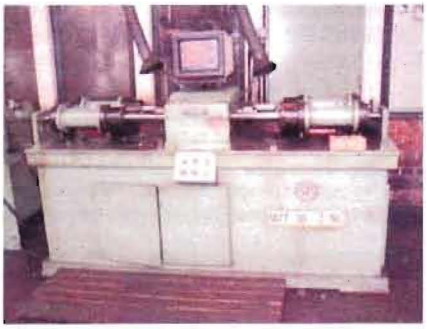
Nada Ratković[1], Dušan Arsić[1], Vukić Lazić[1], Ružica Nikolić[1,2*], Branislav Hadzima[2]

[1] Faculty of Engineering, University of Kragujevac, Serbia
[2] Research Center, University of Žilina, Slovakia

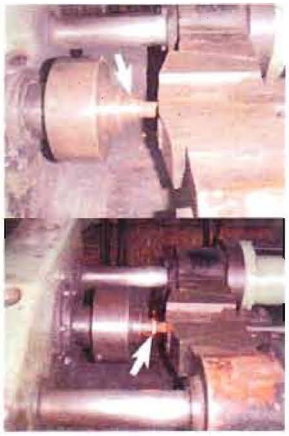
The theoretical and experimental analyses of the friction welding pressure influence on the plastic deformation level and the quality of the friction welded joint are presented in this paper. The joint of the tempering and the High-Speed steel was realized by the friction welding. Some basic principles of the friction welding procedure are presented, as well. The objective of the paper was to relate the basic process parameters, especially the friction and compacting pressures to plastic deformation parameters, during the friction welding of two dissimilar steels, what additionally complicates both the welding procedure and its analysis.
The friction welding is a very specific and complex process, since in the joint zone material is heated and plasticized with necessary action of the multi-step pressure to realize the joint. The total deformations in the axial and the radial directions are directly dependent on the applied welding pressure. Considering that geometry and shape of the friction welded joint directly depend on the friction pressure, here are presented some basic shapes of the welded joint obtained with various pressures.
The experimental investigation was conducted on cylindrical samples made of the two steels and the analysis of experimental results served to establishing the influence of the friction and compacting pressures on changes of the steel samples dimensions and shapes.

Keywords
Friction welding, friction pressure, compacting pressure, HS Steel, tempered steel.

Welding machine



Friction welding process



*Corresponding author: ruzicarnikolic@yahoo.com