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Evaluation of Creep resistance and superficial Study of Titanium Alloy Treated by PIII-N

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The search for alloys with improved high-temperature specific strength and creep-resistance properties for aerospace applications has led in the last decades to sustained research activities to develop new alloys and/or improve existing ones. Titanium and its alloys are excellent for applications in structural components submitted to high temperatures owing to their high strength to weight ratio, good corrosion resistance and metallurgical stability. Its high creep resistance is of great importance in enhancing engine performance. However, the affinity by oxygen is one of main factors that limit its application as structural material at high temperatures. Materials with adequate behavior at high temperatures and aggressive environmental became a scientific requirement, technological and economically nowadays. The objective of this work is the roughness and creep studies of the Ti-6Al-4V alloy after treatment by nitrogen Plasma Immersion Ion Implantation (PIII-N) process. The aim of this process is the improvement of superficial mechanical properties of the Ti-6Al-4V alloy. The selected alloy after ionic implantation process by plasma immersion was submitted to creep tests in 600 ºC, in constant load mode at 250 and 319 MPa. The techniques used in this work were Auger, AFM, X ray, Raman and creep test. The results show the significant increase of material resistance, it can be used as protection of oxidation in high temperatures applications.

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Experimental and Numerical Analysis of the Effect of Ribs and Beds in Sheet Metal Parts with 90 ° Bend

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Bending is one of several operations in the general category referred to as the forming of sheet metal [1]. Due to the ease of bending and generally lower costs, during the past few years many parts have been redesigned to permit manufacture by bending. But in bent the parts is not stiffness; corner beads may often be used to impart rigidity bending which might otherwise be too flexible and weak. With the increase in rigidity, we can reduce material and manufacturing costs. This paper aims at the numerical and experimental investigation of increasing bending strength when stamping in right-angle bent sheet a rib o bead in different depth and separation between each and other. The cross-sectional of bead is V, in steel sheet of gage No. 16 (U.S. standard).