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Ebrahimi, M., Tabei, K.H., Naseri, R., Djavanroodi, F.

Effect of flow-forming parameters on surface quality, geometrical precision and mechanical properties of titanium tube
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Abstract
In this study, the flow-forming process for fabricating seamless thin-wall tubes is experimentally investigated on a commercially pure titanium sample. For this purpose, the influence of three processing parameters including feed rate, mandrel revolution, and thickness reduction is studied on the surface quality and geometrical accuracy of flow-formed tube. It is found that the feed rate increment results in more longitudinal displacement of the roller on the tube sample. This intern results in, more area of the material to be in contact with the roller during the tube revolution; hence, higher tube surface roughness. Also, surface finish and dimensional precision of spun tube are lessened by increment of the mandrel revolution due to the intensification of machine vibration. Additionally, increased reduction of wall thickness leads to the enlargement of diametral growth and the loss of roundness. Also, it will increase the resistance of the material flow, which results in the wave creation at the tube surface, thereby decreasing the surface quality of the spun sample. © IMechE 2017.

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