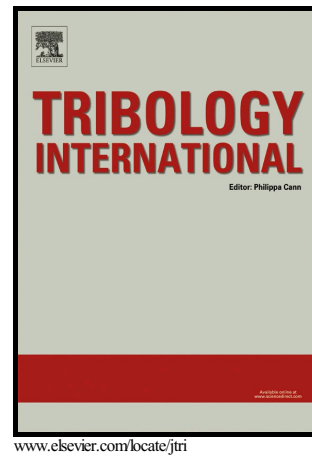


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On the erosive wear of 304L stainless steel caused by olive seed particles impact:**Modeling and Experiments**

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Abstract

Erosive wear presents a very complex material damage process which is the result of the impact between solid particles and the surface of devices. It has been the main concern in olive-oil extraction industries. In the present work, a three-dimensional finite element (FE) model has been used in order to study the effect of velocity and angle in the erosion phenomenon under the impact of olive seed. Both elastic-plastic materials behavior has been employed. The stainless steel has been described by Johnson-Cook visco-plastic model and the material removal is related with Johnson-Cook failure model. The evolution of the erosive wear is studied and discussed in terms of impact parameters such as impact angle, impact velocity and the olive seed fragments penetration into the target. A new device was designed, realized and then used to conduct real experiments illustrating the erosive wear of stainless steel caused by olive seed. The predicted results are in good agreement with the published results obtained experimentally and from analytical erosion models. The use of the experimental device has proven that this numerical study could be useful and efficient in studying erosion damage caused by solid fragments impact.

Key words: Erosive wear; Impact; FE simulation; Stainless steel; Johnson-Cook model.

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