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A. Dalmau, C. Richard, A. Igual – Muñoz

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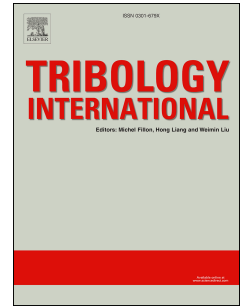
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## Degradation mechanisms in martensitic stainless steels: wear, corrosion and tribocorrosion appraisal

A. Dalmau<sup>1</sup>, C. Richard<sup>2\*</sup>, A. Igual – Muñoz<sup>1,3</sup>

1 Institute for Industrial, Radiophysical and Environmental Safety, Universitat Politècnica de València, Camino de Vera s/n, 46022 - Valencia, Spain

2 Université François Rabelais de Tours, 7 avenue Marcel Dassault, 37200 Tours, France

3 Tribology and Interfacial Chemistry Group, École polytechnique fédérale de Lausanne, Route Cantonale, 1015 Lausanne, Switzerland

\* Corresponding author: caroline.richard@univ-tours.fr

### Abstract

A deep understanding of degradation mechanisms of metals is crucial for developing new materials with high performance. Within the different families of stainless steels, martensitic stainless steels are widely used in a great variety of industrial applications where mechanical properties, such as strength, wear resistance and fatigue behavior, need to be high. In many of those applications, such as bearings or gears, martensitic stainless steels may be subject to tribological conditions leading to wear. Furthermore, when a contact operates in a corrosive environment its deterioration can be significantly affected by surface chemical phenomena, leading to a tribocorrosion degradation mechanism. Indeed, martensitic stainless steels degrade through a great variety of wear and corrosion mechanisms. This paper aims to review the published data from 2005 to present related to wear, corrosion and tribocorrosion of martensitic stainless steels. Individual studies of tribological and corrosion behavior of martensitic stainless steels have been widely published since 2005. From the wear point of view, ploughing or abrasive wear in dry contacts involving martensitic stainless steel has been reported, while pitting corrosion is the most common mechanism for those steels. However, only nine papers were found since 2005 related to tribocorrosion of martensitic stainless steels, although most authors concluded that this joint action is the most important material degradation in martensitic stainless steels.

**Keywords:** Martensitic stainless steels, wear, corrosion, tribocorrosion

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