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## Simulation of the wear phenomenon of hydrogen engine valves

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Technological advances and the introduction of increasingly stringent emissions regulations have forced a major overhaul of traditional propulsion systems, making the operating conditions of internal combustion engines increasingly complex and difficult to manage. In this context, switching to engines powered by alternative fuels, such as hydrogen, is one of the most promising solutions to reduce environmental impact without sacrificing performance. However, the use of hydrogen poses new design challenges, particularly for critical components such as the valve system, which have to operate under extremely severe thermal, mechanical and tribological conditions.

The present work focuses on the operating and contact conditions of the valve system of an innovative hydrogen engine in order to predict the operating conditions of valves and their interactions with valve seats, with a special focus on fundamental quantities such as equivalent stresses, contact pressures, and relative slippages and to estimate the amount of worn material.

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