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REDUCING OF THE MICROBIOLOGICAL CONTAMINATIONOF THE CUTTING FLUID BY APPLING THE ULTRAVIOLET RADIATION

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Abstract

The aim of this study is to evaluate the economic and environmental gains of the application of ultraviolet (UV) radiation through a prototype installed in a machining center of a factory. This study tested the application of UV radiation for the control of synthetic base cutting fluid microorganisms, using a device specially built for this propose. The experiment was conducted in an industrial environment, in which the economic and environmental gains were assessed. The experimental results indicate that UV radiation treatment controlled the microbiological contamination of the cutting fluid, obtaining an economic gain of 33.33% due to the prolongation of the fluid life, positively impacting the environment and avoiding the disposal of 191 kg waste. This paper shows that UV radiation treatment is an innovative and potential sustainable solution for the manufacturing sector, with regards to the control of microbiological contamination of the cutting fluid.

Key words: cutting fluid, economic evaluation, environmental evaluation, sustainable and green manufacturing, ultraviolet radiation

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