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Evaluation of surface quality by Fractal Dimension and VolumeParameters

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Abstract: This study aims, the evaluation of the surface quality by the fractal dimension "D" and volume settings (Vmp,Vmc, Vvv). Experimental work was conducted by process of surface mechanical treatment; in this case ballburnishing was applied on a commercial aluminum alloy material. Three parameters of regime were considered:"burnishing feed f", "burnishing force Py" and "burnishing ball diameter Db". Mathematical models wereidentified using the plans of multifactorial experiments "Box-Behnken" for prediction of fractal dimension "D"and volume parameters. Experimental and simulation results have enabled to show than the large diameter ballunder low loads and medium feed speeds, favors the elimination of peaks and reduction of fractal dimensionwhence quality improvement of surface.

Keywords : burnishing, volume parameters, fractal dimension, experimental designs