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# Engineering stainless steel surface via wire electrical discharge machining for controlling the wettability

Won-Gyu Bae<sup>a,b</sup>, Doogon Kim<sup>b</sup>, Ki Young Song<sup>c</sup>, Hoon Eui Jeong<sup>d</sup>, and Chong Nam Chu<sup>b,\*</sup>

<sup>a</sup> Interdisciplinary Program of Bioengineering, Seoul National University, Seoul 151-742, Korea

<sup>b</sup> School of Mechanical and Aerospace Engineering, Seoul National University, Seoul 151-742, Korea

<sup>c</sup> Sharp Engineering, Gyeonggi-do, 429-939, Korea

<sup>d</sup> School of Mechanical and Advanced Materials Engineering, Ulsan National Institute of Science and Technology, Ulsan, 689-798, Korea

\* Corresponding author. TEL.: +82 2 880 7147; E-mail address: cnchu@snu.ac.kr

## Abstract

We present a straightforward method to realize a wettability-controlled stainless steel surface via wire electrical discharge machining. Samples of AISI 304 stainless steel were prepared, having various depth of groove, while width and pitch of groove were set to be 500  $\mu\text{m}$  and 600  $\mu\text{m}$ . Wetting properties of the fabricated samples were quantified by measuring static contact angle of deionized water and silicone oil, and sliding angle of water droplets. Mechanical robustness test was conducted by comparing static contact angle of water and silicone oil before and after 1000 cycles of abrasion. In order to propose potential applications, we demonstrate oil-water separation and polymer molding for fabricating superhydrophobic surfaces.

**Keywords:** wettability; interfaces; stainless steel, electrical discharge machining

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