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**Effects of flexible friction on the properties of nanocrystalline nickel prepared by
jet electrodeposition**

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Abstract: To optimize the flexible friction in improving the coating properties of nanocrystalline nickel, based on the jet electrodeposition technology, a movable flexible friction device with a biological bristle as the friction medium and an online pressure detection device were developed. The different contact pressures' effects on the nickel coating properties were studied by changing the contact length between the brush and deposited layer. Also, the surface morphology, organization structure, microhardness, and corrosion behavior of the nickel coating were characterized using the field emission scanning electron microscope, x-ray diffraction/transmission electron microscope, microhardness tester and electrochemical workstation, respectively. The results show that the contact pressure between the flexible friction medium and the coating has an essential effect on the coating properties. Compared with non-friction, when the contact pressure is controlled appropriately, the coating surface is smoother and more compact, the grain size is reduced by 3.3nm, the hardness is increased by 12.6%, and the coating corrosion resistance is improved significantly.

Keywords: Jet electrodeposition; flexible friction; contact pressure; coating property

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