Editorial

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Editorial Note on Oral Exposure of Nano Nickel Titanium Wires

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Editorial Note

The invention of nickel-titanium (Ni-Ti) alloys has revolutionized the orthodontic wire industry, making the dream of applying continuous and constant forces a reality. To gain from the extraordinary super elasticity and shape memory properties of Ni-Ti alloys, many improvements were made in the manufacturing of austenite active (super elastic) and martensitic active (heat-activated) Ni-Ti wires.

Surface roughness and chemical stability are both influenced by the corrosion resistance of Ni-Ti wires. The efficiency of Ni-Ti wires in the oral cavity has been a major source of concern for researchers because it is the setting in which they are designed to work.

Many researchers have analyzed and compared super elastic and heat-activated Ni-Ti wires "as obtained" and "retrieved." Those studies were either conducted under unreliable conditions, used mixed types of orthodontic Ni-Ti wires, or measured corrosion resistance without proper standardization of orthodontic forces (different malocclusion grades, different inter-bracket distances).

Dimensions of dental crowns and bone reaction Different masticatory powers, oral hygiene status, different types of foods and drinks, mouth temperature, oral flora, and pH variations among patients were all not coincidental in the *in vivo* studies.

Despite the fact that the oral environment is a corrosive environment in which super elastic and heat-activated Ni-Ti wires are expected to function, there appears to be no reported evidence comparing the roughness of both forms of Ni-Ti wires and the possible release of Ni ions following clinical exposure in a variety of *in vivo* conditions other than orthodontic forces.

Heat-activated Ni-Ti wires have rougher surfaces than super elastic Ni-Ti wires, but both forms emit nearly identical quantities of Ni ions in artificial saliva. Surface roughness of Ni-Ti wires increases significantly after clinical exposure, while the amount of released Ni ions in artificial saliva decreases; an increase in surface roughness would be observed to a greater degree in super elastic Ni-Ti wires compared to heat-activated ones, but there might not be a difference in Ni ions release following oral exposure.