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## Synergistic Effects of Surface Treatments & Graphene Nano-Platelets on Adhesion and Mechanical Performance of NiTi-based Fiber Metal Laminates

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Muzafar Hussain<sup>1</sup>, Wael Zaki<sup>2</sup>, Wesley J. Cantwell<sup>1,3</sup>, Muhammad Yasir Khalid<sup>1,3</sup>, and Rehan Umer<sup>1,3</sup>

<sup>1</sup>Department of Aerospace Engineering, Khalifa University of Science and Technology, Abu Dhabi, United Arab Emirates

<sup>2</sup>Department of Mechanical and Nuclear Engineering, Khalifa University of Science and Technology, Abu Dhabi 127788, United Arab Emirates

<sup>3</sup>Research and Innovation Center for Graphene and 2D materials (RIC2D), Khalifa University of Science and Technology, Abu Dhabi, United Arab Emirates

Contact@ rehan.umer@ku.ac.ae (R. Umer))

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Fiber Metal Laminates (FMLs) are widely used in aerospace industry for enhanced mechanical performance and light-weighting of structures. Several mechanical and electrochemical surface treatment processes such as etching, sandblasting, and anodization etc., are usually carried out in order to enhance the adhesion between the metal surface and the polymer matrix of the FML. In this study, the mechanical properties of NiTi-based smart FMLs are explored. Prior to manufacturing, NiTi sheets were anodized using different surface treatment methods. The wettability of NiTi sheet surfaces after treatment was also analysed using the contact angle measurements using a goniometer. The anodized surfaces were fully characterized using the SEM to visualize the morphology of the metal surfaces after anodization. The vacuum assisted resin transfer molding (VARTM) process was used to manufacture Glass fiber/NiTi FMLs by drilling an array of holes in the NiTi sheets to facilitate through thickness resin flow. Graphene nano-platelets (GNPs) were infused with resin to add multifunctionality to the structure. Finally, several mechanical tests were conducted as per the ASTM standards to observe synergistic effect.

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### References

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## Figures

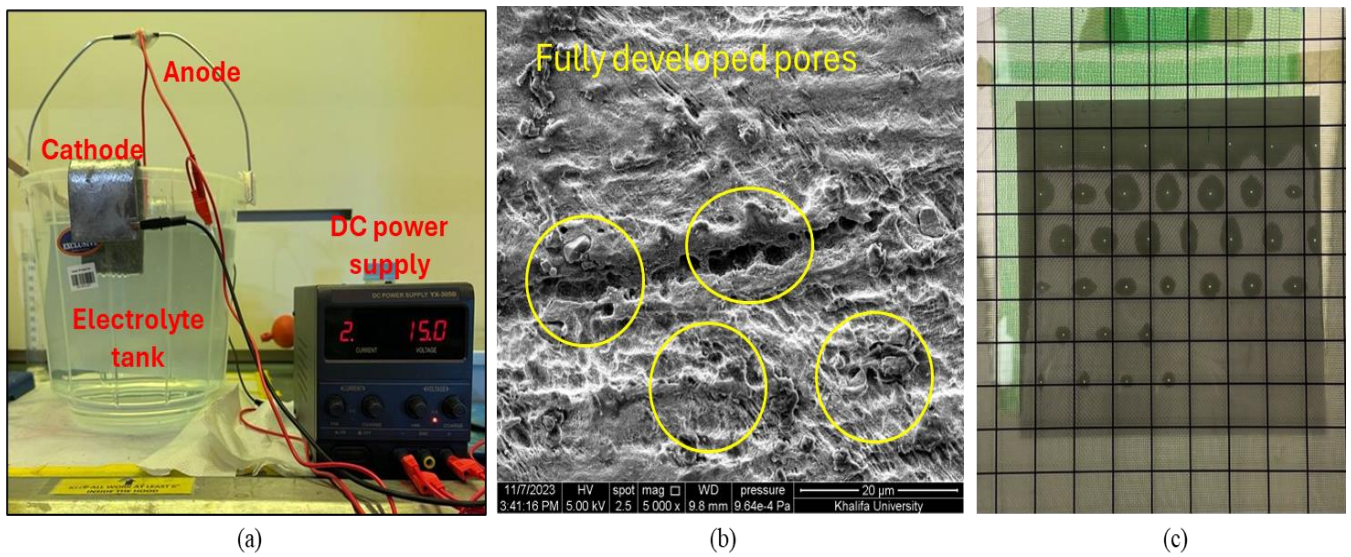


Figure 1 (a) Experimental setup for anodization of NiTi, (b) SEM morphology of anodized NiTi surface, (c) FML being manufactured through VARTM process.