PREMIO DI LAUREA "F. SOAVI" 2024

Scheda sintetica tesi

Titolo tesi: Ottimizzazione di una stampante 3D per la prototipazione rapida con tecnologia CFF

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Abstract del lavoro di tesi:

In the industrial field, Additive Manufacturing is a production concept that is gaining ever more ground. The secret of its success lies in its definition: being able to produce an object by the progressive deposition of material instead of its removal as is the case of traditional machining. In this way, problems such as waste quantities, complex geometries and machining changes are greatly reduced, making these processes particularly useful and effective for rapid prototyping and the production of small series of objects.

After an introduction about the main Additive Manufacturing techniques and the materials used, this paper examines a 3D printer initially set up for the use of polymeric materials with Fused Deposition Modelling technology. Going into more detail, this machine was modified in such a way as to make it compatible with the introduction of polymer filaments reinforced with continuous carbon fibre according to the main principles of Continuous Fiber Fabrication technology. The changes made also involved electronics and IT so that the printer could be easily operated via a platform.

Immagini illustrative (massimo 3):

1. Onyx extruder
2. CCF extruder
3. Print bed
4. CCF nozzle
5. Onyx nozzle

a)   b)
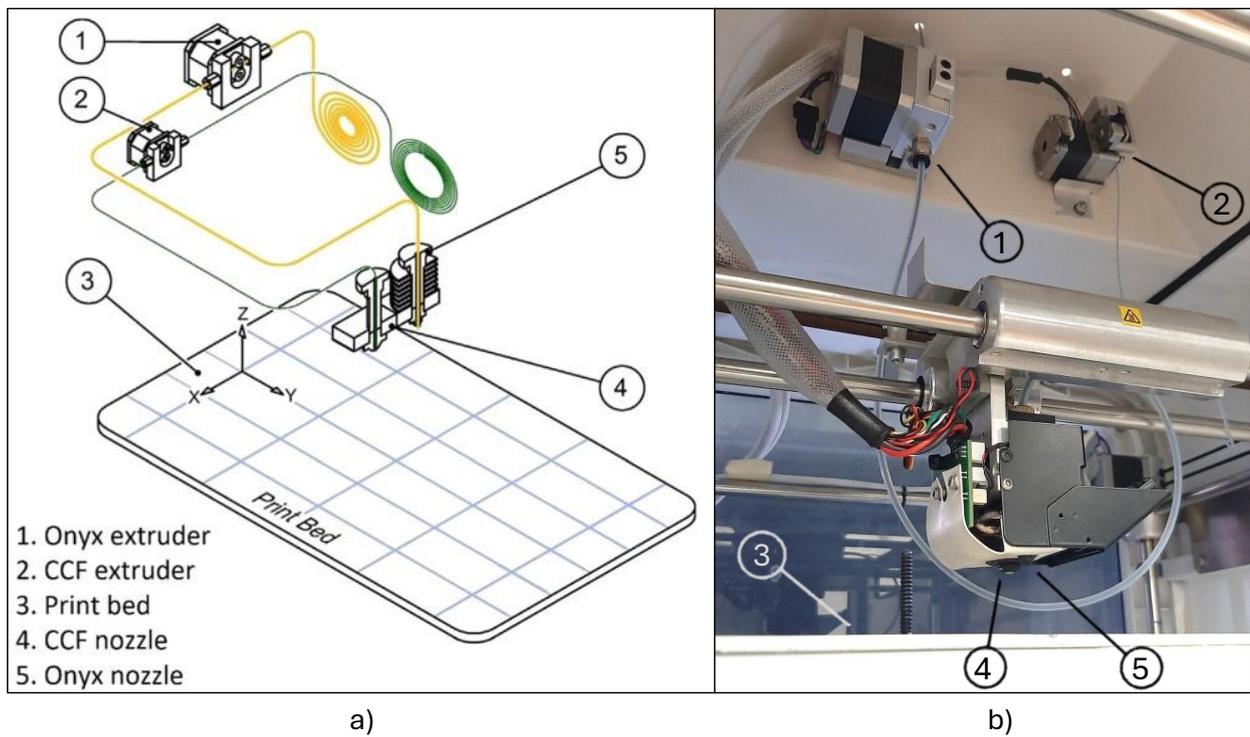
Fig. 1 – Stampa 3D tramite tecnologia Continuous Fiber Fabrication: schema del processo di stampa (a) e dettaglio sui principali componenti Markforged installati (b)
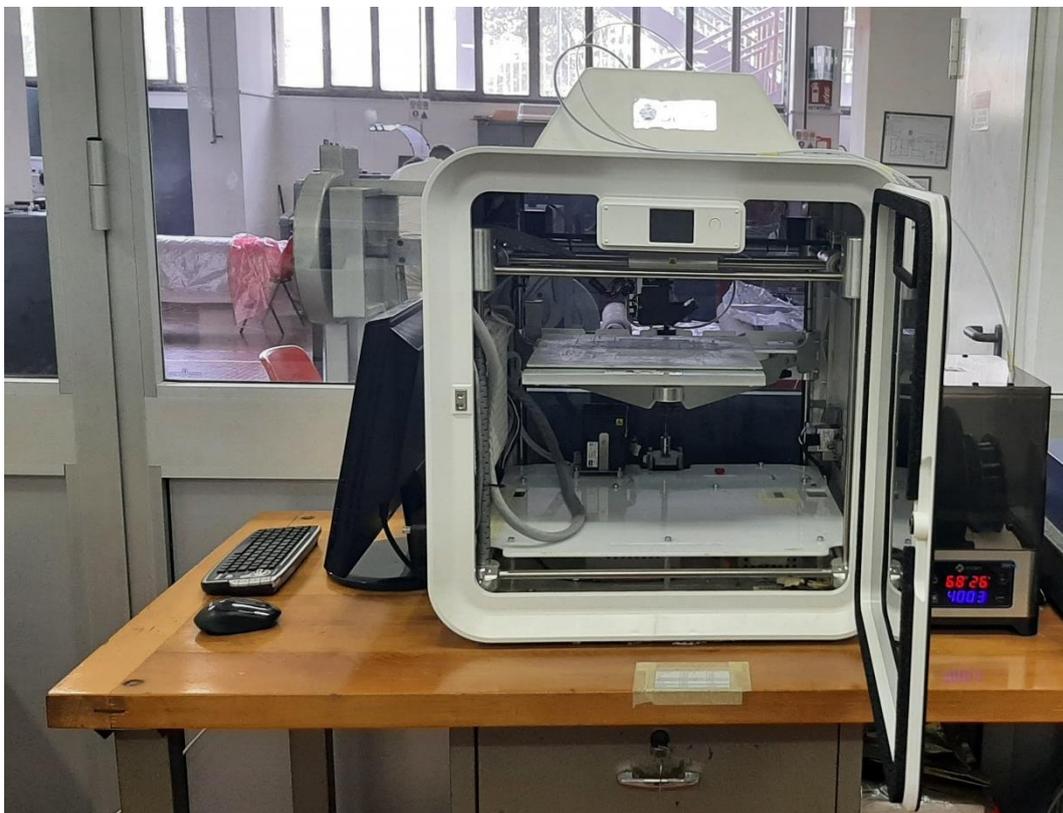
Fig. 2 – Stampante CubePro Duo adattata alla tecnologia Continuous Fiber Fabrication