REPLICATION TOOL AND METHOD OF PROVIDING A REPLICATION TOOL - DTU Orbit (11/12/2018)

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The invention relates to a replication tool (1, 1a, 1b) for producing a part (4) with a microscale textured replica surface (5a, 5b, 5c, 5d). The replication tool (1, 1a, 1b) comprises a tool surface (2a, 2b) defining a general shape of the item. The tool surface (2a, 2b) comprises a microscale structured master surface (3a, 3b, 3c, 3d) having a lateral master pattern and a vertical master profile. The microscale structured master surface (3a, 3b, 3c, 3d) has been provided by localized pulsed laser treatment to generate microscale phase explosions. A method for producing a part with microscale energy directors on flange portions thereof uses the replication tool (1, 1a, 1b) to form an item (4) with a general shape as defined by the tool surface (2a, 2b). The formed item (4) comprises a microscale textured replica surface (5a, 5b, 5c, 5d) with a lateral arrangement of polydisperse microscale protrusions. The microscale protrusions may be provided on a flange portion of a first part and are configured to act as energy directors when forming an ultrasonic joint with a cooperating flange portion of a second part.

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