Use of Cluster Analysis for Assessment of Surface Replicas Machined by a Laser Beam

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This article deals with research of replica preparation of polypropylene surfaces machined by a laser beam. For the production of replicas, we decided to test the material SILOFLEX© which is mainly used in dentistry. There we are also looking for expertise in the preparation and application of this material on the surfaces. Subsequently investigated methods of statistical evaluation. In this article the cluster analysis is primarily used, this analysis uses four basic methods: Ward's Minimum Variance, Furthest Neighbour, Weighted Pair-Group and Pair-Weighted Centroid Group. The results are there also demonstrated using Abbott Firestone curves. The result of the article is to demonstrate the similarity of the amplitude of surface roughness parameters using above mentioned four methods Cluster analysis using Cophenetic correlation coefficient and using average values of cumulative totals compiled into the Abbott Firestone curve and the replica of the original surface. Original surfaces and replicas will be scanned using a contactless 3D scanner Talysurf CLI 500.

Keywords: Surface, Replica, Laser, Machining, Polypropylene

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