

Gold-Plating of Non-Precious Surfaces

with **GAMMAT® optimo2** and **ECOLYT SG 200**

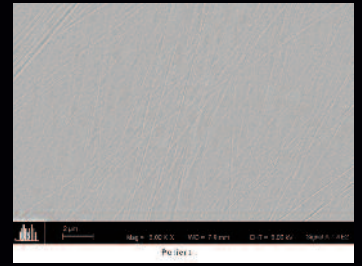
Final Report

Dr. Franz-Josef Faber (University of Cologne)

A variety of materials is used for the different indications of dental restorations that all must meet certain mechanical and esthetical requirements in the long term. These dental materials range from precious and non-precious alloys via porcelain up to acrylics. For particular applications with high mechanical requirements, e.g. in case of model cast dentures

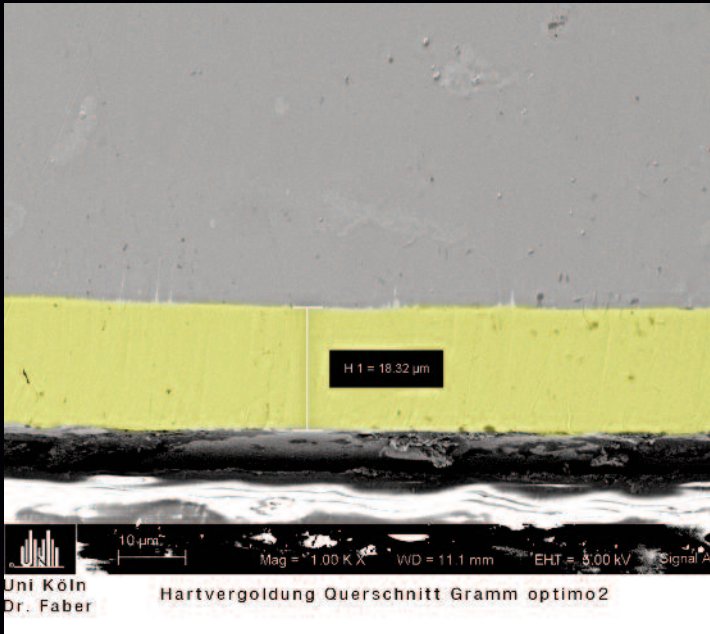
as removable restorations, non-precious alloys are considered as standard. Besides meeting mechanical and esthetical requirements, the materials used in the dental practice first of all have to be harmless to health. The main health hazards caused by dental alloys are allergic reactions on corrosion products. Non-precious alloys contain, among

others, the elements chromium and nickel or cobalt which might cause allergic reactions in individual cases. In such cases, it is important to either find a replacement material meeting the dental requirements or to passivate the surface of the suitable material in order to prevent the release of health-hazardous metal ions. One possibility of passivating the surface of model cast restorations is the galvanic gold-plating technique. However, in case of non-precious alloys the creation of a sufficient bonding compound between the alloy and the gold layer means a special challenge. In the method examined, bonding of the electroforming gold layer on the metal surface is achieved by a particular etching technique that provides a microscopic roughness within the range of a few μm . In a second step, the thus created undercuts are furnished with a pre-gold-plating layer with a thickness between 2 and 3 μm . This first gold layer serves as bonding layer between the



Polished Surface

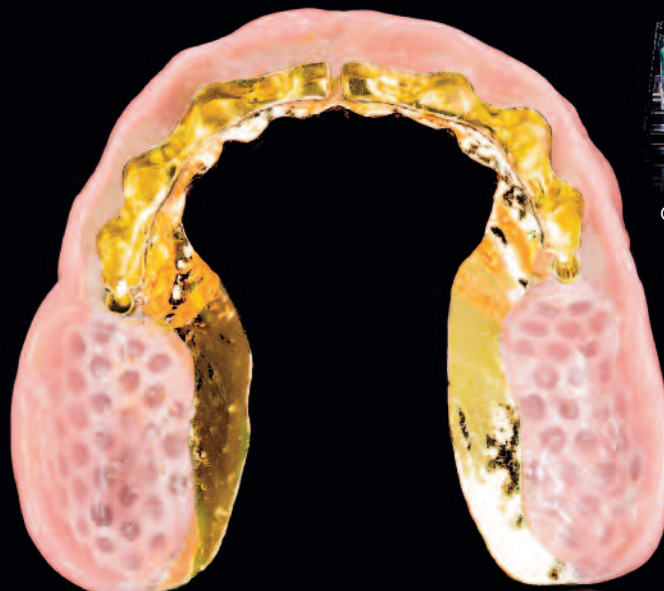
metal framework and the final gold-plating with a thickness of approx. 8 μm . In comparison with conventional gold-plating with a thickness of the covering layer of less than 1 μm , the gold layer applied by this method is relatively thick. This ensures that the gold layer resists the wear and tear over the years and prevents that the non-precious surface underneath might be exposed. The microscopic examination of the three gold-plating phases of polished metal surfaces proves that in the end a completely covering gold surface is achieved which in individual cases can inhibit possible allergic reactions to the products used.



Gramm's gold-plating: cross-section



Gramm Technik GmbH
Dental Division
Einsteinstrasse 4
71254 Ditzingen
Germany
Phone +49 - 7152 - 500960
Fax +49 - 7152 - 500980
e-mail gramm.dental@t-online.de
www.electroforming.de



GAMMAT® optimo2

