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Surface characteristics and optical properties of plasma deposited films on indirect aesthetic restorative dental materials

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**Title:** Surface characteristics and optical properties of plasma deposited films on indirect aesthetic restorative dental materials

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**Abstract:** The aim of this study was to develop and characterize wettability, morphology, chemical composition and color of plasmadeposited thin films on the surface of dental materials. A porcelain (VM9, VITA (PC)) and two indirect composite disks (Enamic, VITA (EN) and Lava Ultimate, 3M ESPE (LU)) were used. Different methodologies of film deposition were established: plasma-enhanced chemical vapor deposition (PECVD) with HMDSO/Ar (PAr); PECVD with HMDSO/O<sub>2</sub> (PO<sub>2</sub>); plasma immersion ion implantation and deposition using HMDSO/Ar (PII). Surface roughness and film thickness were determined by profilometry. Contact angles were measured with a goniometer. Morphological analysis was evaluated using SEM and chemical composition was investigated by FTIR and XPS. Color differences ( $\Delta E$ ) were verified by a spectrophotometer. The films' thicknesses were 620 nm (PAr), 540 nm (PO<sub>2</sub>) and 70 nm (PII). Surface roughness was not changed for most of the groups. An increase in contact angles for all film groups was detected, except for LU-PII group. In PO<sub>2</sub> films, granular structures covered the entire surface and their presence

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