Abstract

Title: Utilizing DLP Technology for End-Use Parts Production

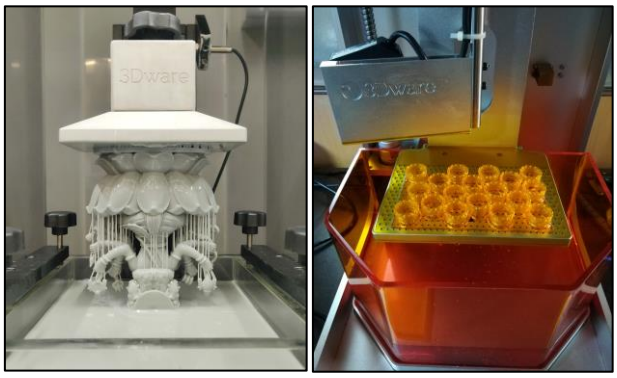
Keywords: DLP, Digital Micromirror Array, tessellation anti-aliasing, CLIP, urethane acrylate, cyanate ester

I. Abstract Body (up to 250 words)

Fundamentals of SLA/DLP 3D Printing: Understanding how the optical components (such as light source, Digital Micromirror Array, illumination and imaging optics), file processing software (tessellation techniques, support addition methods, anti-aliasing) and printing approach (such as physics of adhesion in bottom-up printing, CLIP technology and top-down printing) affect production speed and part quality. Differentiating between factors affecting true performance versus brochure myths and obscure technical data and how to make the right machine purchase decision for a given application. How SLA/DLP technology is being used for end-use parts production (for precision industries such as dental, hearing aid and jewelry) will be covered.

Development of 3D Printing Inks for SLA/ DLP Technology: The chemistry of photopolymers (urethane acrylates, epoxy acrylates etc) for DLP 3D printing has been inspired from the UV Coatings (urethane acrylates/methacrylates) and adhesives (cyanate esters) industry. An explanation of the transition from wood coatings and nail gels to SLA/DLP 3D Printing resins and how a given polymer base is used to create different physical properties required for a given industry (such as bio-compatibility for nail gels/ dental 3DP resins and toughness for UV Coatings/ engineering-grade materials) will be provided. Finally, a briefing on chemicals developed specifically for 3D Printing such as HA-TCP, ZrO2, SiN and wax loaded materials will be given alongwith how they could disrupt the medical (dental/ bone implants), engineering (aerospace/ automotive/ industrial electronics) and jewelry domains.

II. Image:



III. Reference:

1. Cristian Mendes-Felipe Juliana Oliveira Ikerne Etxebarria José Luis Vilas-Vilela Senentxu Lanceros-Mendez. State-of-the-Art and Future Challenges of UV Curable Polymer-Based Smart Materials for Printing Technologies

2. Se Yeon Song Min Soo Park, Doojin Lee, Jung Woo LeedJi SunYun Optimization and characterization of high-viscosity ZrO2 ceramic nanocomposite resins for supportless stereolithography

3. Mohit Kumar, S. B. Ghosh, A. Palshikar and S. Bandyopadhyay-Ghosh. Fused filament fabrication (FFF) with engineered biopolymer composites combined with post-mortem examination-a sustainable approach towards additive manufacturing

IV. Biography:

CTO and Co-Founder of 3Dware, Mohit built his first 3D Printer at the age of 19. With deep interest in polymer chemistry and automation, Mohit formulated proprietary materials for SLA/DLP 3D printing while pursuing Mechanical Engineering in BITS Pilani. He has also designed the world's first 4K Top-Down DLP 3D Printer. Currently, his research is focused on developing ceramic and wax loaded 3D Printable photopolymers which could potentially disrupt the dental restorations and jewelry manufacturing domains.

V. Presenting author details



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