



The Significance of Precision

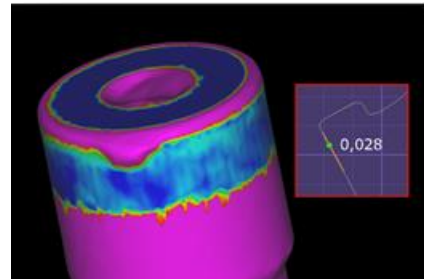
In Fabricating Implant-Supported Dental Prosthetics

Dental implant-supported prosthetics are continually ranked among the most desired growth trends in modern dentistry. Implant-supported prosthetics have revolutionized modern dentistry, offering dental patients a durable and functional solution for replacing missing teeth. However, the success and longevity of implant-supported restorations hinge significantly on the accuracy of the restorative process. The success of these prosthetics has given dental patients and clinicians, solutions for a multitude of ailments, restoring function, esthetics and comfort. In the realm of modern dentistry, implant-supported dental prosthetics represent a transformative solution for patients with missing teeth. These type of implant-supported prosthetics rely heavily on the highest level of precision at every stage of fabrication, in order to ensure optimal fit, function, and longevity. **ipd Dental Group**, the European leader in dental prosthetic components, creates the highest level of accuracy and precision with several ingenious engineered solutions that facilitate best practices and the ultimate success for fabricated implant supported prosthetics.

Precision in Treatment Planning:

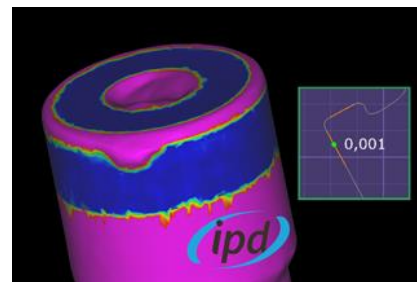
The process begins with meticulous treatment planning, which involves evaluating the patient's oral health, bone density, and anatomical structures. Precision in treatment planning ensures optimal implant positioning, taking into account factors such as bone volume, density, proximity to vital structures, and esthetic considerations. Advanced imaging technologies like CBCT scans enable clinicians to visualize the patient's anatomy in three dimensions, facilitating precise treatment planning. Accurate implant placement is essential for achieving Osseointegration and long-term success. Precise implant placement minimizes the risk of biomechanical complications such as screw loosening, implant fracture, and compromised prosthetic function.

Scanning accuracies are heavily dependent on the type of intraoral scanner being utilized, as studies have shown that there are differing results when reviewing scan data from several popular intraoral scanners. Accurate scans are critical for fabricating well-fitting implant-supported prosthetics. Digital intraoral scanners offer enhanced precision, capturing detailed impressions without the limitations of traditional impression materials. Inaccuracies in impressions can lead to discrepancies in the fit and occlusion of the final restoration, causing discomfort and compromising function. When integrating varying scan data, laboratories often experience the potential discrepancy of an approximate 5-30% enlargement. As shown in this image, one can clearly see that although the scans are very close to the CAD library, there is a deviation and therefore the accuracy and level of precision will be heavily compromised.

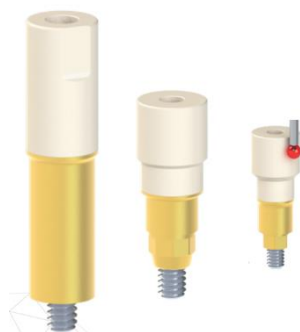




ipd Dental Group has provided a direct solution to this challenge by creating a multi-library process that further delivers precise solutions for these discrepancies, simply by having multiple libraries that provide the best geometrically stable rendering for a particular type of ios scanner. In the software (3Shape & exocad), the dental technologist can toggle among the scan abutments to attain the best and most accurate rendering that align with the clinician's ios and thereby initiate the design with the appropriate library that is geometrically stable and accurate for the scanner utilized, and in so doing the most accurate treatment protocol for the patient.



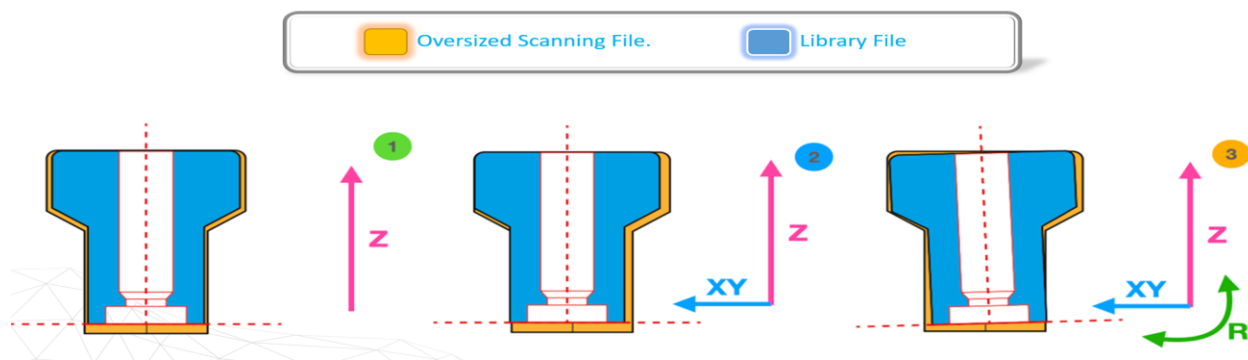
Scan Flags: Intraoral, Desktop and Tactile



To further enhance the accuracy and precision, ipd Dental Group is the only manufacturer that has multi height scan flags for all the major platform manufacturers in a two piece and at a ± 0.005 micron manufacturing tolerance. The intaglio surface is made out of titanium, making it most suitable for x-rays to ensure it is fully engaged and a PEEK head to reduce any potential scanning noise. The shape of the scan flag never exceeds the implant diameter and enjoys a captive screw with a single screw connection for all platform systems, thereby not resulting in anymore lost screws. ipd's scan flags are autoclavable for up to 100 cycles and can be used intraorally or a desktop scanner, being that they are one of the same; alleviating any potential confusion between clinical use and laboratory use.

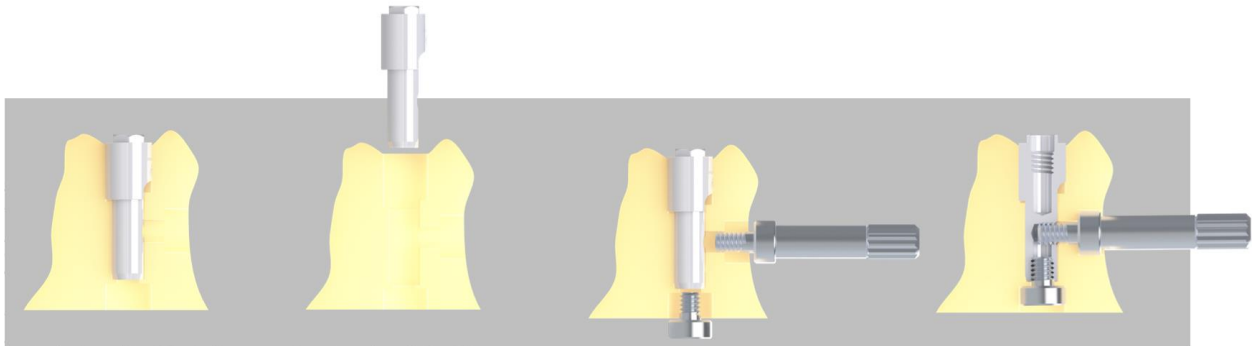
Precision in Prosthetic Design and Fabrication, begins with a verified model

CAD/CAM technology plays a vital role in precise prosthetic design and fabrication and for this reason, capturing the implant's placement, orientation and timing is critical to the success and longevity of the case. As a result of utilizing digital means of fabrication, subsequent the scanning, the laboratory prints implant models that may exhibit their own potential issues, which may lead to inaccuracies. ipd Dental Group has observed this and found that there are discrepancies not only in the Z axes, but also in the X and Y axes, as well as the Rotational axes.





An extremely innovative process and solution developed by ipd Dental Group is the use of two fixation screws for implant models. One at the bottom of the model ensuring an accurate Z axes, while another at the buccal side fixing any potential X & Y axes. Using both fixation screws ensures proper, stable and unique position with the added value of geometric stability all along the X, Y and Z axes and rotational discrepancy. Inaccuracies in prosthetic design or fabrication will result in ill-fitting restorations, occlusal discrepancies, and an increased risk of biomechanical complications.



Are all 3D printers alike?

There are a plethora of variations when it comes to 3D printers and all offer a slightly different expansion, depending on type of resin used, light source, additive technology and other factors. As the laboratory community accepts intraoral scans and converts them to a physical model, 3D printing has truly become a staple within the dental laboratory. Thus far, we've taken multiple steps to ensure high levels of accuracy and we must be mindful not to forego our efforts and lose the necessary level of accuracy when 3D printing. ipd Dental Group, the innovative implant solution provider, created what they call the ipd testing protocol; which is a validation test for each individual 3D printer a laboratory utilizes.

The protocol consists of printing a block, shown below (ipd provides a stl file), for the printer and resin utilized for the laboratory's implant models and then utilizing the testing protocol block to validate the offset value. In essence, employing the pin provided by ipd to find the best fit on the block, which will then inform the laboratory as to that particular printer and resin's offset. Once the offset is derived, ipd's customer support can provide the dental laboratory with the appropriate library that accommodates for the laboratory's printer/resin offset. This ensures there is zero discrepancy in accuracy and precision, from scanning to printing, allowing the laboratory to moving forward with greater confidence for the case.





Implant-supported dental prosthetics must seamlessly integrate with the patient's natural dentition. The dental laboratory employs artistic skills and attention to detail to create restorations that mimic the color, shape, and translucency of natural teeth. The precise layering of dental ceramics and characterization techniques contribute to the aesthetic success of the final restoration. Shade matching, texture replication, and individualized staining and glazing techniques ensure the accurate replication of natural teeth, resulting in a harmonious and lifelike appearance.

Precision and accuracy in the fabrication process directly correlate with the long-term stability and patient satisfaction of implant-supported prosthetics. Proper fit, occlusion, and material selection ensure the restoration can withstand functional forces and maintain its integrity over time. Accurate design and fabrication contribute to the patient's comfort, chewing efficiency, and overall satisfaction with the prosthetic restoration. Regular follow-up visits and maintenance protocols are crucial in ensuring the longevity and success of implant-supported prosthetics.

Precision and accuracy are indispensable in the dental laboratory when fabricating implant-supported dental prosthetics. From implant planning to final restoration, every step must be executed with meticulous attention to detail. ipd Dental Group developed solutions for dental professionals, by dental professional, thereby significantly elevating the success and outcomes, with their system. Their view is that it's an entire solution to restore dental patients with implants. The convergence of advanced technologies, materials, and skilled craftsmanship ensures the successful integration of implant-supported prosthetics into the patient's oral cavity. By prioritizing precision and accuracy, dental laboratories can enhance patient outcomes, satisfaction, and the overall success of implant therapy. The continuous advancements in digital workflows, materials, and manufacturing techniques further contribute to the precision and accuracy achievable in implant-supported dental prosthetics, ultimately improving patient care and quality of life.

About the Author: *Daniel Alter MSc, MDT, CDT experience and repertoire is comprised of more than 30 years in the dental profession; with more than ten years of owning and operating a successful mid-sized dental laboratory, coupled with a Master's degree in Business Management and Organizational Leadership, and a respected stellar educating record as a Professor of Restorative Dentistry at the City University of New York. The National Association of Dental Laboratories Board recognized Daniel with the Educator of the Year Award in 2016. Daniel is a recognized published Author, Presenter and Consultant on various relevant subjects, and is continually active in learning and sharing his knowledge with like-minded professionals. Daniel continuously serves the profession as the Executive Editor of Inside Dental Technology (IDT). Daniel provides comprehensive knowledge and expertise for any business and organization. He has been providing valuable consultation services for businesses large and small, ranging from start-ups to global multi-national enterprises.*