

Medical Technology

Precision in Every Dimension: How 3D Scanning Transforms Medical Device Innovation

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3D Scanning: Fast. Flexible. Intelligent.

3D scanning captures the exact dimensions and shapes of objects or environments, transforming them into precise digital 3D models. Using advanced methods such as laser triangulation, structured light, and photogrammetry, it delivers detailed, high-accuracy data for a wide range of industrial and medical applications.

Driven by rapid advancements in miniaturization and the integration of artificial intelligence (AI), 3D scanning has become smarter, faster, and more accessible than ever before.

From manufacturing to medicine, it's revolutionizing the way we work – enabling greater precision in quality control and inspection, and unlocking new possibilities in digital dentistry, prosthetics, plastic surgery, diagnostics, and medical training.

No longer just a tool, 3D scanning is redefining what's possible.

Major Trends in 3D Scanning

1

Automated 3D scanning: Automation is an emerging trend in the 3D scanning industry. Robotic systems are increasingly used to capture 3D data, reducing manual effort and boosting efficiency.

2

Miniaturization: The trend towards smaller and more efficient 3D scanners has opened new possibilities, especially in fields requiring precision and portability. Miniaturization enhances the applicability of 3D scanning in sensitive areas, like medical procedures.

3

Leveraging the Power of AI: AI and deep learning enhance 3D scanning by improving model accuracy, reducing manual editing, and streamlining the overall process.

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Role of AI in 3D Scanning



Generation of Depth Maps

AI-based stereo vision technology enables precise depth detection and spatial perception of complex scenes. By bringing accuracy and realtime performance on a new level, it lays the foundation for safer, more intuitive navigation in medical applications.



Segmentation of Image Data

AI algorithms facilitate the segmentation of complex image data, allowing for detailed analysis and manipulation of scanned objects. This can help to automatically identify and track objects within 3D scans that need to be inspected and measured.



Diagnostics

In medical 3D scanning applications, AI helps to analyze the patient's anatomy, aiming to enhance accuracy, speed and efficiency in diagnosing diseases and personalizing patient care.

How 3D Scanning Has Revolutionized Dentistry

3D scanning has revolutionized dentistry by unlocking the power of digital workflows. With our advanced intraoral scanners, dental professionals can capture precise digital impressions effortlessly – streamlining the design and fabrication of dental appliances, speeding up treatment times, and delivering exceptional patient experiences.



Applications

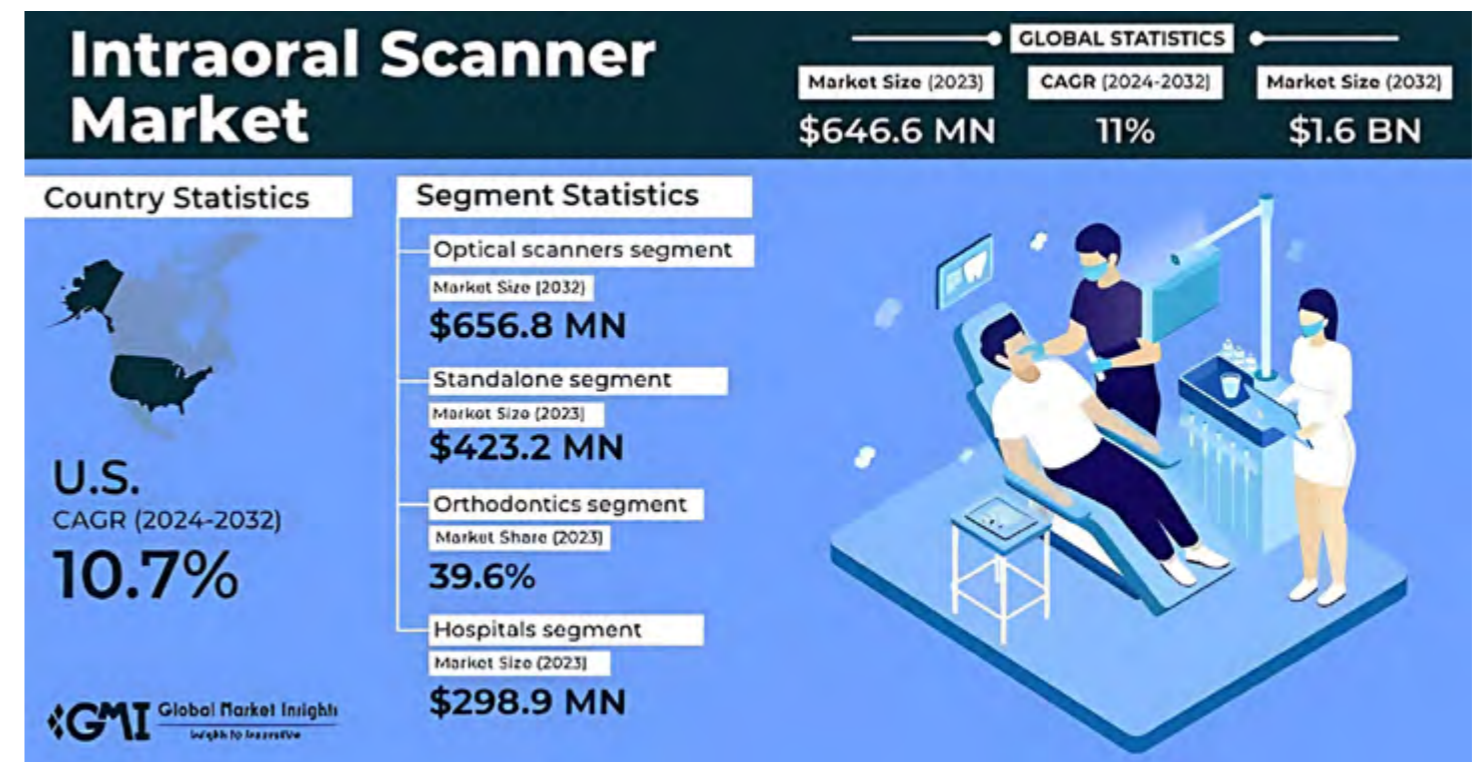
3D scanning is employed in creating prosthetics, veneers, aligners, and other dental appliances, enabling customized and precise treatments for patients.

Market Adoption

The growing use of intraoral scanners among dentists highlights a broader shift toward digital workflows that improve both efficiency and accuracy in dental practices.

In a recent survey from the [Institute of Digital Dentistry \(IDD\)](#), 78.8% of the participants reported daily use of their intraoral scanners. This study included 1,072 dentists from 109 different countries. In the United States, a 2021 survey by the [American Dental Association \(ADA\)](#) found that 53% of dental practices had adopted intraoral scanners.

The demand for 3D scanning technologies in dentistry is huge. [Global Market Insights](#) estimates the global market for intraoral scanners to be \$646.6 MN in 2023. This value is expected to grow to \$1.6 BN in 2032, reflecting a CAGR (Compound Annual Growth Rate) of 11% during the forecast period. These figures indicate a significant global shift towards digital workflows in dentistry, with intraoral scanners becoming an integral tool in modern dental practices.



Source: [Global Market Insights](#): Intraoral Scanner Market, Report, Published Date: May 2024

Digitizing the Oral Cavity With Precision

Intraoral scanners have redefined how dental professionals capture impressions. Once reliant on analog methods using silicone or alginate materials, dentists today increasingly turn to digital scanning to obtain high-resolution 3D images of a patient’s teeth, gums and oral structures. The handheld devices use optical or laser-based technologies to produce accurate, real-time digital models – eliminating discomfort, speeding up treatment workflows, and enhancing clinical outcomes.



What Are Intraoral Scanners Used For?

Intraoral scanners are now widely used across nearly all fields of modern dentistry with beneficial outcomes:

Restorative Dentistry	Orthodontics	Implantology	Prosthodontics	Patient Communication
Precise digital impressions for crowns, bridges, inlays/onlays.	3D Scans for clear aligners (e.g. Invisalign), retainers, and appliances.	Designing custom abutments and implant-supported restorations.	Full-arch scans for dentures and complex prosthetics.	Visualizing before/after treatment outcomes.
Faster turnaround and fewer patient visits.	Real-time treatment simulation and tracking.	Planning and fabrication of surgical guides.	Improved fit and fewer adjustments.	Monitoring tooth wear or gum recession over time.



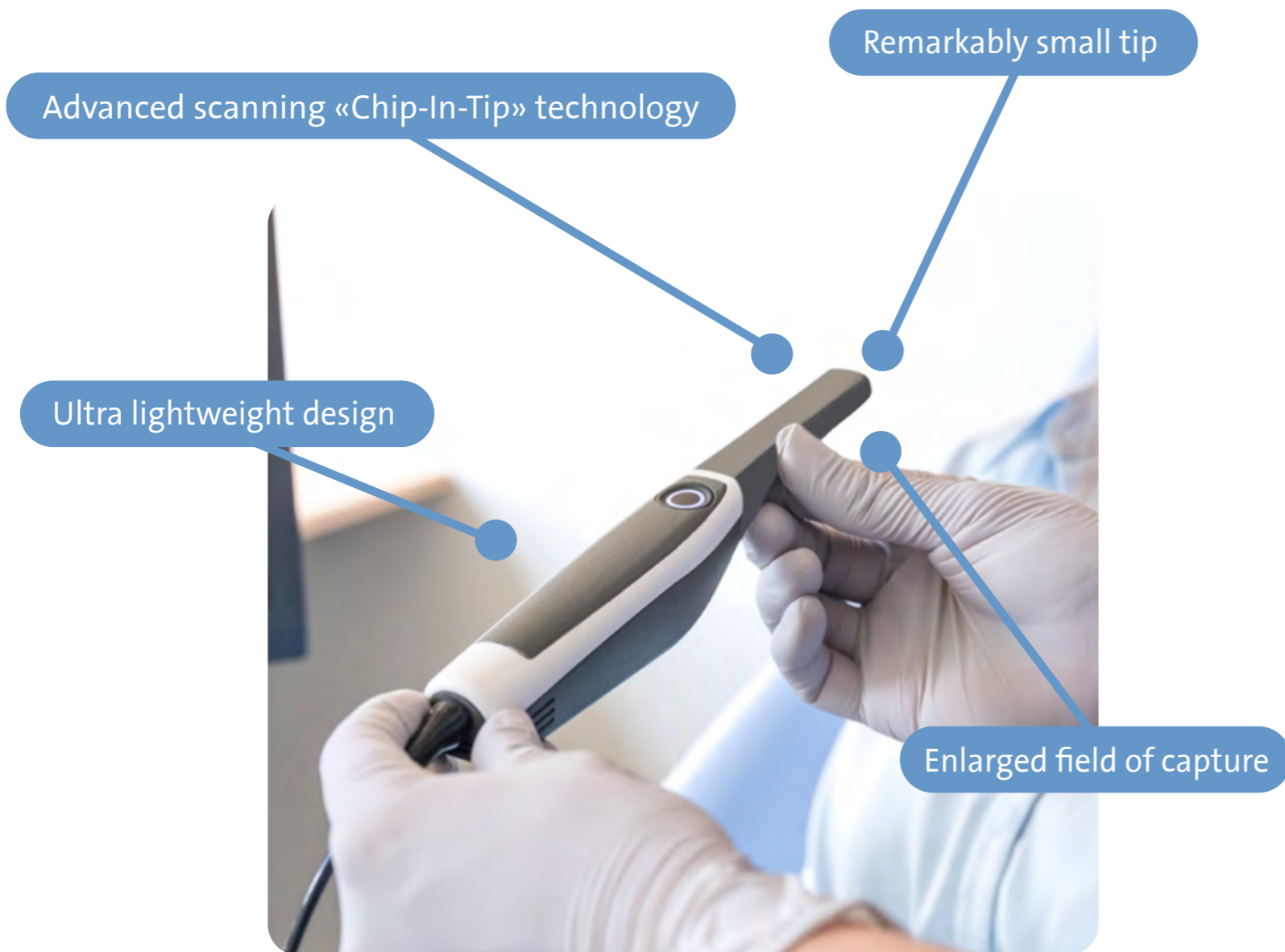
Does Accuracy Matter?

3D scans in dentistry need to be sufficiently accurate to enable the design and manufacture of a clinically acceptable restoration. This includes capturing detailed information of the dental arches, crown preparation margins, and abutment teeth for various types of restorations. To ensure this level of accuracy, ISO 20896-1 was introduced. It provides a standardized testing methodology and strategy to help manufacturers of intraoral scanners meet the required quality standards.

Private Label Intraoral Scanner From Brütsch Technology



As a Swiss Medtech company with decades of experience, we deliver CE-certified and FDA-approved devices ready for market launch. Our white-label intraoral scanner is a high-performance, ready-to-brand solution that lets MedTech companies expand their portfolio quickly and cost-effectively – without internal development or regulatory effort.



Technical Specifications

Tip Dimensions	10.74 x 14.67 mm
Weight	116 gr
Scan Technology	Active Stereovision with multi-camera-system
Scan Depth	Up to 30 mm
Field of Capture	28x28 mm at 20 mm
Data Output	STL, OBJ, PLY
Connection	USB-C power delivery
Reusable Sleeve	No mirror, autoclavable 50+ times

Chip-In-Tip Technology

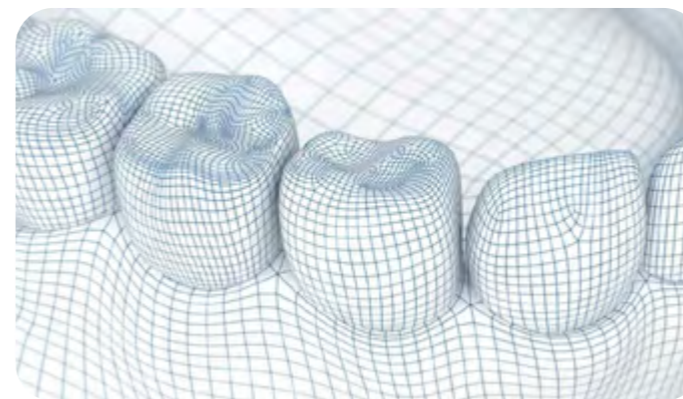
Miniaturized cameras in the distal part of the handpiece enhance the user experience, allowing for effortless scanning of even complex cases.

AI-based Stereovision

Unique 3D reconstruction scanning technology ensures fast, precise scanning with dual capture fields and a range of up to 30 mm.

Enabling Your Digital Workflow

Scan data (3D models) can be seamlessly integrated into your chairside application, enabling a customized digital workflow.



More Info & Get in Touch



Compact and Powerful – Designed for Ultimate Comfort

Our small and light IOS is an innovative solution and enhancement for every digital workflow designed to elevate patient satisfaction, boost dental practice efficiency and maximize lab precision.

Future Medical Applications: Robot-Assisted Surgery & SLAM Endoscopy

The future of 3D scanning technology holds promising developments, particularly in medical fields. Working within millimeters of vital structures, robotic surgery leaves no room for error – precision is not optional, it's essential.

Real-time SLAM (Simultaneous Localization and Mapping) has proven to be a groundbreaking solution, particularly in endoscopy applications. SLAM is a family of algorithms that help a moving camera or robot understand where it is while creating a 3D map of its surroundings at the same time.

Until now, external sensors using magnetic or radio signals have been used to determine the position of the endoscope, which often led to potential errors and increased manufacturing costs. Integrating 3D scanning with robotic surgery and SLAM endoscopy can enhance precision and navigation during procedures. Real-time SLAM algorithms create accurate 3D maps of the surgical environment, aiding in localization and mapping without external sensors.



Potential Benefits

- 1 Better Navigation and Localization in the human body
- 2 3D Mapping of Internal Organs
- 3 Improved Diagnosis and Treatment Planning
- 4 Augmented Reality (AR) Integration for student & hospital staff training
- 5 Enabling AI-based and predictive analysis for patient outcomes

Advancing Healthcare Through Technology

The synergy between 3D scanning and real-time SLAM represents a major step forward in modern healthcare. These technologies empower medical professionals to optimize workflows, reduce costs, and, most importantly, deliver better patient care. By embracing these innovations, the healthcare sector continues to unlock new possibilities and redefine standards in both clinical treatment and medical research.

Brütsch Technology's 3D Scanning Solutions

As a trusted OEM partner, Brütsch Technology AG offers end-to-end expertise – from development to production and after-sales support. We deliver regulation-compliant, advanced 3D scanning systems tailored for MedTech companies.

Specializing in compact, cost-efficient 3D vision solutions, our AI-powered stereo vision and real-time SLAM software enable precise depth capture and fast mapping.

Using GPUs, FPGAs, and precise calibration, we ensure accurate, reliable digital models for diverse applications.

Why Partner With Us

- Swiss company, founded in 1971, 150+ employees, 50+ engineers
- 20+ years medical technology experience
- High service level – Sales, PLCM, 3 level support under one roof
- We invest to facilitate our customer's growth

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