



# ENVIRONMENTAL IMPACTS OF PLASTER OF PARIS- A pilot study



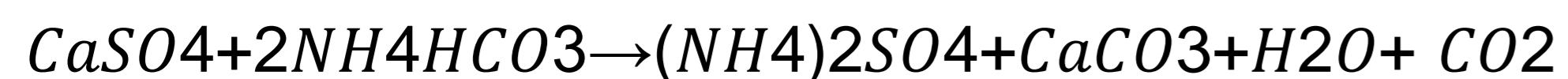
Harmful effects of the commonly used POP in P&O and its recycling and alternatives, like Scanning

## INTRODUCTION

Plaster of Paris (POP) is one of the recalcitrant wastes generated in P&O. The current practice of disposing of POP-harboring biomedical material by incineration is highly critical and environmentally unfriendly (Navale et al., 2018). The environmental impact of Plaster of Paris (POP) includes greenhouse gas emissions during production, air and water pollution from production and disposal, and the depletion of natural gypsum resources

## METHODS (Recycling)

The eco-friendly and rapid disintegration of POP waste was done by treating with ammonium bicarbonate solution (20% w/v ABC) to form non-hazardous products like ammonium sulphate and calcium carbonate in the form of sludge. The ammonium sulphate (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> is generally used in agriculture as a chemical fertilizer and calcium carbonate (CaCO<sub>3</sub>) as an additive in construction sector making this process cost-effective and value addition (Navale et al., 2018).

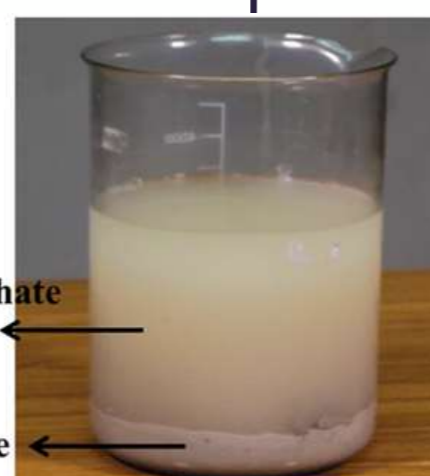


Harden POP Plaster

20% ABC

Ammonium Sulphate Solution

Calcium carbonate



Cotton and Bandage

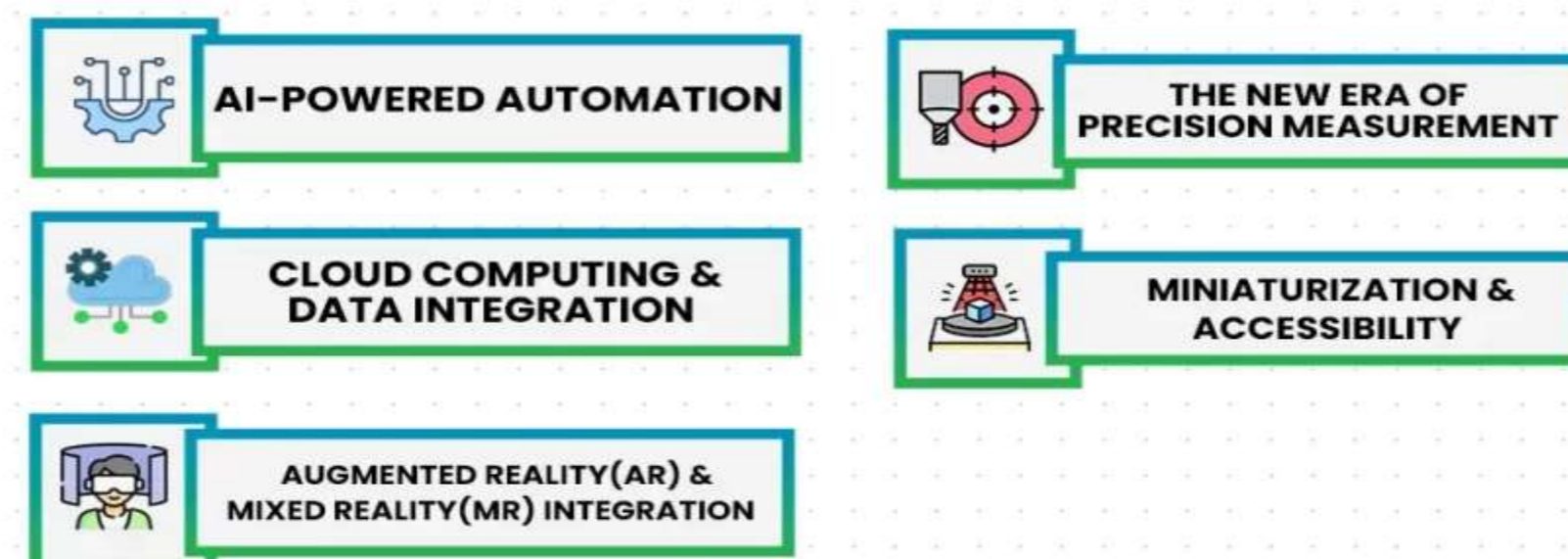


Foam Impression Box

## 3-D Scanning – The Next Generation

The blend of artificial intelligence and changing hardware has taken 3D scanning to a new level. Advancements in light-based scanning, particularly in LiDAR (light detection and ranging) are transforming the way we capture spatial data, These systems emit laser pulses and measure the time it takes for reflections to return allowing for precise calculations of object distances and shapes (2025).

### THE NEXT GENERATION OF 3D SCANNING



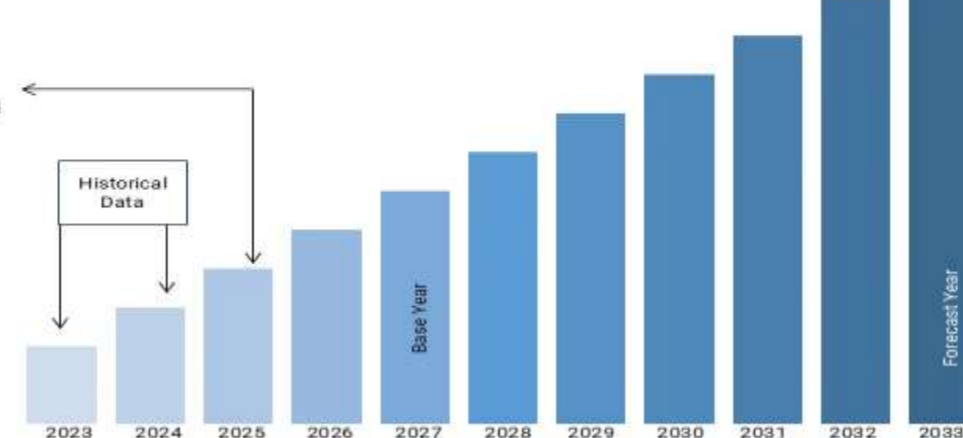
### Global Structured Light 3D Scanner Market

Market Size Overview

# 22.21%

Global market CAGR, 2025 - 2033

USD 2.84 Billion



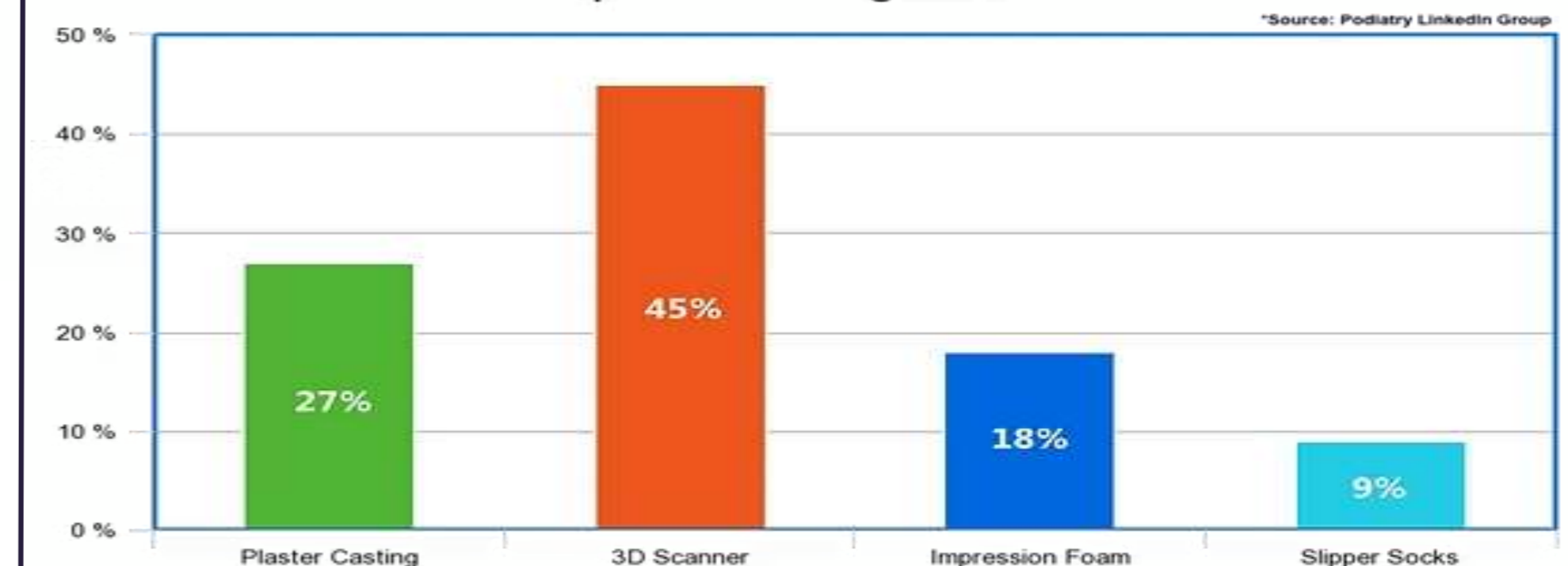
USD 14.11 Billion

## RESULTS AND DISCUSSION

As 3-D scanning continues to evolve, the next wave of advancements will include AI-powered automation, cloud computing and augmented reality integration. With more affordable and user-friendly scanners, 3D scanning is becoming an essential tool for professionals across industries. The transition from laser-based scanning to AI-enhanced light-driven solutions is just the beginning of a new era of precision measurement and special data visualisation to create precise 3D models of a person's body.

Also, we should focus more on proper recycling of POP, to reduce its harmful effects on the environment.

Popular Casting Methods



## CONCLUSION

All casting methods have advantages and disadvantages. While POP casting can be beneficial in certain scenarios, it is the recycling of POP, in a proper way, which is crucial. FIB's are still mostly restricted to insoles 3-D scanning can be the future, but it might be difficult to implement it in all types of casting and can also raise concerns of private patient information breach.

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