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Arkema PA11 Brings Efficiency and Sustainability to Global Orthotics Industry

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3D printing at ABCorp with Arkema PA11 allows global orthotics industry to becomes more efficient and sustainable

The global foot orthotic insoles market is projected to grow from $3.93 billion in 2022 to $6.15 billion by 2029, at a CAGR of 6.6% in forecast period 2022-2029. There are ways to improve both the insole manufacturing process and product quality. Most podiatrists make a plaster mold of the patient's foot and send it to a laboratory with a prescription. Technicians pour plaster into the mold and when it hardens, it exactly reproduces the bottom of the patient's foot. The process efficiency improves through both a scan of the patient's foot and 3D printing. Efficiency and sustainability were proven throughout the pandemic, as orthotic clinics with digital technologies such as 3D scanners and digital imaging maintained business which the casting model couldn't keep.

Every patient has a distinctive foot, build, and lifestyle which require complete customization of their orthotics. Traditional manufacturing methods made customization a longer and less efficient process. 3D printing allows for an entirely digital process printed on demand with the patient having a custom insole delivered within 48 hours. It is now achievable, through 3D printing with the correct material, that both podiatrists and end users will be more satisfied with the final product.

The Material

Many clinicians have moved from Nylon or Polyamide 12 (PA12) to Polyamide 11 (PA11). PA11 is produced from castor beans by Arkema under the trade name Rilsan. PA11's minimal environmental impact helps companies improve their environmental initiatives and sustainability goals. PA12 has a higher environmental impact stemming from the use of crude oil during manufacturing. PA11 has superior mechanical performance in comparison

to PA12 as PA11 has proven higher impact strength, better heat resistance, better formability, and resistance to fatigue, making it an advantageous fit for insoles. The superior properties increase the lifespan of the orthotic which can offset the higher price of PA11.

ABCorp Manufacturing Capabilities

ABCorp's roots as a secure printer trace back through American Bank Note Company over two centuries, to 1795 when the newly established First Bank of the United States called upon them to create a counterfeit-resistant currency for a young nation. ABCorp's US, Canada, Australia, and New Zealand locations combine to deliver omnichannel content to over 120 countries. ABCorp offers the latest generation of HP Multi Jet Fusion, and Desktop Metal Binderjet technology, with a wide array of available materials from PA11, PA12, Polypro, BASF TPU, and Full-Color PA12. In addition, they offer 174PH stainless steel and finishing within their highly secure envelope.

A fast-growing market calls for quick operational improvement, a product the industry can confidentaly back, and most importantly – happy patients. A fully customized insole, quick delivery of the insoles to the patient, a durable insole, and improved health increases both doctor and patient satisfaction. This recipe for patient satisfaction is

created by 3D printing using PA11. ABCorp has manufactured thousands of custom insoles using the same model where the patient's feet are scanned, analyzed, and turned into a CAD model. ABCorp receives the print ready CAD model and prints within a few days. No casting or time-consuming adjustments are necessary. As a 3D printer of PA11 insoles, ABCorp has helped their customers keep up with the demand of the rapidly growing orthotic insoles market.

Conclusion

Most people believe health is the most important aspect of their life, making the expedition of health improvement a top priority. As Henry Ford said, "Time waste differs from material waste in that there can be no salvage. The easiest of all wastes and the hardest to correct is the waste of time, because wasted time does not litter the floor like wasted material." Arkema PA11 has proven superior mechanical properties with a low carbon footprint, and 3D printing has significantly faster lead times compared to traditional orthotic manufacturing. For over two centuries, ABCorp has been the industry leader in secure printing with a recent track record of delivering quality orthotics. Together, Arkema PA11 and ABCorp 3D printing create a proven blueprint to improve the efficiency and sustainability of orthotics.