3D-Printed Insoles
Diabetic Insensate Patients

At Steeper we continue to develop and improve our 3D-printed insole products, to provide clinicians and patients with the latest innovative insole products on the market.

We are pleased to announce, that following independent trials performed by the University of Hull within their Biomedical Engineering Department, we can now open 3D-printed insoles to the final patient population; **Diabetic Insensate Patients.**

Method

- Led by Dr Harriet Talbott, Medical Engineering Programme Director at the University of Hull, the University conducted in-shoe pressure tests using TekScan technology and finite element analysis.
- The University conducted a pilot study performing 120 tests with 5 participants, comparing plantar pressures of 3D-printed insoles to EVA at base depths of 3mm and 6mm (sample data provided below).
- 3D-printed insoles were produced in medium density and compared to medium density EVA.
- Each insole had a 3mm grey poron top cover.
- Samples with 1st and 5th Met pink poron plugs were also provided in both 3D-printed and EVA, to compare site specific offloading.

Results

- 3mm 3D-printed plantar pressures across the tests demonstrated an average of 90.7 Kilopascals (kPa) of pressure. 3mm EVA in comparison demonstrated 94.7 kPa average plantar pressures. Although 3D-printed demonstrated a slight reduction in pressure compared to EVA, there was no statistical difference between the two comparisons.
- 6mm 3D-printed insoles demonstrated an average of 82.2 kPa of plantar pressure, and EVA demonstrated 95.2 kPa. Indicating a small statistical significance in favour of 3D-printed plantar pressure improvement.
- Both 3D-printed and EVA demonstrated a reduction of plantar pressures when compared to barefoot, with average barefoot plantar pressures for the test subjects of 182 kPa.
- None of the plantar pressures recorded throughout the testing reached pressure values that would trigger an ulceration.
- Plugs across both 3D-printed and EVA offloaded equivalently.

Steeper Group are grateful to Dr Harriet Talbott and her team at the University of Hull for conducting this study.

We now invite all our Orthotists and Customers to use Steeper 3D-printed insole products across all patient groups and based on the results of this study, provide our prescription guide on diabetic insoles below:

3D Printed Diabetic Prescription Guide

1) Base: Medium Density
2) Top Cover: 3mm Grey Poron
3) Site Specific Offloading with Plugs: Grey or Pink Poron

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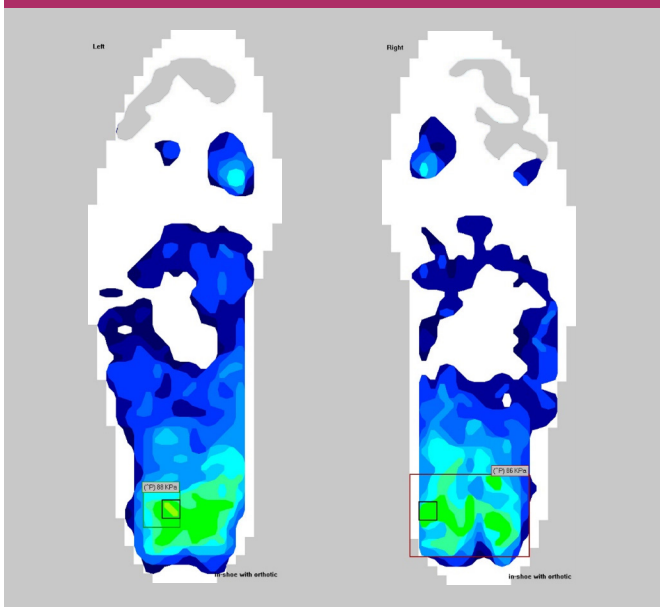
Review Periods

As with all at-risk patients, we recommend face-to-face reviews to ensure any orthotic prescription is performing as expected.

Sample Data

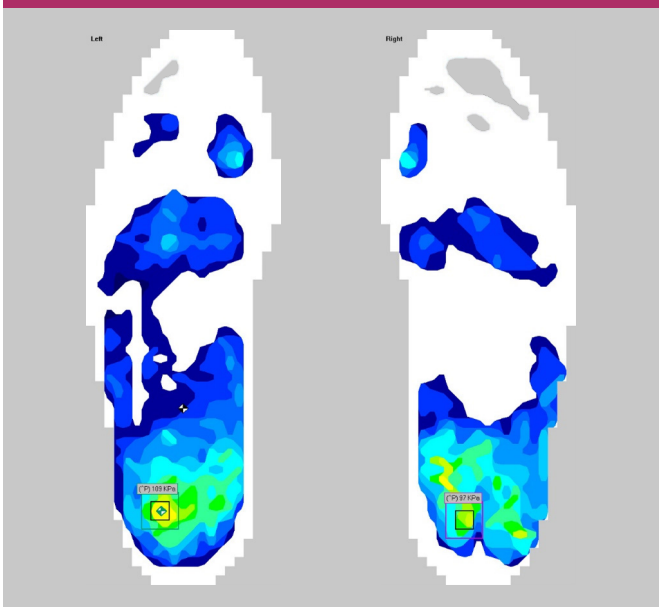
3mm 3D Printed Average Peak Pressure (kPa)

L: 89.5 R: 85.5



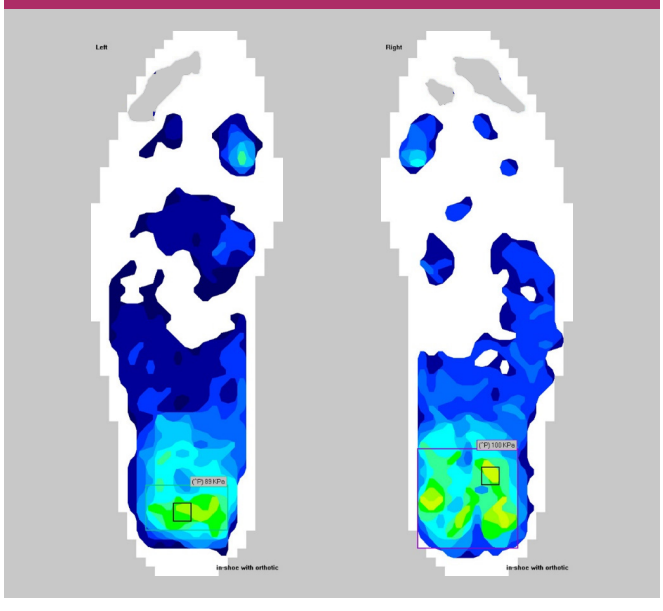
3mm EVA Average Peak Pressure (kPa)

L: 112.3 R: 89.3



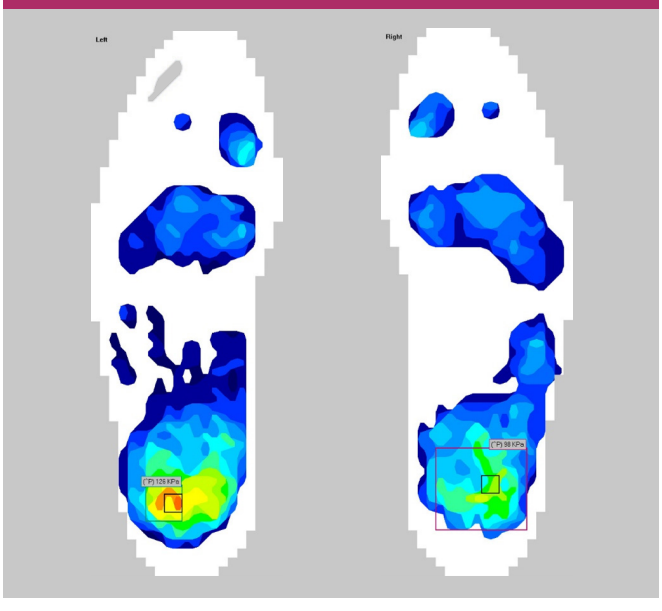
6mm 3D Printed Average Peak Pressure (kPa)

L: 86.7 R: 98.8



6mm EVA Average Peak Pressure (kPa)

L: 129 R: 96.6



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