

POLYURETHANE PRODUCTS REDISTRIBUTE THE PRESSURE UNDER THE SHOE ON SOFT, SAND SURFACES



Universiteit Utrecht

Yteke Elte, Meike van Heel, Jan de Zwaan, Gerben Bronkhorst, Wim Back

Department of Equine Sciences, Faculty of Veterinary Medicine, Utrecht University, Yalelaan 12, NL-3584 CM Utrecht, The Netherlands
w.back@vet.uu.nl.



Introduction

This study was conducted to objectively evaluate the effects of Equibuild®, a urethane pour-in hoofpad, on pressure distribution underneath the shoe.

The tested hypotheses were that shoes filled with Equibuild® would increase the bearing surface and as a result provide lower mean pressures and peak pressures. Furthermore it was hypothesized the supporting effects of Equibuild® were similar on different ground surfaces.

Materials & Methods

This study was performed on 6 clinically sound, adult Dutch Warmblood horses (Fig.1). The horses were shod at random with regular steel horseshoes and the same shoes filled with Equibuild® (Fig.2). Data were collected using a Footscan®/Force plate combination (Fig. 3), on two different ground surfaces, a rubber, hard surface, and a sand, soft surface.

The bearing surface (cm²), the mean pressures (N/cm²), the peak pressures (N) and the pressure distribution were determined. The data has been tested for significance with a GLM repeated measurements test with if applicable (p<0.05) a LSD post-hoc test. The load distribution pattern was tested with a chi-square test.



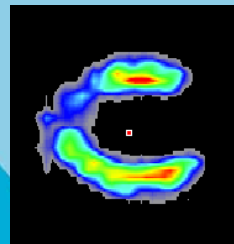
Fig.1 A valid measurement, with the horse in square standing position



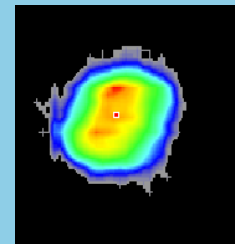
Fig.2 A shoe filled with Equibuild®



Fig.3 The Rsscan® on top of the Kistler® Force plate



A



B

Fig. 4 Typical Rsscan pictures of A; a shoe on sand and B; a shoe filled with Equibuild® on sand

Results

Normal shoes had an increased bearing surface on sand compared with shoes filled with Equibuild®.

The mean pressure is lower on sand than on the hard surface in both shoeing conditions.

Equibuild® on a sand surface gave a significant decrease of 23% in peak pressures.

There was a significant difference in pressure distribution pattern on a soft surface between shoes filled with and without Equibuild® (Fig. 4, 5).

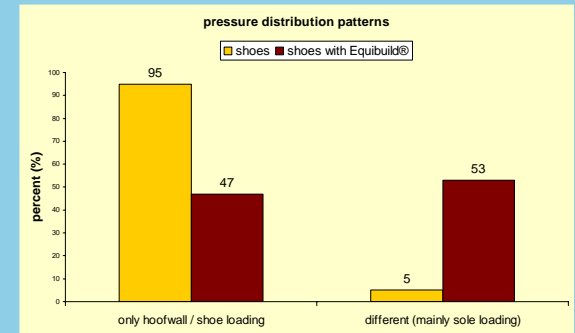


Fig.5

Conclusions

It seems that with the use of Equibuild® it is possible to alter the pressure distribution underneath the shoe. This explains why so many farriers use the product successfully in horses with a defect in their hoofwall.