

Protective and safety shoes

Optimisation of toe caps

In this Aif project, ISC and PFI developed innovative toe caps for safety shoes that offer improved ergonomics as well as protection against submersion in the shoe base.

The first step was to improve the ergonomics of toe caps. To this end, extensive forefoot measurements and biomechanical investigations were carried out. The aim was to develop and test different models of toe caps for ready-to-wear safety footwear that meet different toe shapes and requirements. Furthermore, design and material modifications of the caps as well as various combinations for the cap substructure were designed and tested, which in the case of compressive loads from above or from the side reduce the immersion of the cap into the floor materials. This considerably improves the protective effect of the toe caps, especially against roll-over accidents. At the same time, new test methods for safety shoes have been developed and tested, which make it possible to determine the submergence behaviour of the protective caps. It was planned to include these new test possibilities as an additional safety criterion in the existing norms and standards. Based on the test results, design guidelines for toe caps with improved properties were drawn up. In this way, safety shoes could be decisively improved both in terms of fit and protective effect. The project promises safety shoe manufacturers (mainly SMEs) a clear competitive advantage over low-cost suppliers.



The project management was carried out by the ISC, which is working on the task in close cooperation with the PFI. The project has the AiF funding number 18548 N.

It started on 1 October 2016 and ended on 31 March 2019.

Further information:

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