

A seat with increased resistance to dirt and damage caused by acts of vandalism in public transport vehicles.

Adrian Mróz^{1,2,3}, Maciej Szymański^{1,2}, Paweł Koch², Marek Pawlicki³, Robert Edward Przekop⁴, Karol Kłaba¹

¹STER Instytut Maciej Szymański, ²"STER" sp. z o.o., ³Uniwersytet Kaliski im. Prezydenta Stanisława Wojciechowskiego, ⁴Uniwersytet im. Adama Mickiewicza w Poznaniu

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ABSTRACT

The product solution represents the synergistic effect of two parallel projects implemented by STER Instytut Maciej Szymański as both the Beneficiary and the contractor: POIR.01.01.01-00-0480/18 and POIR.01.01.01-00-0763/18. The projects were carried out in cooperation with subcontractors — Poznań University of Technology and Adam Mickiewicz University in Poznań, respectively.

OBJECTIVES

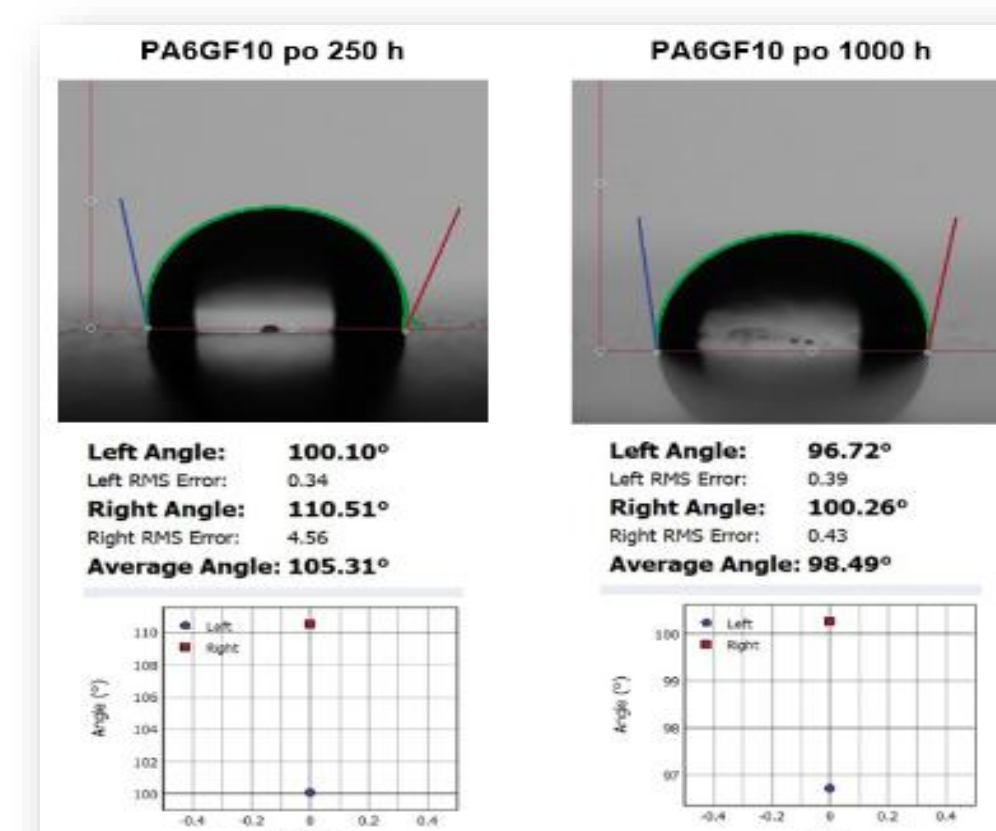
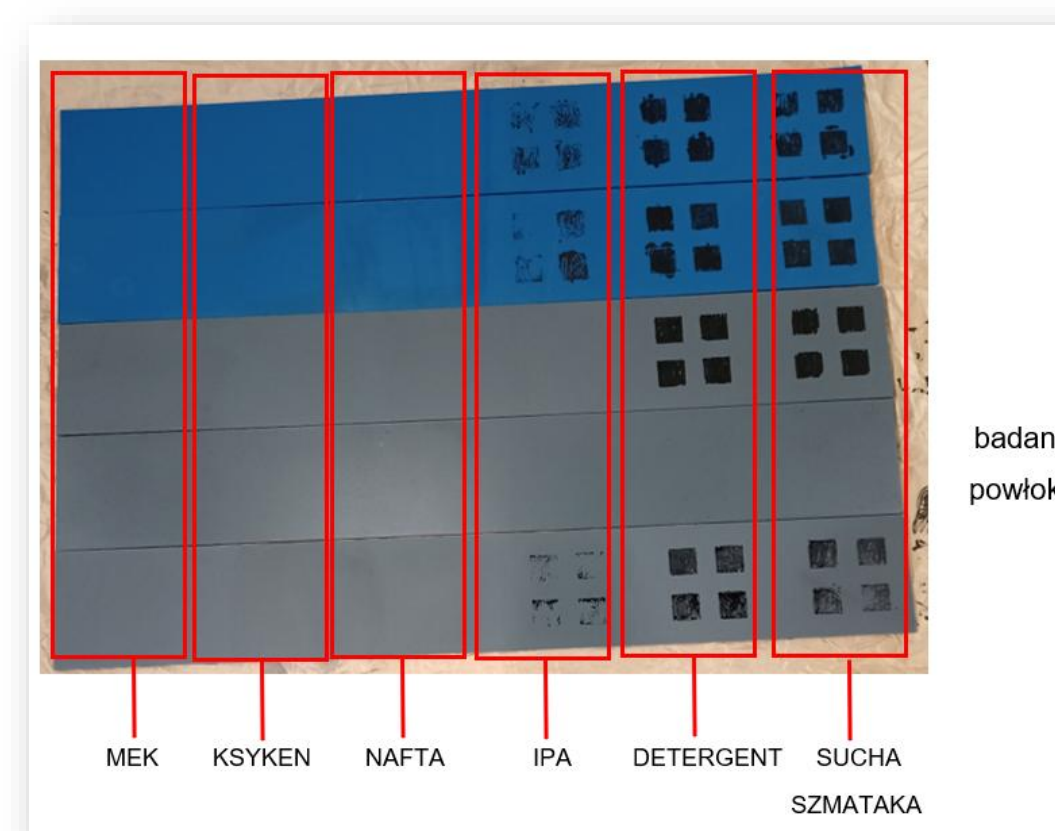
The result of the first project is a technology for automatic design, manufacturing, and supervision of the production process of a passenger seat for public transport vehicles. The seat is characterized by enhanced kinetic energy absorption during road incidents compared to polymer-based equivalents, which translates into improved passenger safety (e.g., reduced forces acting on the head or chest). The seat is lightweight, with a mass starting from 5.36 kg, depending on the configuration. The seat structure has been positively verified in terms of static and dynamic strength through advanced numerical simulations as well as crash tests (UNECE Regulation No. 80, Annexes 1 and 2) conducted at the Beneficiary's testing laboratory.



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The result of the second project is a technological solution that ensures functional effectiveness in removing graffiti-type contaminants from the seat surface. Contaminants caused by paint or marker inks can be removed without the use of chemical agents, while maintaining color stability and surface gloss. In addition, the protective coating provides barrier properties against UV-A radiation. The coating's functional properties have been confirmed according to the following standards: ISO 2409, ASTM D6578/D6578M-13, ISO 5659-2, ISO 5660, ISO 4892-3 (cycle 2 according to ASTM G154).



CONCLUSIONS

The synergistic outcome of both projects is a public transport vehicle seat that combines a set of functional features such as enhanced safety, reduced weight, and resistance to contamination caused by vandalism. The results of both projects have been implemented into industrial practice by STER Ltd.

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CONTACT

dr inż. Adrian Mróz, prof. UK
a.mroz@uniwersytetkaliski.edu.pl
adrian.mroz@ster.com.pl