

## INFLUENCE OF WEATHERING PROCESSES ON ADHESIVE PROPERTIES OF PLASMA-MODIFIED SBS

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### Abstract

The subject of this research are SBS elastomers (styrene-butadiene-styrene block elastomers) with plasma modified surface towards upgrading their adhesive properties. Research is aimed at determining the influence of weathering processes on ripping durability of leather glued with SBS with the use of polyurethane glue.

Gluing elastomers like SBS to other materials is a very important problem in many branches of industry i.e. shoe making industry.

SBS samples surface was treated with oxygen plasma with the power of 10W or 80W for 5 min and 10 s respectively.

Following that both treated and untreated samples were aged for 900h in Atlas WOM Ci 400 and UVCON 2000 in PN-EN ISO 4892-2 described conditions.

Aged SBS samples were glued with leather used for shoe manufacturing. Measurements of samples durability were conducted on Instron 5566 apparatus.

Decisive process responsible for SBS surface adhesive properties towards polyurethane glues is the forming of covalent bindings between C-OH and >C=O groups present on copolymer surface. The increase of durability shortly after plasma treatment and it's later decrease is connected with chemical binding between plasma modified polymer and polyurethane glue. With passing time function groups as C-OH and >C=O are removed from the polymer surface. The character of this process is nonlinear what indicates a complex mechanism.

Application of plasma treatment on polymer surface increases their adhesive properties. Those changes are heavily dependant on the conditions in which the samples were aged before gluing.