



**AKADEMIA GÓRNICZO-HUTNICZA
IM. STANISŁAWA STASZICA W KRAKOWIE**

**«TESTING THE TENSILE STRENGTH OF SAMPLES MADE
FROM A COMPOSITE MATERIAL «STAHL 1018» APPLIED
TO THE STEEL SURFACE»**

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Introduction

Composite Stahl 1018 is applicable to the preservation of machine elements and tools working in the mechanical wear conditions. This material was designed for maintaining metal materials and construction materials, e.g. for fixing bridges, pillars, reservoirs.

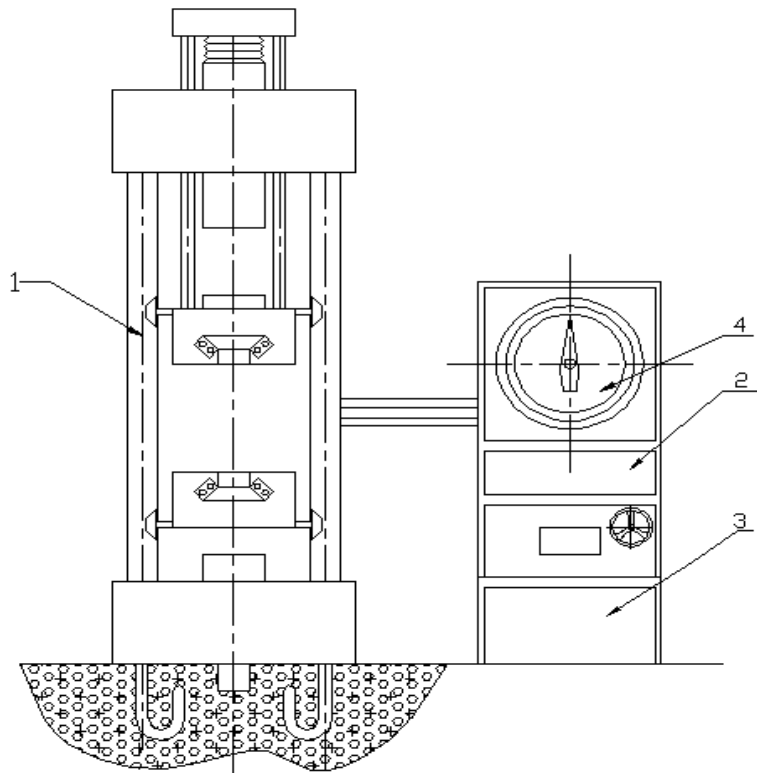
Owing to its complex build, i.e. polymeric matrix and powdery filler, this material has maximal

- compressive strength 60 N/mm²,
- tensile strength 80 N/mm²,
- bending strength 89 N/mm²,
- elasticity modulus 14000 N/mm²
- heat resistance up to 90°C .

The polymeric matrix has high chemical resistance and does not tend to shrink after solidification. The filler materials, i.e. steel, ceramics and additives improving surface tension exhibit high chemical resistance. The analysis of the analytical results shows that this material can be also used for the maintenance of machines and devices used in metallurgy and foundry industry.



Methods



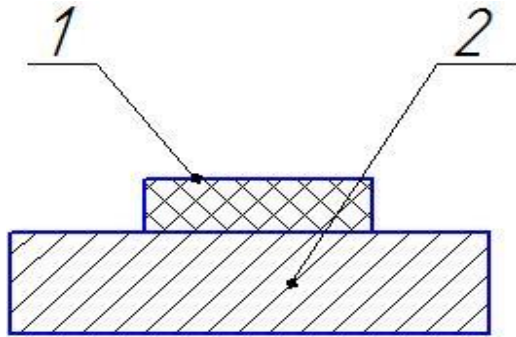
Schematic of RM-20



Zwick Roell Amsler HB 100



Methods



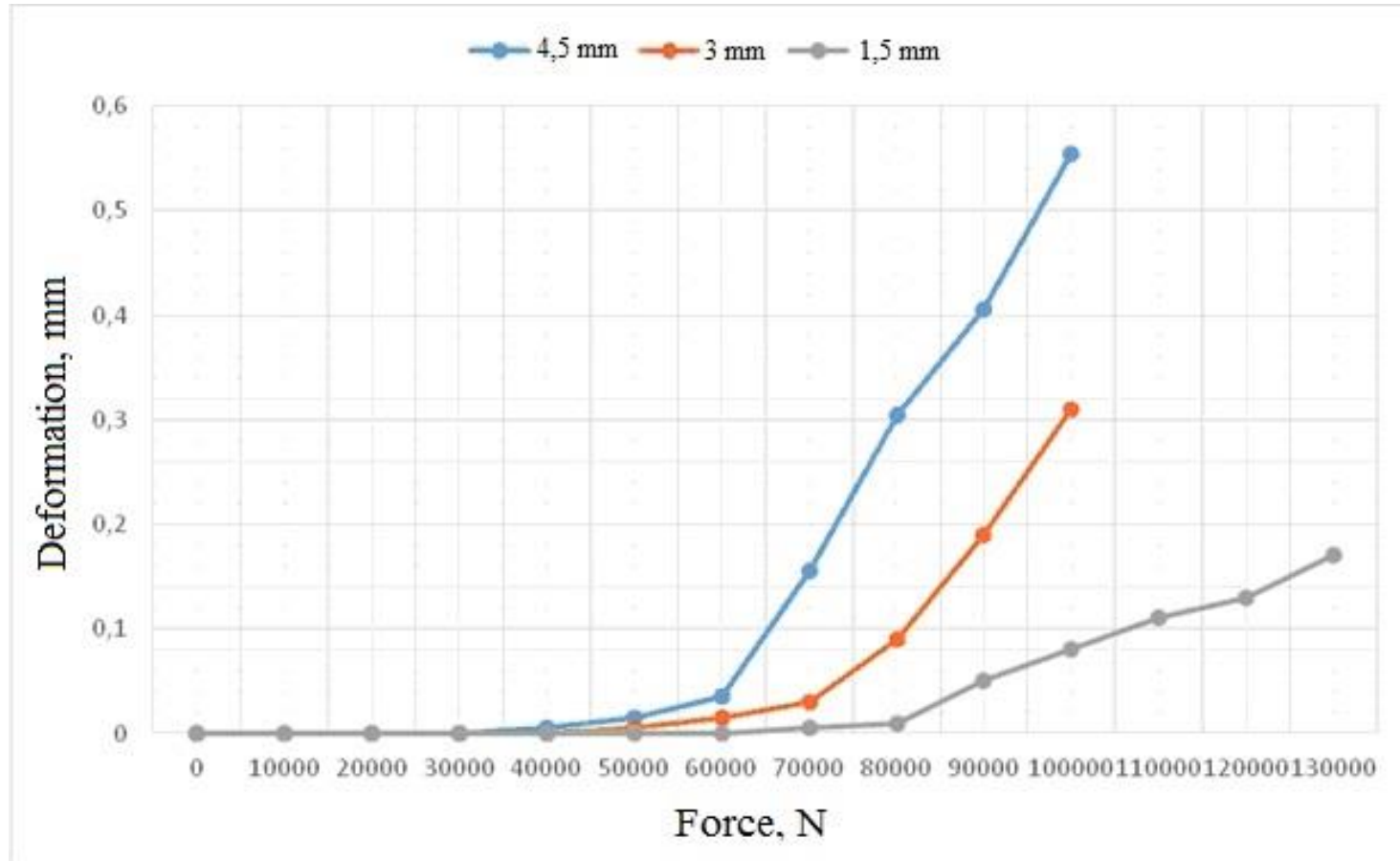
Sample imitating maintenance of a surface with a composite – a one-sided contact of composite and steel base, 1 – composite layer; 2 – steel base.



Zwick Roell Amsler HB 100



Results of experiments



Strain vs. force [N] in samples simulating surface maintenance



Conclusions

- Tensile strength tests of composite samples put on a steel surface showed that the best strength parameters were observed for a sample with a *1.5 mm* thick composite layer.
- In samples with a composite layer $H=3$ and $H=4.5$ mm the sample was destroyed under a force of *100 000 N* and *90 000 N*, respectively.
- In the sample with a *1.5 mm* composite layer the first cracks appeared under the force $F=100\ 000N$, and was destroyed at $F=120\ 000\ N$.
- Concluding, the best maintenance properties were observed for a thin composite layer.



Acknowledgement and References

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Thanks for attention!

Dziękuję za uwagę!

Děkuji za pozornost!

