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## Effect of Laser Processing on the Qualitative Parameters of Protective Abrasion-Resistant Coatings

- [V.B. Tarelnyk<sup>1</sup>](#)
- [Ie.V. Konoplianchenko<sup>1</sup>](#)
- [O.P. Gaponova<sup>2</sup>](#)
- [N.V. Tarelnyk<sup>1</sup>](#)
- [V.S. Martsynkovskyy<sup>1</sup>](#)
- [B.O. Sarzhanov<sup>1</sup>](#)
- [\[...\]](#)
- [O.A. Sarzhanov<sup>1</sup>](#) &
- [B. Antoszewski<sup>3</sup>](#)
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The wear of centrifuge screws, common components in industrial and municipal wastewater treatment plants, is studied. The TN-20 tungsten-free hardmetal serves for protecting screw flights against abrasive wear. The 12Kh18N10T steel is primarily used in the manufacture of centrifuge screws. A combined technique of depositing protective wear-resistant coatings is proposed. The technique includes electrospark deposition of a T15K6 hardmetal electrode, application of a metal polymer material (MPM), and final laser processing. To reinforce the MPM, small portions of a VK6 hardmetal mixture were added to a two-component epoxy system filled with ferrosilicon and thoroughly stirred. The reinforcement content was ~60%. This technique produces coatings up to 600 μm thick, with 7.3–10.0 GPa microhardness and 100% continuity. Abrasive water jet tests of the 12Kh18N10T steel samples with protective coatings show that their wear resistance is 7.5 times higher than that of the uncoated samples.

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Fig. 1.

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## Author information

### Affiliations

1. Sumy National Agrarian University, Sumy, Ukraine

V.B. Tarelnyk, Ie.V. Konoplianchenko, N.V. Tarelnyk, V.S. Martsynkovskyy, B.O. Sarzhanov & O.A. Sarzhanov

2. Sumy State University, Sumy, Ukraine

O.P. Gaponova

3. Kielce University of Technology, Kielce, Poland

B. Antoszewski

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### Corresponding author

Correspondence to [V.B. Tarelnyk](#).

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- **Fig. 1.**
- **Fig. 2.**
- **Fig. 3**
- **Fig. 4**

- **Fig. 5**
- **Fig. 6**
- **Fig. 7**
- **Fig. 8**
- **Fig. 9**
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