

Preface to the English Edition

The process of boriding is widely used for the purpose of improving the wear resistance of details and tools produced from a range of steels and smelts. The present edition is the translation of the original book—"The Plasticity of Boronized Layers"—which was first published in 2010 by Fizmatlit Publishing House in Russia and has achieved certain recognition and demand. The book deals with the production of wear-resistant layers as a process aimed at finding ways for improving the only disadvantage of borides—their brittleness.

The book contains the systematic analysis of various data on the theory, technology, and usage of boriding and boronized layers. It has finally allowed to specify the usage of different morphological structures of boronized layers for certain loading types of the details and tools under hardening. Moreover, the book has given the impulse for the further theoretical development and has opened new directions in the technology of applying boronized layers. In particular:

- the improvement of statistical and thermodynamic calculation methods of eutectic temperatures and concentrations in two- and multicomponent systems which assist in determining the temperature for boriding of technical construction materials and smelts;
- the invention of technological processes of simultaneous saturation by boron and nitrate, boron and phosphorous, etc.
- the expansion of the studies aimed at obtaining boronized layers with different morphological structures involving concentrated energy sources (electrophysical, laser, electron beam impact).

The English edition contains several corrections to the previous edition; thus it now involves the analysis of the studies which either were overlooked in the original book or were published after 2010. The main focus is done on the improvement

of the technology and expansion of boring application. Finally, the authors offer a new original chapter which covers the analysis of the scientific and practical results achieved over the last years.

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