

**Сборник
научных трудов
Донбасского государственного технического
института**

Сборник
Выходит 4 раза в год
Основан в июне 1999 г.
Выпуск 22 (65) 2021

Collection of Scientific Papers of DonSTI

Collection
Publishing 4 times a year
Founded in June 1999
Issue 22 (65) 2021

Алчевск
2021

**UDC 622(06) + 669(06) + 69(06) + 65.011.56 +
+ 621.3 + 33 + 621.37 + 1**

**Collection of scientific papers
of Donbass State Technical Institute**

Collection
Issue 22 (65) 2021

**Establisher:
SEI HE "DonSTI" (LPR)**

*Certificate of the Ministry of Communications
and Mass Media of the LPR
for mass media registration III 000169
dated 08.12.2020*

*By order of the Department of Education and Science
of the Donetsk People's Republic of 2 May 2017
№ 464 the Collection of scientific papers is being
offered in the list of peer-reviewed scientific editions
with required publications of the main scientific PhD
and Doctor's thesis results, approved by an order of
the Department of Education and Science of
the Donetsk People's Republic of 1 November 2016
№ 1134, according to annex 1*

*By order of the Department of Education and Science
of the Lugansk People's Republic № 911-OD
of 10.10.2018 the Collection of scientific papers of
DonSTI is being offered in the list of peer-reviewed
scientific editions with required publications of the
main scientific PhD and Doctor's thesis results,
approved by an order of the Department of Education
and Science of the Lugansk People's Republic
of 15 May 2018 № 477-OD*

*Recommended by academic council
of SEI HE "DonSTI"
(Record № 8 dated 26.03.2021)*

Added to scientometrical database of RSCI

Format 60×84½
Conventional printed sheet 17
Order № 75

Circulation 100 copies
Publishing office is not responsible for material
content giving by author for publishing

Address of editorial office, publishing and establishing:
SEI HE "DonSTI"
Lenin avenue, 16, Alchevsk, LPR
94204
e-mail: info@dstu.education
web-site: <http://www.dstu.education>

PUBLISHING AND PRINTING CENTER
room 2113, tel/fax 2-58-59
Certificate of State registration for mass media
publisher, owner and distributor
MI-SGR ID 0000055 dated 05.02.2016

Editor-in-chief

Kuberskiy S. V. — PhD in Engineering, Prof.,
Acting Rector

Deputy Editor-in-chief

Vishnevskiy D. A. — PhD in Engineering, Asst. Prof.

Editorial board:

Litvinskiy G. G. — Doctor of Tech. Sc., Prof.
Borshchevskiy S. V. — Doctor of Tech. Sc., Prof.
Korneyev S. V. — Doctor of Tech. Sc., Prof.
Leonov A. A. — PhD in Engineering, Asst. Prof.
Kharlamov Yu. A. — Doctor of Tech. Sc., Prof.
Zinchenko A. M. — PhD in Economics, Asst. Prof.
Zelinskiy A. N. — PhD in Engineering, Prof.
Snitko S. A. — Doctor of Tech. Sc., Prof.
Dolzhikov V. V. — PhD in Engineering, Asst. Prof.
Denischenko P. N. — PhD in Engineering, Asst. Prof.
Sholukh N. V. — Doctor of Arch., Prof.
Andriychuk N. D. — Doctor of Tech. Sc., Prof.
Pilavov M. V. — Doctor of Tech. Sc., Prof.
Bondarchuk V. V. — PhD in Engineering, Asst. Prof.
Psiuk V. V. — PhD in Engineering, Asst. Prof.
Skomskaya S. A. — secretary to the editorial board

For research scientists, PhD seekers, students of
higher educational institutions.

Issue language:
Russian, English

Computer layout
Ismailova L. M.

© SEI HE "DonSTI", 2021
© Chernyshova N. V., graphic cover
design, 2021