

ISSN 2181-8622

Manufacturing technology problems



Scientific and Technical Journal Namangan Institute of Engineering and Technology

INDEX  COPERNICUS
INTERNATIONAL

**Volume 8
Issue 4
2023**



SLIB.UZ
Scientific library of Uzbekistan

NamMTI ILMiy-TEKNIKA JURNALI

Tahrir hay'ati a'zolari:

Paxtani dastlabki ishlash, to'qimachilik va yengil sanoat

1. Axmadxodjayev X.T., t.f.d., prof. - NamMTI
2. Muradov R.M., t.f.d., prof. - NamMTI
3. Jumaniyozov Q., t.f.d., prof. - "Paxtasanoat ilmiy markazi" OAJ
4. Eshmatov A.B., t.f.d., prof. - Tojikiston Milliy Texnologiyalar Universiteti
5. Xoliqov Q., t.f.d., prof. - NamMTI
6. Ergashev J.S., t.f.d., dots - NamMTI
7. Obidov A.A., t.f.d., dots. - NamMTI

Qishloq xo'jaligi mahsulotlarini yetishtirish, saqlash, qayta ishlash va oziq-ovqat texnologiyalari

1. Toshev A., t.f.d., prof., akad. - Janubiy Ural davlat universiteti, Rossiya
2. Banu Yucel., q.x.f.d., prof. - Ege Universiteti, Turkiya
3. Alimov U., t.f.d. - O'zR FA UNKI
4. Xudayberdiyev A.A., t.f.d., prof. - NamMTI
5. Sherquziyev D.Sh., t.f.d., prof. - NamMTI
6. Merganov A., q.x.f.d., prof. - NamMTI
7. Mamatov Sh., t.f.d., prof. - Webster Universiteti

Kimyo va kimyoviy texnologiyalar

1. Namazov Sh.S., t.f.d., prof., akad. - O'zR FA UNKI
2. Botirov E.X., k.f.d., prof. - O'zR FA O'MKI
3. Akbarov H.I., k.f.d., prof. - O'zMU
4. Boymirzayev A., k.f.d., prof. - NamMTI
5. Nurmonov S.E., t.f.d., prof. - O'zMU
6. Salihanova D.S., t.f.d., prof. - O'zR FA UNKI
7. Kattayev N.T., k.f.d., prof. - O'zMU

Mexanika va mashinasozlik

1. Zaynobiddinov S., f.m.f.d., prof., akad. - ADU
2. Mardonov B., f.m.f.d., prof. - TTYSI
3. Usmanov P., f.m.f.d., dots. - NamMTI
4. Matkarimov P.J., t.f.d., prof. - NamMTI
5. Sharibayev N., f.m.f.d., prof. - NamMTI
6. Erkaboyev U.I., f.m.f.d., dots. - NamMTI
7. Musoyev S.S., t.f.n., prof. - BuxMTI

Ta'limda ilg'or pedagogik texnologiyalar

1. Goncharenko I.I., f.m.f.d., prof. - BMTU, Belorussiya
2. Hüseyin Kamal, t.f.d., prof. - Ege Universiteti, Turkiya
3. Ergashev Sh.T., t.f.n., dots. - NamMQI
4. Musayev J.P., p.f.d., prof. - IRV
5. Xoshimova D., f.f.d., prof. - NamMTI
6. Maxkamov A.M., t.f.d. - NamMTI

Iqtisodiyot

1. Maniki Tiagi, i.f.d. - KIET, Xindiston
2. Malcolm Ng Cher Herh., t.f.d. - INTI IUC, Malaysia
3. Soliyev A., i.f.d., prof. - NamMTI
4. Saidboyev Sh., i.f.d., prof. - NamMTI
5. Matkarimov K., i.f.n., prof. - NamMTI
6. Kadirova X.T., i.f.d., dots. - NamMTI
7. Bustonov M.M., i.f.d., dots. - NamMTI

Muharrirlar guruhi

S. Yusupov, O. Kazakov, B. Xolmirzayev, A. Mirzaev,
A. Tursunov, O. R. Qodirov (mas'ul muharrir)

4. J. Yuldashev, M.Mirxojaev, D.Atambaev, D.Raimberdieva. Analysis of modern sportswear materials. International Journal of Advanced Research in Science, Engineering and Technology Vol. 6, Issue 3, March 2019

5. D.Atambaev. Analysis of Fibrous Waste Generated in the Preparation Departments of Spinning Mills and Cotton Processing. International Journal of Advanced Research in Science, Engineering and Technology Vol. 7, Issue 9, September 2020

6. D.Atambaev, M.Sultanov. Murakkab tuzilishdagi pishirilgan iplarning notekisligini kamaytirishda cho'zish asbobining ahamiyati. Farg'ona politexnika institute Ilmiy-texnika jurnali T 26,2022, 198-201 b.

7. M.Mirxojayev, D.Atambaev. Change Of Cotton Fiber Quality Indicators Under Technological Processes. The American Journal of Interdisciplinary Innovations and Research Volume 03 Issue 04-2021, 241-249 p.

UDC: 625.03

ASSESSMENT OF THE TECHNICAL CONDITION OF THE WEIGHT CHECKING WAGON TYPE 640-VPV-271

ADILOV NODIR

Tashkent State Transport University
E-mail.: adilovnodir1991@gmail.com, phone.: (+99899) 850 62-78

Abstract:

Objective. When carrying out strength calculations of the metal structure of a weighing wagon, it is necessary to take the wall thickness into account, taking into account its reduction by the value of the average wear value. Thus, it is necessary to subtract the average amount of wear from the value of the size of the thickness of the sheets of elements. In this way, it will be possible to determine whether the design of the weighing wagon with existing wear will withstand the loads required by the standards.

Methods. The study was conducted using two different methods.

Visual method. By examining the analysis of the technical condition of the metal structure of the scales, the faults that could affect their service life were identified. Experimental method. To compare them with the normative values and to take them into account when conducting strength studies, the values of the magnitude of the impact on the elements of the metal structure of the scales were determined.

Results. Thus, when calculating the metal structure of a weighing car, the wall thickness be taken taking into account its decrease by the average wear value to determine whether the strength of the wagon structure complies with the required standards.

Conclusion. When carrying out strength calculations of the metal structure of a weighing wagon, it is necessary to take the wall thickness into account, taking into account its reduction by the value of the average wear value. Thus, it is necessary to subtract the average amount of wear from the value of the size of the thickness of the sheets of elements. In this way, it will be possible to determine whether the design of the weighing wagon with existing wear will withstand the loads required by the standards.

Keywords: railway, six-axle semi-wagon, freight wagon, longitudinal beam, pivot beam, end beam.

Introduction. One of the conditions for the gradual development of railway transport in the Republic of Uzbekistan is to replenish the fleet of domestic wagons with modern wagons manufactured in accordance with world standards, to extend their service life in order to optimize the operation of existing wagons [1-3].

Wagons for various purposes make up the wagon fleet, which is one of the most important parts of the rolling stock of the railway. Wagons of various types are used to transport goods and passengers.

For the implementation of the transportation process, UTY JSC has a fleet of freight wagons in the amount of 20.28 thousand freight wagons, including insulated wagons. The fleet of freight wagons includes universal and specialized wagons.

The volume of work on the dispatch (loading) of goods in tons is determined on the basis of applications from shippers [4-6]. To date, accurate measurement of the mass of rolling stock using railway scales located at the stations is a very important task. In particular, inaccurate measurement of the weight of the rolling stock by scales adversely affects the following important aspects of the organization of the safety of cargo transportation: 1-travel documents; 2-factors of the economic component; 3-control of the load falling on the rails from each wheel pair; 4-intensity of wear of rails, etc.

To date, the country's railways have weight checking wagons designed to periodically check the accuracy of measurements of railway scales located at stations.

These wagons, according to the instructions, are checked 4 times a year with the wagons being checked, designed to check the scales located at the stations. After successfully passing the test by the weighing wagon, a special certificate is assigned to the railway scales [7].

The technical condition of the metal structure of the wagon of the type 640-VPV-271 of Bukhara regional railway junction, designed to check the railway scales, which perform such an important function, was analyzed.

In order to compare them with the normative parameters of the analysis and to take them into account when conducting strength studies, the values of the magnitude of the impact on the elements of the metal structure of the scales were determined.

The weighing wagon model 640-VPV-271, located at Bukhara regional railway junction, was built in 1965. The date of the last depot repair was April 28, 2013. The weight of the wagon is 123 tons.

Previously, before determining the wear values of body elements of weighing wagons, schemes of measurement sites were drawn up, shown in Figures (1-4).

A survey of the technical condition of the main bearing elements and structural parameters of the body of this weighing wagon was carried out [8-9]. The measurement results are shown in graphs (2-5).

Methods. The studies were carried out using visual and experimental methods.

Based on the results of wear thickness measurements h^i , the value of the average thickness h_{cp}^i is calculated taking into account the tolerance “ $\delta=0.2$ mm” for cleaning, which is determined by the formula:

$$h_{cp}^i = \frac{1}{n} \sum_i^n h^i - 0,2$$

where n is the number of measurements.

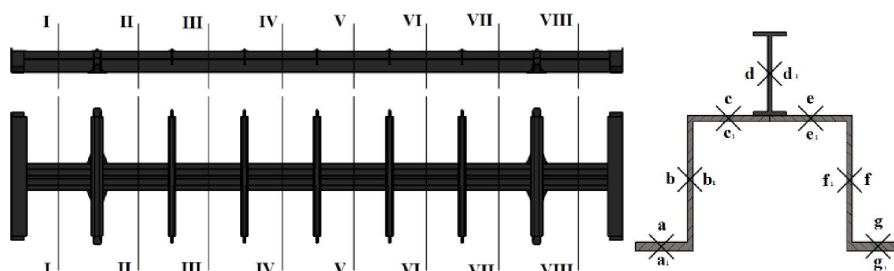


Figure 1. Scheme of measuring the wear thickness of sheets on the center beam of the frame of the weighing wagon 640-VPV-271

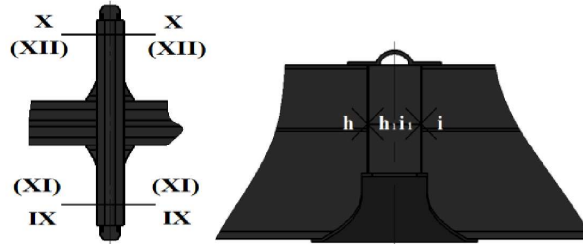


Figure 2. Scheme of measuring the wear thickness of sheets on the pivot beam of the frame of the weighing wagon 640-VPV-271

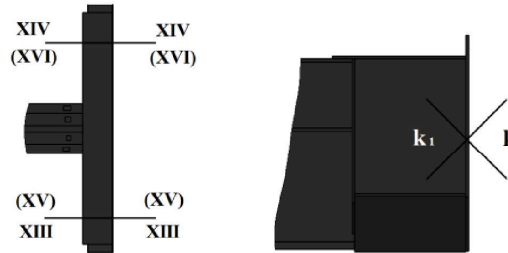


Figure 3. Scheme of measuring the wear thickness of sheets on the end beam of the frame of the weighing wagon 640-VPV-271

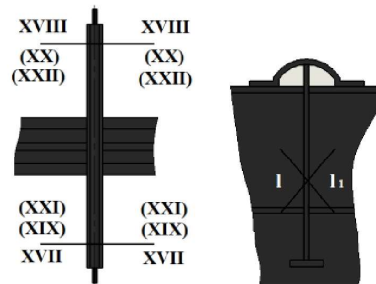


Figure 4. Scheme of measuring the wear thickness of sheets on the longitudinal beam of the frame of the weighing wagon 640-VPV-271

Table 1

The results of measuring the thickness of wear sheets on the center beam of the frame of the weighing car

№	Section	Measurement values of the wear thicknesses of the elements of the pivot beam of the body frame, mm													
		a	a ₁	b	b ₁	c	c ₁	d	d ₁	e	e ₁	f	f ₁	g	g ₁
1.	I-I	0,61	0,56	0,63	0,26	0,6	0,65	0,32	0,33	0,56	0,63	0,52	0,43	0,38	0,34
2.	II-II	0,58	0,61	0,57	0,43	0,38	0,47	0,28	0,4	0,45	0,66	0,48	0,52	0,43	0,38
3.	III-III	0,53	0,49	0,63	0,37	0,57	0,63	0,61	0,37	0,58	0,42	0,51	0,41	0,36	0,42
4.	IV-IV	0,62	0,55	0,59	0,68	0,54	0,26	0,33	0,67	0,49	0,39	0,43	0,37	0,71	0,35
5.	V-V	0,46	0,44	0,61	0,35	0,55	0,51	0,48	0,26	0,57	0,67	0,45	0,47	0,36	0,29
6.	VI-VI	0,38	0,57	0,59	0,23	0,63	0,38	0,53	0,35	0,46	0,65	0,34	0,47	0,42	0,62
7.	VII-VII	0,64	0,55	0,53	0,58	0,52	0,68	0,36	0,32	0,62	0,63	0,48	0,36	0,41	0,54
8.	VIII-VIII	0,47	0,42	0,57	0,29	0,48	0,65	0,41	0,47	0,52	0,59	0,42	0,52	0,37	0,37
	<i>h¹_{cp}</i>	0,77													

Table 2

The results of measuring the thickness of wear sheets on the pivot beam of the frame of the weighing car

№	Section	Measurement values of the wear thicknesses of the elements of the pivot beam of the body frame, mm			
		h	h ₁	i	i ₁
1.	IX-IX	0,32	0,23	0,34	0,32
2.	X-X	0,37	0,25	0,33	0,35
3.	XI-XI	0,42	0,22	0,36	0,27
4.	XII-XII	0,34	0,27	0,35	0,31
<i>h_{cp}ⁱ</i>		0,43			

Table 3

The results of measuring the thickness of the sheets on the end beam of the frame of the weighing car

№	Section	Measurement values of the wear thicknesses of the elements of the end beam of the body frame, mm	
		k	k ₁
1.	XIII-XIII	0,65	0,58
2.	XIV-XIV	0,58	0,45
3.	XV-XV	0,54	0,58
4.	XVI-XVI	0,66	0,51
<i>h_{cp}ⁱ</i>		0,94	

Table 4

The results of measuring the thickness of wear sheets on the longitudinal beam of the frame of the weighing car

№	Сечение	Значения измерений толщин износов элементов продольной балки рамы кузова, мм	
		l	l ₁
1.	XVII-XVII	0,32	0,82
2.	XVIII-XVIII	0,74	0,56
3.	XIX-XIX	0,36	0,65
4.	XX-XX	0,28	0,43
5.	XXI-XXI	0,35	0,37
6.	XXII-XXII	0,63	0,43
<i>h_{cp}ⁱ</i>		0,79	

Results and Discussion. From the above obtained data of the five examined wagons, we determine the average wear of the sheets for the elements of the metal structures of the weighing wagon according to the formula [10]:

$$h_{cp} = \frac{1}{n} \sum_{i=1}^n h_{cp}^i.$$

The results of calculations of the average wear of sheets are summarized in table 5.

Table 5

Results of average wear thicknesses according to the elements of the weighing wagon 640-VPV-271

№	Wagon model	Center beam	Pivot beam	End beam	Longitudinal beam
1	640-VPV-271	0,77	0,43	0,94	0,79

Conclusion. When carrying out strength calculations of the metal structure of a weighing wagon, it is necessary to take the wall thickness into account, taking into account its reduction by the value of the average wear value. Thus, it is necessary to subtract the average amount of wear

from the value of the size of the thickness of the sheets of elements. In this way, it will be possible to determine whether the design of the weighing wagon with existing wear will withstand the loads required by the standards.

References

- [1]. Decree of the President of the Republic of Uzbekistan dated December 2, 2017 No. PP-3422 "On measures to improve transport infrastructure and diversify foreign trade routes".
- [2]. Decree of the President of the Republic of Uzbekistan "On the organization of the Ministry of Transport of the Republic of Uzbekistan" dated February 1, 2019 No. PP-4143.
- [3]. Decree of the President of the Republic of Uzbekistan dated February 1, 2019 No. PF-5647 "On measures to radically improve the public administration system in the field of transport."
- [4]. Business plan of the JSC "UZBEKISTON TEMIR YOLLARI" for 2019.
- [5]. Business plan of the JSC "UZBEKISTON TEMIR YOLLARI" for 2020.
- [6]. Business plan of the JSC "UZBEKISTON TEMIR YOLLARI" for 2021.
- [7]. GOST 30414-96. Scales for weighing vehicles in motion. General technical requirements. - Minsk.: IPK Standards Publishing House, 1997. - 8 p.
- [8]. Ikonnikov E.A. Means for measuring mass and weight verification tools used in railway transport. - M.: Route, 2003. - 40 p.
- [9]. Maintenance and operation manual. Weight checking wagon brand 640 VPV. – 38 s.
- [10]. Yadgor Ruzmetov, Nodir Adilov, and Shokhruk Sultonov. Strength assessment of the body of a weight checking wagon type 640-VPV. E3S Web of Conferences 264, 05021 (2021) <https://doi.org/10.1051/e3sconf/202126405021> CONMECHYDRO - 2021.

C O N T E N T S

PRIMARY PROCESSING OF COTTON, TEXTILE AND LIGHT INDUSTRY	
N.Usmanova, M.Abdukarimova, Sh.Mahsudov	
Information modules for automation of the process of forming the structure of industrial collection of women's clothing.....	3
O.Turdiyeva, A.Khojiyev	
Research analysis of transformation new assortment development.....	10
M.Rasulova, Sh.Mamasoliyeva, G.Norboyeva	
Evaluation of heat conductivity of special clothing.....	15
D.Rayimberdiyeva, N.Nabidjanova, N.Ismailov	
Mathematical model of the influence of a gymnast's strength on clothing fabric.....	22
G.Gulyaeva	
Modeling of strength reliability and transformation of a knitted loop at the limit state of the structure.....	26
H.Diyorov	
Experimental determination of the cleaning efficiency of the fiber in the pipe..	31
S.Khashimov, R.Muradov	
Problems in cleaning cotton-seed and their solution.....	35
GROWING, STORAGE, PROCESSING AND AGRICULTURAL PRODUCTS AND FOOD TECHNOLOGIES	
N.Kurbanov, S.Bozorov	
Development prospects of the oil production industry in the republic of Uzbekistan and foreign countries.....	41
Sh.Rasulov, Kh.Djuraev, A.Usmanov, M.Khalikov	
Kinetics of drying process of tomato fruit.....	45
M.Sobirova, J.Farmonov	
Oil extraction studies from flax seeds.....	52
M.Meliboyev, G.Makhmudova, N.Muydinova	
Importance of potato powder extraction technology in production and industry.....	56
CHEMICAL TECHNOLOGIES	
E.Panoev, Kh.Dustov, J.Jamolov	
Research of corrosion and foaming processes in gas absorption purification and technology of their protection in inhibitors.....	61
U.Odamov, M.Komilov	
Assessment of the degradation process of solar photovoltaic plants in the climatic conditions of Uzbekistan.....	69
R.Dusanov, Kh.Turaev, P.Tojiev, D.Nabiev, KH.Eshankulov	
Physical-mechanical properties of composite materials based on vermiculite, bazalt, wollostanite, and polyethylene P-Y 342 and polyamide PA-6.....	77
Z.Voqqosov, M.Ikromova	
Bentonite and phosphorite production of organomineral fertilizers based on raw materials and nitrogen-fixing microorganisms ((CD:B:NFM=100:5:(0-4)), (CD:B:PF:NFM=100:5:5:(0-4))).....	81
D.Abdirashidov, Kh.Turaev, P.Tajiyev	

Studying the structure and properties of polypropylene filled with nitrogen, phosphorus, metal-containing oligomers.....	90
M.Khoshimkhodjaev, M.Khuramova	
Optimization of the method for instrumental neutron activation analysis (inaa) of natural objects.....	100
F.Rakhmatkariyeva, M.Koxxarov, Kh.Bakhronov	
Isotherm of ammonia adsorption in zeolite CaA (M-22).....	105
R.Kurbaniyazov, A.Reymov, B.Pirnazarov, Sh.Namazov, O.Badalova, B.Beglov	
Rheological properties of ammophosphate pulps obtained using phosphorite powder of the khodjakul deposit.....	111
F.Eshkurbonov, A.Rakhimov, J.Rakhmonkulov, E.Safarova, A.Ashurova, N.Izzatillayev, M.Bobokulova	
Investigation of the chemical-mineralogical composition of bentonite of the khaudag deposit and synthesis of wine fining agents based on its.....	117
J.Shukurov	
Modeling the production of dimethyl ether from natural gas.....	126
D.Makhkamova, Z.Turaev, M.Dedaboyeva	
Study of interaction of components in $ZnSO_4 - NH_4H_2PO_4 - H_2O$ system....	137
D.Akhunov	
Study of the problems of atmospheric waste water collection and green field irrigation.....	142
D.Jumaeva, R.Akhrorova, S.Barnoeva, O.Kodirov, U.Raximov	
Study of adsorption isotherms of polar and non-polar molecules on silica adsorbents.....	146
MECHANICS AND ENGINEERING	
E.Abdullaev, V.Zakirov	
Using parallel service techniques to control system load.....	154
E.Aliyev, A.Mamaxonov	
Development of efficient chain transmission construction based on analysis of constructive characteristics of chain drives of technological machines.....	161
S.Utaev, A.Turaev	
Results of a study of the influence of oil contamination on wear of the working surface of diesel cylinder lines.....	171
L.Tilloev, Kh.Dustov	
Separation of the polymer mass from the waste of the alkaline cleaning process of pyrogas by the extraction method.....	177
A.Mirzaalimov	
Effect of temperature on photoelectric parameters of three-way illuminated solar cells.....	183
Sh.Mamajanov, A.Qakhharov, Sh.Isaboyev	
On training of competitive personnel - on the basis of creating a new generation of teaching literature in the educational process (in the example of mechanical science).....	193
K.Ismanova	
Mathematical model and analytical solutions of the process of physics-chemical hydrodynamics.....	197
N.Sharibayev, B.Nasirdinov, G.Rasulova	

Microcontroller-based mechatronic system with heating and humidity sensor for silkworm eggs incubation.....	205
M.Rasulmuhamedov, K.Tashmetov, T.Tashmetov	
Methods of determining transport flows.....	210
J.Izzatillaev, U.Khudoyberdiev, X.Mamadiev	
Prospects for the application of vertical axis wind turbines in the Jizzakh region.....	218
Y.Asatillaev, N.Israilov	
Problems and possibilities of laser synthesis of metal powders in additive technologies.....	230
U.Meliboev, D.Atambaev	
Determination of acceptable values of the main factors affecting the production of twisted thread.....	237
N.Adilov	
Assessment of the technical condition of the weight checking wagon type 640-VPV-271.....	242
ADVANCED PEDAGOGICAL TECHNOLOGIES IN EDUCATION	
M.Ikromova	
Programming as one of the main approaches in the development of children's komputational thinking.....	247
A.Yuldashev	
Developing activities, the academy of public administration under president of the republic of Uzbekistan.....	253
B.Kholhodjaev, B.Kuralov, K.Daminov	
Block diagram and mathematical model of an invariant system.....	259
B.Mamadaliyeva	
Improving students speaking skills in practical lessons.....	267
G.Rasulova	
A lexical-semantic study of terms related to agricultural technology in Uzbek and English languages.....	273
ECONOMICAL SCIENCES	
M.Bustonov	
Digital economy and employment.....	279
M.Bustonov	
Econometric analysis of the activities of multi-sectoral farms.....	285
M.Rahimova	
Prospects for the development of small and medium business in Namangan region.....	292
A.Abdullayev, H.Djamalov	
Organizational structure of the internal control service for the fulfillment of tax obligations of enterprises.....	297
H.Djamalov, A.Abdullayev	
Issues of organizing internal control of fulfillment of tax obligations of enterprises.....	307
Sh.Maripova	
Specific features of management in small business enterprises.....	316
N.Abdieva, R.Abdullayeva, U.Rajabov	
The constituent elements and the need for state regulation of small business and private entrepreneurship.....	324