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The Methods of Researching of Input Raw Material for Medical Goods.

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ABSTRACT: In the article are considered test methods of input raw materials for development of new sample of cotton, woven medical unsterile bandage the first time entered in Uzbekistan. The bleached yarn as input raw material for getting of new sample of bandage is subjected to physical and chemical tests on 17 indicators. As well as given results of the research on a basis of requirements worked out by authors SE Uz-14847912-001-00.

KEY WORDS: In the article are considered test methods of input raw materials for development of new sample of cotton, woven medical unsterile bandage the first time entered in Uzbekistan. The bleached yarn as input raw material for getting of new sample of bandage is subjected to physical and chemical tests on 17 indicators. As well as given results of the research on a basis of requirements worked out by authors SE Uz-14847912-001-00.

I.INTRODUCTION

Working out of new textile products for use in medicine is important and socially significant, that words "textiles" and "medicine" and are inseparably connected for a long time. Textile materials of medical prescription are not the products of mass demand, but in certain volume is found steady sale.

Problem of the present work is getting of the textile materials, widely used at creation of coverings for treatment of wounds and burns.

The purpose of the present work is consideration of ways of testing input raw materials for development of new sample of cotton, woven medical unsterile bandage the first time entered in Uzbekistan and developed on machine tool Fittex on is developed by us Tsh Uz 1447912-001-2001y. Bandage woven medical unsterile [1].

As it is known, traditional cotton gauze bandage were included into our use. But we should recognize and that getting this textile product for medicine is rather labor-consuming and multistage.

Due to existing technology, the full cycle of manufacture of cotton gauze bandage includes spinning, weaving and bleaching, then the bleached gauze bandages are sent to pharmaceutical factory, where gauze bandages are formed by cutting on the set length and width.

Getting of yarn, severe gauze, and then the bleached gauze is occurred in three differing from each other separate, technologies and by the equipment, textile manufactures and only in pharmaceutical factory input raw materials are checked on physical and chemical indicators in accordance with GOST 9412 [2]. Having passed so long way of transitions on technology the bleached gauze, at unsatisfactory test result at least on one indicator, is not allowed as input raw materials for development of gauze medical bandage.

II.ANALYSIS OF EXISTING FILTERING MATERIALS AND RESEARCH RESULTS

For the purpose of the prevention of possible receiving of a poor-quality product, the input raw material for receiving of new sample of bandage is subjected to physical and chemical tests.

We had been developed standard documentation on new production where tests of input raw materials on physical and chemical indicators are put in initial stages of preparation of getting final production.

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III. LITERATURE SURVEY

Getting bandage on a new way on machine tool FITTEX (Italy) on all indicators surpasses to traditional gauze bandage. The new technology of development of cotton woven medical unsterile bandage consists of the following basic stages: bleaching of severe yarn, wringing and drying of the bleached yarn, tape-bandage development on the machine tool, receiving of finished goods [3].

On technology of receiving any medical means and drugs first of all is checked the input raw materials from what the ready product is made. For receiving of the new sample of bandage of input raw material is the bleached yarn, but not the bleached gauze as it happens at receiving of bandage from gauze. Such check statement gives the chance to reveal earlier discrepancies on physical and chemical indicators of input raw material, thereby to warn poor-quality production output. The severe yarn on OST-17-198 [4] is bleached according to formulation, which was developed by us and approved in Industrial Regulations PR 42 Uz. 03873-14807912-178-04 2001 [5].

Physical and chemical tests of the bleached yarn are carried out on 17 indicators on a basis of our developed requirement SE Uz-14847912-001-00 [6].

We carried out limit of acidity and alkali, adipose substances and tests for cleanliness of input raw material according to article 677 of the State Pharmacopoeia [7].

For carrying out of some test in laboratory conditions we had been conducted test for cleanliness of input raw material.

Test for cleanliness of input raw material to be spent as follows: 10 g the sample in a glass it is poured 200 ml by hot water, we put on boiling water -bath for 10 minutes On cooling the sample it is wrung out by a glass stick and liquid is filtered. The filtrate should not be opalescent and foam at stirring.

For definition of limit of acidity of input raw material on 50 ml before the prepared filtrate are added some drops of phenolphthalein, thus the filtrate should be colorless. Red coloring should appear from addition no more than 0,1 ml 0,1 n. solution of caustic soda.

For definition alkalinity of input raw material on 50 ml of the same filtrate we added 1 drop of methyl orange solution and at addition no more than 0,1 ml 0,1 n. a solution of hydrochloric acid, the solution should be painted in red color.

Adipose substances of input raw materials is defined at extraction by an ether 10 g the sample in the extraction device. Further the ether evaporates, the rest is dried up, the rest weight should be no more than 0,3 %.

Such tests as water extract reaction, a mass fraction of chloride, sulfuric and calcium salts, the maintenance oxidized, finished and coloring substances, ash content, we carried out in accordance with GOST 9412.

Reaction of water extract we defined as follows: from each selected party dot -test in weight 5 g each, we connect and filled in 150 sm3 by the distilled water, we boil within 15 minutes. Then the sample is wrung out by a glass stick. The liquid is merged in pure dish and it is cooled up to a room temperature. Reaction of water extract is defined by a universal display paper or bromthymol blue. Reaction of water extract should be neutral.

For definition of mass fraction chloride, sulfuric and calcium salts, and also maintenances oxidized, finished and coloring substances we apply the solution of the water extract which we received earlier.

IV. EXPERIMENTAL RESULTS

In 10 sm^3 the solution A of water extract is flowed 0,5 sm^3 of solution of nitric acid and 0,5 sm^3 of nitrate silver, and mixed. Simultaneously in 10 sm^3 the exemplary solution B is flowed on 0,5 sm^3 of solution of nitric acid and 0,5 sm^3 of nitrate silver, and mixed. In a 5 minutes both solutions are compared. The received solution is considered to correspond the requirements whether its opalescence not exceeds opalescence of exemplary solution, i.e. no more than 0,004 %.

For definition mass fraction of sulfuric salts in 10 sm^3 the solution A of water extract is flowed 0,5 sm^3 of a solution of hydrochloric acid, 1 sm^3 of a solution of chloride barium and mixed. Simultaneously in 10 sm^3 the exemplary solution B is flowed 0,5 sm^3 of solution of hydrochloric acid, 1 sm^3 of solution of chloride barium and mixed. In a 20 minutes both solutions are compared. The received solution is considered to correspond the requirements whether its turbidity not exceeds turbidity of exemplary solution, i.e. no more than 0,02 %.

For mass fraction definition calcium salts in 10 sm^3 the solution A of water extract is flowed 1 sm^3 of solution of chloride ammonium, 1 sm^3 of solution of ammonia and 1$см^3$ oxalic acid ammonium and mixed. Simultaneously in 10 sm^3 the exemplary solution B is flowed 1 sm^3 of a solution of chloride ammonium, 1 sm^3 of a solution of ammonia and 1$см^3$ oxalic acid ammonium and mixed. In a 10 minutes both solutions are compared. The tested solution is considered to correspond the requirements whether its turbidity not exceeds turbidity of exemplary solution, i.e. no more than 0,06 %.

ISSN: 2350-0328

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Vol. 6, Issue 3, March 2019

Finished substances (appret) we define the addition to 10 sm^3 of water extract of one drop of iodine solution in accordance with GOST 4159 with mass fraction 0,5 mol/dm^3. The tested solution is considered to correspond the requirements if it was not painted in dark blue or blue color.

The maintenance of oxidized substances we define addition to 10 sm^3 of water extract of 3-5 drops the dissolved sulfuric acid and 3 drops of solution calcium of permanganic acid. The received poor- coloring liquid should not disappear within 5 minutes.

The maintenance of coloring substances is defined as follows: a glass in diameter no more than 5 sm we put on a white paper, we pour in it of 50 sm^3 of solution of water extract and is added 5 sm^3 of acetic acid in accordance with GOST 61. The acidified and neutral extracts should not be painted. Intensity of coloring we defined on vertical layer of liquid.

At definition of cindery substances of input raw materials the dried up two elementary tests are burnt till complete combustion in porcelain bowls, preliminary is brought to constant weight. Ash content (A) it is in percentage calculated under the formula:

$$З = \frac{m_1 \cdot 100}{m_2},$$

m_1 -mass of ash, g

m_2 -mass of basic sample after drying, g

The rest weight should not exceed 0,3 %.

Such indicators as wettability and capillarity are important for any medical bandaging material.

Wettability is defined on SE Uz-14847912-001-00 as follows: 5g of the test sample is put by tweezers in the straightened kind on a surface of the distilled water in temperature 20^0C. The width of the dish should exclude possibility of a touch of the sample to its walls. Test should plunge into water not later than in a 10 seconds.

Definition of humidity, whiteness and stability degree of whiteness is carried out due to GOST-3816 [8], GOST 18054 [9].

For definition of humidity of input raw materials about 1 g of the sample is dried up at 100-105^0C to constant weight. Weight loss should not be more than 8,5 %.

According to SE Uz-14847912-001-00 from the yarn sample we cut out a strip in the size 25x250 mm. Samples are maintained in exsiccator within the days at relative humidity of 60 % and temperature 20^0C. At definition of capillarity the top end of the sample is fixed on a support -stand, and bottom is put to a ditch, filled with a bichromate solution of potassium concentration 3 g/l. Value of capillarity corresponds to height of solution lifting on the sample in millimeters for 1 hour and should be not less than 7 sm/hour

The essence of the method of whiteness definition consists of coefficient measurement the surface reflexion of the sample in dark blue spectrum areas at an optical filter, reproducing in combination with a photo-detector, a standard curve addition in (l) towards to coefficient reflexion on ideally white surface of equal 100 %.

Whiteness (%) is calculated under the formula:

$$W = 100 \cdot P_z \cdot P_{z0}$$

Where, P_z - reflexion coefficient test at dark blue optical filter (an average arithmetic results of three measurements)

P_{z0}- reflexion coefficient of white plate standard at the same optical filter.

Whiteness of the sample we define by measuring coefficient of reflexion P_z towards to white plate standard which reflexion coefficient is known at the same optical filter. Each test we put on trial in three places.

For definition stability degree of whiteness, we make measurements of whiteness of the sample before and after its processing in atmosphere of sated with water steam at temperature 100-103^0C (steaming) within 3 hours. Exclude pollution and under a lobe of samples steam. The steam environment should not contain any reactants (acids, alkalis).

Stability degree of whiteness is calculated under the formula

$$DW = W_1 - W_2$$

W_1 -whiteness sample before steaming, in %

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W_2 - whiteness sample after steaming, in %

The received results of tests are given in the table

Table 1

Test results of input raw material on physical and chemical indicators

№	Name of indexes	Norma on SE	Actual assessment of concentration [10].
1	Test for purity	pure	pure
2	Reaction of aquatic extract	neutral	neutral
3	Mass fraction of salts: chloride	Not more 0,004%	0,030%
4	sulfuric	Not more 0,02 %	0,013%
5	calcium	Not more 0,06%	0,045%
6	Substance of oxidize materials	Not less 5 min	12 min
7	Substance of finished materials	Not be allowed	Not be allowed
8	Substance of colored materials	Colorless extract	Colorless extract
9	Mass fraction of adipose material	Not more 0,3%	0,21%
10	Wettability	Not more 10 sec	6,2 sec
11	Capillarity	Not less 7 sm/h	7,5 sm/h
12	Humidity	5-8,5%	7,5 %
13	Ash content	Not more 0,3%	0,29 %
14	Whiteness	Not less 80%	85 %
15	Degree of whiteness stability	Not more 10%	8,4 %
16	Cap of acidity	Red coloring	Red coloring
17	Cap of alkalinity	Red coloring	Red coloring

At unsatisfactory result of test at least on one indicator, the bleached yarn is excluded as input raw material for development of new sample of woven medical unsterile bandage.

VI. CONCLUSION AND FUTURE WORK

Any medical means should meet all requirements of its safety for life and population health. Physical and chemical researches of input raw materials are carried out by standard techniques and have allowed to make conclusion, that results of all indicators correspond to requirements. We had been conducted tests of input raw material of new sample in the conditions of the industry and finished goods output is made about 2 million units per year of woven medical unsterile bandage.

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