ISSN: 2350-0328

International Journal of Advanced Research in Science, Engineering and Technology

Vol. 7, Issue 1 , January 2020

Method for Calculating the Consumption of Raw Materials, Output of Products and Waste for the Production of Non-Woven Materials on Knitting and Sewing Units

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ABSTRACT*:* This article discusses the method of calculating the consumption of raw materials, yields and waste for the production of unwoven materials on knitting and washing machines. Set out gradually from the calculation of basic and scouring , the fabric of interwoven yarns and frame canvases as well as the canvas of pierced webs and the calculation of consumption of each component of cotton.

KEYWORDS*:* Raw materials, waste, linen, screed, clarify, sew, main thread, rewind, linen, weave, loops, fibers, canvas, density, component, blend, product.

I.INTRODUCTION

It is known that large bales of cotton fibers in the process of pressing are Packed with non-woven materials in the process produced from the waste of cotton spinning production and cotton factories, so-called packaging materials [1]. Production of a web with a set thickness and weight of one pog. m, is carried out with the help of basic and stitched threads. Consumption of main threads for 1 pog.m of fabric (g / pog.m) defined by the formula

$$q_0 = \frac{N_0 \cdot T}{1000 \cdot A_0} \qquad (1.1.)$$

where: N_0-number of main threads in the filling
T-linear density of main threads, tex;
A_0- the coefficient of output of a severe web from the main threads, we find from the formula:

$$A_0 = \frac{(100 - \alpha)}{100}$$

where: α - working out the main threads, %
Thread processing α (%) is determined by the formula

$$\alpha = \frac{l_1 - l_2}{l_1} \cdot 100$$

where: l_1 - the length in the knitting stitch-bonded fibre material, м.

ISSN: 2350-0328

International Journal of Advanced Research in Science, Engineering and Technology

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The processing of washing threads depends on many factors:

The length of the coupler, with a linear density of yarns in all three systems, the tension on the yarns, the type of knitting stitch-bonded fiber Assembly, etc. Rabotku main wash threads depending on the length of the screed in the thread of the stitched cloths can be determined by table 1.1

Table.1.1

The length of the screed	1,3	1,5	1,7	2,0	2,4	2,7	3,0
α %	9,6	11,0	12,0	12,8	13,5	16,0	17,5
β %	73,5	69,7	68,4	67,3	66,2	65,5	70,5

Consumption of weft threads q_y (g / pog.m) defined by the formula:

$$q_y = 20N_y \cdot h \cdot T /(100A_y), \quad (1.2)$$

where:N_y- number of weft threads per 50 mm of web width;

h - the width of the filling weft threads,м;

A_y - coefficient of output of a severe web from weft threads (A_y =0,98)

Consumption of sewing threads q_n (g / pog.m) is determined by the formula:

$$q_n = \frac{N_n \cdot T}{1000 \cdot A_y} \quad (1.3)$$

where: N_n - number of stitched threads in the filling;

A_y - coefficient of output of a severe web from stitched threads,

$$A = \frac{(100-\beta)}{100}, \quad (1.4)$$

where: β -working on firmware threads, % (table 1.1)

The total consumption of the thread 1 pog.m of severe canvas (g / pog.m)

$$q=q_0+q_y+g_n \quad (1.5)$$

Thread consumption (g / pog.m) taking into account the waste on the knitting and sewing machine is determined by the formulas [2]:

$$G_0=100q_0/(100-y_0), \quad (1.6)$$

$$G_y=100q_y/(100-y_y), \quad (1.7)$$

$$G_n=100q_0/(100-y_n) \quad (1.8)$$

where: y_o, y_y, y_n - waste of main weft and sewing threads, %

The average amount of waste on knitting and sewing machines VPM is (%)

The main thread 1,5-2

The weft thread 1-1,5

Sewing threads 2,5-3,5

We accept waste at warping equal to 1%. If necessary, the yarn can be rewound, tethered, twisted, and re-rewound before warping.

Data on yarn waste for technological processes are shown in the table below. 1.2.

Yarn waste during rewinding, tying and twisting (%).

Table. 1.2.

Typeofwaste	Rewinding of a single yarn	Tromenie	Torsion	Rewindthetwistedyarn	Total
The ends are steep single thread	0,-3-0,4	02,-0,3	0,3-0,4	-	0,8-1,1
Also, two-thread	-	-	0,1-0,25	0,1-0,15	0,2-0,4

ISSN: 2350-0328

International Journal of Advanced Research in Science, Engineering and Technology

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Notice Irrevocable fumes	0,1 -	0,1 -	0,2 0,3	- -	0,4 0,03

For fabric sewing fabrics, the consumption of sewing threads and frame fabric is determined. The consumption of stitched threads is determined by the formula (1.3), the coefficient A_n - by the following formula:

$$A_n = (100 - \gamma)/100 \quad (1.9)$$

where: γ – processing of stitched threads, depending on the length of the tie, the type of weave, the height of the platinum, and other factors. Processing of sewing threads is taken from the filling calculation according to production data. Working out of stitched threads depending on the length of the tie is determined by the table.1.3.

Table.1.3.

Lengthties	1,5	1,7	2,0	2,4	2,7	3,0
γ ,%	89	88	86	85	83	82

The consumption of sewing threads, taking into account waste, is determined by the formula (1.8). Waste of sewing threads in the process of preparing them for production and in the production of harsh fabrics is set at the rate of 1.5%.

For canvas fabrics, the fiber consumption is determined by the component of the mixture and the sewing thread. The consumption of the sewing thread q_n (g/m^2) is the product of the length of the sewing thread 1m^2 of the web by its linear density in Tex. we determine [3,4] using the following formulas:

for the production of single comb webs

$$q_n = 4 \cdot 10^{-4} \cdot P_\partial \cdot P_{ш/} (100 - \gamma)/T \quad (1.10)$$

for double-ribbed webs

$$q_n = 4 \cdot 10^{-4} \cdot P_\partial \cdot P_{ш/} (l_1 + l_2)/T \quad (1.11)$$

for double-ribbed webs with a parting through the needle:

$$q_n = 2 \cdot 10^{-4} \cdot P_\partial \cdot P_{ш/} (l_1 + l_2)/T \quad (1.12)$$

for two-comb webs using threads of different linear densities.

$$q_n = 4 \cdot 10^{-4} \cdot P_\partial \cdot P_{ш/} (l_1 \cdot T_1 + l_2 \cdot T_2) \quad (1.13)$$

for webs with a weave of tricot-weft (stitched and frame thread with the same linear density)

$$q_n = 10^{-3} \cdot T(0{,}4 P_\partial \cdot P_{ш/} \cdot l + 20 P_k) \quad (1.14)$$

With different linear densities:

$$q_n = 4 \cdot 10^{-4} \cdot \frac{P_\partial \cdot P_ш}{T_n} + 10^{-2} \cdot P_k \cdot T_k) \quad (1.15)$$

where: $T(T_1 T_2 T_n + T_k)$ – linear density of yarn, tex;

ISSN: 2350-0328

International Journal of Advanced Research in Science, Engineering and Technology

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P_o - stitch density by length;

$P_ш$ - the density of the stitching width;

l_1 and l_2 - loop length, mm.

P_k - the density of frame threads;

The content of the sewing thread in the web S (%) is determined by the formula:

$$S = \frac{q}{M} \cdot 100 \quad (1.16)$$

where: M - surface density of the web, g/m^2

The consumption of the sewing thread on the harsh fabric, taking into account the waste, is determined by the formula (1.3) and is given in tab. 1.4

Waste of sewing thread

Table. 1.4

Indicators	Cottonyarn				
Linear density of the sewing thread, tex	50	25	25x2	18,5	18,5x2
Wasteofsewingthread, %	1,0	0,6	0,9	0,5	0,7

Fiber consumption of $1m^2$ harsh fabric $q_в$ (2)

$$q_в = q_k + q_n \quad (1.17)$$

Determined by the formula:

The yield of the canvas from the fiber (when processing cotton) of chemical fibers or mixtures is determined by the formula

$$B = A_1 \cdot \alpha_1 + A_2 \cdot \alpha_2 + \cdots\ldots\ldots A_n \cdot \alpha_n \quad (1.18)$$

where: $A_1, A_2 \ldots\ldots A_n$ output of the canvas from a fiber or mixture, provided that the canvas is produced from one given component;

$\alpha_1, \alpha_2 \ldots\ldots \alpha_n$ the proportion of components in the mixture.

The consumption of each fiber component or mixture is determined by the formula [5]:

$$G_i = q_x \cdot \frac{B_i}{A_i} \quad (1.19)$$

where: q_x - surface density of the canvas,g/m

B_i - content of the component in the mixture,%

A_i - output of the component from the fiber or mixture,%.

II.CONCLUSION

Improving the use of raw materials is the most important task of the company for recycling waste and the cost of raw materials used for the production of non-woven materials is up to 85% of the total cost of the product.

REFERENCES

1. B. V. Ozerov, V. E. Gusev. Designing the production of nonwovens. Light and food industries .1984. 400 pages.
2. G. A. Barabanov et al. Laboratory workshop on non-woven materials technology M, Legprombytizdat 1998 416 p.

ISSN: 2350-0328

International Journal of Advanced Research in Science, Engineering and Technology

Vol. 7, Issue 1 , January 2020

3. F. A. Kurbanov, A. A. Temirov, Sharapov M. N. Demolition on ulichnogo gene and its influence on the performance of generowania. ”Internauka". Scientific journal No. 14 (96) April 2019. Part I. S. 71-73
4. F. A. Kurbanov, Gafurova M. Z., Baubekov S. D. Wear of sewing machine parts. Materials of the international scientific and practical conference "Continuity of education and science, development prospects in the Eurasian space of the XXI century" Taraz, Kazakhstan, October 18-19, 2018. pp. 7-9
5. Investigation of the solubility of chlorophenols in hydrophobic ionic liquids. Suleiman, R., Haji-Kali, M. K., H., S., Mulyono, S., AlNashef, I. M. journal of chemical thermodynamics 2019, 135, pp. 97-106.