

Study of the influence of the heating temperature of the conveying rollers of the humidifier on the fiber quality.

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ABSTRACT: Laboratory experiments have shown that the effect of light on the natural technological properties of the fiber, when the temperature in the tire rollers specially designed in the tray between the fiber condenser and the press camera, increases to 74 °C. As a result of the carried out researches in laboratory conditions it is established that at increase in temperature of tent rollers specially established in a tray between a fiber condenser and the press chamber optimum temperature to 74 °C, influence on natural and technological property of a fiber as factor of reflection Rd remains at level of admissible norms.

KEYWORDS: cotton, technological process, cleaning, jining, fiber, condenser, press chamber, temperature, humidification, natural technological properties, ray reflection coefficient, level of yellowness.

I.INTRODUCTION

Taking into account the need to achieve completeness of the natural technological properties of the fiber during the acceptance, revolt, storage and technological process of primary processing of raw cotton, as well as taking into account its further beneficial effects on the processing in spinning plants [1], In order to achieve the degree of fiber dampening on the tray of the chamber press after the fiber condenser up to 1.5 % and more, together with the Department of Devices, Equipment and Industrial Design of JSC “Pakhtasanoatresearchcenter” was created working drawings of the installation for heating and dampening at different temperatures were made (Fig. 1).

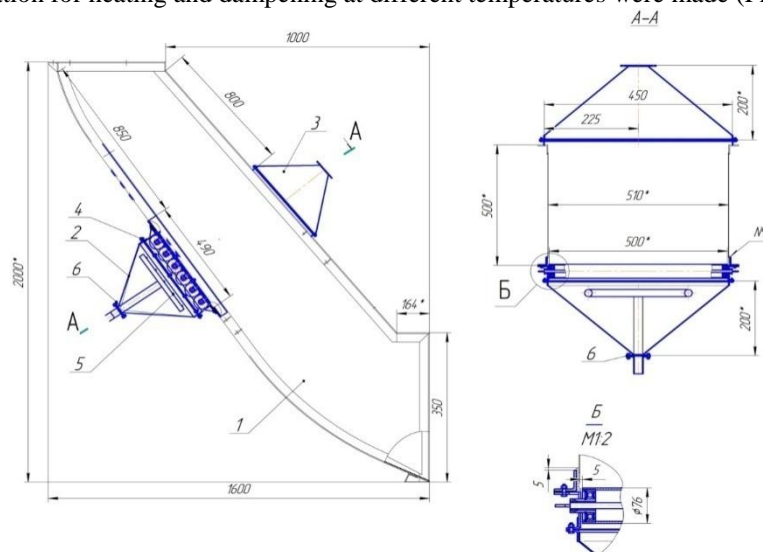


Fig.1. Working drawings of the installation for heating and humidifying the fiber.

1-chamber tray; 2-chamber; 3-chamber; 3-chamber top; 4-chamber rollers; 5-chamber for even steam distribution; 6-chamber outlet pipe.

On the specified installation in the experimental laboratory of JSC “Pakhtasanoat research center” the tests were carried out on a fiber of selection of Sultan I grade, I grade, developed after jining, and fiber cleaning at the experimental cotton plant of JSC “Pakhtasanoat research center”, on the tray of the press chamber after the fiber condenser (2) on the specially made equipment for heating and humidifying on the 12-cell device with the width of 47 mm. , with the length of 49 mm. cells 16,3x11,7 mm on each row of which were placed on 20 g. of fibers from below by 1 g. and passing them through them within 1 min. at different temperatures in the system HVI, the results of the study of the natural technological properties of the fiber as a coefficient of reflection of the rays and the degree of yellowness . The obtained results are reflected in Table 1 and Table 2.

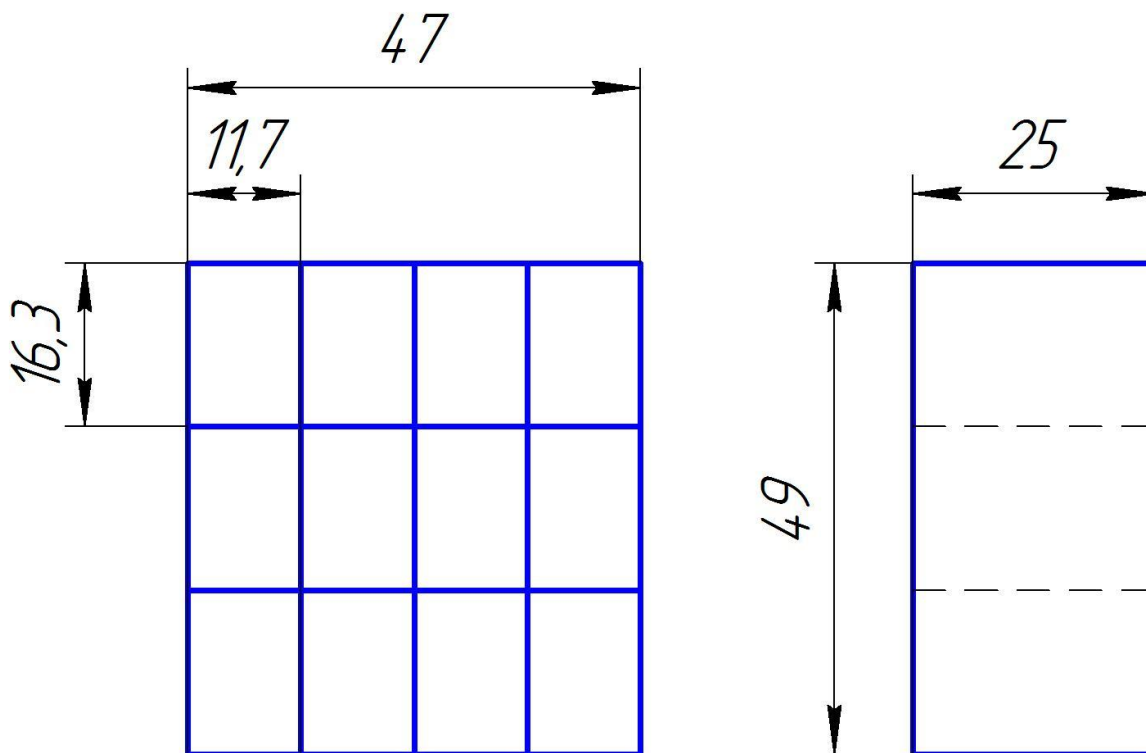


Fig. 2 Adjustment for experiment with fiber placement.

Table 1

Awning roller temperature °C	The frequency of experiments and the coefficient of reflection of the fiber rays (Rd) в %										
	I	II	III	IV	V	VI	VII	VIII	IX	X	Aver.
60	80	78,9	79,9	79,6	79,6	80,0	79,5	80,0	79,2	80,1	79,68
70	79,6	78,8	78,9	79,6	78,9	79,1	79,7	79,2	79,1	79,4	79,23
80	78,4	78,4	78,6	79,3	79,4	79,2	79,2	79,0	78,4	79,4	78,98

90	78,3	78,5	78,6	78,1	78,2	78,5	78,5	78,2	78,4	78,5	78,38
100	77,7	77,7	78,0	77,7	77,7	78,5	78,1	78,0	77,3	77,3	77,80
110	77,1	77,0	76,8	77,3	77,3	76,9	77,5	77,0	77,4	77,4	77,17
120	76,5	76,8	76,6	76,7	76	76,8	76,3	76,1	76,2	76,6	76,46

As can be seen from the table, when the temperature of the rollers increases from 60⁰C to 70⁰C, the indexes of the fiber ray reflection coefficient are from 79.68% to 79.23%, i.e. within the limits of permissible norms.

Table 2

Awning roller temperature °C	Frequency of experiments and degree of yellowness of the fiber (+b) in %										
	I	II	III	IV	V	VI	VII	VIII	IX	X	Ўртача
60	9,4	9,5	9,0	9,0	9,3	9,5	9,7	9,4	9,5	9,5	9,41
70	9,4	9,5	9,3	9,3	9,6	9,6	9,3	9,5	9,7	9,7	9,49
80	9,5	9,3	9,2	9,4	9,6	9,6	9,8	9,9	9,4	9,5	9,52
90	9,5	9,7	9,7	9,5	9,3	9,7	9,5	9,5	9,4	9,4	9,52
100	9,5	9,6	9,8	9,9	9,4	9,7	9,2	9,5	9,2	9,9	9,57
110	9,5	9,7	9,6	9,7	9,4	9,2	9,9	9,3	9,5	9,6	9,58
120	9,6	9,6	9,7	9,7	9,7	9,7	9,6	9,7	9,7	9,7	9,67

As a result of processing of results of experiment by a method of the regression analysis the mathematical model of dependence which is described by the following equation is received:

$$y_1=0,000363x^2+0,014x+80,15$$

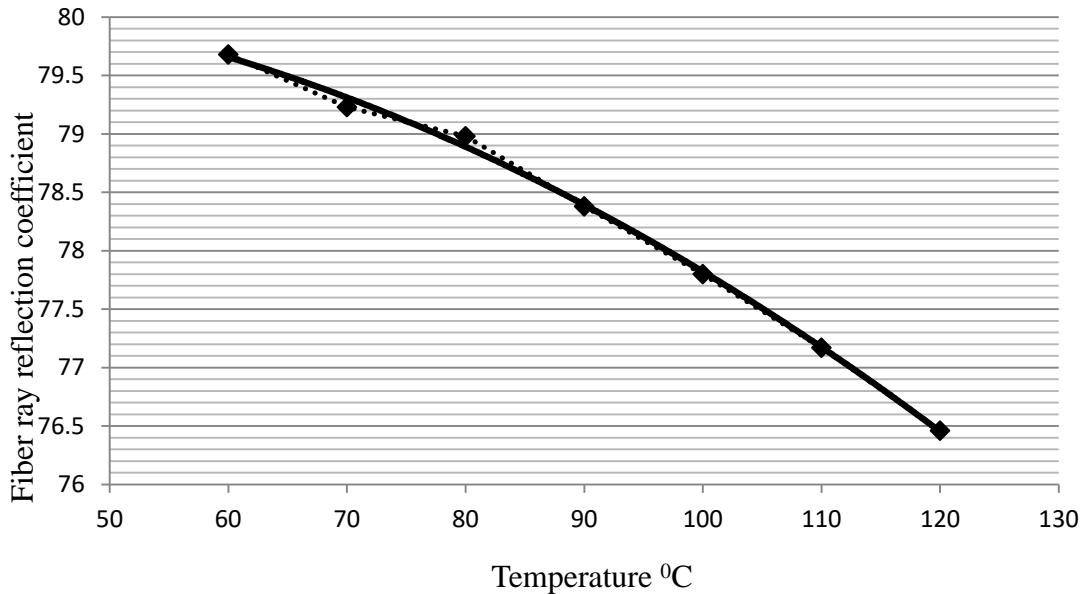
$$y_2=0,000006x^2+0,002536x+9,258333$$

y₁ - value of the fiber beam reflection coefficient %

y₂ - degree of yellowness of the fiber, %.

Based on the obtained results of the mathematical model, graphs of the dependence of Fig. 3 are made.

a)



b)

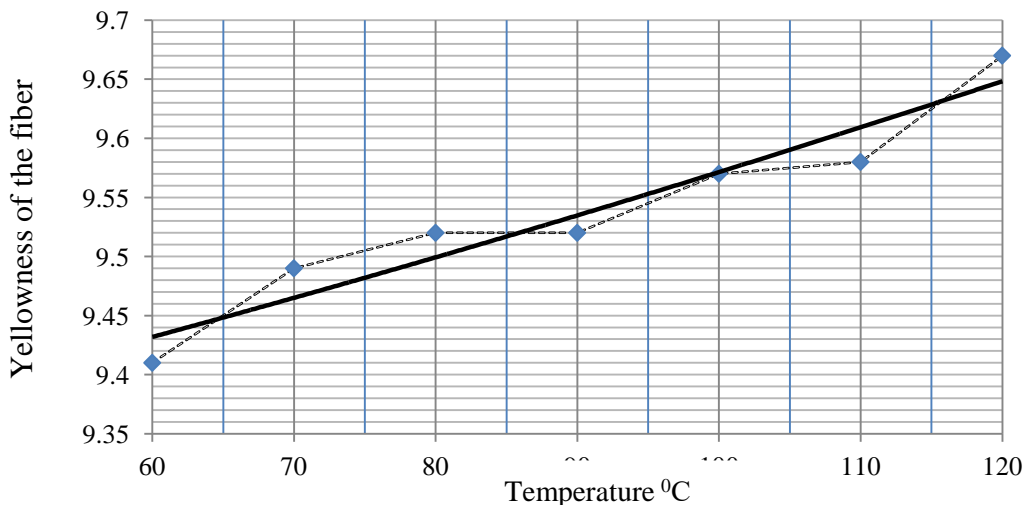


Fig. 3. a) -fiber ray reflection coefficient %

b) - the degree of yellowness of the fiber, %.

The analysis of the given dependence shows, at increase in temperature from 60⁰C to 74⁰C the index of reflection of beams of fibres keeps in normal limits from 79,68 % to 79,18 %, and at increase in temperature to 120⁰C decreases on 2,72 % in comparison with 74⁰C, and in comparison with 60⁰C decreases on 3,22 %.

On other natural technological property of a fibre as degree of yellowness at increase in temperature of a roller from 60⁰C to 120⁰C analyses show that at 60⁰C degree of yellowness makes 9,41 %. And at 120⁰C it worsens on 0,26 %, i.e. makes 9,67 % that is below a standard indicator.

II.CONCLUSION

According to the results of the experience, it is possible to achieve full preservation of technological properties of the fiber at roller temperatures of up to 74⁰C.

REFERENCES

- 1.Primary treatment of cotton, Toshkent-"Mekhnat" 1999 p.167
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