

EFFECT OF DISTANCE CLIP HEIGHT OF RING SPINNING FRAME ON THE PROPERTIES OF YARN

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Abstract: The paper deals with the effect of the height of the distance clip (spacer) of the ring spinning frame on selected properties of the produced worsted ring spun yarns (unevenness, the number of yarn faults, tenacity, breaking elongation). The effect on mass irregularity was also evaluated using the experimental modulus of the relative transfer function.

Keywords: distance clip, experimental modulus of the relative transfer function, ring spinning frame, drafting arrangement.

The properties of yarns are influenced by the properties and character of the fibres as well as the conditions during spinning - the setting of machine-technological parameters (e.g. the number of twist, rotational speed and speed of working parts, type of traveller, ...), selection of machine components, wear of working parts of machines. The influence of some components of ring spinning machines on the properties of yarn has been discussed by several authors. In the works, for example [1], [2] the authors dealt with the influence of the height of the spacer clip during ring spinning of cotton yarns. Their conclusions are not entirely clear. In general, the setting of the drafting device is a more complex problem, the movement of the fibres and their control are influenced simultaneously by several factors and it is always a compromise between minimizing the possibility of additional mass irregularity and at the same time the possibility of realizing sufficient straightening and alignment of the fibres in the drawn ribbon.

This work is aimed at the analysis of the influence of the height of the spacer on the drafting arrangement of a ring or compact spinning frame. According to [4], the distance clip adjusts the distance M of the upper and bottom aprons at the output of the apron field of the drafting device (see Figure 1). It thus defines the length of the nip line between the take-off rollers of the drafting device and the apron field, and affects the control and release of the fibres in the main drafting zone. This mainly affects the mass irregularity and the number of yarn faults, tenacity and breaking elongation of the produced yarn.

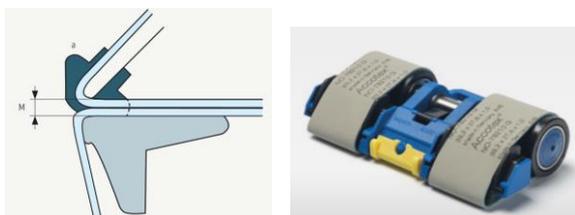


Figure 1 Distance clip – exit opening M [4]; cradle with distance clip [5]

The effect of the spacer was evaluated on a set of worsted ring spun yarns of several counts and material composition (see Table 1). The yarns were spun on ring and compact spinning frames using three different distance clip heights. In the experiment, yarn tenacity, breaking elongation, mass irregularity and the number of yarn faults were measured and evaluated. During the evaluation, the change of the mentioned properties was observed depending on the height of the clip. From the measured data of mass irregularity of rovings and yarns experimental modulus of the relative transfer functions was constructed and the influence of the drafting device on the transformation of mass irregularity was evaluated.

Table 1 Experimental yarn

Sample	Fibre raw material	Yarn count [tex]	Spinning technology
1	100% WO	16,67	compact
2	100% WO	20,83	ring
3	70%WO / 30% SE	14,29	ring
4	80%WO / 20% PA	11,76	ring
5	70%WO / 30% SE	20,83	ring

The results indicate that using a higher distance clip opens more space between the upper and bottom aprons and the length of the nip line between the aprons field and the take-off rollers increases. This leads to a greater potential for straightening the fibres, but also a tendency towards greater mass irregularity and the number of faults.

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