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THE STUDY OF ACTIVITY REGARDING THE PROCESSES QUALITY ACCORDING TO ISO STANDARD 9004-2.1

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***Abstract**: Among the activities regarding processes quality according to ISO 9004-2.1 there is one refering to planning to keep under control the processes, achieved by: documentation of current activities, development of documented work instructions, establishing checkpoints and quality inspection techniques, assess the potential effectiveness of technological processes.*
A first step in this direction represents the presentation of the general elements that contribute to insuring the quality of each stage of manufacturing processes, the data being possible to suit for individual cases. It shall be noted that in industrial practice these quality assurance measures are designed interdependent. Preventive control during the technological processes has an important role in improving the technological processes in textiles and also increasing the quality performance of products in order to improve production and creating a recognizable brand in the world market.
Quality of products manufactured in textiles has a decisive role in the present, when facing with an excess of production in this domain and a special competition between firms in the world market. A company that wants to continue to exist and develop must regularly check the quality/satisfaction degree obtained for the products manufactured. The application of quality control system implies a reference system compared to what can be measured by which we obtain "the quality level required and expected." The referential system can be formed in a set of performance indicators so we can say that a company continues to be competitive as far as it established and achieved a series of performance indicators and in addition it controls these indicators every day.

***Key words:** control, cloth spread, cutting, transferring onto screens, humid-thermal treatments, stitching operations,*

1. INTRODUCTION

Quality of products manufactured in textiles has a decisive role in the present, when facing with an excess of production in this domain and a special competition between firms in the world market. A company that wants to continue to exist and develop must regularly check the quality/satisfaction degree obtained for the products manufactured. The application of quality control system implies a reference system compared to what can be measured by which we obtain "the quality level required and expected." The referential system can be formed in a set of performance indicators so we can say that a company continues to be competitive as far as it established and achieved a series of performance indicators and in addition it controls these indicators every day.

2. ENSURING THE QUALITY OF MANUFACTURING PROCESSES

2.1. Ensuring the transferring onto screens quality

Transfering onto screen is the operation of framing patterns/templates on the material and consists in finding the optimal arrangements in order to reduce the specific consumption. It is obvious that transferring onto screens does not actually appear as an act of manufacturing process unless it concerns changing the pre-established markers. Transferring onto screens must contain a number of technical information regarding [1], [2]:

- Elements for identifying the pattern
- Positioning the patterns on the fabric, the deviations permitted from the nominal direction of the parts are determined mainly by the way of attaching their deformations. Thus if the deformation elements are only fixed by humid-thermal treatment, the permitted deviations are of maximum 10^0, and for the elements that are fixed by additional seams or hardening materials, the deviation angle is allowed to be 15^0
- Items that ensure positioning accuracy of product elements, arranged both on the outer contour of the parts and also on the inside. They can be V-shaped or semicircular and because they are made with pneumatic device they have a tolerance layout contour ranging from ± 1 mm and ± 2 mm and a depth of 4-5 mm.

The general principles of optimum achievement of this process stage vary, receiving the technological indications and restrictions regarding the method of optimum classification and grouping of sizes and waists, considering the restrictive conditions imposed by the characteristics and peculiarities of materials required by model and the cutting tool. Thus, for the arrangement of parts which requires a high precision of cutting, the distance between parts is of 3 mm. The signs for positioning and control are marked inside the parts to be visible during cutting. The transferring onto screens quality depends on the number of products enframed, the height of the pattern and the type of framing. According to the complexity of the model and the height of the material, the parts can be done across the width or half its width. The framing method depends a lot on the material width, frequent underdimensions below the tolerance limit requiring changes in the initial framing, with direct implications on specific consumption. Oftentimes, practical consumption is different from that obtained at the technical service, because the framing at a small scale is done usually on the maximum width of the fabric, plus 2 cm compared to the nominal width.

Other factors are dependent on the material are colour palette, colour ratio and drawing sense, surface features, graining direction or orientation of elements. Thus for the materials with checked, striped drawing, which need symmetries of pair parts, the symmetrical parts will be assigned with a technological backup, following the warp yarn direction. In these cases the transferring onto screens will be done on the doubled material. For the strenghtening materials often is done with a rolls cut with a disc knife, thereby eliminating transferring onto screens.

2.2. Ensuring the quality of cloth spread

Cloth spread aims to assure the simultaneous severing of parts for cutting and placing the layers of cloth spread, taking into account the restrictive conditions imposed by the nature of the raw material and the technological process used [3].

Cloth spread quality must be assessed according to the following factors:

- the characteristics of raw materials,
- factors dependent on the achievement of technological act
- peculiarities of the product.

The characteristics of the textile surface will influence maintaining the position of cloth spread layers, while the thickness will have direct influence on the height of the cloth spread. For materials with high coefficient of slipping the cloth spread height will be limited and will be additionally secured with clamps or by scoring. Where friction coefficients have different values on the two sides of the material, the cloth spreading will be done with the front part of the material facing in the same direction. Stiffness and elasticity of the materials influence the way the layers are arranged and the easiness of the edges overlapping on a longitudinal side of the cloth spread. According to the variation of the materials' width, the cloth spread can have both longitudinal sides perpendicular to the surface of the worktop or only one side. The tolerances for vertical wall are ± 3 mm, and for the cloth spread ends are of ± 5 mm. In case of synthetic materials, there often occur undesirable phenomena due to static electricity generated by the material in the process of cloth spreading. They can sometimes affect the cut parts, the difficulties appeared either when separating the layers adjacent to parts, or in the process of sewing to join the two parts.

Cloth spreading must be done without tension and without being too loose. In the case of manual cloth spreading, for the ones stretched loosely, especially items with lower stiffness can occur creases on the cloth surface, which affects negatively the quality of the severing and the cutting, causing additional repositioning maneuvers. Tensed cloth spreadings will be done on the longitude after the spreading is realized. In the case of an immediate cutting, by subsequent contractions there occur underdimensioning of parts that are directly proportional to strain of the cloth spread. For mechanized or automated cloth spreading these defects are removed. Depending on the fabric quality the binding of the cloth spreading is achieved. Binding involves overlaying of two ends in a spread and aims primarily at removing from tha cloth spread of fault. Errors regarding the direction or sense when repositioning the materials create irreparable defects in the future product. The height of the cloth spread will be dependent on the technical characteristics of the cutting machines, the equipment features and the number of products in the order.

2.3 Ensuring quality of severing and cutting

Analysis of manufacturing the clothing products reveals the fact that the cutting operations are taking place both in the cutting and also preparation sections, in the process of manufacturing cutting is used for correcting the parts, for making some matching signs, and also for some phases performed by semiautomatic machines: straight or round head buttonhole machines and cutting the opening of the pockets with the machine for pockets with re-threads and for cutting the thread.

For classic cutting, the cutting-off operation is preceded by severing the cloth spread, which facilitates the handling of sections when travelling towards the fixed cutting machine with belt.

The quality of the cutting is dependent on a number of factors, including:

- the number of component parts of the product and the complexity of their contour;
- the characteristics of the tool and the cutting instrument (the character of cutting tool movement);
- textile material and cloth spread characteristics (rigidity, thickness and fibrous composition of the material).

One of the decisive criteria regarding the quality of the cutting is the type of cutting tool. The most widely used cutting tools are belt-knives operated in various ways:

- reciprocating motion on the vertical, for mobile cutting off machines and those with double articulated arm used in cutting the contour parts;
- continuous translational motion, for stationary machines with 3-4 wheels of starting the cutting belt, machines used for cutting on the contour parts;

- special motion, by combining the movements of lifting-lowering, rotating on its own axis and parallel plan motions, for the automated cutting systems.

For the reciprocating motion, the cutting edge triggers a lifting-lowering movement and the cloth spread material, the cutting quality is not optimal. For automatic machines this drawback is removed by fixing the cloth spread layers with vacuum. For the translational movement, due to the cutting belt in the same direction, the edges are less damaged, the system being possible to be applied on any type of material. There is an inconvenient: the manual moving of the cloth spread, which determines an increase of the contact time between the cloth spread and the cutting tool, with negative repercussions on the look of the the cloth spread edges. For thermoplastic materials it should be avoided welding or melting of the edges, by correlating the velocity of the belt with the speed the cloth spread.

Knife sharpening angle influences both the quality of cutting and wear resistance of the knife. Since the angle value is directly proportional to the resistance to wear and inversely proportional to the cutting quality, it is required to set a best interval, taking into account the relative position of knife-material and also the material's characteristics.

If the knife is perpendicular to the material, it is recommended:

- 15°–20°, for regular materials;
- 30°–35°, for tough materials.

Cutting is done exactly on the contour of the parts parts, by marking the control signs with signs of 4-5 mm, cut perpendicularly on the contour line [4]. As a result of cutting there are shape deviations and the size of the pattern reference, tolerance is between 1-11 mm, being dependent on the length and complexity of the contour line. For one colour materials the permitted deviations are higher, while for stripes and checked materials the deviations are minimal or zero. Whatever type of fabric, the deviations from the direction of the warp yarn maximum permissible is 0.20 mm.

In the case of materials with high coefficient of unravelling, sizing and correct marking are done with difficulty although the depth of signs gets up to 4-5 mm. For materials with high slipping coefficint the precision of markings should be maximum considering that normally the tolerance is small. The parts positioning in the product will determine the precision required by the cutting. Thus, for the basic materials the precision will be higher than for linings, for the parts of the basic material the precision of the cutting is of ± 1 mm and for linings is ± 2 mm, however, in both cases, for sewing with automatic machine, the deviations are zero.

2.4. Ensuring the quality of humid-thermal treatment

The main purpose of humid-themral processes for garments is to ensure some stable deformations, by the action of external forces (tensile, compression, etc.), changing the accumulated tensions of the fabric during mechanical force and fixing the technological effect, traced in certain temperature conditions, humidity and pressure, in a determined interval.

2.5 Ensuring the quality of stitching operations

The processes of products manufacturing consist of separate elements and subassemblies and their subsequent assembly [5], [6]. They exhibit many differences dictated by the technological constructive features of the product, equipment and material properties, as described in Figure 1.

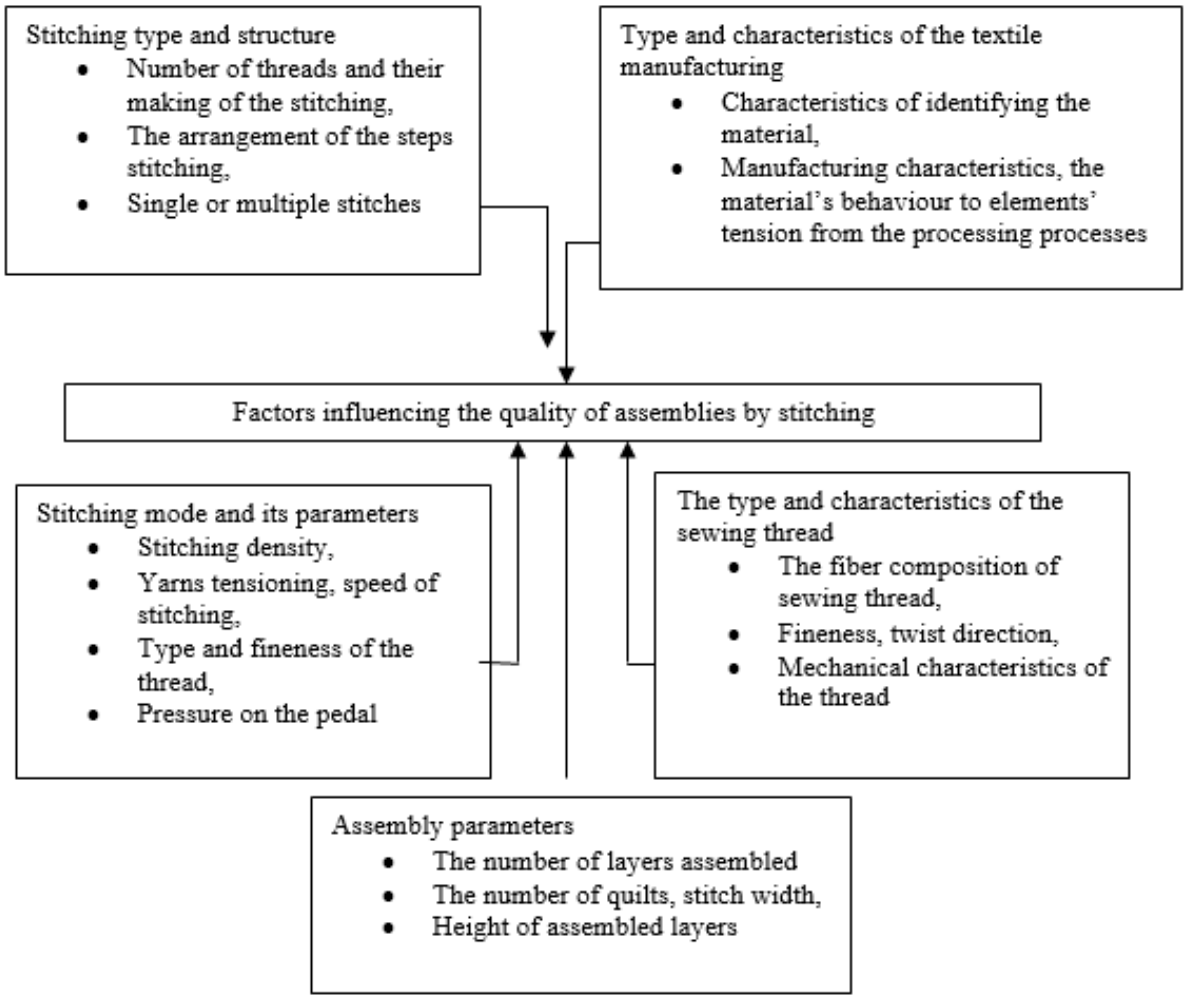

Fig.1: *Factors influencing the quality of assemblies by stitching*

3.CONCLUSIONS

Preventive control during the technological processes is increasingly important for improving the technological processes in textiles and also increasing the quality performance of products in order to improve production and creating a recognisable brand in the world market. The products quality manufactured in textiles has a decisive role at the moment, when faced with an excess of production in this area and a special competition between firms in the world market.

This is one reason for making special efforts which could improve the quality of technological processes in confections.

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