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Detection and defect correction of operating process

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Annotation:
The article is devoted to the current problem of enterprise competitiveness rise in hard and competitive terms of business environment. The importance of modern equipment for detection of defects and their correction is explained. Production of chipboard is used as an object of research. Short description and main results of estimation efficiency of innovative solutions of enterprises are considered.
Key words: defect, production, parameter, chipboard, control, losses.

Introduction

Competition is a main feature of business environment. A government implements a policy of control and limitations of monopoly arbitrary action and support of fair competition for social production efficiency rise and social focus. In modern conditions of innovative development of economics problems of competitiveness rise of both production and enterprise itself are becoming vital. At the same time implementation of innovations is considered as one of the main ways of produced goods competitiveness rise, keeping up high rate development and earning power of an enterprise. That is why the problem of new equipment and technologies implementation at an enterprise is current and very important nowadays.

The quality of products produced at an enterprise and business costs are interrelated factors: the higher quality is the less nonconforming products are and the less level of business costs is. The less level of business costs is, the more possibilities for competitiveness in price are, which is often one of the main conditions of consumption. Thus, problems connected with the quality, can do harm to an enterprise [1].

Combining factors and conditions of production process, which correction can keep from nonconformity, cause problems connected with the quality of products.

Purpose of the work

The aim of the article is to show how modern methods allow identifying the sources of losses in the form of defect production, make analysis of its appearance at manufacturing of chipboard during three years (2013-2015).

Results

A technological process of chipboard manufacturing is a combination of a lot of stages [2, 3] where there is a possibility of nonconformity appearance which is described in detail in [4].

For production quality detection [5,6] a part of nonconformity production out of the whole number of chipboard is defined. Losses due to rejects in terms of value are defined as losses of an enterprise. Types of defects, detected during chipboard manufacturing and fixed monthly in a quality control department in reports for registration of defects, are set. They are: grinding defects, dust and tar pitch, end face, lengthwise edge, pulling off, shear of angle, short board, flocculent board, oil. Ways of chipboard use are identified in dependence on defect types. Prices of chipboard with defects are defined. Losses connected with reject rate amounted 13,8835 million rubles in 2014.

Analysis of reject rate frequency on defect names was done with the help of Pareto diagram shown in fig. 1.

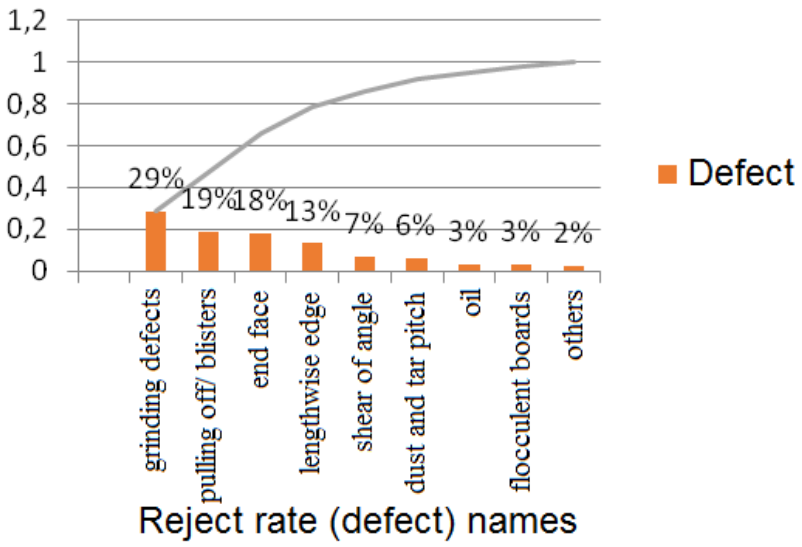

Figure 1. Reject rate (defect) names

It is obvious from the Pareto diagram that the most spread defects are: grinding defects, pulling off/ blisters, dust and tar pitch, short and flocculent boards.

For correction of defects such as pulling off and blisters (air blisters) a modern defectoscope UPU 3000 was used. The defectoscope detects some types of blisters such as: air blisters 1 / area, air blisters 2 / reject rate, air blisters 2 / maximum allowed length, air blisters 2 / category, cross-cut air blisters.

There is information on the defectoscope display, shown in fig. 2.

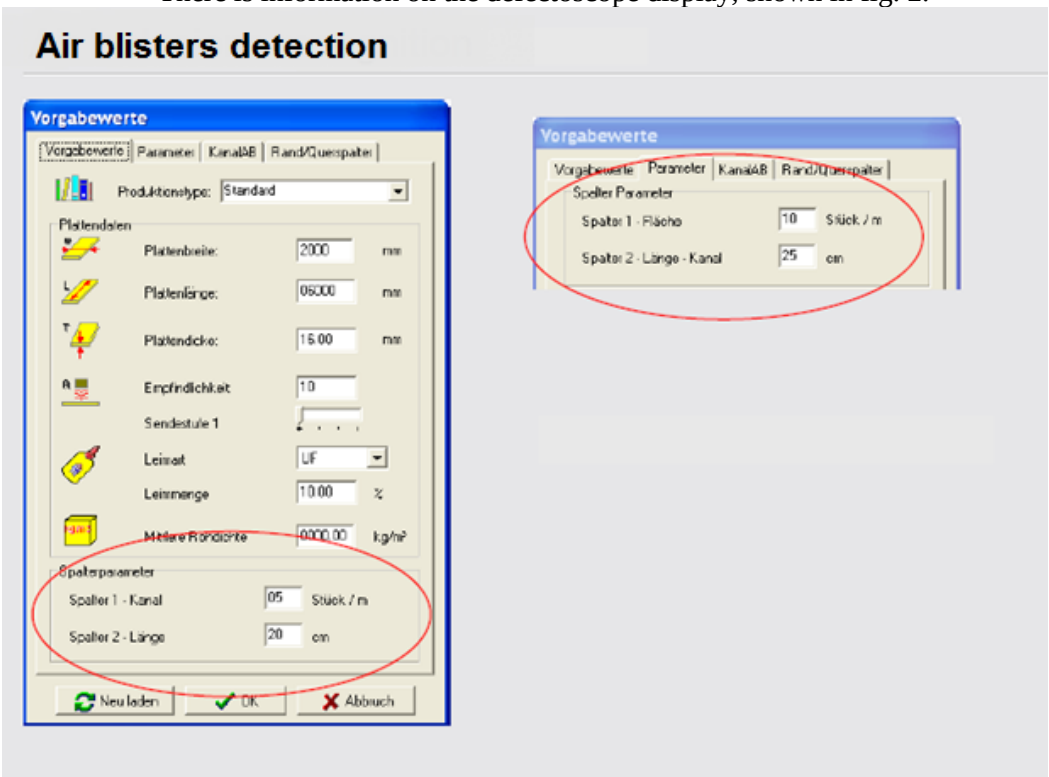

Figure 2. Air blisters detection

Understandings of air blisters are in fig. 3

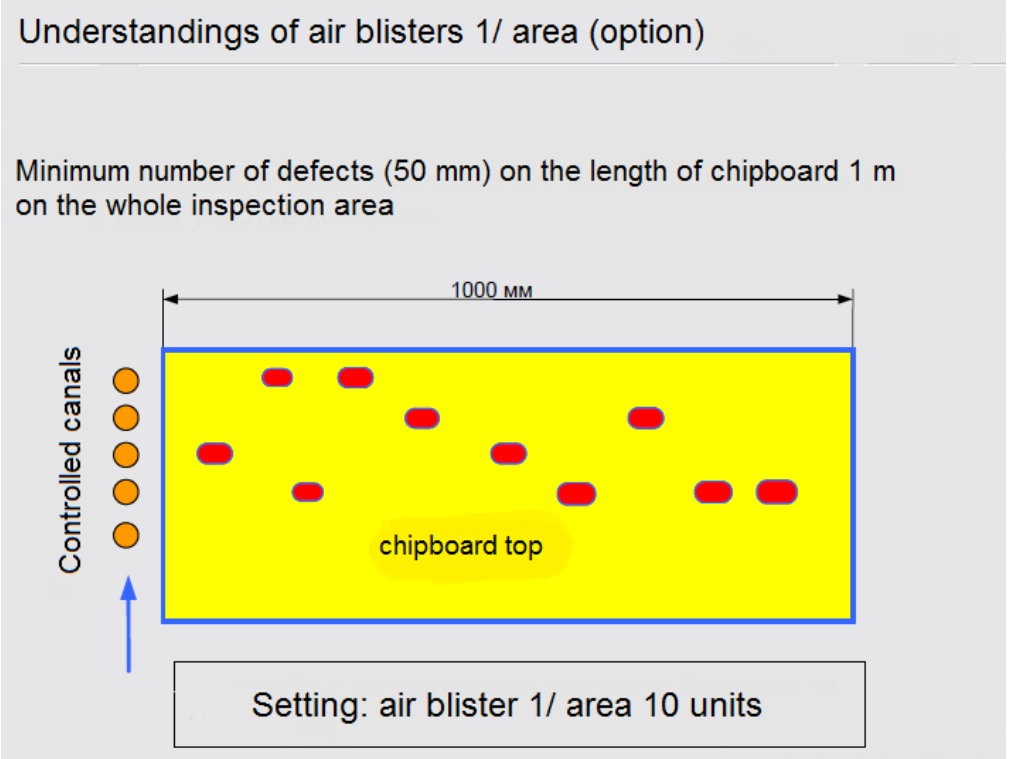

Figure 3. Understandings of air blisters 1/ area (option).

Furthermore there are quality indicators of process on reject rate before (2013) and after defectoscope installation in 2014 and 2015.

On the basis of the graph it can be stated that: a number of rejected rate is more in winter months rather than in warm ones. This can be explained by the fact that moisture is high in winter months and there are more blisters at manufacturing in winter months rather than in summer time. A number of reject rate decreased after installation of defectoscope UPU 3000. This is obvious when comparing January 2013 with January 2014 and 2015.

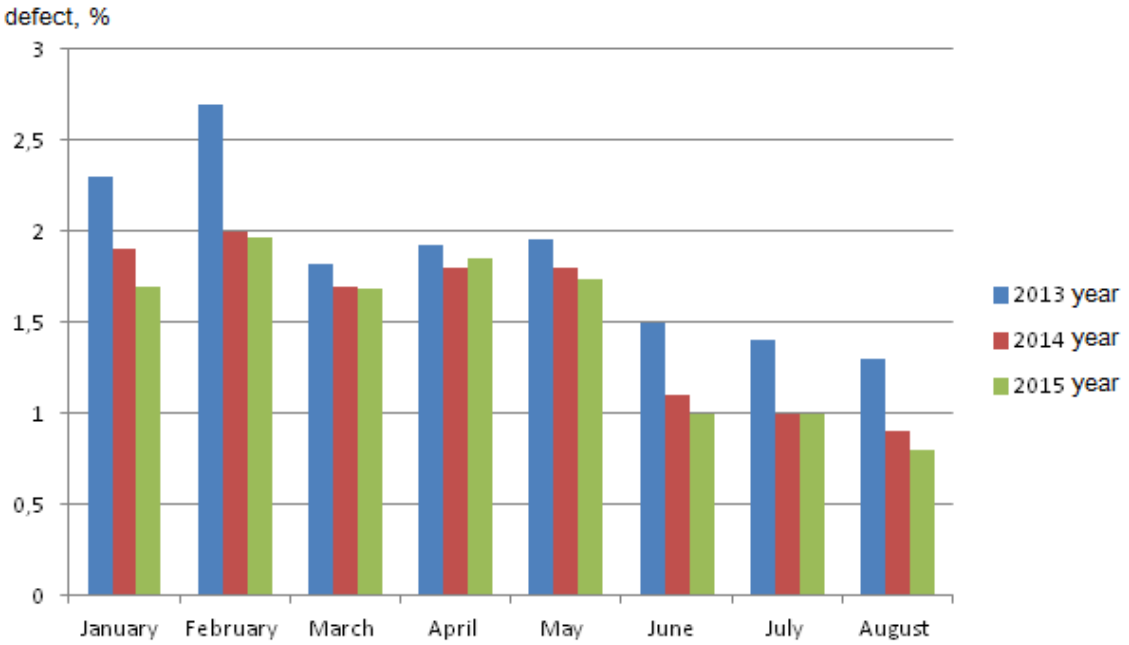

Figure 4. Quality indicators of process on reject rate.

Conclusion

Thus, having made analysis between the diagrams we can conclude that the appearance of the defect "pulling off, blisters" decreased after installation of the defectoscope. The defectoscope is intended for the defect "pulling off, blisters" prevention and not to allow chipboard with the defect to come in the market to consumers. It was proved that the defectoscope installation positively influenced the decrease of the reject rate indicator and prevention of production launch. The sum of losses caused by reject rate products was calculated; this value makes up about one per cent percentage wise or a share of one per cent from the volume of produced production.

On the basis of the research we can make a conclusion about the necessity of further modernization of technological process, study of the factors influencing the parameters of chipboard quality for reasonable fixation of their optimum values in normative and technical documentation.

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