Analysis of defects in wood flooring manufactured by Brazilian companies members of a certification quality program

INTRODUCTION

Wood flooring is a high-value-added product and the defects occurrence, mainly when finished, is not interesting, once it may cause installation problems and in consequence, customers dissatisfaction. In Brazil, ANPM - National Hardwood Flooring Association – developed a Quality Certification Program (PQ) to improve product quality and seek reduction on defects occurrence.

It’s important to emphasize, as Deming (2003) affirms, that it’s hardly found a “zero defect” in industrial processes. In wood-flooring case, it’s hard to get 100% conformities because it is a natural, heterogeneous and variable material, according to Kozak & Maness (2003). However, defects which compromise product installation should be avoided. The absence or minimum of defects is important to captivate customers and for a positive divulgation of product and company. In this way, the present work aims to analyze the current defects on wood-flooring fabricated by Brazilian companies.

MATERIAL & METHODS

The defects evaluation involved products from PQ participants and non participants companies. It has been conducted using ANPM database’s information and simulated audits. All products are normally trade in national and international market. The purpose was also to evaluate if there is any differences between products from certified and international market. The adopted procedures were the same employed on ANPM’s PQ, using as base technical standards and audit results. Figure 01 presents a sequential summary of procedures related to audits.

![Figure 01 – Audit procedures summary](image)

Defect analysis was performed by evaluating the compliance with technical standard ABNT NBR 15799 - Brazilian Association of Technical Standards (ABNT, 2010), recording defects absence, presence and/or measurement.

In 120 audits of PQ participant companies, from a total of 15.000 analyzed wood-flooring samples, 912 presented defects recorded as non conformities which equate to 6.1% of all. Figure 03 presents results related to observed defects.

![Figure 03 – Wood-flooring defects observed in PQ participant companies](image)

In 4 audits of non participants companies, from a total of 500 analyzed wood-flooring samples, 142 presented defects recorded as non conformities, equating to 24,8% of all. This percentage can be considered significant in terms of losses for companies and superior when comparing to the certified companies, the main problem is the percentage of participant companies’ defective sample, which was 6,1%. Figure 04 presents results related to observed defects.

![Figure 04 - Wood-flooring defects observed in PQ non-participant companies](image)

RESULTS & DISCUSSION

In 120 audits of PQ participant companies, from a total of 15.000 analyzed wood-flooring samples, 912 presented defects recorded as non conformities which equate to 6.1% of all. Figure 03 presents results related to observed defects.

Analyzing the defects amount, it can be observed differences on quality patterns of certified and non certified companies. The 28 registered defects from certified companies represent 4,5% of all analyzed samples, indicating compliance with ABNT NBR 15799 requirements, which allows 5% of non conformities. Considering non certified companies, the 142 occurrences represent 28,4% of analyzed samples, i.e., more than 6 times comparing to certified companies and not in conformity with the standard. Considering non certified wood-flooring, it is noted that half of defects is related to manufacturing process and the other part consists in handling and classification problems. For wood-flooring of certified companies, the main problem is the surface checks which can be considered classification failure and are often hard to visualize. It can be affirm that process problems of products are more serious than handling and classification problems, which usually are connected to esthetic.

CONCLUSIONS

# Certification contributes to defects reduction.

# In PQ participants companies, the more frequent defects are those harder to visualize, while in PQ non participants defects are related to manufacturing, handling and classification.

# PQ participants companies presented 6,1% of non conform pieces. In the case of PQ non participants companies, 28,4% of all analyzed samples were classified as non conform pieces, implying in a high amount of loss.

REFERENCES


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