

University for Business and Technology in Kosovo

UBT Knowledge Center

UBT International Conference

2013 UBT International Conference

Nov 1st, 2:15 PM - 2:30 PM

Quality Of Wood Drying Which Is Using In Residential Buildings Depending On Its Thickness (Case study timber of beech, with different thickness that is drying in conventional kiln in the territory of Kosovo)

Rrahim Sejdiu

University of Prishtina, rrahim.sejdiu@uni-pr.edu

Kushtrim Cuka

University of Prishtina

Selam Ceka

University of Prishtina

Muharrem Sejdiu

University of Prishtina

Follow this and additional works at: <https://knowledgecenter.ubt-uni.net/conference>



Part of the [Architecture Commons](#)

Recommended Citation

Sejdiu, Rrahim; Cuka, Kushtrim; Ceka, Selam; and Sejdiu, Muharrem, "Quality Of Wood Drying Which Is Using In Residential Buildings Depending On Its Thickness (Case study timber of beech, with different thickness that is drying in conventional kiln in the territory of Kosovo)" (2013). *UBT International Conference*. 2.

<https://knowledgecenter.ubt-uni.net/conference/2013/all-events/2>

This Event is brought to you for free and open access by the Publication and Journals at UBT Knowledge Center. It has been accepted for inclusion in UBT International Conference by an authorized administrator of UBT Knowledge Center. For more information, please contact knowledge.center@ubt-uni.net.

Quality of Wood Drying Which is Using in Residential Buildings Depending on its Thickness (Case study timber of beech, with different thickness that is drying in conventional kiln in the territory of Kosovo)

Rrahim Sejdiu¹, Kushtrim Cuka ², Selam Ceka ², Muharrem Sejdiu ²

¹ University of Prishtina “Hasan Prishtina”

Faculty of Applied Science - Ferizaj

Department of Design and Wood Technology

Str. " Besim Rexhepi", w.n. Ferizaj , REPUBLIC OF KOSOVO

rahim.sejdiu@uni-pr.edu

Abstract. Wood processing industry is one of the most developed industries in Kosovo. In the framework of this industry, special importance should be given to the wood drying process, as a necessary process for further processing of wood. Therefore, a proper study of the drying quality of sawn boards which is using in residential buildings would be necessary. For the study were taken 13 subjects which are stretch throughout the territory of Kosovo. The study shows that the sawn timber in thickness 25-37mm, is drying well, but lacks air conditioning and equalization of moisture content throughout its thickness. While timber thickness 38-49mm and 50-70mm, did not dry enough, lack of moisture equalization throughout the thickness and conditioning is not done at all. The following results provide data for three thicknesses obtained in the study. Thickness (mm).

<i>Thickness (mm)</i>	<i>Number of samples</i>	<i>Average moisture content in shell (%)</i>	<i>Average moisture content in core (%)</i>	<i>Average moisture content in shell (%)</i>	<i>Average for all thicknesses (%)</i>
25-37	52	7,16	8,86	7,17	7,73
38-49	44	12,61	14,65	12,71	13,12
50-70	33	13,1	16,74	12,88	14,24

In conclusion we can say that the sawn timber over 37mm thickness, is not eligible for further processing products used in residential and domestic objects is in contradiction with EU norms.

Keywords: equilibrium, moisture, prong tests, shell, core.

1 Introduction

Water in wood normally moves from higher to lower zones of moisture content. This fact supports the common statement that “wood dries from the outside in,” which means that the surface of the wood must be drier than the interior if moisture is to be removed. Drying can be broken down into two phases: movement of water from the interior to the surface of wood, and removal of water from the surface. Moisture moves to the surface more slowly in heartwood than in sapwood, primarily because extractives plug the pits of heartwood. In drying, the surface fibers of heartwood of most species reach moisture equilibrium with the surrounding air soon after drying begins. This is the beginning of the development of a typical moisture gradient (fig. 1), that is, the difference in moisture content between the inner and

territory of Kosovo. In figure 2. are marked the places where samples were taken for study (13 operators stretch throughout the territory of Kosovo).

For study was chosen beech timber, it is because all of our researches that we done reported that, in Kosovo the majority of wood processing are using this kind of wood. Areas where this species of wood are taken are: Kamenice, Jezerc, Globoqice, Kacanik, and Decan.

Works in terrain

During the work in terrain are making several visits to enterprises for listed, followed and taking samples for further working. First visits are done during filling the kiln chamber, and then they are visited during drying to determine the condition of the boards. The same enterprises also are visited after drying. This is done to obtain necessary samples to determinate the distribution of moisture content in the thickness of boards.



Fig 3. Stacking boards and marked samples

To prove the non-uniformity of moisture during timber drying are made "prog" tests which shows the quality of drying depending on moisture content in core and shell of boards.

Material preparation

Materials for the study are improves from enterprises immediately after kiln drying is done figure 5. Boards just after drying are sawn according to standard recommendations (5586 ML88, for thicknesses 25-37 and 38-49 figure 4a, while for thickness 50-70mm samples are taken with recommendation that shown in figure 4b). To test core and shell of sawn material are weighed the outer (surfaces) and the inner (core) parts (figures 5a and b). Immediately after initial weighing, samples are brought to the laboratory of FAS in Ferizaj and are oven dried in the thermostat to 0% of moisture content (drying temperature $102 \pm 30C$), samples are weighed several times until it reached the same weight after three measurements (weighted).

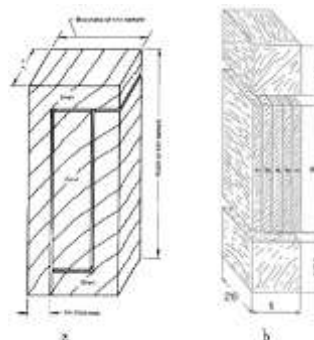


Fig 4. Method of cutting section for measuring shell and core moisture content. (ML88 5586). a. for thickness 25-37 and 38 to 49 and b. for thickness 50 to 70



Also to establish non-uniformity of moisture content on boards we have made "prongs" probes (Figure 6a and b) which show the performance of major tensions with bending toward the center of the boards (Figures 6).

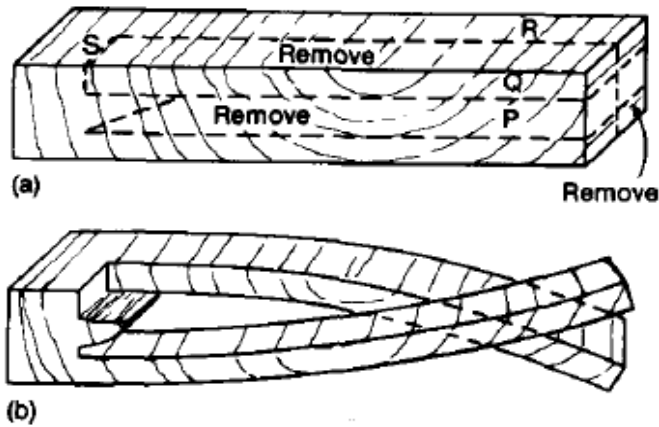


Fig 6 (a) Method of cutting stress sections for severe casehardening tests. (b) Prongs are offset so that they can cross and indicate severity of casehardening. (ML88 5584)



Fig 7. Samples for prongs probes with different thickness

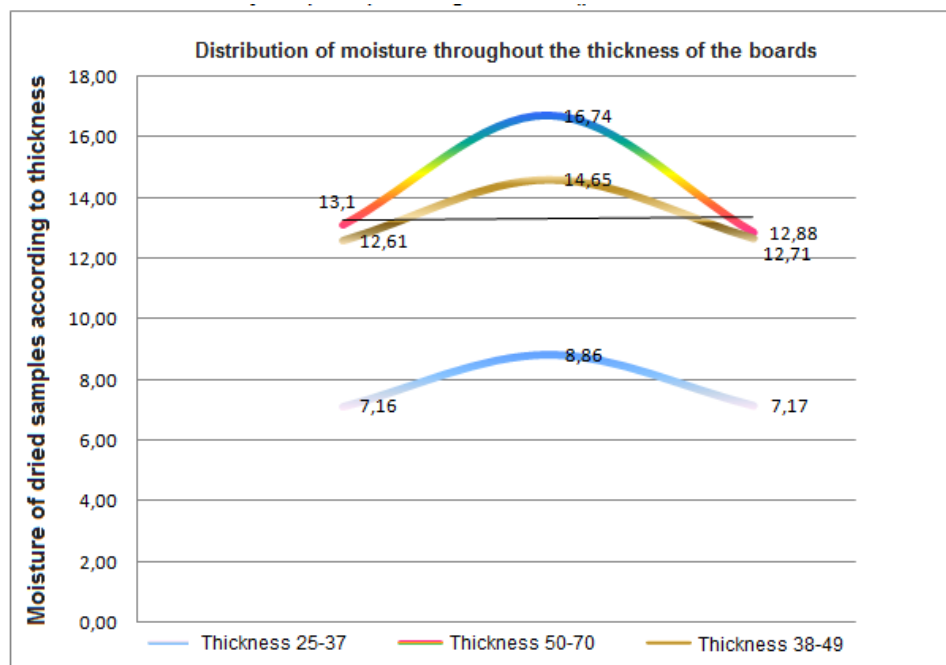


4 Results

Table 1. Show the number of samples and moisture content for three different thicknesses.

Thickness (mm)	Number of samples	Average moisture content in shell	Average moisture content in core	Average moisture content in shell	Average for thicknesses
25-37	52	7,16	8,86	7,17	7,73
38-49	44	12,61	14,65	12,71	13,12
50-70	33	13,1	16,74	12,88	14,24

Data from the Table 1. Are shown in figure number 10.



5 Conclusions

Based on the results we can conclude that the quality of wood drying in Kosovo is not satisfactory. Good results of the wood drying are founded in thickness 25-37mm, but the average of moisture content and conditioning are not done. Poor results were found in two other thicknesses (38-49 and 50-70mm), expect high moisture content that we have seen on boards, also are found non-uniformly dried lumber (different distribution in core and shell). The same results are shown from the "prongs" samples which obviously have significant tension and both sides are curved toward the center which means that the moisture in the core is higher than in the shell, as a such wood products that are drying in convectional kiln in Kosovo does not fulfill European Union conditions for residential houses 6-10%.

References

1. Dry Kiln Operator's Manual, William T. Simpson, Madison, Wisconsin 1991,
2. Susenje i Parenje Drva, Juran Kërpan, Sumarski Fakultet-Zagrab 1965,
3. Tharja e Drurit, Arben Bejtja, Universiteti Bujqësor i Tiranës 1985,
4. Teknologjia e Finalizimit të Drurit, Osman Osmani, Shkolla e Lartë Teknike-Ferizaj 2001,
5. Tharja dhe Përpunimi Hidrotermik i Drurit, Sulejman Meta, Lectures for students in the Faculty of Technical Applied Sciences in Ferizaj,
6. Changes of Equilibrium Moisture during the Natural Drying of Wood in the Territory of Kosova (for years 1960-2008), Rrahim Sejdiu et al International Journal of Current Engineering and Technology, Vol.3, No.2 (June 2013), page 653-654.
7. Shrinkage of Beech Wood Depending on the Geographical Location of the samples in the Tree, Rrahim Sejdiu et al International Journal of Current Engineering and Technology, Vol.3, No.5 (December 2013), page 1664-1666.