

ABSTRACTS (MASTER THESIS)

**The evaluation of visual differences among variously dried woods
- for the utilization of Japanese forest products -**

**(Graduate School of Agriculture,
Laboratory of Structural Function, RISH, Kyoto University)**

Mayu Ueda

Introduction

Now, Japanese forest has become mature and utilizable for timber. However, we encounter severe difficulties for utilization of them. One of them is confusions on the method of wood drying. Especially, Japanese cedar (Sugi: *Cryptomeria Japonica*), which is endemic to Japan has high moisture content and is difficult to dry. The kiln drying with high temperature is the most popular, but its dried products are bad visual condition because of burned surface. In this study, we evaluated the visual differences, color and gloss among variant dried-woods for improvement the dry technology and quality management.

Materials and methods

Sugi (135×135×4000mm) was used for specimen and cut into two members; 3000mm for kiln drying and another 1000mm for natural drying. Four different kiln drying methods were used such as high temperature drying, drying with high frequency wave, drying under decompression and medium temperature drying. The former three methods were subjected to high temperature steam process to control dimension change. 10 lumbers were provided for each kiln drying and 40 lumbers for natural drying. The specimens of 120×120×15mm were taken from these lumber for measuring of color and gross. Values of the color of the wood on the CIEL a^*b^* system was measured by imaging spectrophotometer (JFE Techno-Research Corporation) and gross was measured by a gross meter instrument (NIPPON DENSHOKU).

Results and discussion

Figure 1 shows the value of lightness L^* of sapwood color of each kiln dried samples and natural dried samples. The values of kiln dried were lower than that of natural dried. It is considered that the sapwood color became darker thorough kiln drying. The lightness of high temperature drying was lowest and that of high frequency wave was second lowest among kiln methods. Among kiln drying methods, three methods subjected to high temperature steam process showed significantly lower value in lightness. From this, it may be said that the drying schedule after this process mainly influenced on the lightness of sapwood. On the other hand, the value of redness a^* of heartwood showed different tendency. The value of above-mentioned three kiln methods was lower than that of natural, while medium temperature was not remarkably different from natural. In addition, the redness didn't show positive differences among above three kiln methods. From this, we may say that the redness became faint through high temperature steam process. In fact, the color change by kiln drying shows different behavior between sapwood and heartwood. The relation to high temperature steam process should be researched more particularly.

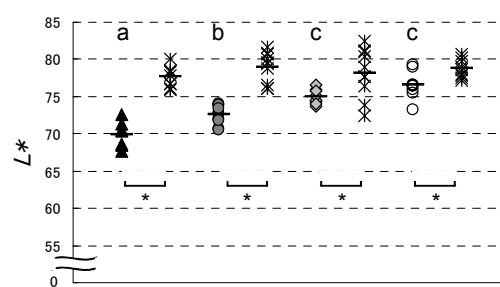


Figure 1. The Lightness difference of sapwood
Legend: * natural drying ○ medium-temp drying
◆ decompression ● high frequency wave
▲ high-temp drying — average