

# **KD EXPERT V2.0: COMPUTER-BASED TRAINING SOFTWARE FOR LUMBER DRYING**

Ian D. Hartley  
Research Scientist  
Forintek Canada Corp.  
Vancouver, British Columbia

## **Introduction**

The personal computer has been around for over a decade and its use varies widely, from analyzing data and performing complex calculations to providing entertainment with games. It has become a valuable tool in our businesses and even now in drying operations, especially those computers that control the kilns. Another important use of the computer is for education purposes in schools and universities as well as in training and updating of people's skills allowing them to use new software. In kiln drying, Forintek Canada developed a computer based training software in the early 1990s called KD Expert. It allowed new and experienced users the ability to have important kiln drying information on a computer. Over the last year, Forintek has been updating KD Expert to be used on newer computers which can handle multimedia software.

In 1991, details of KD Expert were presented to this meeting by Luiz Oliveria and Graham Mackay, and their presentation is found in the proceedings of that meeting. The purpose of this presentation is to highlight key elements that were used in designing of KD Expert v2.0.

## **History of KD Expert v2.0**

The earlier version of KD Expert was DOS-based and can be used in any computer that offer a DOS operating system. It covered a large variety of subject areas and used graphics to help illustrate key points in drying. Over the last 8 years, it has been widely distributed and sold to many mills in Western Canada and elsewhere. Its success has been monitored and industry has used it for the training of kiln drying operators in combination with local kiln drying workshops. As the computer technology advanced quickly, KD Expert began to become 'old', meaning that new multimedia technologies was quickly showing that the advanced-software of 1990 was dating itself.

As kiln drying operations have upgraded controllers that use newer computers with newer operating systems, it became apparent that KD Expert should be upgraded to meet the new computer technologies. In the summer of 1997, Forintek began to evaluate and re-design KD Expert with the viewpoint of incorporating multimedia concepts into a newer KD Expert. As of this meeting, the new version of KD Expert is almost complete and will be ready for distribution by the end of the summer 1998.

## Design and Concepts of KD Expert v2.0

With newer computer technologies changing almost daily, developing a software today that will be still available and useful over a long period of time, is not a simple task. There has to be careful planning with regards to two key issues: (1) the needs of the audience requirements, considering their level of skills and the environment with which the software will be used; and, (2) "crystal-ball gazing" of which one has to look into the future and predict changes in computer technology.

Since the task of putting newer information and graphics into KD Expert was to be completed over a one year period, the planning of the new KD Expert had to be dynamic and always changing to meet (2) above. As tasks and milestones were met, there was careful evaluation of the next task, either keeping on the same track or by adjusting strategies based on feedback from beta users. This allowed for up to the minute changes with the development software. In any event, the best overall strategy used was to "keep it simple," and it was a strategy used for use in all aspects of the new KD Expert's development.

There are three key distinct areas of designing and developing software: (1) presentation; (2) content; and, (3) software.

**Presentation:** The software will be used by a wide variety of people with different levels of computer skills. It had to be user-friendly and intuitive when moving around different screens within lessons and tests. The use of the mouse was key to its operation, however, several commands could be executed from the keyboard. This increased the user-friendliness because the user was not limited to either the mouse or the keyboard. An issue that required several weeks of consideration was the appearance of the material within KD Expert, *i.e.*, how it looked to the user. All of the pictures, graphics, and text material had to be aesthetically pleasing. Color and font choices were carefully chosen since the user would be looking at the screen for hours at a time.

**Content:** All of the material within KD Expert v2.0 had to be up-to-date and easy to understand. To help with making concepts clear, images, artwork and graphics were incorporated. As well, at any time, the user has access to a glossary with over 120 definitions related to drying. The basis of the new KD Expert was from Forintek's successful lumber drying correspondence course. Other sources of information were from the old KD Expert and several kiln drying manuals from Canada, United States and Britain.

**Software:** The software used to develop KD Expert v2.0 was Authorware, a product of Macromedia. It is a widely-used development multimedia software that provides programmers with features that allow use of images, texts, keyword search facilities to be included into any software being developed. KD Expert v2.0 is developed for the Microsoft Windows 95 operating system and will run on Windows NT and Windows 98 (although not yet tested). Any computer capable of running Windows 95 would be able to use KD Expert v2.0. An advantage of using Authorware was that it allows for quick updates and customizing of KD Expert v2.0 as needed.

## Lessons and Tests

KD Expert is essentially divided into two separate parts: Lessons and Tests. For each Lesson, there is a corresponding Test, but these parts cannot be executed at the same time. Therefore, the user can either go directly to the Lessons or Tests from the main screen. The subject areas covered in KD Expert are:

- |                                      |   |
|--------------------------------------|---|
| 1. Concepts and Terms Used in Drying | 7. Air Circulation  |
| 2. Moisture in Wood                  | 8. Kilns  |
| 3. Shrinkage                         | 9. Kiln Drying Schedules                                  |
| 4. Drying Stresses and Degrade       | 10. Storage and Transport of Dry Lumber                   |
| 5. Heat, Temperature and Humidity    | 11. Alternative and Additional Technology for Kiln Drying |
| 6. The Drying Process                | 12. Statistical Quality Control                           |

At the end of each Lesson, there is a series of questions (answers are not provided).

### Design of Presentation

A major use of KD Expert v2.0 is to read the kiln drying information on a computer screen. Therefore, colors and fonts were carefully chosen to make it "pleasing to the eye." As well as aesthetics, the buttons and icons in which the user must press to navigate around the lesson or between lessons have to be presented in a user-friendly manner. An example of this concept is presented in FIGURE 1. Several areas on the screen were consistent for all sections in each Lesson as well as in the Test sections; these areas are discussed in detail below.

*Program Navigation Bar:* The user is able to display the Table of Contents for either the **Lesson** or **Test** part of the program. Also on the Bar is **Options** where the user can control several aspects of KD Expert. This Bar is consistent on all screens of KD Expert.

*Lesson Contents:* This is a list of the sections within the particular lesson that the user is currently reading. If the user wishes to read a different one within the same lesson, he/she can easily use the mouse to click on the section title.

*Detailed Artwork and Images:* The pictures contained in KD Expert are clear and will have a corresponding Figure caption. Where possible, text material describing the figure is on the same screen.

*Lesson Navigation Bar:* With this navigation bar, the user can quickly move around the lesson with the use of the mouse. It includes buttons for going

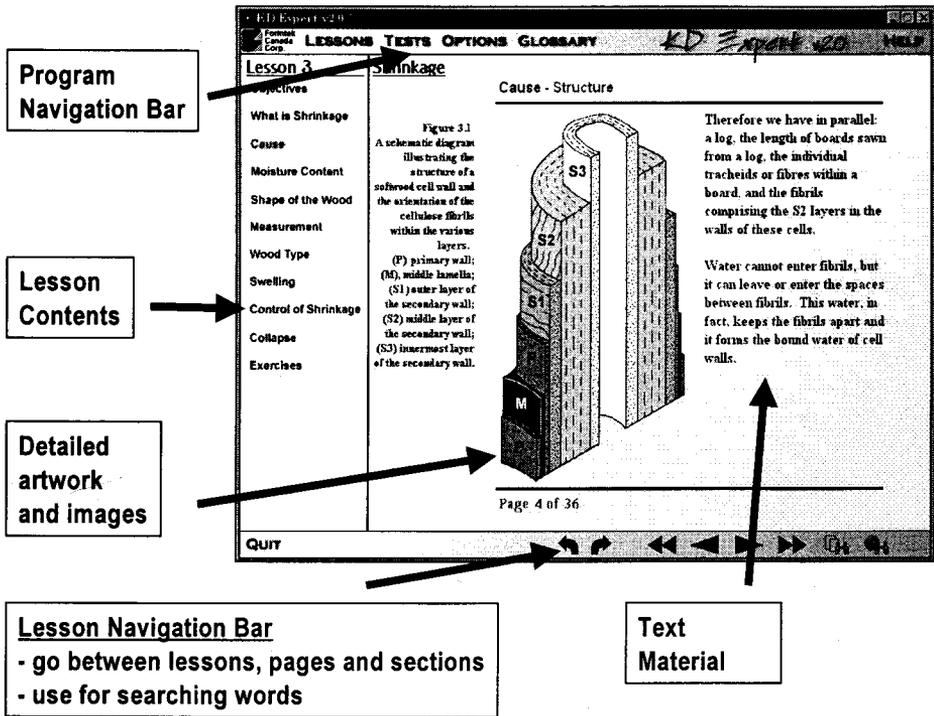


FIGURE 1. Example of a user-friendly screen.

forward or backward for pages and sections within Lessons and for moving between Lessons. This Bar is consistent on all screens of KD Expert.

*Text Material:* The text was formatted to the font type of Time New Roman 11pt. This font was chosen because of its readability on computer screens.

Not shown in FIGURE 1 is the background color. A light yellow gradient was chosen as the background color, and in combination with the font, it is very readable for hours at a time.

### Features of KD Expert v2.0

Using a software development package such as Authorware, allows several features to be included in the final product of KD Expert. Included features is the ability to have **Multiple users**, allow for **Extensive Word Searches**, as well as **Glossary** and **Help** functions; these features enrich the usefulness of the program.

*Multiple Users:* Another important point to make about KD Expert v2.0's design is that one copy of the program on one computer will allow for several users to sign-on to use the program. In this manner, each user has separate

and individual profiles such that if User A has completed several tests, User B will not be able to find out Users' A progress or results.

*Extensive Word Search:* The user is able at any time to search words within the current Lesson or within the entire program. To illustrate the usefulness for the ability to search words in KD Expert, typing in "casehardening" will produce a lot of pages or phrases with that word contained in it. The user is then able to go directly to that page to read more about casehardening. With this ability to search words, KD Expert can be used as a reference tool.

*Glossary:* At any time, the user can use the glossary to obtain definitions to over 120 terms used in kiln drying.

*Help:* If the user is uncertain how to use various navigation bars or needs to find a keyboard combination for specific functions, then at any time, the user can use the help found at the top of the screen.

### **Summary**

1. Designs and concepts are critical areas in producing a quality product.
2. Training materials have to keep up-to-date with technologies for both computers and kilns.
3. KD Expert v2.0 fits with today's technology and will be able to expand to meet mill and training sites' demands in kiln drying.
4. KD Expert v2.0 is a training software as well as a reference tool.
5. KD Expert v2.0 will become a useful tool for all personnel in the lumber drying industry, from the new operator to the experienced supervisor.