TEXTBOOK OF PRODUCT ENGINEERING AND STRENGTH DESIGN OF FURNITURE

Carl A. Eckelman
Professor of Wood Science
Purdue University

West Lafayette, Indiana.
January 15, 2003

Preface

Although furniture designers have always been concerned with the strength of the furniture they create, a methodology has never developed which permits a designer to analyze the strength requirements of a specific piece of furniture and then calculate on a scientific basis the size of the members and the joints needed to satisfy these requirements. Several years ago, the author became interested in problems related to the strength of furniture and undertook research to obtain quantitative answers to a number of perplexing strength problems. Additional investigations followed which over a period of years have developed into a continuous program of furniture research. The collection of data and information which followed resulted in the need to transmit this knowledge to others. Short courses were held for industry personnel and a formal university class was developed and taught to present what had been learned in a systematic manner. The formalized set of class notes developed formed the basis for this book. In general, the intent of this book is to introduce and develop the concepts and principles of strength design as applied to furniture and to collect pertinent information concerning the subject into a single document. No book of this nature can ever be complete, however, since research constantly produces new knowledge which should be included with the old. Nevertheless, a start must be made at some point, and this book should be recognized for what it is, a first attempt to organize and present a rational methodology for the strength design of furniture.

Preface

Although furniture designers have always been concerned with the strength of the furniture they create, a methodology has never developed which permits a designer to analyze the strength requirements of a specific piece of furniture and then calculate on a scientific basis the size of the members and the joints needed to satisfy these requirements. Several years ago, the author became interested in problems related to the strength of furniture and undertook research to obtain quantitative answers to a number of perplexing strength problems. Additional investigations followed which over a period of years have developed into a continuous program of furniture research. The collection of data and information which followed resulted in the need to transmit this knowledge to others. Short courses were held for industry personnel and a formal university class was developed and taught to present what had been learned in a systematic manner. The formalized set of class notes developed formed the basis for this book. In general, the intent of this book is to introduce and develop the concepts and principles of strength design as applied to furniture and to collect pertinent information concerning the subject into a single document. No book of this nature can ever be complete, however, since research constantly produces new knowledge which should be included with the old. Nevertheless, a start must be made at some point, and this book should be recognized for what it is, a first attempt to organize and present a rational methodology for the strength design of furniture.