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Introduction

Goals of this book

The author's primary purpose in writing this stepladder book is to improve stepladder design to prevent accidents. It is one of the codes of ethical conduct in professional organizations and in state licensing requirements of engineers to protect the health, welfare and safety of the public.

A secondary goal is to assist in the product liability litigation process. Justice cannot be served if defense experts or plaintiff experts intentionally or through ignorance create non-scientific theory. The typical courtroom is filled with confusing "technical noise" that buries relevant information. Hopefully, this book can get engineers and lawyers focused on the real technical problems with stepladders and users of stepladders. Tort reform may be needed, but more importantly an engineering reform is desperately needed.

Still another goal of this book is to lower the expert witness costs to product liability lawyers and to better prepare both the lawyer and the engineer.

Some of the statements made by the authors can be found in public records such as depositions, letters and trial transcripts. Other sources include books, articles and newspapers written by others to name a few. A significant portion of the material is the result of the author's research and testing of stepladders. Sources of information will be identified in the book. The reader should verify independently any conclusions reached and published by the authors before proceeding in litigation or in new design. However, the test procedures and calculations are presented so that the reader can easily follow the methodology and verify the results independently.

Finally, there is no direct reference to any manufacturer of stepladders. Names have been covered in photographs, and there are no references to manufacturers in the text. Our goal is not to give one manufacturer any commercial advantage over another. The book sales are limited in numbers, and the market for the book is primarily product liability lawyers and their experts. In addition, names of individuals are not used. The authors may quote what individuals have said in sworn testimony published in depositions that are public record.

Stepladder Accidents:

In 1995, there were 140,000 people who went to emergency rooms for ladder-related treatment. There were 301 deaths in 1993 from ladders and scaffolding. The authors have investigated many stepladder accidents where both front and rear legs were bent. One hundred percent of the time, defense experts claimed the plaintiff fell on the stepladder after falling off. There were at least two other cases known to the authors where the lower legs folded inward and there were no lawsuits. This failure with

associated injuries happens frequently and is widespread. The statistics gathered and published by a number of sources does not represent the total number of ladder accidents. It is the tip of the proverbial iceberg. Many Christians believe it is not “Biblical” to file lawsuits. Many times the injuries are not catastrophic and the injured parties have insurance. Some of these people see little advantage in suing. Sometimes the injured are paraplegic or quadriplegic. Sometimes the injured are dead.

Forensic engineering firms involved in stepladder accidents often have trouble with storage of stepladder evidence or exemplar stepladders used in tests. The stepladder experts find themselves buried in bent and broken stepladders. Shown in Figure 1-3 are some examples of stepladder failures found in forensic engineering firms.



Figure 1 - Stepladder Failures and Exemplars at Authors' Shop



Figure 2 - More Stepladder Failures at a Forensic Engineering Firm



Figure 3 - More Aluminum Stepladder Failures

Since the authors work in a relatively small forensic engineering environment, the relatively large number of stepladder accidents that come into the office is troubling. However, the reader must remember that the number of stepladder cases exposed to one engineering firm does not prove or disprove too much. The authors could be getting 100% of all stepladder accidents in the nation. Perhaps, the statistics would then prove the stepladders were safe because there were so many stepladders sold. Then again the authors may be getting only 0.001% of all the stepladder accidents as an example, which might mean that stepladders were very dangerous. Other factors enter into the

scheme of things such as hours of use. People often own stepladders that they rarely use. The National Safety Council publishes the death rate per 100,000 of automobile drivers. When this figure is compared with past years, there is a trend downward. The figure is helpful to see a trend, but it is almost impossible to compare stepladders to automobiles. To be fair in the evaluation of stepladders, the quantity of accidents alone is not necessarily enough to prove the quality of stepladders. Assume that the total of all stepladder accidents was known that caused injury or death per 100,000 users. Assume that the total number of hours the stepladder was used is known. Then some meaningful comparison could be made with other products. The conclusion is simply that a thorough engineering analysis is necessary. The engineering analysis will show in some stepladders that the product is unreasonably dangerous and defectively design. Occasionally stepladders are defectively manufactured.

An interesting side note that relates to stepladder problems, a truck driver delivering material to the author's shop commented that he just took a semi-truck load of stepladders rejected by a large retailer back to a stepladder manufacturer. There may be more defectively manufactured stepladders than previously experienced because retailers inspect the product and send them back to the manufacturer.

Is There a Case?

Initially, most lawyers want to know if they have a case or not. Few will want to read the ***Stepladder Manual*** through before deciding one way or the other. In the executive summary, the authors have placed accident situations that point strongly to the stepladder as the problem and not the injured person. The information covers many of the problems, but further reading of the manual may be necessary if the stepladder accidents fall outside the executive summary.

Stepladder Types Involved in Litigation:

Our general experience is that aluminum stepladders type I and IA, are rarely involved in litigation. Type IA are the strongest ladders with the highest load rating. This is followed in rating by Type I, Type II, and Type III. There are several reasons Type I and IA rarely are involved in litigation. The Type I and IA are stronger and heavier. There are also fewer on the market, but these commercial stepladders are often used more than the light type II and III stepladders. Fiberglass and wood stepladders can have material problems, but if a client walks into the law office with a type III 6-foot aluminum stepladder made overseas, there is a much higher likelihood of material problems. In fact any type III 6-foot aluminum stepladder or any type II 8-foot stepladder made anywhere may be defectively designed and unreasonably dangerous. Industry practices and standards are largely to blame for these flimsy ladders. Further reading of this manual will detail the reasons behind this.

Stepladder Damage – What to Look For:

The next three pictures show the most common damage that indicates the stepladder was racked. Racking is one of the cardinal sins of the stepladder manufacturers. Racking occurs when one of the rear ladder legs becomes raised off of the ground and displaced sideways. Racking is a result of under-designed ladders, ladders not designed to handle the magnitude and direction of forces that people using ladders generate. Certain ladder damage frequently occurs in racking accidents. If an injured client comes to you with a ladder, look for the following evidence of damage caused by racking. If it can be shown that a stepladder racked, the case will have merit, and should be pursued.



Figure 4 - Bent Spreader Bars Indicate Racking



Figure 5 - Lower Front Leg Bent Inward Indicates Possible Stress Overload from Racking



Figure 6 - Bent Rear Legs from Racked Stepladder