

# PRODUCT LIABILITY

## 7-1 INTRODUCTION

Industrial, commercial, and consumer products are a significant source of injuries and death. Injured parties frequently sue manufacturers and those in the distribution chain for compensation. Estimates of the number of product liability lawsuits in courts throughout the United States range from 100,000 to 1,000,000 each year. Over the last few decades, there has been a major increase in product liability lawsuits. Along with this increase in the number of suits, there were many changes in product liability laws and legal interpretations of them. There is growing pressure for many forms of liability reform to reduce the legal burden on business in the United States.

Product liability litigation is one means for society to cope with the technological risks imposed on it. Not all product liability litigation is initiated for this reason. Decisions and actions of engineers, managers, and others during planning, design, manufacturing, distribution, and marketing of products can impact their safety. Because of this, engineers need to know the fundamentals of product liability. Knowledge of the legal concepts and processes for seeking remedies is important for engineers so they can act prudently, professionally, and ethically at an early stage to keep unnecessary risks associated with products out of the marketplace.

## 7-2 THEORIES OF LIABILITY

A manufacturer or seller of a product is not liable for all injuries that may result from a product. That would be absolute liability. However, in most states, three theories of liability apply to products and establish the duties of a manufacturer or seller toward a user or consumer. The three theories are (1) warranty, (2) negligence, and (3) strict liability. Warranty addresses performance of a product regarding implied or explicit claims made for it by the manufacturer or seller. Negligence involves the conduct or behavior of a person or corporate body regarding something they did or failed to do. Strict liability deals with characteristics of products that are unreasonably dangerous. More than one theory may apply in a legal case.

The theories of negligence and strict liability are part of tort law. Torts are wrongful acts, injuries, or damages for which civil (as opposed to criminal) action can be brought. Warranty is part of contract law and the relationships between buyers and sellers.

Product liability developed from English common law. As the industrial revolution of the late 1800s placed new products on the market, the social and legal climate at that time gave them an esteemed position. The legal concept was *caveat emptor*—let the buyer

beware. Complaints about a product usually were virtually ignored. The law held that a buyer was negligent for not examining a product for defects at the time of purchase.

A manufacturer was further protected by “privity of contract,” or the doctrine of privity. It limits the parties involved in a negligence case to those directly involved in a transaction—the buyer and seller. As long as a manufacturer was not part of the direct selling of its product, there was no need for concern over suits from buyers. There was little need to worry about defective and unsafe products. In 1916, the decision in *MacPherson v. Buick Motor Company*<sup>1</sup> ended the privity doctrine for negligence cases and opened the door to changes in product liability law. The court ruled negligence occurred on the part of a remote (from the sales transaction) manufacturer of an automobile for a defectively made wheel that broke and injured the plaintiff. The court’s opinion noted: “Without regard to a contract between buyer and seller and when a buyer is not likely to check a product for defects, the manufacturer of a thing of danger has a duty to make it carefully.”

Similarly, a 1960 decision removed the doctrine of privity as a barrier in implied warranty cases.<sup>2</sup> The court held that a buyer is not capable of determining the fitness of an automobile for use. It also recognized that under modern market conditions, a manufacturer who places a product on the market and promotes its sale becomes a party to the sale through implied warranty.

In 1962, the theory of strict liability emerged. It removed the need to show breach of express warranty on the part of a plaintiff.<sup>3</sup> The court ruled: “A manufacturer is strictly liable in tort when an article he places on the market, knowing that it is to be used without inspection for defects, proves to have a defect that causes injury to a human being.” In 1965, the American Law Institute published the Second Restatement of Torts (Section 402A). Most courts accept it as the rules for strict tort liability.

As a result of the changes in liability law, approximately 95% of all liability suits are now handled under the theory of strict liability. With these shifts in the law, society has recognized that users and consumers should receive compensation in many cases for injuries resulting from defective products. The legal pendulum has swung from manufacturers, who had been virtually immune from liability, toward users and consumers. Adjustments in product liability continue as the courts determine if the pendulum has swung too far in favor of product users or not far enough. More recently, the use of negligence has increased and there is a growing effort to limit liability and to minimize frivolous product liability suits.

### 7-3 PRODUCT LIABILITY EVIDENCE

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The plaintiff in a product liability lawsuit must bring certain evidence in support of his claim. Except in expressed warranty cases, the plaintiff must prove

1. that the product was defective
2. that the defect existed at the time it left the defendant’s hands
3. that the defect caused the injury or harm and was proximate to the injury

In strict liability, cases no other evidence is required to establish the basis for a case. However, under negligence, additional evidence is needed. The plaintiff must show that the defendant was negligent in some duty toward the plaintiff. In warranty cases, the plaintiff must merely show that a product failed to meet implied or expressed warranty or represented claims for the product.

The defendant may use a number of defenses for the three kinds of evidence. The questions surrounding the existence of a defect in a product can be complex. The defendant may try to show that although the product is dangerous, the danger by itself is not a defect. The defendant may try to show that the plaintiff altered the product or unreasonably misused it. The defendant may claim that the product met accepted standards of government, industry, or self-imposed standards related to the product, to the claimed defects, and to the use of the product. In addition, the defendant may try to show that the product did not cause the injury or was not the proximal cause.

## 7-4 NEGLIGENCE

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Besides the three elements of evidence just noted, a plaintiff acting in a negligence case must show that the defendant had a duty toward the plaintiff in providing a product free of the claimed defect and was negligent in performing that duty. Negligence includes acts of omission (failure to act) or commission (performing an act). Because negligence has to do with the behavior of an individual or organization, it is often very difficult for the plaintiff to gather sufficient information about the behavior of the defendant to prove negligence. It would be difficult, for example, to show what decisions a defendant made in the process of designing a product. It may be hard to find out how or why they were made. Such records may not exist. Similarly, without the defendant's records it would be difficult to portray a quality control program in manufacturing that was not being implemented according to policy and standards for the batch containing the injury-causing product. Through discovery procedures, a plaintiff can seek to obtain such information about the defendant if it exists. A plaintiff may attempt to demonstrate that a manufacturer did not use technology available at the time the product was made.

A defendant may claim that he had no duty toward the plaintiff or that the duty was performed without negligence. The defendant may argue that he met government, industry, consensus, or even self-imposed standards and standards of professional practice applicable to the product or the defect. The defendant may try to show that the plaintiff was negligent in the use of the product (contributory negligence), which led to the injury. The defendant may also try to show that the plaintiff was fully aware of the defect and voluntarily accepted the risks associated with the defect in using the product.

In judging behavior on the part of a defendant or plaintiff, actions are compared with the "reasonable person." Negligent conduct occurs only when an act is less than that which a reasonable person would have performed under similar circumstances. Creating the reasonable person standard opens the door for many legal arguments. Included are arguments about the probability of preventing harm, the likelihood that injury will occur, how serious a resulting injury would be, and the cost of preventing injury from occurring.

## 7-5 WARRANTY

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There are two types of warranty: implied and express. Through the Uniform Commercial Code, adopted by nearly all states, the user or consumer of a product receives some guarantee regarding the quality of a product. This is implied warranty. Implied warranty is divided into (1) merchantability and (2) fitness for a particular purpose. Merchantability means that a product is fit for the ordinary purposes for which such goods are used. Merchantability applies only to the sellers who normally deal in particular goods. Buyers

assume that such sellers have knowledge about the products they sell. Buyers do not expect the same kind of expertise about a product with a one-time seller.

The other type of implied warranty is fitness for a particular purpose. Before purchasing a product, a buyer may wish to know whether a product will perform for a particular application, not just in general. The buyer may ask the seller for advice, a recommendation, or to select a suitable product. If the product purchased on the basis of the seller's assistance does not perform, the implied warranty of fitness for a particular purpose is breached.

Implied warranty is a branch of contract law rather than a tort. If injury results to the buyer from the intended use of the product, the buyer can act against the seller. The buyer and members of the buyer's household are the only persons who can bring a case against the seller. However, the buyer cannot act against the producer of the product under this theory.

Express warranty occurs when a seller makes expressed claims or representations for a product that become a basis for the bargain. The plaintiff must establish only that the product failed to meet the seller's warranty or representations and that an injury resulted from the failure. The plaintiff does not have to prove that a defect or unreasonable danger existed in the product.

Advertising frequently creates express warranty. Overselling a product and making claims for characteristics it does not have can lead to product liability lawsuits. In an early case of this nature, the purchaser of a new automobile relied on the manufacturer's claim that the windshield was shatterproof.<sup>4</sup> While driving the car, a stone struck the windshield and a fragment of the glass lodged in the plaintiff's eye, causing injury. The plaintiff received compensation in the case. The court ruled:

[It would] be unjust . . . to permit manufacturers . . . to create a demand for their products by representing that they possess qualities which they, in fact, do not possess, and then, because there is no privity of contract existing between the consumer and the manufacturer, deny the consumer the right to recover if damages result from the absence of those qualities when such absence is not readily noticeable.

One problem associated with express warranty is trying to differentiate actual misrepresentations from overstatements of a product's qualities (called puffing) that buyers typically expect salespeople to make. In express warranty cases, a jury must decide if there is misrepresentation.

## 7-6 STRICT LIABILITY

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Negligence is difficult to prove. Warranty often restricts the parties involved in a case to buyer and seller. As a result, the theory of strict liability emerged in the early 1960s. Operating under the Second Restatement of Torts, Section 402A,<sup>5</sup> a plaintiff in a strict liability lawsuit does not have to prove negligence. The behavior of the defendant is irrelevant. The defendant cannot show how well his quality control or product safety program was operated to prevent defects. Neither must breach of warranty be proven. Strict liability focuses on the qualities of the product that caused injury. The plaintiff must present the three fundamental elements of evidence:

1. that the product was defective
2. that the defect existed at the time it left the defendant's hands
3. that the defect caused the injury or harm and was proximate to the injury

## 7-7 DEFECTS

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Defects in a product may arise from design, from manufacturing, or from inadequate warnings and instructions. Defects are conditions that are not compensated by the ultimate consumer and that are unreasonably dangerous to him or her.

### Design Defects

Design defects are unreasonably dangerous characteristics of a product resulting from decisions, calculations, drawings, or specification of the design process. Design defects occur in all products of a particular make or model.

There are many factors in design from which defects may result. One factor is selection of materials. For a particular product, selection of materials is based on such considerations as cost, durability, function, maintenance, appearance, and strength. In one case involving selection of materials, the use of soft pine that was not acceptable for ladders according to a consensus standard resulted in a plaintiff winning a negligence case.<sup>6</sup>

Another design factor involves management of energy. A baseball pitching machine depended on a spring to energize the arm and cause it to throw a ball. Even when the machine was unplugged, the spring could be storing energy that could be released suddenly. A boy's face was injured by such a machine. He recovered damages when vibration caused the catch holding the spring and arm to release.<sup>7</sup>

Providing functional features in a product is another important factor in design. Reasonable safety in arrangement of features is needed. For example, an outdoor lounge was designed to adjust to different positions. However, the court found it to be unreasonably dangerous when a plaintiff severed a finger in the part of the chair's arm that moved for adjustment.<sup>8</sup>

A design must include safety features. The court found the design of an earth-moving machine defective because it did not have a rearview mirror as a safety feature. A mirror would allow the driver to see a blind area behind the machine when backing up. A worker, standing in the blind zone, was injured and recovered damages from the manufacturer when the machine backed over him.<sup>9</sup>

An important factor to consider in design is the use environment. Use environment refers to the context in which a product is used. What may otherwise seem safe could become unreasonably dangerous when one understands the physical, social, and behavioral context for the product's use. For example, it is likely that a storm door will face the impact of a rolled-up newspaper thrown by a delivery boy. The use environment includes such behavior. Another example is the load a kitchen drawer must withstand when a child uses it as a step to climb to the countertop.

In product design, it is important to comply with government and consensus standards. Lack of compliance may prove that a design defect exists. Standards are minimums. Even complying with them will not ensure that a design is adequate. The best protection is designing out the hazard. One should note that standards may go beyond published standards; they can include standards of practice. Standards of practice may be principles or practices appearing in textbooks or taught in courses or practices typically used in a discipline or a company.

Besides complying with standards, it is important for designers to stay abreast of technology, even that outside their specialty field. Failure to use available technology in a design may place unnecessary liability on a product.

## Manufacturing Defects

Manufacturing defects occur in a limited number of products of the same make. A manufacturing defect in a product can be identified easily by comparing a good product from the same manufacturer with the defective one. Manufacturing defects usually result from inadequate quality control, testing, and inspection or from errors in assembly. One example of a manufacturing defect is a poor weld that fails at a later time.

The legal doctrine of *res ipsa loquitur*—the thing speaks for itself—frequently applies to negligence cases involving manufacturing defects. Classic cases are exploding soft drink bottles or food products containing foreign material, such as metal or glass.

## Defects in Instructions and Warnings

A product may meet all necessary standards of design and contain no production flaws, yet it may be unreasonably dangerous, because instructions for use or warnings about dangers during use or misuse are inadequate or absent. Under both the theories of negligence and strict liability, a supplier has a duty to warn of dangers that remain in a product or occur during its use. See Chapter 35 for a discussion of some standards requiring risk analysis, hazard reduction, and protection for hazards that remain.

One must make a clear distinction between instructions (or directions) and warnings. Warnings identify dangers inherent to the product or dangers that may result from its use or misuse. Instructions explain how to use a product effectively or safely. Instructions explain what actions one must take to eliminate or reduce the likelihood of injury from a product's dangers.

Instructions and warnings must have many characteristics that are based on good writing skills, knowledge of use environments, ergonomic principles, and other factors. Table 7-1 lists 15 important characteristics of warnings.

A common error in writing instructions is representing them as descriptions of what a product does, not as imperative statements or what steps must be followed and in what order. A review of warnings by legal experts, human factors specialists, users, and others may be helpful in making them effective. Also important is the education, reading skills, and ability of the ultimate user and the language of the warning or instructions. Warnings and labels also are discussed with several other topics.

## 7-8 MISUSE AND FORESEEABILITY

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In some product liability cases, the supplier of a product may be liable even when a product is used for some purpose or in some manner other than intended. In cases of misuse, the courts use a test of “foreseeability.” This test determines whether a misuse reasonably could have been anticipated on the part of the supplier. A classic case involving foreseeability is that of a child standing on the open door of a kitchen range to reach something in the cupboard and having the range tip over on him. A manufacturer must allow for abuses and misapplication of a product and minimize the liability by designing the product for or providing warnings and instructions that address foreseeable misuses.

## 7-9 MODIFICATIONS AND SUBSTANTIAL CHANGE

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A defect must have existed at the time the product left the defendant for liability to exist. Sometimes a user or owner modifies or alters a product in some way during its life. A sup-

**TABLE 7-1 Characteristics of Warnings**


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<b>READABILITY.</b>	The ability to read or receive a message. Multiple languages, pictorials or symbolics, and braille are all methods to ensure that a message is received.
<b>UNDERSTANDING.</b>	The ability to understand individual components of a message. Some words are beyond the vocabulary of certain readers. Not all symbols are recognized or understood by every viewer.
<b>COMPREHENSIBILITY.</b>	The ability to understand the overall message. Messages must be simply stated, must require little technical or specialized knowledge, and must be precise.
<b>PRACTICALITY.</b>	The ability to heed or comply with a warning in light of behavior that is normally expected or given a normal context for the warning.
<b>EFFECTIVENESS.</b>	Having valid and reliable test data to establish whether a warning does, in fact, communicate its message and is not just assumed to do so by its writer or designer.
<b>BEHAVIOR MODIFICATION.</b>	Achieving the behavior desired by the warning, that is, preventing unsafe or injury-causing acts that might otherwise occur.
<b>COMPATIBILITY.</b>	Suitable for and consistent with expectations of individual applications. Warnings should agree with local customs and practices, should be consistent in similar situations (standardized), should meet requirements of consensus and local standards, and should be appropriate for a particular application situation.
<b>CONSPICUOUS.</b>	Provide a reasonable certainty of perception, without search and in a short time. This characteristic includes size, color contrast, stimulus novelty, brightness level, and other characteristics.
<b>DURABILITY.</b>	The ability to resist environmental conditions, such as abrasion, wear, wetness, chemicals, sunlight, and so forth.
<b>RELIABILITY.</b>	Must be present when needed. This property is particularly applicable to visual and audio warning devices that must act when a danger is present.
<b>REINFORCEMENT.</b>	Giving people additional or more detailed data about a warning or its importance through training sessions, operating manuals or other means. The goal is to influence the receiver's sensitivity toward the warning.
<b>DANGER SIGNAL.</b>	Attention-getting enhancements, such as underlined or boxed text, bright colors, signal words like danger or warning, special auditory tones, and so forth.
<b>PLACEMENT.</b>	Locating warnings where they are likely to be seen or heard and where the danger is; proximity in distance and time.
<b>NOVELTY.</b>	Use of attention-getting features like animation, voice synthesized messages, color, and so forth.
<b>TYPE.</b>	Classification of purpose or function. For example, one might classify a warning as (a) advisory, (b) explaining what to do, (c) reminder, and so forth.

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Derived from G. A. Peters, "15 Cardinal Principles to Ensure Effectiveness of Warning Systems," *Occupational Health and Safety*, May:76-79 (1984).

plier is responsible for those risks that he introduced. He may be liable for some modifications introduced by a user, but generally, the one who modifies a product is liable for modifications. Failure to include an important feature, which then necessitates a user modification, may shift the liability to a manufacturer.

## 7-10 STATUTE OF LIMITATIONS

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Another problem for a manufacturer is that of expected product life and its role in liability. Many states have statutes of limitations that limit the period during which product liability claims can be filed. The time allowed under statutes of limitations varies considerably, but usually involves a fixed number of years from the date of sale or a time



limit for claim after injury. A typical design problem is whether the product and its components will fail within the statute of limitations period and whether the failure may lead to injury.

## 7-11 THE LAWSUIT PROCESS

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The procedures for a liability suit involve three main steps: complaint, discovery, and trial. Variations from this simplified model occur in particular cases. Within each step, a number of activities may occur and the entire process can end at any point. A number of factors can impact conclusion of a case. A defendant may find that a plaintiff has a good case. Parties may want to avoid legal costs and reach a settlement. A defendant may petition the judge overseeing the case for a summary judgment that removes the defendant from the case. A defendant may not want the arguments to become general knowledge through case law.

### Complaint

In the first step, the attorney for the plaintiff files a complaint with the court that has jurisdiction. Before filing a complaint, significant investigation may be needed to establish that a lawsuit has a reasonable chance of success. After the defendants receive a copy of the complaint, defense attorneys usually deny the accusations. In suits naming several defendants, each defendant may file a petition stating why they should not be named in the suit. One defendant may bring additional defendants into the case by filing additional complaints against the additional parties.

There are several reasons for naming a person or organization as a defendant in a complaint: the potential defendants have a duty toward the plaintiff and may have a role in a defect causing injury to the plaintiff. Another consideration is the ability of the defendant to pay damages. A defendant with the capability (through assets or insurance) to pay is commonly called a deep pocket.

### Discovery

In the discovery step, the plaintiff sends written interrogatories to the defendant, who may have to answer them in a certain number of days. The defendant may not have to answer them if they are unreasonable or cause unreasonable expense to prepare an answer.

Based on the complaint and written interrogatories, each party begins to develop its case by identifying witnesses who will testify in the case. Each party may question the opponent's witnesses under oath in discovery depositions. A legal reporter makes a record of the questions and answers. The plaintiff and others who may have witnessed the injury events are deposed. Expert witnesses—persons with specialized knowledge, like doctors, engineers, and others—may be deposed about their knowledge and opinions of the facts in the case. Each side develops a sense of whether they can win the case. If both believe they have solid arguments, the process continues into the trial step. If there is a good case but the issue revolves around which parties must pay, the case may also continue. If the plaintiff has a weak case, one or more defendants may petition the court for dismissal.

### Trial

In a jury trial, each side presents its arguments. Witnesses are questioned once again under oath. Not all witnesses in the deposition step may appear at trial. An attorney may ques-



tion a witness about statements made during a deposition. After each side completes arguments, the jury must decide whether the plaintiff should receive compensation and how much to award. If the case involves the theory of comparative negligence (allowed in some states), the jury must decide the portion of negligence attributable to each party and apportion the total award accordingly. For example, a manufacturer might be assigned 20% of the total dollar value of an award, a user 50%, and the employer 30%.

At any time before a case goes to the jury, the parties may negotiate a settlement. If a settlement is reached before the case goes to a jury for a decision, the evidence presented does not go on the court record. As soon as the jury is given the case for decision, the evidence presented is public record. Similar cases by others may use information in the court records.

## 7-12 EXPERT WITNESSES

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If the facts in a legal case involve specialized and technical subject areas, expert witnesses may testify in the case. In product liability cases, engineers often are needed to testify about a product, existence of defects, use of the product, design alternatives, negligence, compliance with published standards or standards of practice, the state of the art, and other matters. A case may require the expertise of engineers, safety professionals, and other specialists.

Besides giving testimony, an engineer may serve other functions in a product liability case. An engineer may help the attorney understand the technology involved in the case; may help establish whether a defect existed through testing and evaluation of products, literature searches, or other means; may help reconstruct the incident and help the attorney prepare interrogatories; and may locate standards, gather facts, and perform tests.

Before an engineer serves as an expert witness, the attorney doing the hiring will determine whether the potential witness is qualified in the area of specialization needed. The attorney will examine the candidate's training, experience, and professional credentials. Later, in depositions or at trial, the opponents may challenge the qualifications of the expert to testify on the subject matter in question.

Ultimately, the attorney will seek the technical opinions of the expert on issues in the case. Often sought are opinions "with a reasonable degree of scientific and engineering certainty." In a legal sense, this infers a certainty of 51% or more. The question is whether the expert is more sure than not sure on an issue. It is not to be confused with certainty in a statistical sense, where one uses a 95% or similar confidence level in drawing inferences or conclusions from data.

## 7-13 REDUCING LIABILITY RISKS

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There are risks in any product. A manufacturer or seller of a product must face those risks in putting a product on the market. A manufacturer or seller cannot prevent a user from initiating a lawsuit after being injured by a product. However, liability does not mean absolute liability. A manufacturer or seller can minimize liability in a number of ways. Attorneys will defend a manufacturer in the courts. Engineers can prevent many lawsuits by defending the manufacturer in design, manufacturing, packaging, and the marketplace.

For product liability, the primary role of an engineer is to remove unreasonable dangers from products and environments and to prevent defects from reaching the marketplace. Products with few defects will produce few product injuries and even fewer

liability claims. Engineers must account for the use environment, foreseeable misuses, product life, possible product modifications, hazards, potential injury, seriousness of injury, compliance with standards (as a minimum), state-of-the-art practices, quality control, packaging and handling, advertising, and claims for products. They must face concerns like cost, function, maintenance, maintainability, and durability of a product. Engineers must see that warnings identify remaining hazards and instructions necessary for user protection. There are detailed programs and guides for managing these items in a systematic way.

A good technique for reducing hazards in a product is thorough design review. A review team not involved in the design, and thus independent and with limited bias, can analyze a product for hazards and acceptable controls. The team may include engineers, attorneys, safety professionals, and others. The collective knowledge and experience of the team can provide a broad foundation of experience and expertise. The review team may work closely with the designers throughout the design process, rather than coming in after a design is completed. Sometimes this review team is called an audit team, particularly when the team is reviewing for compliance with laws, regulations, standards, and practices.

## EXERCISES

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1.
  - (a) Select a product. Identify its primary use.
  - (b) Try to identify possible use environments for it.
  - (c) Try to identify foreseeable misuses and the hazards involved.
  - (d) Evaluate the product for product safety. Consider alternatives for design and manufacture that would reduce or eliminate its hazards.
  - (e) Compare design alternatives in terms of risk, cost, function, product life, and other factors.
  - (f) Prepare a set of instruction for use of the product.
  - (g) Prepare a set of warnings for the product and its hazards and draft instruction for its safe assembly, installation or use.
2.
  - (a) Obtain the warnings and instructions accompanying some product. Identify uses and misuses for the product.
  - (b) Determine whether the warnings and instructions adequately identify the risks for a user and whether instructions adequately tell users how to protect themselves from the risks.
3. Arrange with an attorney working on an actual product liability case or a law school holding mock proceedings to monitor the deposition of an expert witness or the conduct of a trial.

## REVIEW QUESTIONS

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1. What are the three theories of product liability?
2. Explain major differences among the three theories.
3. What evidence must the plaintiff provide for each of the three theories?
4. Under which theory are most product liability lawsuits argued today?

5. What is absolute liability?
6. What is privity of contract or the privity doctrine?
7. What is contributory negligence?
8. What is a defect?
9. What are the three types of defects? Give an example of each.
10. What is the difference between warnings and instructions?
11. Name at least five characteristics of warnings.
12. What is the doctrine of proximate cause?
13. What is *res ipsa loquitur*?
14. What does *caveat emptor* mean?
15. What is the statute of limitations?
16. Explain the role of an engineer as an expert witness.
17. How can engineers reduce liability for a product?
18. What is the reasonable person test?
19. What is merchantability?
20. What is comparative negligence?
21. Explain the difference between implied and express warranty.
22. What does “reasonable scientific and engineering certainty” mean?

## NOTES

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- 1 217 New York 382, 111 Northeastern 1050 (1916).
- 2 *Henningsen v. Bloomfield Motors*, 32 New Jersey 358, 161 Atlantic 2d 69 (1960).
- 3 *Greeman v. Yuba Power Products, Inc.*, 59 California 2d 57, 27 California Reporter 697, 377 Pacific 2d 897 (1962).
- 4 168 Washington 456, 12 Pacific 2d 409 (1932).
- 5 *Restatement (Second) of the Law: Torts*, American Law Institute, St. Paul, MN, 1965.
- 6 *Wilson v. Loe's Asheboro Hardware, Inc.*, 259 North Carolina 660, 131 Southeastern 2d 501 (1963).
- 7 *Dudley Sports Co. v. Schmitt*, 279 Northeastern 2d 266 (Indiana App.) (1972).
- 8 *Mathews v. Lawnlite Co.*, 88 Southern 2d 299 (Florida) (1956).
- 9 *Pike v. Frank G. Hough Co.*, 2 California 3d 465, 85 California Reporter 629, 467 Pacific 2d 229 (1970).

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