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# Guidelines to managing product liability risk for silica-containing building products

Ricky Lee Chan

# GUIDELINES TO MANAGING PRODUCT LIABILITY RISK FOR SILICA-CONTAINING BUILDING PRODUCTS

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A Project

Presented to the

Faculty of

California State University,

San Bernardino

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In Partial Fulfillment

of the Requirements for the Degree

Master of Business Administration

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by

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March 2006

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ABSTRACT

The purpose of this project is to develop guidelines that manufacturers of silica-containing building materials can use to manage the risk of product liability claims. These liabilities, if not managed properly, can cost a manufacturer millions of dollars.

By reviewing and applying product liability legal principles to the properties that are unique to the silica-containing building products category, a more tailored plan can be developed to help mitigate product liability risks. However, this project discovered some significant complexities in dealing with this product category. Because of these complexities, recommendations from this project include: spending adequate resources to ensure a well-thought plan is developed; having the plan overseen or reviewed by a legal expert; and using expert technical assistance to evaluate the risks and provide guidance.

Despite the complexities, a template plan is provided that can still help a manufacturer organize a product liability plan.

## ACKNOWLEDGMENTS

I would like to thank the faculty and staff of the Master of Business Administration Program for Executives at the California State University, San Bernardino for their patience and persistence at prodding the project process along. I am sure that without their help, instead of writing this acknowledgement, I would still be writing, "Chapter One."

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# CHAPTER ONE

# INTRODUCTION

## Introduction

The contents of Chapter One present an overview of the project, including its purpose, significance and the scope. This chapter also summarizes the overall approach of the project and the organization of this document.

## Purpose of the Project

The purpose of this project is to develop a set of guidelines for managing product liability risk associated with building products that contain crystalline silica. Crystalline silica is a naturally-occurring material that has the potential to cause disease that, in some cases, may become fatal (National Institute of Occupational Safety and Health, 2002). These guidelines could be used by manufacturers to develop specific plans to minimize liabilities associated with the use of such products.

## Significance of the Problem

Product liability claims present a significant financial threat to any company that manufactures or distributes products that pose a potential safety risk to the users of these products. According to a Rand Institute of Civil Justice study, average awards in product liability cases in San Francisco, California, and in Cook County, Illinois, increased from $100,000-200,000 in the early 1960s to over $800,000-1,000,000 in the mid-1980s (Henseler et al., 1987). In 2002 to 2003, 66 percent of product liability awards nationwide topped $1 million and, in 2004, there were three product liability cases that topped the $100 million mark, including one award of $1 billion (Dial et al., 2005).

Not only have the average awards been increasing at an alarming rate, but the number of claims has been increasing dramatically. Between 1974 and 1990, the number of product liability suits filed in federal courts increased 1,200% with more than 17,000 businesses being named as lead defendants (Emmons et al., 1995).

Recently, liability claims associated specifically with crystalline silica have been rising dramatically. As of June 2003, for instance, the large silica and sand producer, U.S. Silica, reported 22,000 claims filed against it as compared to 3,505 the year before (Warren, 2003). This dramatic increase in filings has occurred despite a trend of decreasing silica-related deaths from 1,157 in 1968 to 187 in 1999 as reported by the U.S. Center of Disease Control (National Institute of Occupational Safety and Health, 2003).

Thus, with a trend of increasing average awards in the United States exceeding the $1,000,000 mark, and the dramatically increasing number of claims related to crystalline silica, it is imperative that businesses dealing with products containing crystalline silica manage these risks appropriately. Understanding the risks and developing a plan to manage those risks is key to eliminating or minimizing any financial loss associated with such claims.

## Scope of the Project

This project focuses specifically on guidelines for a plan to manage product liability risk, as part of an overall risk management strategy. These guidelines address a plan to reduce the likelihood of successful claims against a business. Although at least as important for managing the business risks associated with product liability, this project did not address the identification and management of resources that could be necessary to pay for any claims or associated expenses (e.g., insurance, reserves).

Although many of the concepts and ideas presented in this project can be applied to other product liability claims, this project is specifically designed for the manufacturers of building products that contain crystalline silica. This group is unique because: (1) The onset of silica-related disease can sometimes be over 20 years after exposures, making the claim more complicated to make and defend (National Institute of Occupational Safety and Health, 2002); and (2) the building products industry (makers of materials used in construction) must concern themselves with *both* industrial users (e.g., professional construction contractors that routinely deal with building materials) and private consumers (e.g., homeowners that conduct their own home projects and may only occasionally use building materials). As described later in this document, the nature of a company's responsibility towards these different end-users may vary. Other businesses, such as companies that produce crystalline silica, may only have to concern themselves with the industrial user.

These guidelines were developed to address product liability in the United States. As such, the legal concepts and definitions used to develop the guidelines are specific to United States laws. Discussion of other countries as part of this project are only done in the context of either historical trends or impacts that other country's actions might have on product liability in the

United States. For instance, if a law or regulation requires a more stringent product warning in a particular country other than in the United States, a company might have to consider whether an adoption of that more stringent warning would be necessary globally to avoid the perception that different standards of care are applied to different countries.

## Approach to Developing Guidelines

The guidelines were developed by reviewing existing United States legal concepts and definitions relevant to product liability. Additionally, recent relevant case law and opinions are reviewed, as appropriate, to understand trends. These legal concepts and opinions form the basis for the development of these guidelines.

## Report Organization

This project report is divided into five chapters. Chapter One (Introduction) discusses the overall purpose and relevance of the project. Chapter Two (Background) describes historical information regarding product liability, the building products industry and crystalline silica issues to put the project in context. Chapter Three (Legal Considerations) discusses legal concepts, definitions, recent case law and opinions pertinent for consideration in developing a plan for managing product liability risks. Chapter Four (Guidelines) outlines and discusses the elements that businesses need to consider when putting a plan together. Chapter Five (Closing Remarks) reiterates some of the limitations of the guidelines and emphasizes the need to manage these product liability issues. Based on the guidelines provided in Chapter Four, a template plan was prepared and included as an Appendix to this document. A list of project references follows the appendix.

# CHAPTER TWO

# BACKGROUND

## Introduction

Chapter Two discusses background material relevant to the project. A historical perspective of product liability will suggest the potential financial impact that could occur if product liability risk is ignored. A discussion of the building products industry will provide the reader with the sense of magnitude of individual and industry loss that such risk could impose and together with a description of what crystalline silica is and why it is of such great importance in managing product liability risk.

## The History of Product Liability

Product liability is an area of tort law dealing with claims associated with product defects (Cross & Miller, 2004). The traditional means of recovering remedies in product liability claims was based on contract law where the *privity* of contract rule was applied (i.e., there had to be a direct relationship between the seller and purchaser of a product for a claim to be valid (Emmons et al., 1995; Yelkur et al., 2001)). Prior to 1916, to make a claim against a manufacturer of a product, a series of purchaser-seller relationships would have to be made from the original plaintiff to the original manufacturer of a product (Emmons et al., 1995). Thus, if a consumer wanted to make a claim against a manufacturer, he/she would have to claim a series of relationships that might involve a retailer, wholesaler, distributor, and, ultimately, the manufacturer.

However, in 1916, in MacPherson v. Buick Motor Co., the New York Court of Appeals ruled that the privity rule was superceded when a product defect made a product dangerous (Emmons et al., 1995). This opened the doors for consumers to sue manufacturers directly in these types of cases even though not in privity with the manufacturer (Emmons et al., 1995). But even in such cases, the claim had to demonstrate that there was *negligence* involved - the failure to exercise that degree of care that a reasonable, prudent person would have exercised under the same or similar circumstances - to be successful (Cross & Miller, 2004; Emmons et al., 1995).

The first rules of *strict liability* - liability without privity and without the necessity of proving negligence - were established in the food industry under an implied warranty theory (Emmons et al., 1995; Stearns, 2001; Yelkur et al., 2001). In 1960, the New Jersey Supreme Court in Henningsen v. Bloomfield Motors expanded this concept to all types of products and to every foreseeable user of the products (Stearns, 2001). Additionally, in 1963, the California Supreme Court in Greenman v. Yuba Power Products further clarified that product liability was not covered by the law of warranties, sometimes used as a basis for imposing strict liability in product liability cases, but by the law of strict liability, stating that "to establish the manufacturer's liability it was sufficient that the plaintiff proved he was injured while using the [product] in a way it was intended to be used as a result of a defect in the design and/or manufacture of which the plaintiff was not aware that made the [product] unsafe for its intended use" (Stearns, 2001).

In the 1960s, most states began imposing greater accountability on manufacturers by applying, under certain circumstances, these strict liability concepts (Emmons et al., 1995; Yelkur et al., 2001). These court interpretations ultimately led to a law codified in the Second Restatement of Torts in 1965 that established strict liability for products that were "unreasonably dangerous" - based on the expectations of the ordinary consumer (Yelkur et al., 2001).

Instead of demonstrating privity in product liability cases, a plaintiff could now invoke the doctrine of *joint and several liability* - a rule that makes each individual who contributes to an injury liable for the entire sum of awarded damages in about one third of the states or liable for that portion of the damages for which the individual was responsible (*proportionate liability*) in 33 states (Perkins Coie Product Liability Practice Group, 1999; U.S. Department of Justice, 2000).

Not surprisingly, claims rose significantly during the period after the 1960 decisions. Between the period of 1974 and 1990, the number of product liability suits filed in federal courts increased 1,200%, with more than 17,000 United States businesses being named as lead defendants (Emmons et al., 1995). Awards have also trended upward from averaging $100,000-200,000 in the early 1960s to having 66 percent of awards exceed $1 million in 2002-2003 (Dial et al., 2005; Henseler et al., 1987).

Awards can include both *punitive awards* - awards which are imposed as punishment for intentional wrongdoing to deter future occurrences of a similar wrong - and *compensatory damages* - awards which are calculated based on actual losses as a dollar value (Cross & Miller, 2004). Punitive awards are usually only awarded in cases involving intentional torts - cases where the perpetrator intended the consequences of his/her actions - or in cases of gross negligence - the intentional failure to perform a manifest duty in reckless disregard for the consequences of such a failure (Cross & Miller, 2004).

Because the purpose of punitive awards is to punish the perpetrator and to deter others from conducting themselves similarly, these awards can heavily outweigh the compensatory damages awarded. For instance, in Grimshaw v. Ford Motor Company in 1981, a jury awarded $2.5 million in compensatory damages plus $125 million in punitive damages because, even though the fatal accident rate of a Ford Pinto was no greater than other subcompacts, the cost of a single $10 part by Ford could have prevented a rear-end collision victim's death (Yelker et al., 2001). In essence, this was a jury's denouncement of a perceived "profits-over-lives" policy (Yelker et al., 2001).

However, some recent decisions by U.S. Supreme Court decisions have provided some guidance designed to prevent excessively high punitive awards. In BMW of North America, Inc. v. Gore in 1996, where a lower court jury awarded $4 million in punitive damages along with the compensatory award of just $4,000, the U.S. Supreme Court ruled that excessive punitive damages violated procedural due process and established three guideposts to determine excessiveness: (1) The reprehensibility of the defendant's conduct; (2) the ratio to compensatory damages awarded; and (3) comparison of punitive awards with civil and criminal penalties that could be imposed for similar conduct (Yelkur et al., 2001; U.S. Supreme Court, 1996).

Furthermore, in State Farm Mutual Automobile Insurance Company v. Campbell in 2003, the U.S. Supreme Court struck down a jury's $145 million punitive verdict beyond the awarded compensatory damages of $1 million as excessive and further clarified that rarely would a punitive award that exceeded a single-digit ratio between punitive and compensatory damages be seen as satisfying due process (U.S. Supreme Court, 2003).

A study in 1987 found that one in ten defendants in California were assessed punitive damages (Peterson et al., 1987). Punitive damages also tend to be higher for wealthy defendants since punitive damage's effectiveness depends on a defendant's ability to pay (Emmons et al., 1995).

Class action suits - claims made collectively by a group of individuals with a common cause - are another avenue by which large awards are granted. However, the punitive damage portions of such awards may be less than if individually claimed (Emmons et al., 1995).

One change that has occurred that favors the manufacturer is the allowance of the *comparative negligence* theory - the sharing of liability among the negligent parties (including, possibly, the plaintiff) based on the proportion of the negligence for which each party was responsible (Emmons et al., 1995).

The many uncertainties in product liability cases make it difficult to manage. Different states have different state laws governing product liability. Additionally, these laws tend to be modified frequently (Manley, 1987). Thus, the inconsistency of product liability laws makes manufacturer's liabilities difficult to ascertain without complex analysis (Yelkur et al., 2001).

Product Liability Reform

There have been many attempts to reform the existing product liability structure under tort laws. However, there have also been many obstacles in effecting these changes and, thus, great uncertainty about the future assessment of such claims. In 1986, liability-limiting legislation was declared unconstitutional (Manley, 1987). Even if reforms are enacted, it is uncertain if the verdict amount or number of claims will be reduced. Manley (1987) noted that even with anticipated reforms coming in 1990, product liability insurance rates had not gone down prior to that time.

State law differences point to the need for a federal law to make the application of product liability claims more consistent (National Association of Mutual Insurance Companies, 2005). Leading up to 1994, the U.S. Congress had consistently blocked reform legislation (Emmons et al., 1995). Tort reform that would have established a statute of limitation on claims and would have put a cap of $250,000, or twice the amount of a plaintiff's economic and non-economic damages, was vetoed by President Bill Clinton in 1996 (Yelkur et al., 2001). Most recently, President George W. Bush, in his State of the Union address on February 2, 2005, reiterated a call for federal tort reform (Kaiser Daily Health Policy Report, 2005).

One of the difficulties in passing tort reform is that it has been very politicized. The advocates for reform claim that such changes would be good for all, while the activists resisting reform, claim that the threat of liability is a deterrent for big business to produce unsafe products, and would also hinder innovation (Yelkur et al., 2001).

Product Liability Trends Outside the United States

With the increasing globalization of businesses, product liability claims outside of the United States cannot be ignored.

In 1985, the European Union established a product liability directive to limit liabilities, which Japan similarly followed in 1994 (Yelkur et al., 2001). Joseph Huggard of the Weinberg Group L.L.C., an international scientific and regulatory consulting firm from Brussels, Belgium, points out that the differences between the United States and the European Union is that the United States emphasizes individual rights and the rights of individuals to justice, whereas, in the European Union, there is a more collective view that looks at the greater good of society as a whole (Winston, 2003).

However, the European Parliament (viewed as pro-consumer) produced its "Green Paper" in 1999 which considered reforms to shift the burden of proof back to the product manufacturers to make it easier to establish liability against them. A report by Lovells, a consultant hired to review and make recommendations based on the Green Paper, noted that there had already been a noticeable increase in product liability cases, though not yet overwhelming (Fennell, 2003). Others believed that, because of out-of-court settlements that are not disclosed, that these cases might still be understated (Fennell, 2003).

## The Building Products Industry

Building products include a wide range of products used in construction. These products may be used for building roads, utilities, and commercial and residential structures. Most of these products are made from materials that fall into one or more of the following categories: (1) wood-based; (2) metal-based; (3) mineral-based; and (4) synthetic or chemically-based. Wood-based construction materials include products such as structure framing, door and window frames, flooring, roof shingles, siding, joineries and moldings, and cabinetry (National Association of Home Builders, 2004). Metal-based construction materials include such products as reinforcing steel, structure framing, door and window frames, fastening hardware, piping, flashing and wiring. Mineral-based construction materials include concrete, tiling, ceramics, glass, insulators, brick, cement fiberboard, and gaskets. Chemically-based construction materials include all plastics and rubbers including polyvinylchloride (PVC) piping and rubber molding (National Association of Homebuilders, 2004).

The Demand for Building Products

As construction activities increase, the demand for building products increases. For every million dollars of highway construction cost completed in 2001, 2002 and 2003, 457 tons of cement, 14,454 tons of aggregate, and 55 tons of steel were used (U.S. Department of Transportation, 2003). In 1999, the value of these materials used for publicly owned construction of highways and bridges was $50 million, with a prediction of a four percent increase annually over the following five years (Construction Specifications Institute, 2005).

According to the National Association of Home Builders, the average new single family home of 2,272 square feet of finished area required 3,103 square feet of roofing material, 2,335 square feet of interior ceiling material, 13,837 board feet of framing lumber, 6,050 square feet of interior wall finish, 2,269 square feet of flooring material, 3,206 square feet of exterior siding material, 3 exterior doors and 19 windows to construct (National Association of Home Builders, 2004). New housing starts (both single family and multifamily homes) increased from 1.3 million in 1980 to a projected 1.7

million in 2004 (National Association of Home Builders, 2004).

Users of Building Products

There is a large number of building product users that can potentially make a product liability claim against a building product manufacturer. There are two primary consumers for the industry: (1) the professional construction contractors that are hired to use these products in their trade; and (2) the non-professional home project users (sometimes referred to as do-it-yourselfers or DIYers).

According to the 1997 U.S. Census Bureau, there were over 5.5 million workers employed in the construction industry. These workers included those in the heavy construction industries (e.g., utility and highway construction, large public works projects), building and development contractors, and specialty contractors who spend most of their time at the actual job sites (U.S. Department of Commerce, 2000). According to the Construction Specifications Institute, the construction workforce was estimated at 7.9 million (Construction Specifications Institute, 2005). This construction labor force makes up the professional class of building product users.

Non-professional users of building products are also increasing. BuildingOnline reports that in 2004, 47 percent of adults who made decisions on home improvements did the work themselves as compared to 38 percent in 2000. Among men, 58 percent stated they do the home improvement projects themselves versus 30 percent who stated they hire professional contractors (BuildingOnline, 2004).

Building Products Liability

The contemporary landmark cases of product liability in the building products industry came at the expense of makers of building materials that were made with asbestos. Asbestos, a fibrous mineral, was used in a variety of building materials including insulation, floor and ceiling tiles, spray-on acoustical ceiling material, and in concrete as a reinforcing material. Asbestos was found to cause several diseases, including lung cancer and asbestosis. Although claims against makers of asbestos-containing products started in the late 1960s and 1970s (less than 1000 claims), these claims did not start to escalate until the 1980s when approximately 10,000 cases were filed between 1980 and 1984, with an estimated 37,000 filings between 1985 and 1989 (Insurance Information Institute, 2005).

In 2003, approximately 110,000 new asbestos claims were filed, bringing the total number of claims to 700,000 (Bloomberg News, 2005; Brickman, 2004) and some project that between one and three million additional asbestos claims may be filed over the next 20 to 40 years (Egan, 2004). According to the Rand Institute for Civil Justice, average asbestos verdicts between 1998 and 2001 increased from $2 million to $6.5 million for mesothelioma cases (i.e., a cancer of the lung lining caused by asbestos), and from $2.5 million to $5 million for asbestosis (Casualty Actuarial Society, 2004). Estimated costs by the end of 2003 to defendants was estimated at $70 billion, with final costs predicted at about $200-250 billion, despite the fact that an estimated 80-90 percent of those making a claim have no actual asbestos-related illness (Brickman, 2004; Casualty Actuarial Society, 2004). The magnitude of the awards and the number of claims made have forced 72 companies to file for bankruptcy which have included the likes of Owens Corning, W.R. Grace and the former GAF (Brickman, 2004; Casualty Actuarial Society, 2004).

## Crystalline Silica

Oxygen and silicon are the two most common chemical elements found in the Earth's crust, so it is not surprising that silica (a combination of oxygen and silicon) is one of the most common minerals found in nature (U.S. Department of Interior, 1992). There are many forms of silica that occur naturally, but crystalline silica is the most common of these forms (U.S. Department of Interior, 1992). Crystalline silica (for the purposes of this project, the terms "crystalline silica" and "silica" will be used interchangeably from this point forward even though the use of the term "silica" will only refer to crystalline silica), which can be found abundantly in all continents, is found in almost all rocks and soils Silica is also a major component of sand and dust in the air (U.S. Department of Interior, 1992).

### Silica Uses

In addition to being found abundantly in nature, silica has widespread beneficial and common uses. These include use in many household consumer products, in industrial uses, and in construction materials. In household commodity products, it may be found in abrasive cleansers, cosmetics, clay pottery and pet litter; in industry, it is used to make glass, to make molds for founding, as a filtering media for water filtration; and, in other common areas, it is found at beaches and playgrounds (beach sand), in agricultural areas (topsoil) and unwashed agricultural products, and golf courses (sand traps) (U.S. Department of Interior, 1992).

Silica is used extensively in building and construction materials. It can be found in stone and rocks, concrete, ceramic tiling and fixtures, cementatious boards, paints (as fillers), gypsum wallboard, bricks, mortar, granite countertops, joint compound, and asphalt (U.S. Department of Interior, 1992).

Silica Dangers

Inhaling fine dust containing silica has the potential to cause serious health effects. It has long been known that excessive inhalation of these fine dusts can cause a disease known as "silicosis" - a lung-scarring disease that interferes with the ability of the lung to function properly. There is no cure for silicosis, and silicosis can be fatal. Although extremely high exposures over a short period of time can cause the disease to occur in a relatively short period of time (weeks to a few years), the more common association has been with excessive, but lower levels of exposures over many years, with a resulting disease that may not manifest itself until 20 or more years after exposure (National Institute of Occupational Safety and Health, 2002).

There is also the possibility that inhaling silica may cause cancer. While some studies have concluded that there is a link between silica exposure and cancer, others have not (Graham et al., 2004; International Agency for the Research on Cancer, 1997; Steenland et al., 2001). In 1996, the International Agency for Research on Cancer (IARC) classified crystalline silica as causing cancer in humans (International Agency for the Research on Cancer, 1997).

Controversy surrounds the issue of just how dangerous silica is. The United States Occupational Safety and Health Administration (OSHA), the agency responsible for developing and enforcing regulations to safeguard the American workforce, has an established safe level that workers may be exposed to. However, other recognized institutions in the United States and around the world have identified safe levels that differ from OSHA's - some more conservative and some less conservative (American Conference of Governmental Industrial Hygienists, 2001; International Minerals Association - Europe, 2003). Thus, there is no current consensus on what a safe level is.

In the building products industry, fine dust is generally only produced when the product is disturbed - that is, in its intact, undisturbed state, there is typically no dust emitted. However, it is when these products are aggressively handled that fine dusts can be created. These activities may include such things as pouring dry ingredients together to make concrete, or sanding and grinding tuck points (i.e., the connecting points of mortar between two pieces of brick), or cutting or drilling into bricks, boards, block or tiles (National Institute of Occupational Safety and Health, 1996).

The primary parties that might be exposed would include construction contractors who perform such services as part of their craft, and do-it-yourselfers (DIYers) who take it upon themselves as individuals to do the construction. The key distinctions between these two groups is that construction contractors as a group are typically more experienced and sophisticated in their installation methods than are DIYers, construction contractors will likely handle much more construction materials in their lifetimes than a DIYer, and construction contractors are bound by regulations beyond those of the do-it-yourselfer (including being subject to OSHA regulations for worker safety).

Silica Product Liability Risk

There has been a recent spike in product liability claims being made involving silica. In addition to an increase from 3,505 claims in 2002 to 22,000 claims in 2003 against U.S. Silica, one large insurer faced 30,000 silica cases in the fall of 2003 (Glater, 2003).

Some fear that silicosis litigation may mimic asbestos litigation of the 1980s (Egan, 2004). This is not inconceivable given the numbers of individuals who could have potentially been exposed to silica. OSHA estimates that two million workers are exposed to silica each year, and NIOSH estimates that at least 1.7 million workers are on jobs in which they may become exposed to silica (National Institute of Occupational Safety and Health, 2002). For the construction industry as a whole, where employee-related exposures to building products could occur, the workforce is approximately eight million (Construction Specifications Institute, 2005). Not included in these figures are the non-employed, non-professional persons that could potentially be exposed - the DIYers.

Though some fear a repeat of what has been experienced with asbestos liability, there are interesting differences that contrast asbestos and silica. While asbestos-related deaths have been increasing over the years, silica-related deaths have dramatically decreased (National Institute of Occupational Safety and Health, 2003). One of the issues that marred the asbestos industry was that is was accused of concealing the dangers of asbestos, while the dangers of silica have been widely known (Waldmeir, 2005).

However, regardless of the differences between asbestos and silica, publicity still increases the likelihood of lawsuits involving silica. Publicity may come in the form of making the public aware of the link between a toxic substance and disease, or the possibility of collecting damages from the potentially responsible parties (Dunbar, 2002). Certainly, the publicity given to increased silica filings is somewhat self-perpetuating. However, publicity has also originated from other sources.

Publicity regarding silica has also been provided as a result of actions by several regulatory agencies and recognized scientific groups. Some of these groups have either recently implemented or proposed more restrictive exposure limits for silica, which could alert the public that these institutions have a greater concern about silica and that these institutions may not believe the existing limits are sufficiently protective (American

Conference of Governmental Industrial Hygienists, 2005; National Occupational Safety and Health Commission, 2004; Scientific Committee Group on Occupational Exposure Limits, 2002). Others have provided scientific publications on different topics alerting the public to silica hazard concerns (Lofgren, 2004; Valiante et al., 2004).

The recent spike of silica lawsuits filed is likely due to a combination of factors. Recent state and federal tort reform proposals have created a rush for plaintiffs to ensure filing prior to any reform passage (Waldmeir, 2005). Additionally, the same lung screening services used by lawyers to recruit new asbestos clients are used for recruiting silica clients, thus facilitating the efforts to identify new cases (Carpenter, 2004; Egan, 2004).

In fact, some plaintiffs lawyers have gone as far as to make duel claims of asbestos-related diseases and silica-related diseases, even though it is not typical to have diseases from both concurrently (Hillman, 2005). Though these cases have been filed, recent court statements have suggested that the courts are concerned about the validity of these duel claims (Hillman, 2005).

Bankruptcy of asbestos companies and the difficulty of recovering damages from such companies are also pushing more plaintiffs to find resources through silica claims. The similarities between asbestos and silica can make the claims almost interchangeable. Both afflict the lung, both have long latency periods (i.e., can take 20 or more years to manifest into a disease after exposure), both were widely used and are still used or present in the environment and in most buildings and structures, and many of those who were exposed to asbestos could easily have been exposed to silica (Egan, 2004).

## Summary

Recent and historical trends highlight the need to manage risk related product liability claims. The numbers and amounts of awards in product liability claims have dramatically increased over time, and efforts to limit liability through tort reform to date have proven largely unsuccessful. Claims against product manufacturers have resulted in numerous bankruptcies.

With its history in asbestos litigation, the building products industry is no stranger to product liability. The potential number of product users is large, and is made up of both professional (construction industry) and non-professional (DIYer) users.

Silica has experienced some recent increased publicity in the media. A combination of perceived asbestos similarities, publicity through increased proposed regulation and a spike in silica lawsuit filings have contributed to making silica a prime target for additional lawsuits and, thus, a significant business liability risk.

Key to managing the risks for product liability is understanding the underlying legal concepts that allow such claims to be made. Chapter Three discusses the legal concepts relevant to products liability.

# CHAPTER THREE

# LEGAL CONSIDERATIONS

## Introduction

Chapter Three discusses key legal concepts and definitions relevant to product liability risks. Additionally, trends, current case law and opinions are used to understand how these legal requirements might be applied and interpreted. As laws, opinions and interpretations are always being amended, professional legal advice is recommended in reviewing and implementing a plan for managing liability risks.

This discussion of key concepts is divided into three distinct areas:

1. Legal Theories of Liability
2. Product defects
3. Damages

Legal theories of liability are the primary theories that govern the ways that a manufacturer may be liable in product liability cases. This chapter will also discuss what a product defect is - a plaintiff must demonstrate that a product defect existed in order to establish liability. The remedies are the damages that might be awarded to a successful plaintiff, and for which a defendant may be liable.

## Legal Theories of Liability

There is no federal product liability law (Perkins Coie Product Liability Practice Group, 1999). Most of the laws that are used and applied for product liability cases are state laws designed around manufacturer liability in personal injury cases. A manufacturer can be liable for injuries caused by its products under three theories: (1) Negligence; (2) strict liability; and (3) breach of warranty. The first two are areas covered under tort law, while the third falls under contract law.

### Negligence

*Negligence* is the failure to exercise the degree of care that a reasonable, prudent person would have exercised under the same or similar circumstances (Cross & Miller, 2004). In product liability cases, a manufacturer and the injured party do not have to be in privity of contract (Cross & Miller, 2004). Thus, the mere fact that the injured party has been injured by the manufacturer's product, even though there may have been intermediary handlers (e.g., wholesalers, distributors, retailers, resellers, etc.), gives the injured party the ability to sue the manufacturer.

The key to establishing that negligence has occurred is to demonstrate what a reasonable person in a similar situation would have done. Reasonableness is based on constructive knowledge - what one *should* have known under the circumstances (Stearns, 2001). For instance, diseases associated with silica have been known since the 16$^{th}$ century (World Health Organization, 2000). So it might seem that a reasonable product manufacturer should have known that this potential hazard existed. It is important to note, however, that negligence is based on a manufacturer's failure to *exercise* reasonable care and not just the mere knowledge that a particular conduct is or is not reasonable (Perkins Coie Product Liability Practice Group, 1999).

Strict Liability

As opposed to negligence, *strict liability* is liability regardless of the exercising of reasonable care (Cross & Miller, 2004). This is liability without fault due to the fact that a defendant has undertaken an activity which resulted in a defective product which leads to injury (Cantu, 2001). Thus, regardless of the level of care, manufacturers of defective products that cause harm may be held responsible for an injury. Most, but not all states, have a strict liability law (Cantu, 2001).

Strict liability has six requirements: (1) The product must have been in a defective condition when sold; (2) Sale and/or distribution of the product must be part of the defendant's normal business; (3) the product must be unreasonably dangerous because of the defect; (4) the plaintiff must have been harmed as a result of the defect; (5) the defective condition must be the proximate cause of the injury and (6) the product must not have been substantially changed after manufacture or sale (Cross & Miller, 2004).

The key to establishing strict liability is the demonstration that the product was unreasonably dangerous. An unreasonably dangerous product is: (1) one that is dangerous beyond the expectations of the ordinary consumer; or (2) one in which a less dangerous alternative was *economically* and technologically feasible for the manufacturer, but the manufacturer failed to produce it (Cross & Miller, 2004).

Breach of Warranty

*Breach of warranty* falls under contract law. A warranty is a promise, claim or representation about the quality, type, number or performance of a product under the Uniform Commercial Code (Stearns, 2001). It may be expressed (i.e., specifically stated) or implied (i.e., inference from the nature of the transaction or as a matter of law) (Cross & Miller, 2004).

Because of the adoption of the doctrine of strict liability, breach of warranty has become a less important theory of liability and is no longer a primary avenue for damages in a product liability case (Perkins Coie Product Liability Practice Group, 1999). However, it is often used in addition to claims of negligence and/or strict liability (Perkins Coie Product Liability Practice Group, 1999). There is no need for privity of contract as long as the person alleging the breach depended upon the warranty (Stearns, 2001).

## Product Defects

Product liability cases under tort law are based upon the fact that there is a defect in one or more aspects of the product. In most states, an unsafe product (i.e., one that is unreasonably dangerous) is presumed to be defective (Cross & Miller, 2004; Stearns, 2001). In 2002 in Jarvis v. Ford Motor Co., the U.S. Court of Appeals, Second Circuit, decided that the plaintiff did not have to prove a specific defect when the defect could be inferred from proof that the product did not perform as the manufacturer intended (Cross & Miller, 2004).

For product liability to be established, the product must be shown to be defective, an injury must have occurred and the defect must be the cause of the injury. The product must be demonstrated to be defective by being unreasonably dangerous under the six requirements for strict liability in one or more of the following areas: (1) the design; (2) the manufacturing; or (3) the warning. As discussed above, negligence could be established by demonstrating that the manufacturer failed to exercise the degree of care that a reasonable, prudent person would have exercised under the circumstances when producing the product.

Defective Design

A *design defect* occurs when a risk of harm posed by the product could have been reduced or avoided by the adoption of a reasonable alternative design by the seller or other distributor, or predecessor in the commercial chain and the omission of the alternative design renders the product not reasonably safe (Cross & Miller, 2004). This type of defect must condemn an entire line of production and not just an exception to a particular product run (Cantu, 2001).

To establish whether a design defect occurs, the following tests may be applied: (1) did the product meet the expectation of the user? (2) was the product in a condition considered to be unreasonably unsafe? and (3) did the product's benefits outweigh the risks? (Cantu, 2001).

The *Restatement (Third) of Torts: Products Liability*, a legal guide produced by the American Legal Institute, places the burden of proof on the plaintiff to demonstrate the existence of a reasonable alternative product design, and requires the use of a risk-utility balancing test (Silvergate, 2001).

Furthermore, in determining whether a product design is defective, one may consider instructions and warnings accompanying the product, and can also consider such factors as product longevity, production costs, maintenance, repair, esthetics and consumer choice among products (Cross & Miller, 2004; Silvergate, 2001). Thus, the benefits of one design can be used to balance against the risks of alternative product designs.

A special case defense can be considered for products that can arguably be considered *state-of-the-art*. To be state-of-the-art, a defendant must affirmatively demonstrate that the technological availability and feasibility at the time the product left the manufacturer's control did not permit any reasonably safer alternative (Njcourtsonline.com, 2001). Frequently, however, defendants misapply the state-of-the art defense by arguing that it was the customary standard of the industry instead of proving that it was technologically infeasible or not available (Booth, 1999).

Defective Manufacturing

A *manufacturing defect* occurs when the product departs from its intended design (Cantu, 2001; Cross & Miller, 2004; Silvergate, 2001). This is distinguished from a design defect in that it does not condemn an entire production line, but, rather, can be determined if the particular product causing injury stands alone from the rest (Cantu, 2001).

This type of defect might occur due to substandard raw material used during the manufacture of the product, or deviation in the manufacturing process not intended by the manufacturer (Cantu, 2001).

Defective Warning

A *warning defect* is one in which the foreseeable risk of harm or a foreseeable risk of misuse posed by the product could have been reduced or avoided by the provision of reasonable instructions or warnings by the seller, and the omission of such warning(s) renders the product not reasonably safe (Cross & Miller, 2004; Silvergate, 2001). According to the *Restatement (Third) of Torts: Products Liability*, sellers are not required to take precautions against every conceivable misuse, although reasonably foreseeable misuses must be considered. For instance, the U.S. Court of Appeals, Second Circuit, in Liriano v. Hobart Corp., held that a manufacturer can be held liable for failing to warn that alterations would make its products unsafe (Cross & Miller, 2004).

The warning defect is by far the most contentious area of product liability claims. The *Restatement (Third) of Torts: Products Liability* supplies extensive guidance on proper warnings. Factors for a court to consider in evaluating warnings include content and comprehensibility, intensity of expression and the characteristics of expected user groups (Cross & Miller, 2004). What this means is that warnings that are not clear enough, not strong enough and not understandable by those they are meant to protect are not adequate and, thus, may be considered defective.

One defense that may be used for assessing a warning defect is the *sophisticated user* defense. A sophisticated user, also referred to as a knowledgeable user, is a purchaser or user who is already aware of the dangers associated with the product (Parker & John, 2004). In the recent case of Gomez v. Humble Sand and Gravel, Inc., No. 01-0652, 2004 WL 2090592, 2004, the Texas Supreme Court found that a sand supplier had no duty to warn an abrasive blasting company (customer) of the risks of working around silica dust because the risks of silica exposure were common knowledge in that industry long before the injured party began using the product (Lowe, 2004).

However, in the case of Gray v. Badger Mining Corp., a Minnesota Supreme Court found that, although the purchaser was aware of certain dangers associated with the product, the defendant had greater knowledge than the purchaser regarding certain aspects of effective precautions to protect the user from the dangers and, thus, invalidated Badger's sophisticated user defense (Novotny, 2004). Care must be taken to understand what the risks are of defining sophisticated user groups for a particular product. This leads back to the concept presented under design defects (remember that warnings and instructions may be considered as part of the product design) that considers the expectations of the users of the product.

## Damages

Though the goal of any product liability plan should be not only to provide defect-free products, but to also eliminate or mitigate financial risk due to possibly defective products, the very nature of risk implies a probability that some financial loss can occur. To this end, it is important to understand the possible financial damages that may occur due to a finding that a product was defective and the defect caused injury.

### Compensatory Damages

*Compensatory damages* are monetary awards to an injured party for the value of actual losses or injuries sustained (Cross & Miller, 2004). These losses may include three elements (Perkins Coie Product Liability Practice Group, 1999): (1) Loss of earnings, past and future; (2) medical expenses and loss of ability to perform personal duties and (3) mental and physical pain and suffering. Mental and physical pain and suffering is considered a non-economic loss and can be arbitrary, since an assignment of value must be made based on more subjective criteria. Although legislative attempts have been made to limit the awards for mental and physical pain and suffering, most of these have been found to be unconstitutional (Perkins Coie Product Liability Practice Group, 1999).

Punitive Damages

*Punitive damages* are monetary awards intended to punish the wrongdoer and to deter others from engaging in similar acts of intentional wrongdoing (Cross & Miller, 2004). These are commonly awarded in cases when a manufacturer has shown a willful disregard for safeguarding the users of its product or has intentionally acted in a manner that it knows with substantial certainty that specific consequences would result from the act (Cross & Miller, 2004; Perkins Coie Product Liability Practice Group, 1999). As discussed in Chapter Two, punitive damages can amount to many times the amount of compensatory damages and have become a matter of deep concern to manufacturers, but the U.S. Supreme Court has recently provided additional guidance on punitive awards that might limit these awards to less than ten times the amount of compensatory damages awarded.

Unlike compensatory damages which may be covered under a product manufacturer's liability insurance coverage in total or in part, because of the intent of punitive damages to punish a company for wrongdoing, punitive damages are generally not covered by insurance

(Perkins Coie Product Liability Practice Group, 1999). However, as discussed in Chapter Two, historically high punitive awards have been more recently guided by U.S. Supreme Court decisions to consider the reprehensibility of the acts, the ratio of the award to compensatory damages and a comparison of the award to criminal and civil penalties for similar misconduct (U.S. Supreme Court, 1996; U.S. Supreme Court, 2003).

Joint and Several Liability

*Joint and several liability* is a doctrine under which an injured party may collect an award from one or more of the parties responsible (Cross & Miller, 2004). Under this doctrine, each person who contributes to a party's injuries may be held fully responsible for the damages. This has commonly been tagged as the "deep pocket rule" and can motivate a plaintiff to find the responsible party that has at least some fault, but that has the greatest financial resources to pay for damages (Perkins Coie Product Liability Practice Group, 1999).

It is important to understand that anyone within the stream of commerce of the defective product has the potential to be found as contributing. This may include not only the manufacturer, but also the assembler, component supplier, testing laboratories, advertising agencies, distributors, retailers and repairers (Alexander, 1995). Furthermore, a predecessor company may not be relieved of liability once the business has been sold to another company unless the liability has been expressly assumed in a contract of sale (Alexander, 1995).

Comparative Negligence

*Comparative negligence* can be used in a negligence claim or as a defense or partial defense in a strict liability claim. Comparative negligence is the relative fault of all parties involved in causing an injured party's injuries (Cross & Miller, 2004). On one hand, this can limit the award to the relative amount of fault even between plaintiff and defendant. On the other hand, it provides a plaintiff the ability to recover some damages even if the plaintiff had misused the product (Cross & Miller, 2004).

*Comparative negligence* also affords a defendant, that has been ordered to pay the full award in a case involving joint and several liability, to seek contribution from other responsible parties. However, it must be noted that in most states, those parties who have previously agreed to a settlement with the plaintiff cannot be sued for contribution (Perkins Coie Product Liability Practice Group, 1999).

### Summary

A product manufacturer may be liable for damages regardless of the absence of negligence under strict liability theory or when it has been demonstrated that a manufacturer or other negligent entities did not provide the degree of care that a reasonable person under the same circumstances would have provided. A manufacturer can also be liable for breach of warranty if the user depended upon the warranty to be provided a defect-free product.

Recovery of damages depends on the plaintiff's ability to show that the product was defective either because of design defects, manufacturing defects, and/or warning defects.

Awarded damages may include compensatory damages, and if intentional wrongdoing is found, punitive damages. Punitive damages are designed to punish the wrongdoing defendant(s) and deter others from similar wrongdoing. Punitive damages can be many times larger than compensatory damages. Some damages can be reduced by comparative negligence claims where the award is adjusted by an amount relative to the contribution of the damage by the responsible parties. Additionally, comparative negligence gives a manufacturer and other defendants in a case that have been held responsible for full payment under joint and several liability, the ability to make claims against other responsible parties.

The next chapter applies the background material and the concepts presented in this chapter to provide guidelines for preparing a plan to reduce product liability risks specific to manufacturers of silica-containing building products.

# CHAPTER FOUR

# GUIDELINES

## Introduction

Chapter Four provides guidelines developed by the author to help manufacturers of silica-containing building products prepare a plan for managing product liability risks. These guidelines are based on the basic legal definitions and concepts presented in Chapter Three, and expanded by the author's knowledge of the building products industry to incorporate unique features of the building materials industry and, specifically, those building materials that contain silica.

Risk, by its nature, is a concept of probability and, as such, can be measured as a continuum from no (or low) risk to high risk. The specific plan will depend upon the level of risk a company is willing to accept. These guidelines are designed to provide users with insights to help them match their plan to their company's philosophy and position on risk acceptance. Because product liability risk involves the proper interpretation and application of laws, it is strongly advised that all plans be reviewed with legal experts prior to implementation.

These guidelines can be divided into two primary focuses: (1) Producing and selling a safe product by eliminating defects; (2) protecting a business against claims of product liability. Certainly, a business cannot prevent anyone from bringing a claim against it, but steps can be taken to help a business mitigate risks associated with such claims. Furthermore, it is assumed that a business operates in an ethically and socially responsible manner and is willing to accept its responsibility for causing injury or damage from a product it manufactures and sells which is found to be defective.

## Eliminating Defects

If a product is defect-free, a manufacturer cannot be held responsible for injuries or damages caused by the product in the absence of negligence or breach of warranty. Thus, designing a defect-free product, manufacturing a defect-free product, and properly warning and marketing a product are keys to removing risk of liability for such defects. Elimination of all three of these defects will essentially remove the risk while the appearance of one or more of these defects may result in increased risk and liability.

Designing Safe Silica Products

To determine if the product is safely designed, a product manufacturer must: (1) identify what potential hazard exists from the product; (2) evaluate reasonable alternative designs that could reduce or avoid this hazard and (3) determine whether rejecting the alternative designs makes the product unreasonably dangerous.

Identifying the potential hazards requires looking at both the intrinsic ability of the product to cause harm and the likelihood that the product may cause harm.

There is no dispute that silica has an intrinsic ability to cause harm. The question then becomes, can this product be considered unreasonably dangerous when used as the product was intended to be used? The scientific and governmental communities agree that breathing excessive amounts of fine particles of silica dust can cause silicosis, an irreversible and sometimes fatal lung disease. There is also evidence presented that this silica exposure might also increase the risk of cancer and some other diseases even though there does not appear to be consensus regarding these other health effects.

So assuming that a product manufacturer chooses to use silica in its product, it must accept its responsibility to possibly pay for injuries caused by silica from its product if the product is found to be defective. These costs, at minimum, would include costs of injuries and damages as a result of silica exposures caused by the product. Any punitive damages could add dramatically to the liability risk if the plaintiff proves that the manufacturer knew of the hazard and did little or nothing about it (Perkins Coie Product Liability Practice Group, 1999). Thus, unless a product is designed without silica, a product manufacturer must at least be prepared for potential strict liability claims. Assuming that a product manufacturer is willing to accept this risk, the focus of a design evaluation must then be directed towards minimizing the chance that the product user might actually be harmed.

This next step in the process is to examine how *likely* it is that the product might cause harm in its planned design, and what alternative designs might be available. For silica, this determination is complicated by the fact that the likelihood depends on the size of dust particles that might be created during use, the amount of the dust generated, the amount of dust breathed by a user, and the frequency and duration of that occurrence (National Institute of Occupational Safety and Health, 2002). Unlike some potentially dangerous products that might cause harm from single, brief exposures, the harm from silica more typically occurs after frequent exposures over years (National Institute of Occupational Safety and Health, 2002).

Since it is only the fine dusts of silica that, if breathed, might become harmful, it seems reasonable to consider whether a silica-containing product in its proposed design is likely to be used in a manner that creates fine dust, and if breathing this fine dust can be harmful to the user.

Common construction activities that might generate finer dusts include sanding, grinding and other high-powered activities to which the products may be directly subjected. Other activities such as manually breaking pieces or driving a nail into the product may also create dust, but may not necessarily create as much fine dust as sanding and grinding.

A product manufacturer can systematically list the types of activities and handling of its product that might create dust (e.g., drilling, sanding, cutting, breaking, rubbing) and who it is that may be exposed to these dusts (e.g., professional construction worker, children, passers-by, do-it-yourselfers). The significance of who might be exposed is that frequency and duration of an exposure might differ among these groups. For example, for a passer-by the exposure to the dust might be infrequent and brief, but for a professional construction worker it might be every day for a working lifetime. For silica, generally, brief and infrequent exposures are not as likely to lead to disease as longer, more frequent exposures. Thus, for silica-containing building products, the key at-risk target group would seem to be the professional construction workers who work frequently with the product. By contrast, product manufacturers of products that contain toxic materials that can cause more immediate damaging effects, for example, may be equally concerned with those occasional users of their products.

The difficult job is the task of determining how much dust is being created by each of the identified activities, how much of this is fine silica dust (for most building products containing silica, it can be presumed that some portion of created dust will be fine silica dust), and how much is breathed. Clearly, the targeted users that would have the highest risk are the professional construction workers who might use the product daily over their working careers.

There have been many studies that have assessed fine silica dust exposures for different activities and industries in construction, some of which have been referenced in Chapter Two. These studies can be used to perform a cursory evaluation of the exposure risk. However, each specific product must be evaluated on its own merits. The same dust-generating activity on a similar product, for instance, may generate far more dust with one product than with another because the amount of silica in the product might vary between them, or the process to make or use the product might be different. For example, drilling into an exterior wall material containing silica might result in lower exposures than drilling into an interior wall product of a similar material because the interior wall material may be handled indoors more frequently where less ventilation is available. A few activities and associated products that have notoriously been linked to potentially high fine silica dust exposures and relevant to the building products industry include concrete sanding and cutting, brick tuck pointing, and roofing (National Institute of Occupational Safety and Health, 2002; Valiente et al., 2004).

The bottom-line is that because of the level of sophistication required to determine the likelihood and amount of exposure, if a product manufacturer does not have an in-house expert on silica dust exposure assessments, it would be well-advised to work with a consultant, such as a Certified Industrial Hygienist, who specializes in this type of assessment to help make such a determination. This evaluation may require some vigorous and, often, expensive testing to properly evaluate the risk and likelihood. Generally speaking, higher dust-generating activities include drilling, cutting, sanding and debris cleaning; higher risk groups are professional users that are engaged in the higher dust-generating activities of the product (National Institute of Occupational Safety and Health, 2002). Because silicosis is a disease that is manifested most typically after years of high exposures, other groups may not be at high risk. Creating a matrix of potential exposure activities, populations exposed and the anticipated level of exposure can be helpful in identifying at-risk activities and groups that should be of most concern to the manufacturer. The Appendix provides an example of how this might be organized.

The first step in comparing the selected product to an alternative design is to first determine if the product can be made without silica. Clearly, if the product can be made with all the same critical and desired attributes without using silica, then this alternative design should be seriously considered to eliminate the silica liability risk. In the sandblasting industry, for example, there are other alternatives to silica as a blasting agent that have been successfully used for some applications. Thus, unless there is a specific benefit that can be justified for the use of silica in this particular type of application, it would appear that silica is not a necessary ingredient for sandblasting. So if the answer to the question "Can the same desired effect be achieved with a non-silica product?" is "yes," then the alternative design should be selected, assuming a greater risk is not found with the alternative design.

If the product cannot be designed without silica, a company should determine if using a less hazardous form of silica is possible, such as amorphous silica. (Remember that *crystalline* silica is the primary hazard of concern, but that there are other, possibly less hazardous, forms of silica available.) This question is best addressed by a product engineer.

Another question to consider is whether the process can be changed to render the silica less hazardous or less likely to create a hazard. (Recall that the true risk is associated with fine particles of silica dust.) The size of silica grains added as a raw material can vary.

Consideration can be given to whether the size of the silica grain is critical to the product, or whether an alternative size that may be less likely to create fine dust particles when the product is used can be substituted for the proposed design. Again, a product engineer is the best source to address this question.

When evaluating alternative designs, a building materials manufacturer should investigate whether others in their industry use silica in their products. This evaluation should be taken to at least two levels:
(1) comparing with similar/identical products that compete directly with a company's product (e.g., if a company is planning to make joint compound using silica, it should compare its process with other joint compound manufacturers to see if they all use silica);
(2) comparing with products using other designs that might be used instead of the company's product (e.g., if a company is planning to make granite countertops - granite contains silica - compare the product to other products that might be used in place of granite, such as Formica® or resin-based countertops). Making these comparisons can help a manufacturer evaluate the merits of a plaintiff's negligence argument as to whether a reasonable person would have chosen such a design.

Even if a decision to select a particular design were not considered negligent, the manufacturer should determine if, by ignoring these possible design options, the product can still be considered unreasonably dangerous. In evaluating the design, the manufacturer should not only establish whether the use of silica is necessary, but should also determine how the product might become a danger to the user. (Refer to the earlier example of the interior and exterior wall products.) Since only fine dust of silica creates the hazard, if no fine dust is created by, or exists in, the product, then the danger might not exist. This danger should be evaluated for all users and handlers of the product - from warehouse and distribution, to transportation, to wholesale and retail operations, to product consumers who can be professional installers, DIY installers, or owners or users of the structure being built. In many cases, the mere existence of building materials that contain silica may not be problematic since silica is usually bound to a matrix. More commonly, the hazard might be created only during the handling and use when material is being mixed or cut or abraded in some fashion.

Recall also that the *Restatement (Third) of Torts: Products Liability* allows the use of a risk-utility balancing test to compare with alternative designs. This allows the product manufacturer to consider the benefits of the proposed design against other designs when evaluating the risk. For example, there may be specific applications in which there are no known blasting agents other than silica that will be effective for cleaning certain types of structures even though non-silica blasting agents are available and effective for cleaning other types of structures. If the intent of the design and use is for cleaning a structure that cannot be effectively cleaned with a non-silica agent, then the utility may outweigh the risk.

An additional consideration for the risk-utility balancing tests can be costs. However, for silica-containing building materials, unless the cost difference is extreme as compared to the alternative designs, cost by itself is not a strong case for choosing a proposed design over, perhaps, a safer design. These are questions that should be addressed by the product engineers most familiar with the process and materials, and the product's intended use.

The decision to accept or reject an alternative design is part of the risk acceptance decision that must match a company's tolerance for risk. Considering the continuum of risk concept, the least risky design is to design a product without silica. A strong case for such a design would be if there were already other products able to perform identically as the proposed product without the use of silica. However, one must also balance such risks with the liability that might come with potential hazards related to the alternative designs. One additional important note on the evaluation of the product design is that *The Restatement (Third) of Torts: Products Liability* allows consideration of instructions and warnings accompanying the product (Cross & Miller, 2004). Warnings are discussed later in this chapter.

A product that contains silica, but is not anticipated to generate fine dusts during use and handling might also be considered safe. But a manufacturer must be careful and fairly liberal in its evaluation as to whether those who may come in contact with the product can, in fact, be subjected to fine dusts of silica. This may include any foreseeable misuses of the product that could, in fact, generate dust. For example, if sanding a silica-containing brick is a commonly observed practice, this could be considered a foreseeable misuse requiring a warning even though the brick manufacturer did not intend for its product to be used in such a manner.

If there are foreseeable situations that may generate fine dust, then the manufacturer should assess the likelihood that this dust could expose those who come in contact with it to levels that would be harmful. Would these levels be anticipated to exceed safe levels as compared with regulatory and other recommended safe levels? In situations where fine dust generation is anticipated, the level of risk is higher to the manufacturer than if there were no dust generated.

Again, these assessments may require the advice from experts familiar with process engineering, chemistry and health and safety. This is particularly true for silica because there is not even consensus on what constitutes a safe level. In the United States, the common standards range from 0.05 milligrams per cubic meter to 0.1 milligrams per cubic meter - a factor of two! (American Conference of Industrial Hygienists, 2005; National Institute of Occupational Safety and Health Administration, 2002; U.S. Department of Labor, 2005).

Manufacturing Safe Silica Products

A manufacturing defect can occur when the product is not manufactured per its intended design. To minimize the risk of manufacturing defects, the product manufacturer can focus on two primary issues: (1) ensuring that the raw materials are within designed tolerances and (2) that the manufacturing process is being operated within operational tolerances. Ensuring that silica-containing products are free from manufacturing defects is no different than for other products.

Raw material tolerances establish the formulation limits that are required to meet the product demands. Differences in raw material may occur due to the quality of material from batch to batch, or may also occur due to materials being received from different suppliers. For silica, these tolerances may be based on the size of the silica supplied, or the purity of the supply. These tolerances must be based on the evaluation of the design and whether exceeding these limits would result in a higher risk than anticipated. In general, it might be expected that the smaller the grain size of the silica used in the product, the greater the likelihood that the dust generated from that product would be in the "fine dust" range (i.e., less than 10 microns).

Likewise, operational limits are requirements established to meet the product demands. These operational limits may include the amount of silica that is added to the product. Adding silica in quantities in excess of the limits might result in risks that are higher than what was intended. Exceeding operational limits can be due to process upset conditions and operator errors.

The keys to preventing manufacturing defects are to know what the designed tolerance limits are for both raw materials and manufacturing processes. These limits should be incorporated into the manufacturer's overall quality assurance and quality control plans. Monitoring and checking conditions for values that exceed the tolerance limits will enable the manufacturer to help identify when defective products have been made, and take the necessary steps to remedy the situation.

Properly Warning of Silica Hazards

Assuming that the decision has been made to sell a proposed silica-containing building product, the effort must now turn towards eliminating warning defects. Because warnings are the direct means that a product manufacturer has to communicate potential hazards to the unwitting consumer, defective warnings are frequently the most significant point of contention for claims of product liability.

The two elements for providing proper warning and instruction are: (1) what to warn of and (2) how to warn.

The content of the warning should address both the potential hazards that the user may face during the product's intended use and foreseeable misuse, and the precautions the user should take to avoid such hazards.

There is little controversy that excessive exposures to fine silica dust can lead to certain diseases, such as silicosis. Thus, a building product manufacturer whose product contains silica would clearly be remiss by not warning the users of this potential. And although there continues to be some controversy as to whether silica may cause cancer, since the International Agency for Research on Cancer (IARC) and the National Institute of Occupational Safety and Health Administration (NIOSH) are two credible institutions that acknowledge the potential for silica to cause cancer, silica-containing building products should also include a warning about this potential risk. The information and expert advice gathered during the design phase of the product (see above) should help a manufacturer ascertain what potential hazards may occur and, therefore, what hazards to place on a warning. At minimum, warnings that exposure to the product dust might lead to silicosis and cancer appear warranted.

During the design evaluation process, the manufacturer should also have established the conditions that might render the product unsafe and the precautions that are necessary to change those conditions. The precautions may include conditions to avoid. For silica, some of the general conditions to avoid include generating dust and breathing dust since silica is harmful from breathing the dust only.

Additional detail about conditions to avoid or ways to minimize the risk can also be included. These conditions and precautions should be viewed in the context of the users and handlers that may be put at risk, and the review conducted during the design phase discussed earlier in this chapter. For instance, saying "keep away from children" may not really reduce the risk because children are not likely to be exposed to the degree that would warrant such a warning. However, instructing the users to wear dust masks when using or instructing the users in other ways to minimize the risk might be warranted if the design evaluation suggests that the exposures without the dust masks might be dangerous. For many dust-generating activities, wet-methods of handling or use of dust extracting tools, for instance, may reduce the dust generated. Also, conducting any dust-generating activities in well-ventilated areas and avoiding creating dust in enclosed environments may reduce such risks. It is important to note that not all dust masks, formally called "dust respirators," are the same and that the design and selection of the proper dust mask is dictated by NIOSH and the Occupational Safety and Health Administration (OSHA).

Building manufacturers should consider transporters, distributors, retailers, professional users of the product, amateur or occasional users of the product, structure owners and occupiers, and bystanders or visitors. Again, although it is anticipated that for building products, the professional users of the product would have the greatest risk, risks to other groups must also be evaluated to ensure no harm might come to them in the absence of proper warnings.

Once a warning has been drafted, product manufacturers should compare it with the warnings provided by others in the industry who manufacturer silica-containing products - the closer in relation to the proposed product, the better. Although this may not necessarily protect a manufacturer, an industry standard can help establish a minimum duty of care.

Once a manufacturer has determined what warnings need to be provided, it must decide how to provide such warnings. How to warn will depend on the target audience(s) which may include any or all of those that come in contact with the product. Questions to consider regarding the users include: (1) Is this audience already aware of the hazards of the product? (2) What is the education level of the audience? (3) What language can the audience understand? (4) Where are the most and least likely place that an audience would be most likely to encounter the warning?

The question of whether the audience is already aware of the hazards speaks to whether or not the audience might be a sophisticated user. In the mining, sandblasting and foundry industries, silica and silicosis has been well-documented for years (National Institute of Occupational Safety and Health, 2002). Because of that, it is unlikely that a worker would currently be in one of those industries and not already know of the hazards, or would not be adequately informed by his or her employer of the hazards. By using the sophisticated user argument, a product manufacturer could conceivably avoid or reduce its liability. However, because in the building products industry the at-risk users are likely from the construction industry, the sophisticated user defense is probably weak. Although many efforts by NIOSH and OSHA to inform construction workers of silica-related hazards have been made, this hazard has just more recently been recognized in construction. Thus, it cannot be presumed that users of building materials would automatically know about silica-related hazards and the sophisticated user doctrine should not be depended on to avoid warning users. Furthermore, it is usually not an advisable tactic since the burden of proof would be on the manufacturer to demonstrate that the user should have known of the hazards.

The education level of the audience is important in establishing how simple or complex the warning and instructions should be. A balance may need to be considered between a simple, but understandable warning, and a more complicated, but more descriptive and accurate warning. Also, if the audience is anticipated to be less literate, a graphic representation of the warning may be more effective. The educational level of the construction industry, particularly those that might be in a laborer category, might be expected to be relatively low. Users of this level might be better served by simple, straight-forward wording. This might be the difference between warning that the product might cause "silicosis" versus " serious lung disease." Obviously, there is a balance to be struck between accuracy and simplicity, and sometimes the warning might be best as a hybrid (e.g., "...this product can cause silicosis, a serious lung disease...").

Although in the United States warnings must be in at least English, certain audiences may have limited English speaking or reading ability. Making warnings in the language most understandable to the audience will make the warning most effective. The construction industry, for instance, has a large Spanish-speaking labor force, particularly in the Sun Belt states. Thus, if selling or distributing a silica-containing product in those states, the product manufacturer might want to provide silica hazard warnings in Spanish. Again, a closer evaluation of who the users of the products are will help identify if there are key at-risk users that may warrant language-specific warnings.

The proper placement of the warning can also be an important element of warning effectiveness. The place where the audience may most likely encounter the warning may differ depending on audience. A product installer might most likely see a warning when physically handling the product, and, thus, the most appropriate placement might be on the product itself or the packaging of the product; a purchaser of the product might be more likely to see a warning posted at the point of purchase; a structure or building owner that desires the product may be more apt to observe a warning while browsing through product literature and/or websites to research the product selection; a distributor may be most likely to see a warning on shipping papers when a product arrives at the distribution center. Although a product manufacturer may choose to place different warnings directed towards different types of users, because of the silica hazard and its more imminent threat of being a litigation liability, it seems most appropriate to provide all users the same type of warning.

Since professional users of the product are likely the most at-risk group, special attention should be made to ensure these users receive adequate warning. Frequently with building materials, the products may be large and may not necessarily fit in containers which can be easily labeled. If products are packaged, purchased and delivered on pallets, consideration must be given to how the users might actually see the warning. Besides labeling each individual product piece (envision providing a label warning on each brick on a pallet), a product manufacturer might want to consider placing the warning on pallet packaging if available, or ensuring that retailers and other sellers of the product through the distribution channel provide the purchasers with a warning attached to the receipt.

The warning should capture the attention of those for which it is supposed to warn. This may be achieved by size, color selection and specific placement. Many times, a product manufacturer's marketing department might be reluctant to make a warning too salient for fear that it will adversely affect sales. However, with the recent publicity that silica has had as a possible target for trial lawyers, a product manufacturer would be well-advised to make certain that the warning clearly stood out so that there can be no dispute that a user did not see the warning or was unaware of the warning.

Ensuring compliance with regulations on warnings and instructions, and providing warnings that are consistent with others in the industry must be considered minimum standards (Perkins Coie Product Liability Practice Group, 1999). In deciding the proper warnings, the level of risk a manufacturer is willing to accept should also be considered.

## In Anticipation of Litigation

Another aspect of managing product liability is to be prepared for litigation. Preparation should include maintaining proper documentation of activities and retaining necessary experts to help support a defense.

Documentation

Files should be maintained to document all decisions regarding the proper design, manufacturer and warnings. This documentation may include communications with experts and consultants on whose advice a manufacturer may depend, copies of applicable regulatory and industry standards, rationales used for decisions, risk assessments, quality assurance and control plans, etc. Although the documentation may not necessarily help a manufacturer avoid strict liability, it can be extremely helpful to demonstrate that a manufacturer was not negligent or engaged in willful misconduct.

For silica, some specific issues would be important to document:

- The reason that silica is necessary for the product;
- The reason alternative designs were not appropriate;
- The silica risk evaluation for users of the product;
- How the risk groups will be warned;
- Rationale behind the wording of the silica warning; and

- The means by which the manufacturer will ensure the warning reaches the desired targets.

The Appendix provides a template that can be used to help a manufacturer of silica-containing building products systematically address all the key points discussed in this chapter and can formulate the logic for decisions on the design, manufacturer and warning of the product. This template can also be used to organize the detailed documentation that may be required for a successful defense against a product liability claim. A plan should be periodically reviewed and amended as necessary, particularly in light of on-going science and research on silica hazards, and on-going court decisions related to existing legal cases. Records of historical changes and amendments to the plan can also be easily tracked through maintenance of these plan records. Original and amended plans should also be reviewed by legal counsel on a periodic basis.

Experts

Although a lot of documentation may be readily available to help a manufacturer make decisions, there are some areas for which manufacturers may not have the in-house expertise and must depend upon external experts to assist. This is particularly important when considering areas that may be controversial.

For silica, probably the single most important expert opinion will be with regards to the risk evaluation – determining how silica dust is generated, when and how much is generated, what the exposures will be, and what should be considered safe levels. These are not simple questions to answer and are still sometimes the subject of much controversy. By hiring highly qualified experts, a manufacturer can mitigate risks knowing that they have taken reasonable steps to evaluate the situation in a most objective manner.

Experts in the risk evaluation commonly fall within the profession called industrial hygiene. Industrial hygiene consultants may be found at www.aiha.org.

## Summary

Managing product liability for silica-containing building products should start with a plan. The plan should be focused on manufacturing a defective-free product. A defective-free product will be free from design, manufacturing and warning defects. The reasoning behind the design, the need for proper documentation, and the need for clear, obvious warning must err on the side of inclusion and comprehensiveness due to the fact that filings for silica claims have been on the dramatic rise in recent years.

Having a clear rationale for using silica in its product is an imperative first step for a manufacturer evaluating its product liability risk. This evaluation must also include a determination of at-risk groups, which is a very complicated evaluation that might best be served by engaging experts in the field.

Assuming that a clear decision and case is made to produce, sell and distribute the product, the manufacture must develop a warning that is targeted to the at-risk groups, is clear and understandable, and is accurate. Because there is no dispute that silica is potentially hazardous, the warning must clearly state the potential to cause harm.

As important as the plan in reducing liability is the preparation for any anticipated litigation. This includes both maintenance of applicable documentation and the retention of experts that may be needed to consult or testify.

A template for a product liability plan is provided in the Appendix to help a manufacturer organize and document its efforts to manufacture a defect-free product.

# CHAPTER FIVE

# CLOSING REMARKS

## Introduction

The intent of this project was to provide a framework by which a product manufacturer can develop a plan to help manage product liability risks related to silica-containing building products. Although the task of providing specific details proved more difficult and complex than originally thought, the guidelines do provide some insight on unique features of the silica-containing products industry. These guidelines can provide useful guidance as a starting point for developing a product-specific and a company-specific liability management plan for silica-containing building products.

## Conclusions

The conclusions extracted from the project follows.

1. There is a potential for great financial loss due to product liability claims.
2. The rising number of filed silica cases suggests an imminent threat of product liability claims against manufacturers of silica-containing products - including building products.

3. Although some issues unique to silica-containing building products can help direct a strategy and plan for managing risk, the plan must be much more detailed and specific than can be provided by a more general guideline.

4. Developing case law related to silica can have a dramatic effect on the liability risk a manufacturer might face and, thus, a liability risk plan cannot be static.

This project should benefit the reader by providing insights into applying the myriad of product liability principles to a product category for which there is not a lot of specific case history. Knowledge about technical issues revolving around the hazards associated with silica and its use in the building products industry combined with legal issues revolving around product liability can be used to formulate a plan.

The author found this project to be of considerable value because it highlighted many of the complexities in the details of developing and implementing a product liability plan for a category of products (i.e., silica-containing building products) for which there is no long legal case history. One of the unique features of these products is that, unlike many consumer products that may pose a risk to the everyday consumer, the risk of injury is not likely to the everyday consumer, but rather to the professional construction worker. The characteristics of this product user influences how the product should be considered from a standpoint of evaluation, design and warnings.

## Recommendations

The three major recommendations resulting from the project are as follows:

1. Spend adequate resources to ensure that a detailed, well-thought plan is developed;
2. Have the plan overseen, or at least reviewed, by a legal expert; and
3. Use expert technical assistance to evaluate hazards and to provide specific guidance.

APPENDIX

PRODUCT LIABILITY PLAN TEMPLATE

PRODUCT NAME ____________________

PRODUCT PURPOSE/USE ____________________

**DESIGN CONSIDERATIONS**

**Risk Analysis of Proposed Design**

| *USERS/AT-RISK GROUP* | *DUST-GENERATING ACTIVITY* | *LIFETIME EXPOSURE EXPECTED* | *BASIS FOR EVALUATION* | *RISK CRITERIA BASIS* |
|---|---|---|---|---|
| Professional Installer | Cutting | | Test Data | OSHA Standard |
| | Sanding | | Published Data | ACGIH Standard |
| | Grinding | | Expert Opinion | NIOSH Standard |
| | Drilling | | | Other: |
| | Nailing | | | |
| | Cleaning | | | |
| | Manual Handling | | | |
| | Other: | | | |
| Do-It-Yourself/Occasional Installer | Cutting | | Test Data | OSHA Standard |
| | Sanding | | Published Data | ACGIH Standard |
| | Grinding | | Expert Opinion | NIOSH Standard |
| | Drilling | | | Other: |
| | Nailing | | | |
| | Cleaning | | | |
| | Manual Handling | | | |
| | Other: | | | |
| Bystanders | Cutting | | Test Data | OSHA Standard |
| | Sanding | | Published Data | ACGIH Standard |
| | Grinding | | Expert Opinion | NIOSH Standard |
| | Drilling | | | Other |
| | Nailing | | | |
| | Cleaning | | | |
| | Manual Handling | | | |
| | Other: | | | |
| Retailer/Distributor | Manual Handling | | Test Data | OSHA Standard |
| | Other: | | Published Data | ACGIH Standard |
| | | | Expert Opinion | NIOSH Standard |
| | | | | Other: |
| Transporter | Manual Handling | | Test Data | OSHA Standard |
| | Other: | | Published Data | ACGIH Standard |
| | | | Expert Opinion | NIOSH Standard |
| | | | | Other: |

**Evaluation of Alternative Designs to Proposed Design**

| *ALTERNATIVE DESIGN* | *ADVANTAGES* | *DISADVANTAGES* |
|---|---|---|
| Change in Amount of Silica | | |
| Change in Type of Silica | | |
| Change in Size of Silica | | |
| Silica Substitute | | |
| Process Change | | |
| Other: | | |

**MANUFACTURING CONSIDERATIONS**

| PARAMATER MONITORED | TOLERANCE LIMITS |
|---|---|
| Amount of Silica | |
| Quality of Silica | |
| Size of Silica | |
| Operational Limits | |
| Other: | |

QUALITY ASSURANCE PROGRAM:

| WARNINGS | | |
|---|---|---|
| Text of Warning:<br>Basis of Wording: | | |
| **Warning Placement** | | |
| AT-RISK GROUP | PLACEMENT | OTHER MARKETING/COMMUNICATION ENHANCEMENTS |
| Professional Installer | Product Pieces | |
| | Product Packaging | |
| | Point of Purchase | |
| | Literature | |
| | Website | |
| | Other: | |
| Do-It-Yourself/Occasional Installer | Product Pieces | |
| | Product Packaging | |
| | Point of Purchase | |
| | Literature | |
| | Website | |
| | Other: | |
| Other: | | |
| | | |
| DOCUMENTATION | | |
| DOCUMENT TYPE | LOCATION | RESPONSIBLE PERSON |
| Risk Evaluation | | |
| Alternative Design Analysis | | |
| Tolerance Limit Rationale | | |
| Warning Text Rationale | | |
| RESOURCES | | |
| TYPE | NAME | CONTACT DETAILS |
| LEGAL ADVICE | | |
| PROCESS ENGINEER | | |
| RISK EVALUATOR | | |
| MARKETING MANAGER | | |

Name of Preparer: ______________________________

Date of Plan: ______________________________

Plan Revision Number: ______________________________

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