

Mechanical Fasteners



By Michael Panish
Construction Expert Witness

Mechanical fasteners, when properly used as recommended by the manufacturer, almost always assure safe and secure attachment of a fastened product. In commercial and residential applications, injuries resulting from mechanical attachment failures have often been attributed to inappropriate usage of products, improper installation procedures, or the failure of a poorly manufactured fastening product. When a product becomes disconnected from its point of attachment, serious personal injury can result.

As the retained construction expert witness participating in numerous personal injury claims resulting from loose or falling components in commercial buildings, hotels, hospitals, airports, and housing projects, I have been involved in assessing, analyzing, and determining the reasons for the attachment failures of many types of products.

I have observed, during onsite inspections and investigations, a variety of reasons why products become disconnected from their intended location. Reasons why products become detached and dangerous leading to severe personal injuries include but are not limited to:

- Missing fasteners
- Missing fastener parts
- Inappropriate fasteners for the particular product being attached
- Missed connections of the fastening hardware (failure of the fastener to anchor into backing or wall studs)
- Poorly designed systems that have failed due to lack of structural integrity
- Over tightened, stripped and abused fasteners
- Damaged and fatigued hardware
- Destroyed fasteners or substrate from repeated attempts to secure the fastener
- Poorly manufactured component parts of the fastener
- Substituted import fasteners in place of specified domestic products

The attachment failures that I have observed are usually the result of one or more recurring problems:

In commercial applications such as in a hotel environment, it is not uncommon to have multiple locations using identical products and fastening systems such as in guest rooms or common area hallways. One example of a multiple location installed product would be a guest room headboard. The headboards are usually attached to the headwall with a cleated system. This cleat system is often found loose or detached due to improper anchoring of the original installation hardware. Ornamental art pieces or wall sconces installed along a common corridor become dislodged due to abuse by patrons and or attachment failures occur due to improper usage of wall anchoring hardware. Another example is often seen in hastily or improperly installed door closer hardware. Serious personal injury claims can result from improper preparation of the receptor areas (point of attachment) where stripped, over torqued, or sheared screws ultimately lead to poor or inadequate attachment of the applied hardware products.

A key factor leading to personal injury is the lack of proper maintenance policies and procedures. In many cases, improper maintenance is found to be another prevalent cause of mechanical fastener failures which has resulted in severe injury claims. Maintenance personnel that are untrained or lack the proper tools to perform repairs often make the decision that the needed corrective actions they have taken to make the repairs have been properly completed. In many cases, the corrective maintenance actions actually created a much more dangerous situation, where a once minor problem became a significant factor contributing to a serious personal injury.

There are probably as many different types of mechanical fasteners as there are products that need fastening. Mechanical fasteners can be as simple as a common staple, nut, bolt, nail, or screw. They can be as complicated as a

proprietary connection that requires specialized tools to manipulate the connective surfaces. What is most basic to mechanical fasteners is that they must be used appropriately and as designed by the manufacturer of the fastener.

Most fasteners are designed for a specific application. Manufacturers have engineered their products to evaluate the weight of the object being connected, the substrate that the object will ultimately be connected to, the potential for expansion and contraction or movement of the substrate, and what environment the fastener must function within. Types of materials that sub-surfaces are made from affect the performance of any fastener. It is important to have information as to the component makeup of the point of attachment to insure that the fastener chosen will meet the needs of the applied components. Knowledge of the proper use of fasteners is even more critical in harsh environments. Points of connection with acidic substrates or where temperature, moisture or chemical changes are frequent make choosing the proper fastener even more significant.

On a very basic level, the best fastener for your application must include a calculation to hold the desired object with a margin of safety. Installation methods and techniques must be tailored and designed to exceed the possible abuses that can occur to protect the safety of the patrons of an establishment.

For example, my construction company has installed wall hung pictures throughout hotel rooms and hotel common areas. A small ten pound picture and frame properly attached to a wall does not appear to be a major safety hazard. However, in the most basic installation scenario when hanging this example decoration, my crews have utilized a continuous cleated system that works with a cam lock that assures not only the positioning of the picture, but also assures that the picture and frame cannot be removed from the wall.

If that ten pound picture fell off of the wall, or was hanging over a bed in a hotel room and fell off onto a guest while that guest was sleeping, that small picture and frame could create a serious injury. If the ten pound picture and frame was only attached to the wall using a hook and wire such as would be common in a residential application, the hotel would be negligent in the method of attachment by not protecting its patrons from a possible predictable injury.

While using the hanger wire and hook is reasonable and acceptable in a personal residential application, it could be considered negligent and inappropriate in a commercial application. The possibility that an injury could result from the inadvertent movement and detachment of the frame from the wall when the picture was accidentally brushed in normal usage must be foreseen. The planned potential abuse of this example picture and frame when installed with this locking cleat system answers several requirements that any hotel or commercial location should be concerned with.

1. The hotel should be concerned first with the safety of its patrons.
2. The condition and appearance of the hotel room is important to the management of the hotel.
3. The picture is secure from theft by guests.

With the proper usage of a locking cleated fastening system, the example picture and frame are securely attached. Making certain that the artwork remains level and straight, the design element of the room is maintained precisely as planned by the designers for the patrons to enjoy safely.

As a wide range and variety of wall conditions exist, the requirements of safe and proper attachments vary with the site conditions. Fasteners manufactured for almost any kind of wall and substrate exist, however, are often misused leading to personal injuries that could have been prevented. On different personal injury cases, different causes have been determined to have led to fastener failures.

It has been found that improper usage of fasteners has been the result of:

1. Attempting to lower the product installation costs.
2. Architects or engineers have specified inappropriate products for attachment.
3. Architects omit fastening instructions, so installers choose inappropriate fasteners for the product.
4. Installation techniques were wrong for the installed products.
5. Time constraints limited the quality of work, and due to a rushed schedule, hardware and fasteners were omitted by the installation contractors.

Representing both Plaintiff and Defense in personal injury claims, a variety of entities have been blamed for injuries resulting from improper attachment of installed products. In some large hotel cases, there are multiple tiers of responsibility that begin with poor choices made by an architect, designer or engineer. Contract installers, not questioning the installation requirements, project managers and team evaluators hurrying workmen to complete an installation and the lack of a thorough examination of the site after installation is completed. Finally, maintenance workers, maids or janitors lacking the qualifications to properly evaluate the site conditions on a daily basis fail to alert management that dangerous conditions need repair. In many cases, hidden defective installation practices and/or correct verification of proper

attachments after the products were installed have led to personal injuries making the management or owner of the property the primary responsible party.

When evaluating an injury from the defense perspective, some incident investigations have shown and proven that the abusive actions of a patron created the dangerous conditions leading to the injury. While serious injuries may have resulted to that patron, the actions of the patron sometimes eliminated the obligations of the property owner or management.

Mike Panish is a licensed general contractor in the State of California. He is also a commercial cabinet & millwork contractor experienced in manufacturing and installing architectural products. He has been the retained expert on many cases that have resulted from improper usage of fasteners.

Some of the types of cases where he has been retained to inspect, analyze, and evaluate attachment claims and responsibilities by both plaintiff and defense are as follows:

- Head board detachments in hotel rooms.
- Mirrored surfaces, applied vertically and horizontally.
- Overhead architectural panel systems in private residences.
- Architectural millwork in commercial buildings.
- T-grid ceiling systems in commercial buildings.
- Art work and framed mirrors in hotel rooms and common areas.
- Head trauma cases where casework has fallen on patrons.
- Door and hardware component detachment and failures.
- Book cases and shelving installation defects in housing tract developments.
- Garage storage shelving units in housing tract and condominium developments.
- Garage door component attachments and failures in residential and commercial properties.
- Kitchen and bathroom cabinet detachment and component failures.
- Guard railings and fencing attachment points.
- Cosmetic concealment in themed attractions such as component attachments for restaurants, amusement and entertainment venues.
- Improper installation of permanently attached products in municipal buildings and parks.
- Improper attachment of furnishings and cabinets in residences, hotels and commercial malls, casinos and cruise ships.

Michael Panish is an expert witness, forensic analyst, and consultant in the field of construction. He is licensed in the State of California as a General Building Contractor, Cabinet & Millwork Contractor, Door, Lock & Security Equipment Contractor, Paint & Finish Contractor, and Electrical Contractor. Mr. Panish has over 30 years of hands-on experience in the construction industry. He has been involved in concept designs for Hotels, hospitals, chain stores and franchised retail stores. He has participated in cabinet and millwork defect cases throughout the country. He has been designated as lead expert in the field of cabinets and millwork and has been consultant for both plaintiff and defense. Mr. Panish has provided testimony in construction defect, poor workmanship, product liability, and personal injury cases relating to most construction trades, doors, locks, automatic doors, cabinetry, and custom casework. Mr. Panish has offices in California and the New England area and is available for nationwide consultation, forensic analysis, inspection, report, and testimony. Due to Mikes' diverse background in many construction fields, he has been called in as a more knowledgeable expert witness to replace architects and engineers that were offering theoretical opinions. His real-world working knowledge and personal experiences have made him an incredibly successful and invaluable expert witness for many clients involved in these types of detachment injury claim cases. He has helped achieve high personal injury settlements for Plaintiffs, and significantly limited liability for Defense claims and Insurance settlements throughout the United States.