

Door Defects & Door Related Injury Claims: **A Guided Tour to Manual Doors & Door Hardware**

By Michael Panish – Expert Witness & Consultant

We are all used to opening and closing doors on a daily basis. Unless you encounter a problem with the function of your doors, you probably don't give their operation and component make up much thought. I am continually contacted by attorneys seeking my advice on an injury that took place because of an improperly adjusted or malfunctioning door. In this article, I am simply discussing manually operated doors. Nothing fancy or automatic about them, the kind where you grab a lever, push a plate or bang on a bar to enter or leave a room or building. So, if you want to learn to communicate professionally and simply with your door expert or even your building manager, read on.

Doors are actually a pretty simple and early invention. They probably started with a couple of wide planks to enclose an opening to keep out the weather or separate your belongings from the animals. Modern door systems are much more complex, but still do the basics. They keep your stuff protected from the elements, animals and other people.

While this article is in no means meant to be exhaustive and highly technical, there are a few things that need identification in order for all of us to properly understand their functions and be able to effectively communicate information.

A basic door system is made up of a framed opening, hinges, door, and door latch or lock. As separation and security requirements increase, the door system begins to increase in complexity. The basic door is either considered an unrated fire separation component or a rated fire separation component.

Unrated doors, frames and hardware:

Unrated doors are installed in locations that do not participate in keeping a fire contained. They are typical in most home locations, with the usual exception of a garage to interior home doorway. Unrated doors may be approved for some exterior exit doorways in commercial buildings, as well as interoffice openings. You have probably seen wooden raised panel doors, hollow slab doors, or hand carved ornate doors that appear more like artwork than a doorway. These doors are typically unrated, and do a fine job maintaining separation and privacy in our homes and offices. We are able to use these types of unrated doors in many locations, both residential and commercially, because designers or architects have located fire control walls and separations as part of the building design that make individual fire walls unnecessary. These doorways do not have the stringent requirements for their hardware, frames or doors that a fire rated doorway must have.

Fire rated door systems:

Fire rated doors, along with other augmented system components are able to contain a fire without burning through for a known and tested period of time. Typical ratings of fire doors are 20, 45, 60, 90, and 180 minutes. Uniform building codes and local fire codes determine the appropriate separations needed for a specific area of every building.

A fire rated opening is only as good as its weakest component. Therefore, along with a rated door, you need to have a rated frame assembly. There are many types of fire rated frames in the commercial market. Frames also undergo specific testing to rate their ability to withstand fire for a period of time. Commercially available standard rated frames are made from a variety of products. Rating can be achieved for hollow metal steel frames, aluminum frames, and specially treated wood frames. The correct application and method of attachment

of each type of these frames will limit or rate the opening to match the condition and rating of the wall that it is part of.

Frames are made up of a minimum of three components: A left leg, a right leg, (both vertical pieces) and the header (horizontal piece of the frame). Other more complex frames have the three components plus a clipped on casing mold. Some frames, particularly when associated and required with more stringent fire ratings will be fabricated into one welded assembly. Appropriate installation of all frames requires sturdy and positive attachment to the wall opening and floor system. To assure that the door will not be blown out of the framed opening during a fire, fire rated hardware must be used in conjunction with the fire rated frame. Ratings are given to hinges, door locks, panic bars and other locking devices and related components. To increase the effective barrier from a fire, a seal or gasket of some sort must be used around the opening of the door, as well as along the door bottom. In conjunction with these smoke seals there needs to be a non-combustible threshold between the floor and door sweep. These seals are in place to protect the occupants of an adjacent room from smoke or poisonous gases released from a fire, and are designed to allow more time for evacuation from the fire zone.

Let's talk about how to describe a door opening:

It is important to accurately explain what a door opening looks like and how it functions over the phone so that both parties are visualizing the same type of opening. If you want to do a little preliminary investigation, here are some things that are helpful in describing the door and frame to your expert. First, measure the opening so that you know the rough height and width of the door. The height measurement is taken between the floor and header piece location where the door rests. The width measurement is taken between the door legs at the widest point where the door rests between the legs of the frame. More information about door frames later in this article. A typical commercial door measurement might be 84" high x 36" wide. The actual door size will be slightly smaller, but that is not important for this exercise. A residential door, particularly in older homes, may be 80" high x 32" wide. Obviously, site conditions vary from location to location. Exact measurements may be critical later on in your case, but that is why you have contacted an expert to investigate.

Next, determine if the door opens into the room that you are standing in or away from that room. Does the door swing from the left or right side? Here is a tip on how to figure this out. If you are standing inside a room that the door swings into: Place your back against the door and see if the hinges are on the right side of your body or the left side. If right, you have a right hand door, if left, it is left handed. Remember this saying: "*Your BUTT to the hinge BUTT*". If you are in a room outside of where the door swings into, it gets a little more confusing as to how to describe the handing, but for simplicity, just look into the room and see if the door swings to the right or the left. It may be important to know, as your case may "HINGE".... Ha, ha, ha ...on this detail!

Now that the hard part is done, take a look at the door. What is it made of? Wood, Metal, glass, plastic laminate, etc... Does it have a label of any kind on it indicating a fire rating or special information? Does it have any distinguishing features such as scarring, scratches, damage of any kind? Generally, what condition is the door in? Does it look old or show wear, or is it new and in good shape? Is the door dragging on the floor or rubbing on the frame? Swing the door a few times to see if something is not working properly.

Now, check out the hardware on the door. How many hinges are attached to the door and frame? Do the hinges appear to be solidly attached to the door? Are the screws loose and pulling out of the door or frame? Measure what size the hinges are, if you can. Measure from the top of the hinge to the bottom of one hinge only. They should all be the same size. Are they? Note what color they are. Are they rusty, covered in dust or grease, old or new looking? Does the door have any type of knob or lever on it? Does it have a key lock? Is it activated remotely or by some sort of touch pad? Does it have a panic bar exit device on it, or are we looking at a conventional door lock set? Does it have a round orbit type of knob or a lever to activate the lock? Does the door have a door closer on it? Is the closer on the inside of the door or the outside of the door? What condition

does the overall hardware seem to be in? Are there kick plates or push plates on the door? Take a photograph of the door, if you can, for your file.

Actual Case Experience: Several years ago an early photograph of a door problem, taken immediately after an injury happened, showed that changes had been made to installed hardware. It was claimed by the opposition, during written discovery and deposition testimony that no alterations of any kind had been done to the doors since the injury occurred. After a site visit, I was given the early photos to evaluate, and immediately saw that the hardware had all been changed. This revelation led to some pretty interesting settlement negotiations in favor of my client. *So get the pictures, if possible!*

As long as you are examining the door, you should take a brief look at the frame and the frames' attachment to the wall. How is the frame oriented to the wall? Is there any space on either side of the wall, and what proximity to a perpendicular wall does it have? Is the frame metal, wood or some other material? Does it have a fire rated label or specialty tag on it? Does it appear to be solidly attached to the wall? Are the hinges solidly attached to the frame and door? Does the frame look scratched or worn, and are there grooves or dents?

Now that you have made a preliminary evaluation of the door, you are through with your basic inspection. You have seen firsthand what the site conditions are, and hopefully used my suggestions to evaluate the door for yourself.

Summary:

While your door expert should be thoroughly versed on every aspect of doors, door hardware, and installation elements, your ability to effectively describe the site shows your professionalism and concern for your case.

Doors are either fire rated or unrated. Not all doors need to be rated. They all have basic components such as hinges, locks, or panic devices. Door swing can be determined, as described above. Early photos and expert inspection of an event site can be extremely important for your case. Hiring a competent door expert and capturing critical evidence is one of the most important things that you can do for your client.

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 Door, Lock & Security Equipment Contractor, General Building Contractor, Cabinet & Millwork Contractor, and Electrical Contractor. Michael has over 30 years hands-on experience manufacturing, installing, and servicing doors for most commercial and residential applications. His company, Door & Hardware Systems, specializes in ADA (American Disability Act) and Life Safety compliance issues for hospitals, hotels, County/State facilities, and specialty applications. He has extensive knowledge and experience as a door vendor and custom manufacturer, and is considered a sole source contractor for many California State and County projects. His company does historic restoration and preservation of doors for commercial and residential projects. The 2007 swing gate installation projects throughout the Los Angeles County Court System were designed, fabricated, and installed by Door and Hardware Systems. Michael has consulted and testified in many injury cases pertaining to door related issues as well as most aspects of construction defects, product liability, and poor workmanship. He has offices in California and New England and is available for nationwide consultation, forensic analysis, inspection, and testimony. **Michael Panish can be reached at (818) 992-1975 or (818) 429-1963. Please visit <http://www.ConstructionWitness.com> for more information.**

See next page for Glossary of terms;

Glossary of terms (as they apply to door components in this article):

Hinge: a device usually consisting of two leaves interlaced to receive a removable pin allowing for movement of the two leaves so that a positive attachment can be made to two individual stable components.

Closer: A hydraulic or spring loaded device designed to draw, retard or bring together a door to the door framed opening.

Swing: The direction of movement and arced path of travel taken by a door in a framed opening.

Panic device: A piece of hardware designed to work without any special knowledge, activated by applying force to a bar usually positioned horizontally across the face of the door.

Frame: The product bordering a wall opening allowing connection between wall and door.

Lock set: Any lock device that works in concert with a latch and strike plate.

Smoke seal: Any material capable of gasketing a framed opening. The material that the seal is composed of is specifically designed to isolate transfer of smoke and poisonous gases emitted by a fire.

Door sweep: A piece of weather-stripping or smoke seal designed to stop air, smoke or other objects from entering underneath a closed door. Acts like a broom to sweep along the floor, sealing the door bottom.

Threshold: The boundary of two areas associated with a door way. The material located directly underneath a closed door. Depending on rating requirements, a variety of materials are used.

Latch: The bolt that physically holds a door closed when engaged in a strike plate working as part of a lockset.

Strike plate: The plate attached to a door frame, with a hole to receive the latch..