When a reverse osmosis (RO) water filtration system in a commercial building springs a leak and fails, there is huge potential for significant water damage and property loss; often such incidents end up affecting multiple levels of the building and business below. The resulting damages and cost of these insurance claims can be incredibly high and extremely inconvenient for all involved parties.

In situations of flooding and water damage in a commercial building due to these failed water filtration systems, it is imperative that a forensic investigation happens immediately, before the unit has been moved and before anything has changed. A prompt on-site forensic investigation will make it much easier to determine the cause, document the physical evidence, and assist in an efficient subrogation process.
“RESIDENTIAL” REVERSE OSMOSIS FILTERING SYSTEMS IN COMMERCIAL BUILDINGS?

It is fairly common to find reverse osmosis (RO) water filtration systems installed in commercial buildings. Most are labelled as “residential” units at purchase, but they are well-suited to filtering drinking water at kitchen-style sinks in offices or other places of business.

The problem - if an RO water filtration system installed in a commercial building fails, the resulting costs associated with flooding and property damage can range from tens of thousands of dollars up into the millions.

TYPICAL ISSUES LEADING TO REVERSE OSMOSIS FILTERING SYSTEM FAILURES

There are three potential issues that need to be investigated in cases of reverse osmosis system failures, and determining the origin and cause of the failure is the cornerstone of any subrogation attempts.

1. IMPROPER INSTALLATION

In commercial buildings, reverse osmosis filtering systems are typically installed by professional plumbers. So issues with installation are not very common. But last-minute scope changes and rush jobs during construction or renovation projects can cause problems:

   - Improper components connecting the tubing to the cold water supply line
   - The tubing is not cut straight so it does not engage the connector properly
   - There is a broken (plastic) ferrule/nut resulting from over-tightening
   - The reverse osmosis unit itself was not secured properly, leading to it falling or tipping, breaking a fitting or dislodging a tube
   - Filter cartridges were not installed properly
   - Water supply lines were kinked and/or significantly bent

Leaks may not be evident right away. Following installation, someone might watch it run for an hour and then assume it is working properly, but leaks can happen days or weeks later.

2. IMPROPER MAINTENANCE

Reverse osmosis water filtering systems typically have three pre-filters which need to be changed every three months. Sometimes plumbers are contracted to maintain RO systems, but sometimes less trained people take on the responsibility of maintenance and problems can occur:

   - Replacement filter cartridges were not installed properly
   - Filter housings were over-tightened or cross-threaded
   - Lines or fittings were impacted while someone was trying to work in the tight space, causing a disconnect or damage

Many of the potential installation issues become more prevalent in maintenance situations, often because the person responsible has not had adequate training.
3. MATERIAL DEFECTS
Reverse osmosis water filtration systems are mostly made of plastic materials, and sometimes a problem with a manufacturing procedure can introduce impurities or voids, or create defects in the material that will lead to a leak or failure over time.

Some filter housings are made in two parts and then fused together. Any improper surface preparation, including the presence of impurities or oil on the surfaces, can prevent the mating parts from fusing properly.

• Visual examination alone is often not sufficient to provide an opinion on the failure mode of a component, since important and relevant features of the fracture areas cannot be observed with the naked eye. A Scanning Electron Microscope (SEM) offers significantly superior resolution and depth of field compared to light microscopes.

• Chemical analysis is often required to determine if the plastic materials meet the manufacturer’s specifications and/or if their properties were degraded over time due to exposure to UV light or to undesirable and aggressive chemical compounds (usually found in household cleaning agents).

Proper forensic investigation and using the appropriate analytical investigative tools are required to determine if a manufacturing problem was the cause of a leak or flood and the resulting water damage.

INSURERS ASK THESE QUESTIONS!

Insurers might consider asking the following questions before quoting on commercial property insurance policies:

1. Do you have a reverse osmosis water filtration system installed in your facility?
2. If yes, was it installed by a professionally-trained plumber?
3. If yes, do you contract a professional plumber to service the system and provide regular maintenance?

Insurers might also be extra diligent about asking questions and gathering information if the policy holder occupies space on an upper level of a commercial building, where a leak or flood might adversely impact other businesses.
ADJUSTERS TAKE THESE STEPS!

Insurance adjusters can take the following steps to help increase their chances of determining the true cause of the failure and recovering claim losses:

1. Once the water is turned off, leave the system undisturbed
2. Inquire about when the water filtration system was installed and when/how the filter changes were made
3. Contact a forensic investigator and have him or her examine the system while it is still in place

Having the RO system examined in place will help the investigator to understand and document the true cause of the failure and flood.

IMMEDIATE, ON-SCENE INVESTIGATION IS KEY

We see these types of reverse osmosis filtration system failures fairly regularly, and the losses due to flooding and water damage are often significant. Immediate investigation leaves less opportunity for contamination and unintentional interference. It allows for on-scene testing, extremely accurate identification of the cause of failure, detailed documentation of physical evidence, and positions you best for pursuing subrogation with confidence.