Welcome to the Water Heater Lifesaver site, where we solve a common yet serious problem concerning tank-type residential water heaters. The cost to replace a water heater has never been higher. This simple, inexpensive product will help protect your investment. Note the picture evidence below.

- Gas water heater with retained water damage.
- Electric water heater with retained water damage and attempt to level with uneven, biodegradable wooden shims.
- Gas water heater with retained water damage.
For the Water Heater Lifesaver solution to this problem, please click here, or follow the "Product images" link above. Below, we explain how we recognized this problem and what the Water Heater Lifesaver does to solve it. For more detailed technical information, please click here, or follow the "Description and Product Rationale" link above.

In the home appliance sales and repair business for many years, we began to see a pattern with tank-type residential water heaters installed in catch/drain pans. Many of these water heaters were rusted or water-damaged in some way from standing in water retained in the drain pan. This damage ranged from slight rusting to heavy soot buildup causing improper main burner operation and a fire hazard.

Although the drain pan is the cause of this problem, the drain pan itself has saved many homes from flooding, and we highly recommend its use—along with the Water Heater Lifesaver, a major improvement on the traditional catch/drain pan.

We noticed another problem over the years in home appliance repair: not all water heaters are placed on level surfaces. The Water Heater Lifesaver addresses this leveling issue, too, and ensures that any water heater it supports remains level.

The Water Heater Lifesaver, patent pending, is either one flat disc or a stack of two wedge-shaped leveling discs that can be combined as needed under tank-type residential water heaters. We intend to license or assign this patent to a manufacturer who will take the project from there. With proper handling, this product will have a strong sales position in all areas of today’s plumbing market, ranging from the do-it-yourself home owner to the professional plumber.

Fresh air intake vents completely blocked (retained water level indicated by screwdriver tip) on this Flamable Vapor Ignition Resistant (FVIR) gas water heater. Three-legged gas water heater approaching a premature demise by standing in retained water. Evidence of retained water level covering fresh air intake vents and when dry, leaving powdery residue, clogging the arrestor plate.
Popular brand catch/drain pan showing drain pan connector and potential for one full inch of retained water.

Drain pan with soldered-in bottom drain connector that should not retain water, but due to irregular floor, retained enough water to cover fresh air vents.

Attempt to level water heater with improvised shims on a sloping crawl space slab.

This gas water heater is immersed in over 1 1/4 inches of retained water. The water is caused by a slowly leaking T&P valve draining into the catch/drain pan through the copper pipe on the right.

The catch/drain pan drainpipe connector not being set into the floor, is the cause of over an inch of retained water. As a result, the connector is pushing the edge of the pan up, raising the retained water level.

The reflection in the mirror is one of three submerged legs of a gas water heater rusting and decomposing from retained water.
WATER HEATER LIFESAVER: 
Product Description and Rationale

Overview

Recent innovations in tank-type residential hot water heater installations include seismic strapping and the catch/drain pan. Seismic straps are intended to keep the water heater upright and connected to its energy and water sources during earthquakes, and they are code in earthquake-prone California, which has the most stringent Uniform Plumbing Code seismic requirements of all 50 states. The catch/drain pan is placed under the water heater in case of a leak, is code in some municipalities around the country, and is becoming more popular due to its flood protection benefits.

The typical tank-type residential water heater holds 40-50 gallons. When full, the device weighs 500 - 600 pounds—a quarter ton standing on three metal legs or on the tank’s protective jacket pan, both susceptible to rust and neither meant to be immersed. Earthquakes large enough to tip a water heater over are rare even in California. However, the Uniform Plumbing Code provides for protection against earthquakes without taking into account the fact that residential hot water heaters remain at risk—a more common, perhaps even greater risk—from the catch/drain pans themselves.

The water heater catch/drain pan has protected many homes from potential flooding. But by retaining water, the drain pan has caused loss of structural integrity to the water heater’s support base, created a fire hazard and has been the cause of operational malfunctions.

Observation

The wall height of a catch/drain pan varies from manufacturer to manufacturer. Pans range in depth from an inch to as many as four inches or more. Generally speaking, when a residential water heater leaks into a catch/drain pan, the pan will retain water up to the level of its drainpipe before it begins to drain. This retained water can be half an inch deep or more, depending on the height of the drainpipe connector and whether the drain pan is level and the drainpipe remains unobstructed.

Effects of Retained Water

As beneficial as it is for the home, the catch/drain pan can be detrimental to the water heater because the drain pan contains the “flood” in the area of the water heater. The pan may do its job keeping the house dry, but by retaining water, the water heater is partially immersed, standing in water on its rust-prone legs or jacket pan. Water heaters are located in closets, attics or crawl spaces and are usually not annually inspected as many manufacturers recommend. Even if they are inspected regularly, a lot of damage can occur in a year. As long as they maintain normal hot water temperature and quantities, residential water heaters give no evident reason for concern. A water leak can go unnoticed, allowing the water heater to remain in a partially immersed state for an indefinite amount of time.

All tank-type water heaters need to be installed in an upright, plumb position. Most electric water heaters stand on very short attached legs or have no legs at all and rest on the bottom pan of the water heater’s protective outer jacket (not to be confused with the catch/drain pan). If there is water in the drain pan, some parts of the water heater will be immersed that are not designed or intended to be wet.
When an electric water heater stands in water, its insulation (between the tank and protective jacket) absorbs and wicks water up the sides of the tank and outer jacket. This seeping action causes rust to form on the tank and jacket. Mostly out of sight, rusting can continue until the jacket and/or legs have disintegrated to something less than design specifications and the insulation is damaged. A short circuit also is possible as well as a fire hazard if the dampness should reach the electrical connections of the lower heating element or control thermostat.

Like electric water heaters, some gas-fired water heaters have supporting legs of varying designs and heights, and some don't. Again, if it has no supporting legs, the water heater rests on the jacket pan. Gas water heaters suffer from the same rust damage as their counterpart electric units, the extent of the damage depending on time immersed, depth of the retained water and the support design.

A gas-fired water heater has an additional safety concern. In order to operate properly, all gas-fired water heaters need abundant, fresh combustion air. The combustion chamber for most residential gas water heaters is an enclosed circular chamber the same diameter as the water tank, residing directly beneath the tank, physically a hollow extension of the tank where the gas burner is situated. From the top of the chamber a fluepipe runs vertically up through the center of the tank, aiding in heating the water and eventually routing emissions to the atmosphere.

In operation, a gas water heater has flame at the main burner, where a fundamental law of thermal activity is in effect: hot air rises. Air is being heated and continuously drawn by the combustion process up and out the fluepipe. This thermal activity and combustion process requires cool fresh ambient air, which is drawn through vents into the combustion chamber at the lowest possible point of the chamber.

Standing in water, a gas water heater runs the risk of either fully or partially blocking its fresh air intake vents, creating an incomplete burn or worse. The flame in the combustion chamber is maintained at its most efficient by the proper mix of air and fuel. If this air/fuel mix is incorrect, the flame will burn less efficiently and less safely. Improper air/fuel mix can lead to a flame-out condition, create harmful soot in the combustion chamber and fluepipe, and a possible fire hazard.

Causes of Water Leaks

Water heaters can leak for various reasons, including water expansion during the heating process, which can cause the temperature and pressure relief valve to purge off excess pressure. Although the temperature and pressure relief valve drain should be directed outside the drain pan, it often is not. Other leaking may occur from associated plumbing servicing the water heater, from porosity holes in welds around ports and seams, from the tank itself due to rusting or manufacturing defects, or from any other plumbing or leak source that finds its way into the catch/drain pan.

Summary

Homeowners, handymen and many professional plumbers/installers tend to see any operational problem with a water heater as terminal, requiring heater replacement. This is understandable as these people are usually not electricians or gas service people. The water heater could be perfectly fine, needing only a minor repair that may very well have been caused by retained water. Perfectly good water heaters having these unidentified problems are being replaced at great expense, only to have the same problems reoccur.

THE WATER HEATER LIFESAVER
The Water Heater Lifesaver is designed to address the problems of water heater immersion and leveling that are important for proper installation and function. More precisely, the Lifesaver enables the easy installation of a water heater on a strong, firm support above the retained water level in a plumb and level manner. As a result, the Lifesaver greatly reduces the possibility of mechanical malfunctions, premature failure, expensive service calls, and unnecessary replacement and/or property damage.

The Water Heater Lifesaver is a disc made of tough, recycled, high-density polyethylene placed under the water heater, between the heater and the catch/drain pan. The Lifesaver is engineered to be as economical as possible and still support the weight of today's large residential water heaters. The Lifesaver comes in two versions—flat and angled. The flat Lifesaver is ¾" high at the supporting surface and has a raised edge around its upper circumference to keep the water heater in position on the disc during installation. The flat Lifesaver is all the protection needed for installing on a level surface. If the catch/drain pan has a retained water level of more than ¾", regardless of the version, Lifesaver discs can be stacked to exceed the retained water level, usually requiring no more than two.

On a non-level, sloping surface, two angled Lifesavers are stacked together. When the upper disc is rotated on top of the lower disc, the angle of the upper disc changes. At the upper and lower circumference edge of each disc are clocking points every fifteen degrees that interlock with the disc's counterpart. This configuration allows an angle change from level up to a one inch slope at fifteen-degree increments within the diameter of the disc. If the installer needs to rotate the water heater on the disc stack for proper positioning, with the discs interlocked, the discs won't rotate in relation to each other, keeping the preset level setting of the upper disc intact. Disc diameters vary corresponding to different water heater footprint diameters. Using the Lifesaver in conjunction with the catch/drain pan and seismic strapping, the installer can be assured of the best possible installation.

Conclusion

The Water Heater Lifesaver is designed to prevent common, potentially dangerous, destructive, expensive and wasteful water heater problems not yet addressed by the industry. These safety and function issues appear to be a much more common eventuality than earthquakes and can cause just as much damage as a water heater tip-over. In response to earthquake-related problems, only the State of California has amended its Uniform Plumbing Code to mandate stronger water heater seismic strapping.

But the Code does not yet address the various dangers of water heaters standing in retained water, which, unlike seismic events, occur everywhere. The Lifesaver anticipates the possibility of such a Code requirement and addresses it preemptively, thereby saving and benefiting not only the water heater itself, but also the multiple millions who depend on their water heaters daily for safe, efficient, long-term performance.
Water Heater Lifesaver

Product Images

Top View of Water Heater Lifesaver
Bottom View of Water Heater Lifesaver
Photo of Angled Water Heater Lifesaver
Notice that left edge is narrower than right edge.

For more detailed technical information, click here.
WATER HEATER LIFESAVER

The figures below have been compiled to give you an idea of what the Water Heater Lifesaver could do in the market place and what it might cost to produce. Because China is among the most cost-effective manufacturing countries in the world, we chose it for our example. But a U.S. company with injection mold capabilities could also take the project on. We don’t try to represent all costs and realize there will be others, such as marketing, warehousing and distribution, that must also be considered.

2006 TOTAL RESIDENTIAL WATER HEATERS SHIPPED IN THE USA:

9,446,076

IF JUST 5% BOUGHT WATER HEATER LIFESAVERS:

472,303 WATER HEATER LIFESAVERS

472,303 X $29.95* = $14,145,474

IF JUST 10% BOUGHT WATER HEATER LIFESAVERS:

944,607 WATER HEATER LIFESAVERS

944,607 X $29.95* = $28,290,979

*Estimated market price – your price may differ

www.gamanet.org referenced February, 2008
# WATER HEATER LIFESAVER COSTS

**TOOLING:** lead time 50 days  
Tooling material: P20 LKM mold base

- 20”* Flat Lifesaver (1 x 1 cav.) | US $15,250
- 20 in interchangeable Lifesaver insert | $9,000

*Size will affect pricing.

## WATER HEATER LIFESAVER PROTOTYPE PRICING 5/20/2007

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<th>Lifesaver Description</th>
<th>Qty</th>
<th>Each</th>
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## WATER HEATER LIFESAVER MANUFACTURING COSTS
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<thead>
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<th>Number of Pieces</th>
<th>Price per each</th>
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Prices include material, labor and FOB

WATER HEATER LIFESAVER SHIPPING COSTS AND QUANTITIES

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<tr>
<th>Approximate qty 20&quot; units/container</th>
<th>Cost per unit</th>
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<td>9,030</td>
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COST TO U.S. WEST COAST @ $6.62* PER UNIT INCLUDING MANUFACTURE AND SHIPPING

472,303 x $6.62 = $3,126,645

5% EXAMPLE

$14,145,474 - $3,126,645 = $11,018,829

10% EXAMPLE

$28,290,979 - $3,126,645 = $25,164,334

* Price rate is $5.95 per unit @ 10,000 units per order to manufacture plus $.67 shipping per unit – 40ft. container. Manufacture price will vary depending upon quantity ordered.
Water Heater Lifesaver

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