

MOST HOMEOWNERS HAVE NO IDEA THEIR WATER HEATER IS ALREADY HALFWAY TO FAILURE



Why Your Water Heater May Be Aging Twice as Fast as It Should

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<p>INSIDE YOUR TANK</p> <p>WHAT'S INSIDE</p> <ul style="list-style-type: none"> Sediment accumulates every heating cycle Scale insulates element forcing longer run times <p>T&P valve</p> <p>BATTELLE INSTITUTE / DOE 1/4" sediment = 25–40% efficiency loss on electric heaters Element burnout: 10–15 yr → 3–5 yr in hard water</p>	<p>THE ANODE ROD</p> <p>NEW 5+ YRS FULL tank corrodes DEPLETED</p> <p>HOW IT WORKS The anode rod is a sacrificial metal rod (Mg, Al, or Zn) that runs down the tank center. It corrodes instead of the tank — protecting the steel lining.</p> <p>LIFESPAN 3–5 Years Replace every 3–5 yrs regardless of appearance. Harder/acidic water consumes it far faster. Without it: tank fails in as little as 6 yrs (State Water Heaters / Corro Protec)</p>	<p>PRESSURE & EXPANSION</p> <p>EXP. TANK HEATER PRV GAUGE PSI 60 PSI ✓ NO TANK PSI 150+ PSI △</p> <p>HIGH PRESSURE ACCELERATES FAILURE Overpressure stresses welds, fittings & tank walls with every heating cycle. IRC 2024 requires expansion tank on all closed systems</p>	<p>WARNING SIGNS</p> <ul style="list-style-type: none"> rumbling / popping rusty water slow hot water recovery rising energy bills T&P valve dripping sulfur / rotten egg smell 8+ YRS heater is aging fast moisture / leaks HOT → COLD inconsistent temps <p>HARD FACTS — MANUFACTURER & DOE DATA Tank heater design life: 10–12 years (gas) / 10–15 (electric) No maintenance = avg failure at 6–8 years Water heating = 18% of US home energy use (DOE)</p>
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SEDIMENT & SCALE BUILDUP

How Sediment Kills Your Heater

Every time your water heater fires, dissolved minerals settle to the bottom. Over months this becomes a thick, hard insulating blanket over the heating element or burner. The U.S. Department of Energy confirms **1/4 inch of sediment scale reduces electric heater efficiency 25–40%**. The element overheats trying to push through the barrier — burnout accelerates from a 10–15 year lifespan to just 3–5 years. Sediment also creates hot spots on tank walls, corroding the steel from the inside out.

The Sound You're Ignoring

Rumbling, popping, or banging from your water heater during heating cycles is trapped steam and water bubbling through sediment — not a normal operating sound. It is your tank signaling active overheating. **Manufacturers universally recommend annual flushing** to remove sediment before it hardens into scale. Most homeowners have never done it — and it shows in early failure.

BATTELLE INSTITUTE — DOE-COMMISSIONED STUDY

In a 90-day controlled study of residential water heaters, **sediment and scale were the leading driver of premature element failure and efficiency loss** in electric units. Heaters on treated water maintained factory efficiency for 15+ years. Untreated hard water units showed measurable decline within 2–3 years.

THE ANODE ROD — YOUR TANK'S SACRIFICIAL SHIELD

3–5 Yrs

Recommended anode rod replacement interval — most homeowners never replace it once

6 Yrs

Cost to replace an anode rod — a fraction of a premature \$1,000–\$2,500 water heater replacement

6 Yrs

Minimum tank failure timeline once the anode rod is fully depleted and unprotected (Corro Protec)

18%

Of total home energy use is water heating (DOE) — efficiency loss hits your bill immediately

What the Anode Rod Actually Does

Your water heater tank is steel lined with glass — but that lining has imperfections. The anode rod (magnesium, aluminum, or zinc) runs down the center of the tank and corrodes *instead* of the steel, using electrochemical attraction to draw corrosive minerals away from tank walls. Once it is fully consumed — a wire core with nothing left — the tank becomes the sacrificial element. **Corrosion begins immediately and is irreversible.** Soft or acidic water (like Atlanta's) consumes the rod far faster than normal.

- ✓ Rotten egg / sulfur smell in hot water — anode rod reacting with bacteria
- ✓ Rusty or discolored hot water — tank steel itself is corroding
- ✓ Heater is 5+ years old and rod has never been inspected or replaced

PRESSURE, EXPANSION & T&P VALVE WEAR

High Pressure Shortens Tank Life

Homes on municipal supply without a functioning Pressure Reducing Valve (PRV) routinely see **80–150 PSI** at the tank — far above the 50–80 PSI design range. Every heating cycle in a closed system without an expansion tank generates an additional pressure spike. Welds, fittings, the dip tube, and tank walls absorb these shocks continuously. The T&P (temperature & pressure) relief valve wears out trying to manage what an expansion tank and PRV should be handling.

T&P Valve: The Last Line of Defense

The T&P valve is designed to open in a true emergency — not to cycle with every heating period. A valve forced to drip constantly from thermal expansion will eventually stick open or fail closed. A failed-closed T&P valve combined with a runaway thermostat is the condition that leads to **catastrophic tank rupture**. Test it annually. Replace it every 6 years. Never ignore a weeping valve.

WHAT DAYCO EVALUATES ON EVERY VISIT

- ✓ **System pressure test** — hose bib gauge check confirming PRV is protecting your equipment
- ✓ **Expansion tank assessment** — Schrader valve pressure check and bladder integrity evaluation
- ✓ **Age & serial number decode** — we tell you exactly how old your unit is and where it stands in its lifespan

THE BOTTOM LINE

Sediment buildup, a depleted anode rod, and unmanaged pressure are the three fastest ways to cut your water heater's life in half. Knowing your unit's age and system conditions is the first step — ask your Dayco technician during any service visit.