



CRACKS IN HEAT EXCHANGERS

What are the Causes of a Cracked Heat Exchanger in a Gas Furnace?

A cracked heat exchanger is serious and should not be taken lightly. If a crack makes its way through the walls of your heat exchanger, dangerous carbon monoxide fumes can leak into your home's air. One of the best ways you can protect your home from the dangers of a cracked heat exchanger is to know how those cracks develop in the first place.

5 common causes of a cracked heat exchanger:

Years of normal wear and tear.

- Believe it or not, cracks can develop in most furnaces after years of normal use. Heat exchangers are made of metal that expands and contracts every time your furnace turns on and off. Over time, this stress creates cracks in your heat exchanger. If you keep your furnace well maintained throughout its lifetime, you can significantly prolong the amount of time it takes for those cracks to develop. If your furnace is poorly maintained or installed improperly, heat exchanger cracks can develop much quicker.

Poor airflow.

- Dirty Filters and closed or blocked air registers are a few examples of problems that can slow airflow to your heating system. If your furnace isn't receiving proper airflow, it can overheat and put extra stress on your heat exchanger. This extra stress often leads to premature cracks.

Incomplete combustion.

- Airflow issues can also cause combustion problems in your furnace. If your gas furnace is operating with an incomplete combustion process, your burners will have to run hotter and longer. This excess heat puts more stress on your heat exchanger, which leads to cracking.

Oversized furnace.

- If your furnace wasn't sized correctly when it was initially installed (a problem that is all too common), your heat exchanger will likely develop premature cracks. If your furnace is oversized, for example, it will go through frequent on-and-off cycles and cause your heat exchanger to expand and contract too often. Another problem associated with an oversized furnace is condensation. In a correctly sized furnace, condensation builds up inside your heat exchanger when your furnace first turns on. This condensation eventually evaporates after a few minutes of use. In an oversized furnace, however, that condensation doesn't have enough time to evaporate. This condensation can eventually rust out the walls of your heat exchanger.

Undersized furnace.

- If your furnace is too small for your home, it will have airflow problems and frequently overheat. Overheating will cause your heat exchanger to crack much quicker than it would if your furnace was sized correctly for your home.

How does a heat exchanger work in a furnace?

Step 1: Hot combustion gasses enter the heat exchanger.

- When your furnace kicks on, its burners send hot combustion gasses to the inside of your heat exchanger (often called its "chamber"). As this happens, the heat from the combustion gasses is transferred to the metal walls of your heat exchanger, causing them to heat up.

Step 2: Air is blown over the outside walls of the heat exchanger.

- Now that the walls of your heat exchanger are heated up, your furnace blows cold return air from your home over the outside of the heat exchanger. This allows the air from your home to heat up without picking up any of the dangerous combustion gasses that are housed inside the chamber of your heat exchanger. This warm air is then directed through your home's ductwork and distributed throughout your home.

Step 3: Cooled combustion gasses are vented outside.

- After the heat from the combustion gasses has been transferred to the walls of your heat exchanger (and then to your home's air supply), those gasses need somewhere to go. In standard furnaces, these gasses are blown out of the heat exchanger and vented out of your home. In high-efficiency condensing furnaces, these gasses are sent to a second heat

How carbon monoxide from your furnace can leak into your home's air?

There are several ways that carbon monoxide leaks can develop in your heating system. A few of the most common include:

Cracks in your heat exchanger.

- Inside your heat exchanger, heat from combustion gasses (including carbon monoxide) is absorbed and used to heat your home. If a crack develops on your heat exchanger, CO can leak directly into your home's air supply.

Openings in flue pipes and venting systems.

- The purpose of flue pipes and venting systems is to carry combustion gasses safely out of your home. If cracks or holes develop anywhere on these parts of your heating system, or if connections between them become loose, CO could leak into your home's air instead of venting to the air outside.

Furnace is dirty.

- A dirty furnace can cause your heating system to operate inefficiently, which increases the amount of carbon monoxide your unit produces.

Inadequate air supply to your furnace.

- If your furnace is not receiving enough air either because of improper ductwork design or a **dirty furnace filter**, CO can back draft into your home and infiltrate your home's air.

Incorrect blower installation.

- Your furnace's blower is supposed to direct combustion gasses out of your home. If it was installed the wrong way, it could actually be sending carbon monoxide back into your home's air supply.