Terasen Gas

The heart of your home

Get comfortable with a high-efficiency natural gas heating system

We're here to help

If you're in the market for a new heating system and don't know where to start, this booklet is for you. Inside, you'll find helpful advice to make your new heating system as efficient and comfortable as possible.

Visit terasengas.com for more information on a variety of natural gas topics, or call Terasen Gas and one of our customer representatives will be pleased to help you.

Customer service..... 1-888-224-2710

Call before you dig

For natural gas line location information call:
BC ONE CALL 1-800-474-6886
On a cell phone *6886

To find a licensed gas contractor contact:
BC Safety Authority
Suite 400, 88 6th Street
New Westminster, BC
V3L 5B3
Phone: (604) 660-6286
Fax: (604) 660-6215
Toll Free 1-866-566-SAFE (7233)
www.safetyauthority.ca

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The intent of this booklet is to provide general information only. For comprehensive information and answers to specific questions, please speak with your heating contractor.

The comforts of home

On cold winter nights it's nice to be warm and comfortable inside your home. Your heating system is at the heart of it all.

Given that approximately 50 percent of energy use is for space heating*, choosing an efficient natural gas heating system makes good sense. But efficiency is not just about saving money, it's also about creating a comfortable environment.

Whether you choose a high-efficiency natural gas boiler or a furnace, the payback on your investment and the overall performance of your heating system depends on good design, installation and maintenance. Follow these principles and you'll be on your way to a more comfortable and efficient home.

*Source: Natural Resources Canada, 2005 BC Stats

Replace or repair?

Buying a new heating system is a major investment. It's often worth your while to maintain and repair your old system until it's necessary to replace it.

In 1995, the government raised the minimum required efficiency of new furnaces to 78%. Most furnaces installed before this time were only 60-70% efficient, and some very old furnaces offer as little as 50% efficiency. New high-efficiency furnaces can operate at up to 97 percent efficiency.

Regular inspections and maintenance help to keep your heating system operating safely at its original efficiency level. You can do many things yourself (see page 13), but a licensed gas contractor registered with the BC Safety Authority should inspect and service your heating system at the intervals recommended in your owner's manual.

What's AFUE?

AFUE stands for Annual Fuel Utilization Efficiency. It's a measure of how well an appliance converts fuel into heat. If your furnace has an AFUE rating of 97 per cent, that means that 97 cents out of every dollar you spend on fuel ends up as useful heat.

Before you buy a new system

Explore your options

If you're building a new home, you can choose a forced air or hydronic (hot water) natural gas heating system.

If you are replacing an old system, it's usually easier to replace a furnace with a furnace upgrade, and a boiler with a boiler upgrade.

What you need to know about each option

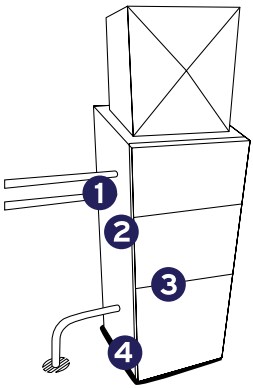
Forced-air furnaces

There are two choices when it comes to new furnaces—non-condensing furnaces, which have AFUE ratings up to 82 per cent, and condensing furnaces, which have AFUE ratings up to 97 per cent. Non-condensing furnaces in BC are no longer available in new home construction, and come January 2010, they won't be available at all.

A high-efficiency furnace is called a condensing furnace because it has a second heat exchanger. This heat exchanger squeezes more heat from the fuel by condensing water vapour (condensate) from the combustion products. A drain disposes of the condensate. When you upgrade to a high-efficiency furnace, the net effect is a reduction in energy used and an increase in savings.

Up close: high-efficiency furnaces

Here's a look at what makes high-efficiency natural gas furnaces different from regular furnaces.



1. **Air intake** – "sealed combustion" or "direct vent" units use outside air for combustion, keeping the already heated air inside your home. This feature saves energy and adds safety.
2. **Exhaust vent** – in high-efficiency furnaces, exhaust gases are blown directly outdoors through a dedicated vent after fuel is burned.
3. **Secondary heat exchanger** (inside your furnace) – heat that normally goes out the vent in a regular furnace is captured by condensing water vapour produced during combustion. The remaining condensate goes out the drain.
4. **Drain** – condensate produced by the secondary heat exchanger drains here.

Why buy a high-efficiency natural gas central heating system?

Comfort. The fresh air and even heat of a natural gas system ensures your living space remains perfectly comfortable.

Savings. When you're saving energy, you're saving money.

Environment. By choosing high-efficiency natural gas equipment and using it wisely, you help protect our environment by reducing greenhouse gases.

Safety. Features like sealed combustion and the use of corrosion-resistant materials help keep you safe and ensure that combustion products don't find their way into your living space.

Boilers
(hydronic heating systems)

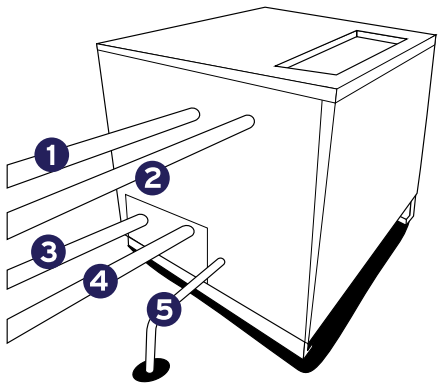
Hydronic (hot water) natural gas heating systems combine comfort and hot water needs in one system. High-efficiency systems range from 85 per cent to 96 per cent AFUE.

Before you buy, make sure your heating system designer and heating contractor size, select and install heating components that match your home's requirements.

Up close: high-efficiency boilers

A boiler creates hot water to heat your home. This heat can be distributed through a system of pipes to a baseboard heater (a low-profile hot water heating device needing minimal space) or a radiant floor panel manifold (to distribute hot water to individual floor panels).

Some of the standard features on high-efficiency boilers:



1. Air intake – as with high-efficiency furnaces, "sealed combustion" or "direct vent" units use outside air for combustion and keep heated air inside your home. This feature saves energy and adds safety.
2. Exhaust vent – in high-efficiency boilers, exhaust gases are blown directly outdoors through a dedicated vent after fuel is burned.
3. System supply piping – heated water leaves the unit here for circulation through the piping system to the rest of the house.
4. System return piping – once the heated water has circulated through the system, it comes back to the boiler for reheating.
5. Drain – condensate produced by the heat exchanger drains here.

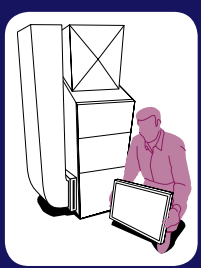
Options for heating systems:

- Use a hot water baseboard and radiant floor manifold to divide your home into “zones” for heating particular areas of your home at a time.
- Consider a forced air fan coil unit. It circulates warm air through ducts the same way a conventional forced air system does, except the fan coil gets heat from the boiler. You can use the boiler for heating, and add air filtration and air conditioning.
- Make your boiler do double duty as a domestic hot water heater. A separate heat exchanger transfers heat from your boiler to a domestic hot water storage tank. Your tank's efficiency will then approach your boiler efficiency (water heaters are usually less efficient than the main boiler or furnace).
- Your system can also be designed to heat your pool or hot tub, or melt snow off your driveway. Your heating contractor can provide you with more information on the options available to you.

How can you be sure your furnace or boiler is properly sized?

Have a heat loss calculation done. An appliance that’s properly sized, installed and maintained will have a long life and keep your home comfortable.

If there is excessive heat loss, be sure to have a professional review your duct and pipe design and installation.



Heat loss calculations, pipe design, and installation practices should follow standards as set out by the Residential Hot Water Heating Association (RHWHA); Heating, Ventilating Cooling Industry Association of B.C. (HVCI); American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE); Thermal Environmental Comfort Association (TECA) or other recognized heating associations.

Add more comfort

Consider these options and accessories to enhance your heating system.

Air filters – an electrostatic or high-efficiency particulate-arresting (HEPA) filter to reduce the amount of dust and allergens in your home.

Thermostats – turn your thermostat down to 20C during the day and 17C at night to save as much as 15 per cent on your heating costs. Better yet, install a programmable thermostat to automatically control the temperature throughout your home.

Electronically commutated motors (ECM) – Offered with some high-efficiency furnaces, these motors run more efficiently than single speed motors and consume less electricity.

Heat recovery ventilators (HRVs) – ventilators remove stale air that becomes contaminated by cooking and living in the home and bring fresh outdoor air in to replace it. HRVs warm the fresh air with heat from the stale air before venting the stale air outside.

Air conditioning – ideal with forced air systems, a central air conditioner can control both indoor temperature and humidity levels.

Zoning – your hydronic heating system can be "zoned" to provide different levels of heating or cooling to different areas of your home, saving energy and improving home comfort. If your home is larger, or has different exposures, you'll find zone heating especially useful.

Three steps to a new system

Step 1: design

Design is often the most critical and overlooked element of the planning process. Here are a few ideas to think about:

Size matters. Your furnace or boiler must be sized to your home. If your heating appliance is too small, it won't meet your needs. Too big, and you'll be paying for more than you need and your installation costs will be higher. You'll also shortchange yourself in the long run. An oversized appliance uses more fuel and cycles on and off more frequently, causing temperature swings, reduced comfort, excessive noise and a shorter life for the appliance.

Look for high-efficiency. The higher the AFUE rating, the more efficient the appliance. A standard furnace with a 78 per cent AFUE rating converts 78 per cent of the fuel it uses into useful heat. Likewise, a high-efficient 97 per cent AFUE furnace converts 97 per cent of the fuel it uses into useful heat.

Look into options and accessories. See page 8 for a wide range of options and accessories.

Don't forget venting and ducting. High-efficiency condensing appliances require special venting to protect against corrosion. Ask your contractor to inspect your ducts and include any changes to venting and ducting in your quote. Your ducts should be properly sized to match your new appliance's heating capacity. Insulate ducts that pass through unheated spaces.

Consider your home renovation plans. If remodelling, consider how renovations could affect your choice of a new heating system. For example, if you upgrade your windows or insulation, you may be able to reduce the size of the appliance you need as these improvements make your home more airtight and reduce the amount of heat lost from your home.

Consider true costs. The true cost of a new heating system usually involves more than the appliance itself. The benefits can outweigh the costs of upgrading. Consider:

- **Appliance cost** – the purchase price of a high-efficiency condensing model can be higher than a non-condensing model.
- **Installation cost** – depending on the system, upgrades may include changes to the venting, ducting systems, or drainage.
- **Energy costs** – you'll save money by saving energy with a high-efficiency model.
- **Maintenance costs** – be sure that your layout allows adequate space and access for servicing. You'll pay less for labour if a technician can easily access your system.

Step 2: install

Installation is the second critical aspect of a new heating system. Even a top-of-the-line system won't perform to its potential if it is not installed correctly. Heating contractors are not necessarily designers and vice-versa. Ask your contractor to confirm which association's guidelines have been used to design your system (see page 7). A good contractor will take the time to explain how your system operates and how to keep it functioning as designed.

When choosing a contractor, remember: least expensive isn't always best—take the time to check references. Here are a few tips:

Choose a contractor who is registered with the BC Safety Authority and employs licensed gas fitters.

Get quotes from more than one contractor. Ensure all quotes are in writing and include the cost of a gas permit, heat loss calculation, venting, drains, disposal of old equipment, and any other costs unique to your home.

Look for contractors who:

- have been trained by the manufacturer to install and verify proper start-up of the appliance you've selected
- will provide heat loss and duct sizing calculations to determine the proper size of appliance needed to heat your house most efficiently
- promote quality at a reasonable rate
- are bonded and insured for public liability and property damage
- offer a warranty that covers equipment, materials and labour (indicating who is responsible for honouring that warranty)
- provide customer references
- offer maintenance and service after the warranty is expired

Choose a contractor you feel comfortable with. Speak with more than one contractor and select the one that gives you a fair price (not necessarily the highest or the lowest), understands the importance of heating design and installation, and considers your home's individual size, age and layout when making recommendations.

Make sure you understand what you're signing. Prices quoted should be all-inclusive to avoid any unpleasant surprises.

Step 3: maintain

Maintenance is a little thing that can make a big difference. If you take care of your heating system, it will take care of you for a very long time.

- At the time of installation, ask your contractor or builder to explain the system's operation as well as the manufacturer's suggested maintenance schedule. Your contractor should also supply operating and maintenance instructions for any accessories that were added to the system.
- Keep all warranties and maintenance instructions near your furnace or boiler for easy reference.
- Many manufacturers will have a condensed maintenance sheet for you to follow. If you aren't comfortable doing some maintenance on your own, ask your heating contractor for a service contract. You'll feel better knowing your system will get regular attention and maintenance to keep it operating at its best.

What you can do yourself:

- Change or clean filters as recommended in the manufacturer's guidelines. **Be sure to shut off the electricity at the appliance switch and breaker panel first!** Keep the fan compartment door tightly closed.
- If your appliance has a fan belt, inspect it for cracks or signs of wear (and replace if necessary) when you change the filters.
- Keep vents and air returns clear of furniture, lint, dust or pet hair.
- Check the chimney and appliance vent system at least once a year. Check that the pipe is connected securely, that there are no signs of corrosion or damage, and that nothing has fallen into the base of the chimney or into the flue.
- If you have a battery-operated thermostat, check and replace batteries as necessary.
- If your furnace motor has oiling points, apply one or two drops of SAE 20 non-detergent oil every heating season. But don't over-oil!
- Keep the areas around your heating equipment clear of anything that can catch fire, especially paints, cleaning solvents, oily rags, gasoline containers and propane cylinders. Never store or use flammable materials near gas appliances.
- Don't enclose your appliance without the help of a licensed gas contractor that is registered with the BC Safety Authority.

Benefits of using natural gas

When it comes to choosing an efficient, safe, and reliable energy source that provides great comfort in your home, natural gas is hard to beat. Here are a few reasons why so many people choose natural gas to heat their homes:

- Versatile – use natural gas for space and water heating, cooking and drying your clothes, as well as your barbecue.
- Convenient and reliable – it's piped right into your home, so you'll never run out of fuel.
- Economical – dollar for dollar, natural gas gives great value for your energy dollar.
- Safe – natural gas is one of the safest forms of energy available.
- Clean burning – natural gas is one of the cleanest burning fuels, making it easier on your appliances, and easier on the environment, too!

For more information

If you would like more information on other natural gas topics or to learn more ways that using natural gas can add comfort and efficiency to your home, visit terasengas.com or call Terasen Gas Customer Service.

Customer service 1-888-224-2710

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Get comfortable.

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