

Residential Wood Pellet Heating

A Practical Guide for Homeowners



ARCTIC ENERGY ALLIANCE

INTRODUCTION

ARCTIC ENERGY ALLIANCE (AEA)

The Arctic Energy Alliance (AEA) is a not-for-profit society established in 1997. Our mission is: "To promote and facilitate the adoption of efficient, renewable and carbon neutral energy practices by all members of NWT society". From our offices in Yellowknife, Inuvik, Norman Wells and Fort Simpson we offer support and advice on energy efficiency, renewable energy and sustainable energy practices for individuals, businesses, communities, and other interested groups in all communities in the NWT.

The purposes of this guide are to introduce wood pellet heating to people who don't know what it's all about, to help people determine whether a wood pellet heating appliance might be suitable for them, and to help those who are interested in buying a wood pellet appliance through the process.

IS THIS GUIDE FOR ME?

This practical guide explains what homeowners should know before buying a wood pellet heating appliance. It explains what wood pellets are, their advantages and disadvantages and the different types of heating appliances that burn them. It is a step-by-step guide to buying a wood pellet heating appliance and includes tips on the space required to install a new system, maintenance, insurance and permits for residential installations. Charts are included to help you remember to ask the right questions!

If you are interested in using wood pellets on a commercial scale, please see [Wood Pellet Heating for Businesses](#), to be released soon.

TABLE OF CONTENTS

INTRODUCTION.....	3
Arctic Energy Alliance (AEA).....	3
IS THIS GUIDE FOR ME?	3
WOOD PELLETS	6
What are wood pellets?.....	6
Where do they come from?	6
How are they made?	6
How popular are pellets in the NWT?	6
Will pellets run out? Is this a fad?	7
Will I save money with wood pellets?	7
What are the benefits to the environment?	7
Where can I buy pellets?.....	8
Are all pellets the same?	8
WOOD PELLET APPLIANCES.....	10
Stoves.....	10
Wood pellet stoves vs wood stoves	11
Wood Stoves and Pellets.....	11
Boilers and Furnaces.....	12
Wood pellet boilers/furnaces vs oil or propane	13
DECIDING WHAT YOU WANT.....	13
How much heat – 1 room or your whole house?	13
How much will it cost?	14
How much work is involved?.....	14
Where should I put a pellet appliance?.....	15
How much space do you need?.....	15
Your home (fill out and take shopping).....	18
Appliances (fill out with salesperson)	19
STOVES - RESIDENTIAL	20
REGULATORY AND INSURANCE ISSUES.....	20
Regulations.....	20
Permits.....	22
Inspections	22
INSURANCE.....	23

INSTALLATION	24
Choosing an installer.....	24
Basic installation.....	24
OPERATION AND MAINTENANCE	25
Choosing your pellets.....	25
Before starting your stove.....	25
Daily operation.....	25
Maintenance.....	26
BOILERS/FURNACES – RESIDENTIAL	28
REGULATORY AND INSURANCE ISSUES.....	28
Regulations.....	28
Permits.....	30
Inspections.....	30
Insurance.....	30
INSTALLATION	32
Choosing an installer.....	32
Basic Installation.....	32
OPERATION AND MAINTENANCE	33
Choosing your pellets.....	33
Before running your system.....	33
Daily operation.....	33
Maintenance.....	33
APPENDIX A.....	36
Local Authority Requirements.....	36
APPENDIX B.....	41
Appendix B City of Yellowknife Solid Fuel Appliance Installation Checklist.....	41
APPENDIX C.....	45
Directory.....	45
APPENDIX D.....	47
Glossary.....	47
APPENDIX E.....	49
Footnotes.....	49

WOOD PELLETS

WHAT ARE WOOD PELLETS?

Wood pellets are small hard cylinders of highly compressed wood. They are made entirely from sawdust or shavings and are between 6mm (1/4inch) and 8mm (5/16 inch) across and less than 38mm (1 1/2inch) long. They won't crumble into sawdust unless they get wet.

WHERE DO THEY COME FROM?

The pellets being sold in the Northwest Territories come from several Canadian manufacturers in different provinces including Alberta, Manitoba and British Columbia.

HOW ARE THEY MADE?

Sawdust used to be considered a waste product from lumber production and was burned or dumped. Now it is often salvaged and made into pellets. The sawdust is dried and compressed into pellets using a die. No additives are necessary because compounds naturally present in the wood, help the pellets keep their shape.



Photo: AEA.

Wood pellets.

HOW POPULAR ARE PELLETS IN THE NWT?

Wood pellets have been used for heating in the NWT for over 10 years. Heating with wood pellets is gaining popularity in the NWT because the pellet supply is more established and diversified than it was even 3 years ago, and because the selection of heating appliances has grown – now you can get pellet boilers and furnaces to heat your house.

Over 1,000 tonnes of bagged wood pellets (equivalent to about 500,000 litres of oil) are used in houses in the NWT every year and the total NWT wood pellet use is over 10,000 tonnes per year (about 5,000,000 litres of oil). This is expected to grow in the next few years as more planned systems come on line.

WILL PELLETS RUN OUT? IS THIS A FAD?

We are not likely to run out of pellets. The Canadian and worldwide wood pellet markets are growing fast. Worldwide production was estimated at about 0.1 million tonnes in 1980, and had grown to about 10 million tonnes in 2008. The Canadian wood pellet production from 32 pellet mills was about 2 million tonnes in 2008, and was expected to continue increasing.

Most Canadian pellets are exported to Europe because a strong domestic market hasn't been created yet. It is estimated that all of the heating requirements in NWT communities could be met by roughly 320,000 tonnes of wood pellets per year, a fraction of the Canadian production.

WILL I SAVE MONEY WITH WOOD PELLETS?

You should expect to save money on your fuel bills if you use wood pellet heating, but the amount depends on how much of your existing fuel you replace with pellets and the cost of your fuel and of pellets.

For example, in Yellowknife the cost of pellets was about 50% of the cost of oil on a heating value basis in June 2008 and about 80% of the cost of oil in June 2009 – mostly due to the change in oil prices.

WHAT ARE THE BENEFITS TO THE ENVIRONMENT?

Wood pellets are considered Carbon Neutral

As long as the trees being used to make pellets are harvested sustainably, they are considered Carbon Neutral. The carbon released by wood pellets when burned is absorbed by the trees growing to replace them so they are not considered net emitters of Greenhouse gases (GHGs). GHGs are thought to be responsible for Climate Change, which is having a huge impact on the NWT's fragile environment.

Moving from oil, propane or natural gas to wood pellets for heating can reduce GHG emissions.

Low environmental impact of spills

Wood pellets are non-toxic so there is no environmental damage if a spill occurs. Spilled pellets can be swept up or left to biodegrade, unlike heating oil which can be extremely difficult and costly to clean up due to its toxic and flammable nature.

WHERE CAN I BUY PELLETS?

Pellets come in 18 kg (40 pound) bags, 1 tonne (1000 kg, 2205 pound) bags or can be delivered in bulk by a pellet delivery truck to an outdoor storage container. The 18 kg bags are widely available from stores (such as hardware stores) in Yellowknife and the South Slave areas. If you live outside those areas, check with your local retailers. 1 tonne bags are currently only available directly from pellet mills, and may be 1 metric tonne (1000 kg, 2205 lbs) or 1 US ton (907 kg, 2000 lbs), check with the supplier before ordering. So far bulk delivery is only available in parts of the North and South Slave regions.



Photo: AEA.

Wood Pellets in 18 kg bags from Yellowknife retailers

ARE ALL PELLETS THE SAME?

The pellet fuel industry, through the Pellet Fuels Institute (PFI), has developed standards for wood pellets. PFI-graded fuel is tested for density, dimensions, fines, chlorides, and ash content. The PFI has three grades of pellets, Utility, Standard and Premium. Most pellets sold in the NWT are Premium grade. Premium pellets must produce less than 1% ash and have more stringent requirements for moisture, fines, and durability. Premium grade pellets are recommended to reduce the amount of ash removal that is required.

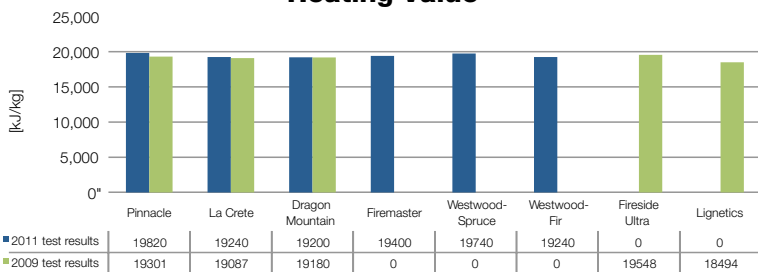
There can be differences between brands of pellets that meet the Premium grade, primarily in ash content, however blind laboratory testing by AEA found that energy content is very similar between brands. The three charts on the following page show the energy content, ash and moisture in the pellets tested.



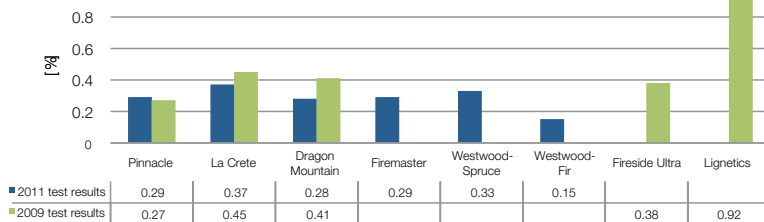
Photo: AEA.

Pellet Fuels Institute Premium Grading Analysis.

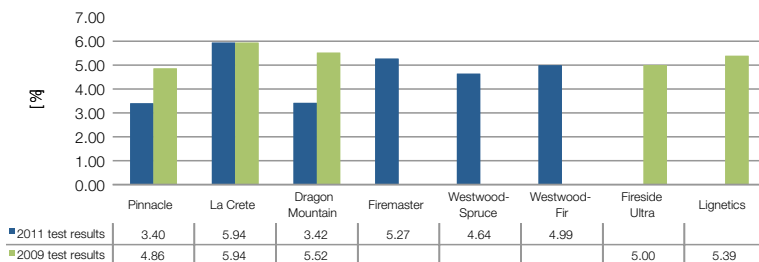
Heating Value



Ash Content



Moisture Content



WOOD PELLET APPLIANCES

Wood pellets can be burned in pellet stoves, boilers and furnaces. This section presents how these appliances work, the differences between them and some advantages and disadvantages of each.

STOVES

Wood pellet stoves are used to heat one room or area without being connected to a central heating system. They are normally located in a well-used room and are designed to be decorative and to provide heat by radiation and/or convection. From the outside they look similar to wood stoves, although the fire inside looks slightly different.

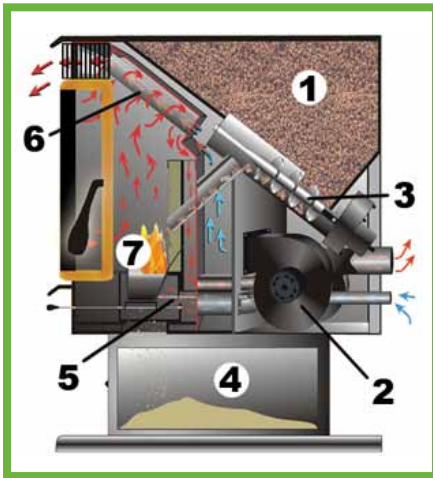


Diagram: PelPro Pellet Appliances ¹⁰.
A typical top-fed stove.

- Wood pellets are stored in a hopper (1)
- They are fed by an electric auger (3) into the burn grate (7) at a rate determined by the temperature control
- An automatic igniter (5) starts the fire
- Fire heats the air in heat exchange tubes (6) and a convection fan (2) blows this heated air into the room where a stove is situated
- The ash pan (4) below the burn grate collects the residue.

Stove design differs between manufacturers but follows the same principles: electricity turns an auger, which moves pellets at a steady rate into the burn area. Clean air is heated indirectly by the fire and is blown out from the stove to heat the room. As the stove heats up, it also warms the room by radiating its heat.

WOOD PELLET STOVES VS WOOD STOVES

Advantages of Pellet Stoves

- Automatic fuelling – don't have to add and turn logs.
- Can be controlled by a thermostat to keep the temperature stable automatically
- Fire starts at the push of a button – no setting the fire or chopping kindling.
- Only need to fill hopper once or twice a day.
- Don't need to open fire box, so embers don't fly out.
- Pellets are cleaner than logs – fill the hopper from the bag, no wood splinters or bark on the floor.
- Less ash than with a log fire.
- Less risk of chimney fires and accidental fires than with logs.
- Don't need to chop wood, spend money on gas, chainsaw, etc.

Disadvantages of Pellet Stoves

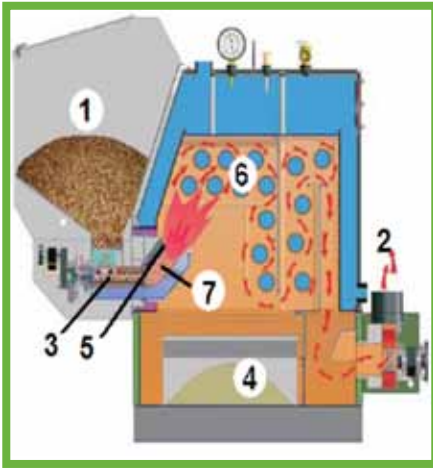
- Must use pellets – can't burn logs in wood pellet appliances.
- Pellet stoves currently available don't work without electricity. It is possible to install back-up power to run your stove, but it is expensive (often \$400 - \$1000).
- Pellets are usually more expensive than chopped wood per unit of heat produced.

WOOD STOVES AND PELLETS

It is possible to use a device to burn wood pellets in a wood stove, however doing so may void the manufacturer's warranty. This is due to the potential for overheating, which is possible because pellets have a lower moisture content than cord wood so they can burn hotter and produce hotter gases. If the chimney has not been cleaned regularly, the hotter gases could ignite the built-up creosote and cause a chimney fire.

BOILERS AND FURNACES

Wood pellet boilers and furnaces are used to heat a whole house and sometimes the domestic hot water too. They are normally put out of sight, in a utility room and heat the house through a central heating system. Boilers and furnaces are larger than stoves and have larger hoppers to store more pellets.



*Diagram: Harman Home Heating¹¹.
A Harman pellet boiler.*

- Pellets are stored in a hopper (1). Here it is built into the boiler. Some models use an external hopper.
- Pellets are fed by an electric auger (3) into the burn pot (7) at a rate determined by the temperature control.
- An automatic igniter (5) starts the fire.
- Fire heats the liquid in heat exchange tubes (6) and the exhaust gases (2) are vented to the outside. Here they are vented through a wall or a flue through the ceiling.
- The ash pan (4) below the combustion chamber collects the residue.

The design and features of furnaces and boilers varies from company-to-company and model-to-model. Boilers heat a liquid (commonly a mixture of glycol and water) which travels through pipes in a house. Heat is transferred from the liquid to a room through a heat exchanger such as radiators, baseboard fin heaters or heating coils. A boiler can also be used to heat your domestic hot water (DHW). Furnaces heat air that is circulated around the house through heating ducts. A boiler with a fan-coil heat exchanger can also be used for forced-air heating.

WOOD PELLET BOILERS/FURNACES VS OIL OR PROPANE

Advantages of Wood Pellet Boilers/Furnaces

- Pellets usually cost much less than oil or propane per unit of heat produced.
- Burning pellets produces fewer GHG emissions than burning oil or propane.
- Spilled or leaking pellets are easier, safer and much cheaper to clean up than oil or propane.

Disadvantages of Wood Pellet Boilers/Furnaces

- Pellet appliances are more expensive than oil or propane appliances.
- Maintenance such as ash removal and cleaning must be performed regularly (usually by the homeowner).
- Pellet container must be filled regularly unless you have bulk storage with an automatic feed (currently only available in Yellowknife).

DECIDING WHAT YOU WANT

Once you understand the basics of wood pellet heating and have decided you might buy an appliance, think about the type of system you want and what will fit into your home. Friends or contractors can make suggestions, but the decision is yours – you have to live with it.

HOW MUCH HEAT – 1 ROOM OR YOUR WHOLE HOUSE?

First, decide what type of system you want. If you want something decorative to heat a room and nearby spaces, look at stoves (space heaters). The stove you buy should be the right size for the space you want to heat – or you could end up with one very hot room; bigger is not necessarily better. The sales people at the store where you buy your stove should be able to help you choose the right size.

If you want to replace the main heating system in your home, look at furnaces or boilers (main heating system). It is easiest and least expensive to replace a furnace with a furnace and a boiler with a

boiler since the piping or venting throughout the house won't have to be replaced. It is also possible to replace a furnace with a boiler and a heating coil which is installed in the ductwork. With some boiler systems, it is possible to heat your household hot water using pellets.

HOW MUCH WILL IT COST?

If you're heating with oil, propane, gas or electricity, offsetting some of your heating with pellets will save you money in monthly heating costs. The amount you save will depend on how much you use your wood pellet appliance and the cost of the fuel you use now.

Purchasing and installing the appliance can be expensive, especially since additional components such as a flue and chimney or vent, wall and floor protection, and permits will be required. Stoves are cheaper than boilers and furnaces – but the annual fuel savings are lower too. The installed cost of stoves is normally \$3,000 to \$6,000. Residential boilers and furnaces are about \$10,000 to \$20,000, installed. When comparing costs, be sure to compare the full installed costs.

HOW MUCH WORK IS INVOLVED?

Operating a pellet appliance involves work; a brief description is given below. The sections on Operation and Maintenance have more details. If you're not able to or interested in doing regular work to operate and maintain the appliance, then pellets might not be for you.

Stoves

Pellet stoves must be filled from weekly to daily depending on how much they're used, the ash pan needs to be emptied regularly (usually weekly), and basic cleaning is required (from weekly to monthly). Regular (normally annual) thorough cleaning of the chimney and stove components is necessary to ensure safe and efficient operation.

Boilers and furnaces

Pellet boilers/furnaces need more care than oil, propane, gas or electric ones, but the care varies – some need daily attention. The hopper may need loading daily, or it may be automated. The ash pan must be emptied and tubes cleaned regularly (often monthly). Annual maintenance must be performed by a knowledgeable person.

WHERE SHOULD I PUT A PELLET APPLIANCE?

Normally stoves are located in living spaces and boilers/furnaces are put in the utility room. The exact location is up to you, although there are some restrictions, mainly to do with venting.

The exhaust gases must leave the house safely, either through a chimney that goes up above the roof, or a vent that goes out through the wall. Your choice of heating appliance will determine the venting method. Some appliances also require outside air for combustion.

The National Building Code (NBC) and the Canadian Standards Association (CSA) Standard B365-10 govern where chimneys and sidewall vents may be placed. For example, sidewall vents must be at least 2.1 m (7 feet) above any public right-of-way and must be at least 1 m (3 feet) from any door or window. See the NBC and B365-10 for details.

HOW MUCH SPACE DO YOU NEED?

Pellet storage

Pellets must be kept dry. If they get damp, they start to crumble and won't burn. Don't use wet or crumbled pellets because they can cause many problems, from jammed augers to overheated stoves. Bags of pellets often have holes in them so they must be kept covered or in a weather tight container if stored outside. Ravens will pick through plastic to the pellets, exposing them to snow or rain.¹² Putting plywood over the bags seems to stop them, but indoor storage is better. One standard 18 kg (40 lb) bag of pellets is about 0.028 m³ (1 cubic foot). In communities where pellets aren't sold locally, you might need to store a full year's supply at home.

If you're storing bulk (loose) pellets, you may need to store 4 tonnes (8,818 lbs) of pellets, which will take about 6 m³ (212 cubic feet). In most communities by-laws specify that the building/tank shouldn't be in front of your house (see Appendix A for details). Don't block access for services such as water and sewage, or your fire escape routes. Bulk storage bins, whether inside or outside, should be sealed and fitted with a vent with a filter to stop dust flying out when it is filled.

Stoves, boilers and furnaces

The clearance requirements (distance they must be from combustible materials, including walls, ceiling, furniture, etc.) for Underwriters Laboratories of Canada (ULC) certified stoves, boilers and furnaces are given in the appliance "Manufacturer's Instructions". They are different for each model and may be decreased by using shielding on the walls and/or ceiling. For example, the clearances might be 7.5 cm (3 inches) at the back and 30 cm (12 inches) on the sides. The default clearances, if the Manufacturer's Instructions don't say any differently, are 150 cm (60 inches) on top, 120 cm (48 inches) on all sides, and they must be mounted so that the floor is shielded from overheating and is protected from embers by a non-combustible material ('ember pad') which must extend up to 20 cm (8 inches) on the sides and back, and up to 45 cm (18 inches) on any side with a loading door - see CSA B365-10 for details. Other system components such as the flue also have minimum clearances. See the section on regulations, permits and installation issues for more information and ask your installer about the options.

Boiler and furnace examples in the NWT

When a wood pellet boiler/furnace is installed, the old one is normally left as back-up (your insurance company may require this). If the old system isn't left, an electric heating appliance can be installed as back-up if needed. You need to have space for both systems.

Some common set-ups found in the NWT are:

- Boiler/furnace with built-in hopper entirely located in the utility room. Normally this type of system requires that the hopper be filled manually by bags of pellets (up to 6 bags at a time). This doesn't involve any external building.
- Boiler/furnace and separate bulk pellet storage located in the utility room. This system feeds automatically and it may be possible to have the bulk storage container filled by a bulk delivery truck. Indoor storage is not practical in small homes because of the amount of space the pellets take.

- Boiler/furnace located in the utility room and bulk pellet storage outside. An auger feeds the pellets from the storage, through the wall, into the appliance. The bulk storage container could be filled by a bulk delivery truck or 1 tonne bags. Local by-laws must be followed when situating the tank. See the section on regulations for NWT information and Appendix A for information for your community.
- Boiler/furnace and bulk storage located in a purpose-built accessory building outside. This system has automatic pellet feed and pipes containing a hot water/glycol solution move heat into the home. It involves building a shed separate from your house. Local by-laws must be followed when building the shed. See the section on regulations for NWT information and Appendix A for information for your community.

YOUR HOME

(FILL OUT AND TAKE SHOPPING)

Answer the questions below and take this page when you go shopping. Your answers will help the salespeople select appropriate appliances to show you. The more information you provide, the easier it will be to narrow down your choices.

While you're shopping, fill out the form on the back of this page with what the suppliers tell you. It will help you compare the options later and you'll have the data your insurance company needs to re-evaluate your insurance.

- 1) Do you want a stove, boiler or furnace? _____
- 2) What type of home do you live in? _____
- 3) What size floor area do you want to heat? _____
- 4) Would you prefer a wall vent or chimney? _____
- 5) What type of heating system do you have now? _____
- 6) How do you heat your hot water? _____
- 7) What was your heating bill last year? _____
- 8) How much fuel do you use for a whole year (in litres)? _____
- 9) How much fuel do you use for the coldest month? _____
- 10) Where do you want to put the appliance and pellet storage?

11) Measure how much space you have for the appliance.

Measure how much space you have for pellet storage.

12) If you want a boiler or furnace, are you leaving your old system in as a back up? Yes No

APPLIANCES

(FILL OUT WITH SALESPERSON)

Store			
Brand			
Model #			
Certified			
Heat output			
Cost of appliance			
Floor protection/ wall shielding options			
Total installed cost			
Installer			
Installation date			
Appliance location			
Pellet storage location			
Pellets used/year			
Manual hopper refill			
Maintenance			
Pros			
Cons			

STOVES - RESIDENTIAL

This section is for people interested in installing residential stoves. For residential boiler and furnace information please go to page 28.

REGULATORY AND INSURANCE ISSUES

Read through this section BEFORE placing an order. It contains important information on some regulatory and insurance issues. It is your responsibility to ensure your installation complies with all relevant codes and regulations. Contact your insurance broker before making a final decision since the insurance company might have special requirements and your premiums might change.

REGULATIONS

Wood pellet stove installations must meet all the relevant codes and standards, and permits from your Local Authority may be required. The requirements listed below apply throughout the NWT. In addition, see Appendix A for a guide to the requirements in each community. Always check with your Local Authority for up-to-date information and to obtain relevant permits before starting a project.

Codes and Standards

National Building Code (NBC 2010) – Pellet stove installations must comply with this. Part 9 Section 9.21 Masonry & Concrete Chimneys & Flues, Section 9.22 Fireplaces, Section 9.32 Ventilation and Section 9.33 Heating & Air Conditioning may be of particular interest.

B365-10 (Installation Code for Solid-Fuel-Burning Appliances and Equipment) – All pellet stove installations must comply with this.

NWT Electrical Protection Act – All pellet stove installations must comply with this and the CAN/CSA Canadian Electrical Code.

Local Authority – All installations must comply with the requirements of your Local Authority and Community By-laws. The information available at time of printing is listed by community in Appendix A.

Certified Stoves – If the pellet stove is certified, it will be labelled as such (ULC S627) and come with “Manufacturer’s Instructions”. The stove installation must comply with these instructions. If there is a conflict between the “Manufacturer’s Instructions” and the B365-10, the “Manufacturer’s Instructions” must be followed.

Mobile Home – If the installation is in a mobile home, the stove must be certified for such installations. Look in the “Manufacturer’s Instructions” to confirm this.

Other certification – Some of the other components of your installation, such as the flue pipe, may also be certified. If they are, they must be installed according to the “Manufacturer’s Instructions” for that component. The table below lists some of the standards you might encounter. It is not necessary for your components to be certified, as long as your installation complies with NBC 2010, B365-10, the *NWT Electrical Protection Act* and any additional requirements imposed by your Local Authority.

Standard (Code)	Standard (Name)
ULC S604	NOT SUITABLE FOR WOOD PELLET APPLICATIONS Standard for Factory Built Type A Chimneys
ULC S610	Standard for Factory Built Fireplaces
ULC S627	Space Heaters for Use with Solid Fuels
ULC S628	Standard Fireplace Inserts
ULC S629	Standard for 650C Chimneys
ULC S632	Standard for Heat Shields
ULC S635	Standard for Liners for Existing Masonry and Factory Built Chimneys
ULC S639	Standard for Steel Liner Assemblies for Masonry Fireplaces
ULC S640	Standard for Liners for New Masonry Chimneys
ULC S641	Standard for Chimney Connectors

PERMITS

Permits are issued by the GNWT Department of Public Works and Services (PWS) or by your Local Authority, depending on the permit. You must apply for and receive all necessary permits before starting work. When you're planning your installation schedule, make sure you leave enough time for all of your permits to be issued and any waiting periods to pass before the installation is begun. (It can take more than 3 weeks for a permit to be issued).

Electrical Permit – Pellet stoves require an electrical connection so an electrical permit is necessary unless your stove is designed to plug directly into an existing outlet. Your electrician should apply for a permit from PWS at the GNWT (873-7399, www.pws.gov.nt.ca).

Mechanical and Building Permits – Mechanical or Building Permits may be necessary, depending on your community. Information regarding permits for specific communities is given in Appendix A.

INSPECTIONS

Electrical Inspections – If an electrical permit is necessary, electrical inspections are required when the work is roughed in and when it's finished. Your electrician will inform PWS when the work has reached the stage where it needs to be inspected.

Local Authority Inspections – Some Local Authorities will conduct inspections based on the permits they issue. Further information is provided in Appendix A. See your Local Authority for details.

INSURANCE

Installing a pellet stove can affect your home insurance. Once you have an idea of the stove you want and how you want it installed, call your insurance broker to make sure there won't be any problems or special conditions that you must meet. Each company has its own requirements, which vary depending on the size, age, construction, etc of your home. Check with your broker even if your neighbour didn't have any problems.

Don't wait until you have bought a stove.

Some points regarding insurance requirements which might apply are:

- All of the insurance companies we've heard from to date require that stoves be ULC certified.
- Some insurance companies require that your stove be installed by a professional or that it be inspected by a Wood Energy Technology Transfer (WETT) Certified Inspector. It may be difficult to get a WETT Certified Inspector outside of regional centres in the NWT. If you need an inspection, book one before installation. To see a list of WETT certified professionals, go to www.wettinc.ca/search.html.
- Some insurance companies require copies of your inspection reports. Keep all the paperwork in a safe place. When you want to sell your house, it will be easier to sell if you have kept the paperwork and instruction manual for the stove.
- A stove which uses more than 80 bags of pellets per year is often considered a primary heating system and falls into the same insurance category as furnaces and boilers.

Table for results of insurance inquiries				
Insurance broker				
Insurance company				
Stove make/model				
New premium				
Special requirements				
Comments				

If you have problems with your insurance company refusing to cover pellet stoves or large premium increases (25 % or more), please contact the AEA. We may be able to refer you to a company that can help.

INSTALLATION

CHOOSING AN INSTALLER

After you have filled out the forms on the previous pages, you need to decide who will install your stove. Your stove is an investment and you want it to work properly and be safe. Whoever installs it should know what he or she is doing. You could ask your supplier to install it or recommend an installer. If you choose to install it yourself, you should understand how it works and what you're doing. Stoves can be dangerous. A poor installation can cause house fires, poor air quality, carbon monoxide in the house and other serious problems. Proper installation of the flue and other components is as important as the installation of the stove itself. If you install it yourself, an inspection by a qualified technician is recommended.

BASIC INSTALLATION

Basic preparatory work for installation includes installing heat and ember protection for the floor, and possibly wall and ceiling shielding for the stove, flue and any components which pass through walls or ceilings. The installation itself includes putting the stove in place, installing the venting equipment including flue pipe, combustion air intake, wall vent, chimney, flue collar, etc, as necessary, making any electrical connections.

OPERATION AND MAINTENANCE

CHOOSING YOUR PELLETS

You must burn appropriate fuel, as described in the information provided with the appliance. Burning other materials can be dangerous and damage the stove. See the section on pellets for more information about different grades of pellets available.

BEFORE STARTING YOUR STOVE

Below are some points to consider before starting your appliance.

- Before operating the appliance, make sure you have working smoke detectors AND carbon monoxide alarms, as described in the National Building Code Section 9.32.3.9. They should comply with the CAN/CSA 6.19 Standard and normally be placed 1 in each bedroom or within 5 metres of each bedroom door.
- Get instructions, any certification and the manual from your installer.
- Have your installer give you a demonstration of how to operate the appliance, including filling the hopper, starting the fire, adjusting any controls, emptying the ash pan and turning it off, and any maintenance tasks that you should perform. This demonstration allows you to make sure the appliance is working properly and ask about any problems or concerns without the need for return visits.

DAILY OPERATION

Operate the stove as your manual directs. Pay close attention to it in the first few months so you will develop an understanding of how it works and what's normal.

Accessories

Stove accessories such as pokers, shovels and forks are not used with pellet stoves as there are no logs to move. The ashes must be removed; sometimes a vacuum is required, while some stoves have an ash pan which can be removed from the stove and emptied. Cleaning brushes may be needed for regular maintenance, and a high temperature resistant shop vacuum is useful, but not necessary.

MAINTENANCE

Stoves should be maintained regularly to prevent breakdowns, ensure the appliance has a long life and to ensure it burns well – reducing fuel consumption and environmental pollution. See your manual for maintenance details. You should keep a servicing log – a record of what has been done to the stove, when and by whom. The maintenance required varies depending on the type of stove you get and how much you use it. Some of the maintenance that might be required is listed below.

Tasks you might complete:

- Check burn pot daily and clean it to keep air inlets open.
- Empty ash pan (this should be done when the ashes are cold). Frequency depends on the stove – may be daily. Ashes should be placed in a metal container with a tight-fitting lid and moved outdoors. No other waste should be kept in this container. The cold ashes can be spread in your garden.
- Clean the glass with glass cleaner, when the glass is completely cool.
- The heat exchange tubes must be scraped clean occasionally with brushes or a built-in device – this may require professional service.
- The ash traps, chambers located behind the fire chamber to prevent excess ash in the exhaust from leaving the stove, must be emptied – may require professional service.

Tasks for your maintenance contractor:

- Empty ash traps and clean exhaust passages.
- Clean and lubricate fans and motors.
- Clean the hopper and fuel feed system.
- Clean the heat exchanger system.
- Clean and check exhaust pipes.
- Verify and adjust the stove settings.

OPERATION & MAINTENANCE

(FILL OUT WITH INSTALLER)

Have your contractor complete the maintenance table below.

Maintenance Task	Frequency	Done by

BOILERS/FURNACES – RESIDENTIAL

This section provides information for people interested in residential boilers or furnaces. If you're interested in stoves, please go to page 20. If you're interested in commercial boilers or furnaces, please get a copy of **Wood Pellet Heating for Businesses**.

REGULATORY AND INSURANCE ISSUES

Read through this section BEFORE placing an order. It contains important information on the some regulatory and insurance issues. It's your responsibility to ensure your installation complies with all the codes and regulations. Contact your insurance broker before making a final decision since your premiums might change and the insurance company might have special requirements.

REGULATIONS

Boiler and furnace installations must meet the relevant codes and standards, and permits from your Local Authority may be required. The requirements that apply throughout the NWT are listed below. In addition, see Appendix A for a guide to the requirements in each community. Always check with your Local Authority for up-to-date information and to obtain relevant permits before starting a project. The contractor you hire to install your system should ensure it meets all regulations and take care of all the necessary permits and inspections, but it's your responsibility to make sure it has been done.

Codes and Standards

National Building Code (NBC 2010) – All pellet boiler/furnace installations must comply with this. Part 6 Heating, Ventilating and Air Conditioning, Part 9 Section 9.21 Masonry and Concrete Chimneys and Flues, Section 9.22 Fireplaces, Section 9.32 Ventilation and Section 9.33 Heating and Air Conditioning may be of particular interest.

B365-10 (Installation Code for Solid-Fuel-Burning Appliances and Equipment) – Pellet boiler/furnace installations must comply with this. If there is a conflict between the Manufacturer’s Instructions and the B365-10, the Manufacturer’s Instructions must be followed.

NWT Electrical Protection Act – All pellet boiler/furnace installations must comply with this and the CAN/CSA Canadian Electrical Code.

National Plumbing Code – All pellet boiler/furnace installations must comply with this.

Utility Company Clearances – If a storage tank or accessory building is erected for the pellets, boiler or furnace, proper clearances must be left for power lines.

Local Authority – All pellet boiler/furnace installations must comply with the requirements of your Local Authority and Community By-laws. The details available at time of printing are listed by community in Appendix A.

CSA B366.1 (Solid Fuel Fired Central Heating Appliances) – If the pellet boiler/furnace is certified, it will be under CSA B366.1, will be labelled as such, and come with Manufacturer’s Instructions. The installation must comply with these instructions. Certification is not required for all boilers and furnaces in the NWT, but is highly recommended. It will be very, very difficult to get permits and pass inspections if the appliance is not certified. Most insurance companies require B366.1 certification.

Other certification – Some of the other components of your installation, such as the flue pipe, may also be certified. If they are, they must be installed according to the “Manufacturer’s Instructions” for that component. The table below lists some of the standards you might encounter.

Standard (Code)	Standard (Name)
ULC S604	NOT SUITABLE FOR WOOD PELLET APPLICATIONS Standard for Factory Built Type A Chimneys
ULC S629	Standard for 650C Chimneys
ULC S632	Standard for Heat Shields
ULC S635	Standard for Liners for Existing Masonry and Factory Built Chimneys
ULC S639	Standard for Steel Liner Assemblies for Masonry Fireplaces
ULC S640	Standard for Liners for New Masonry Chimneys
ULC S641	Standard for Chimney Connectors

Permits

Permits are issued by GNWT Department of Public Works and Services or by your Local Authority, depending on the permit. You must apply for and receive all necessary permits before starting work on the installation. When planning your installation schedule, make sure you leave enough time for all of your permits to be issued and any waiting periods to pass before the installation is begun.

Electrical Permit – Furnaces/boilers require an electrical connection so an electrical permit is necessary. Your electrician should apply for a permit from PWS at the GNWT (873-7399, www.pws.gov.nt.ca).

Boiler Installation Permit – Boilers larger than 30 kW require a boiler permit. Since most residential systems are smaller than this, it isn't normally needed. Your contractor should apply for a permit from PWS at the GNWT (873-7399, www.pws.gov.nt.ca) if necessary.

Mechanical and Building Permits – Mechanical, Development or Building Permits may be necessary, depending on your community. Information regarding permits for specific communities is given in Appendix A.

Inspections

Electrical Inspections – Electrical inspections are required when the work is roughed in and when it's finished. Your electrician will inform PWS when an inspection is necessary.

Local Authority Inspections – Some Local Authorities will conduct inspections based on the permits they issue. Further information is provided in Appendix A. See your local authority for details.

INSURANCE

Installing a pellet boiler/furnace will affect your home insurance. It is very likely that your premiums will increase. Once you have an idea of the installation you want, contact your insurance provider to ensure there won't be any problems and they don't have any special conditions. Each company has its own requirements, which vary depending on the age, construction, etc of your home. Check with your insurance company even if your neighbour had no problems. **Don't wait until you have bought a system.**

Some points regarding insurance requirements which might apply are:

- All of the insurance companies we've heard from to date require that furnaces/boilers be certified to CSA B366.1.

- Some insurance companies require that your appliance be installed by a professional or that it be inspected by a WETT Certified Inspector. It may be difficult to get a WETT certified inspector outside of regional centres. Go to <http://www.wettinc.ca/search.html> to see a list.
- Some insurance companies require copies of your permit applications and/or inspection reports. Keep all the paperwork in a safe place. When you want to sell your house, it will be easier to sell if you have kept all the paperwork for the heating system along with the instruction manual.
- Most insurance companies require that you keep your old heating system installed as a backup. Even if it isn't required, having a backup system will often result in a smaller premium increase. If you can't leave the old system in, it might be possible to install an inexpensive electric heating system as a backup. You should be able to get a backup electrical system for less than \$2,000. However, you will need a 200A electrical service to the house. If you're building a new house, requesting this with your initial power request will save time and money.
- Some insurance companies require that wood pellet boilers/furnaces be located outside the home in an accessory building, and some require that that building be located at least 50 feet from any other building, fuel tank, or other combustible.
- Some companies require that the wood pellet furnace/boiler have a natural draft so there must be a 1.2 to 1.5 m (4 or 5 foot) vertical section of flue pipe. This is to prevent a backdraft if the power goes out or if there's a strong wind blowing outside.

Table for results of insurance inquiries

Insurance provider				
Insurance company				
Boiler/furnace make/ model				
Pellet storage				
New premium				
Special requirements				
Comments				

If you have problems with your insurance company refusing to cover pellet appliances or very large premium increases (25 per cent or more), please contact the Arctic Energy Alliance and we may be able to refer you to a company that can help.

INSTALLATION

CHOOSING AN INSTALLER

After you have filled out the forms on the previous pages, you need to decide who will install your appliance. Your heating system is a long-term investment that can increase the comfort level and resale value of your house. You want it to work properly and safely in the years to come. Whoever installs it should know what he or she is doing. The simplest and often the best option is to ask your supplier to install it or recommend an installer. Unless you're an experienced heating contractor with a thorough understanding of the system, we don't recommend you install it yourself. A poor installation can cause in house fires, poor air quality and carbon monoxide (CO) in the house, frozen pipes or water leaks, and other serious problems.

BASIC INSTALLATION

There are several components to the installation of your wood pellet boiler or furnace. The pellet storage must be built (unless it is built-in), heat and ember shielding around the appliance must be installed if necessary, the venting system must be installed, and the system must be connected to the heating ducts (furnace) or pipes (boiler). Talk to your installer about the details.

OPERATION AND MAINTENANCE

CHOOSING YOUR PELLETS

You must burn appropriate fuel, as described in the information provided with the appliance. Burning other materials can be dangerous and damage the furnace or boiler. See the section on pellets for more information about different grades of pellets available.

BEFORE RUNNING YOUR SYSTEM

Below are some points to consider before starting your appliance.

- Before operating the appliance, make sure you have working smoke detectors AND carbon monoxide alarms, as described in the National Building Code Section 9.32.3.9. They should comply with the CAN/CSA 6.19 Standard and normally be placed 1 in each bedroom or within 5 metres of each bedroom door and 1 in the furnace/boiler room.
- If you have your old oil system as a backup, keeping the oil tank full can help avoid problems with condensation and corrosion.
- Get instructions, certification and the manual from your contractor.
- Have your contractor give you a demonstration of how to operate the appliance, including filling the hopper, starting the fire, adjusting any controls, emptying the ash pan and turning it off, and any maintenance tasks that you should perform. Make sure you also know how to switch to your backup system if necessary. This demonstration allows you to make sure the appliance is working and ask about any problems or concerns without the need for return visits.

DAILY OPERATION

Operate the appliance as your manual or contractor directs. Pay close attention to it in the first few months so you will develop an understanding of how it works and what's normal.

Accessories

Accessories such as pokers, shovels and forks are not used with pellet appliances. The ashes fall into an ash pan which can be removed from the appliance and emptied. Cleaning brushes may be needed for regular maintenance, and a high temperature resistant shop vacuum is useful, but not necessary. Specialized ash vacs are also available.

MAINTENANCE

Boilers and furnaces should be maintained regularly to prevent breakdowns, ensure the appliance has a long life and to ensure it burns well – reducing fuel consumption and environmental pollution. See your manual for maintenance details. You should keep a servicing log – a record of what has been done to the appliance, when and by whom. You might want to sign a maintenance and servicing contract with a trained certified heating contractor covering periodic servicing and condition-based maintenance. Arranging for a follow-up visit by the installer about 1 month after installation is a good idea as it provides the opportunity for the appliance to be fine tuned and provides a chance for you to ask any questions you have. You should report any faults immediately so they can be rectified to prevent damage.

Tasks you might complete:

- Check burn pot daily and clean to keep air inlets open.
- Empty ash pan (this should be done when the ashes are cold). Frequency depends on fuel and appliance. Ashes should be placed in a metal container with a tight-fitting lid and moved outdoors. No other waste should be kept in this container. The cold ashes can be spread in your garden.
- The heat exchange tubes and sides of the combustion chamber must be scraped clean with brushes every 2 to 3 months.

Tasks for your maintenance contractor:

- Service the burner, empty ash traps, clean exhaust passages.
- Clean and lubricate fans and motors and fuel feed system.
- Clean and check heat exchanger system and exhaust pipes.
- Verify and adjust the appliance settings, heat delivery.

**OPERATION & MAINTENANCE
(FILL OUT WITH INSTALLER)**

Have your contractor complete the maintenance table below.

Maintenance Task	Frequency	Done by

APPENDIX A

LOCAL AUTHORITY REQUIREMENTS

In addition to the standards, codes, permits and inspections listed for the NWT, many Local Authorities have additional requirements. The list below is as accurate as possible at the time of printing. Check with your Local Authority before starting an installation.

Community	Requirements	Contact
Aklavik	Community Plan By-law No. 106-97 & Zoning By-law No.107-97 These are only relevant if you're installing pellet storage or a furnace/boiler outside your main building. All installations must comply with both of these, regardless of whether permits are required.	Hamlet of Aklavik 978 -2361
Behchokò	Zoning By-law No. 115-08 This is only relevant if you're installing pellet storage or a furnace/boiler outside your main building. All installations must comply with all of this by-law, regardless of whether permits are required. Development Permit This is necessary to build an accessory building.	Community Government of Behchokò 392-6500
Colville Lake	Nothing additional	Colville Lake - Settlement Corporation 709-2200
Deline	Nothing additional	Charter Community of Deline 589-4800
Dettah	Nothing additional	Yellowknives Dene First Nation (Dettah) 873-4307
Enterprise	Nothing additional	Hamlet of Enterprise 984-3491
Fort Good Hope	Nothing additional	Charter Community of K'asho Got'ine 598-2231
Fort Liard	Nothing additional	Hamlet of Fort Liard 770-4104

Fort McPherson	Nothing additional	Hamlet of Fort McPherson 952-2428
Fort Providence	Nothing additional	Hamlet of Fort Providence 699-3441
Fort Resolution	Nothing additional	Deninoo Community Council 394-4556
Fort Simpson	<p>Zoning By-law No. 295 This is only relevant if you're installing pellet storage or a furnace/boiler outside your main building. All installations must comply with all of this by-law, regardless of whether permits are required.</p> <p>Development Permit This is necessary to build an accessory building if it is higher than 6'. A maximum of 30% of your lot can be built on. See Section 3 of By-law 295 for more details.</p>	Village of Fort Simpson 695-2253
Fort Smith	<p>Zoning By-law No. 673 This is only relevant if you're installing pellet storage or a furnace/boiler outside your main building. All installations must comply with all of this by-law, regardless of whether permits are required.</p> <p>Development Permit This is necessary to build accessory buildings (any building outside) unless it is smaller than 8'x10'.</p>	Town of Fort Smith 872-8400
Gamèti	Nothing additional	Community Government of Gamèti 997-3441
Hay River	<p>Zoning and Building By-law No. 1812 This is only relevant if you're installing pellet storage or a furnace/boiler outside your main building. All installations must comply with all of this by-law, regardless of whether permits are required.</p> <p>Development Permit This is necessary to build accessory buildings.</p> <p>Building Permit This is necessary to build accessory buildings.</p>	Town of Hay River 874-6522

Hay River Reserve	Nothing additional	K'atlodeeche First Nation 874-3229
Inuvik	<p>Zoning By-law No. 2225/PND/04 This is only relevant if you're installing pellet storage or a furnace/boiler outside your main building. All installations must comply with all of this by-law, regardless of whether permits are required.</p> <p>Development Permit This is necessary to build accessory buildings.</p> <p>Building Permit This is necessary to build accessory buildings.</p>	Town of Inuvik 777-8600 www.inuvik.ca/townhall/forms/
Jean Marie River	Nothing additional	TthedzehK'edeli First Nation 809-2000
Kakisa	Nothing additional	Ka'a'gee Tu First Nation 825-2000
Lutselk'e	Nothing additional	Lutselk'e - Dene Band – Designated Authority 370-7000
Nahanni Butte	Nothing additional	Nahanni Butte Dene Band 602-2900
Norman Wells	<p>Zoning By-law No. 04-19 This is only relevant if you're installing pellet storage or a furnace/boiler outside your main building. All installations must comply with all of this by-law, regardless of whether permits are required.</p> <p>Development Permit This is necessary to build an accessory building (any building outside) if it is greater than 4 m².</p>	Town of Norman Wells 587-3700
Paulatuk	Nothing additional	Hamlet of Paulatuk 580-3531

Sachs Harbour	Nothing additional	Hamlet of Sachs Harbour 690-4351
Trout Lake	Nothing additional	Sambaa K'e Dene Band 206-2828
Tsiigehtchic	Nothing additional	Charter Community of Tsiigehtchic 955-3201
Tuktoyaktuk	<p>Zoning By-law No. 258 This is only relevant if you're installing pellet storage or a furnace/boiler outside your main building. All installations must comply with all of this by-law, regardless of whether permits are required.</p> <p>Development Permit This may be necessary to build an accessory building – see the Zoning by-law for details.</p>	Hamlet of Tuktoyaktuk 977-2110
Tulita	<p>Zoning By-law No. 125-97 This is only relevant if you're installing pellet storage or a furnace/boiler outside your main building. All installations must comply with all of this by-law, regardless of whether permits are required.</p> <p>Development Permit This may be necessary to build an accessory building – see the Zoning by-law for details.</p>	Hamlet of Tulita 588-4471
Ulukhaktok	Nothing additional	Hamlet of Ulukhaktok 396-8000
Wekweeti	Nothing additional	Community Government of Wekweeti 713-2010
Whati	Nothing additional	Community Government of Whati 573-3401
Wrigley	Nothing additional	Pehdzeh Ki First Nation 581-3321

<p>Yellowknife</p>	<p>Building By-Law No. 4469 All installations must comply with all of this by-law.</p> <p>Mechanical Permit A Mechanical Permit is required for all RESIDENTIAL stoves, boilers and furnaces. You must receive one before starting work. When you receive your permit, you will receive a plan review sheet listing necessary inspections. You (or your contractor) must contact the inspection department to request an inspection when it is necessary.</p> <p>Zoning By-Law 4404 This is only relevant if you're installing pellet storage or a furnace/boiler outside your main building. All installations must comply with all of this by-law, regardless of whether permits are required.</p> <p>Development Permit This is necessary to build an accessory building unless it is "the construction or relocation of an accessory structure or structure no higher than three metres and covering less than 10m² of site area."</p> <p>Building Permit This is necessary to build accessory buildings if the building is heated, insulated, has electrical power, or is larger than 20 m². All pellet boilers/furnaces use electricity so it is required for all outdoor boiler/furnace installations and large pellet storage sheds.</p> <p>Other See Appendix B for a checklist for residential wood pellet installations.</p>	<p>City of Yellowknife 920-5688 http://www.yellowknife.ca/City_Hall/Departments/Planning_and_Development/Building_Inspections.html</p>
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APPENDIX B

CITY OF YELLOWKNIFE SOLID FUEL APPLIANCE INSTALLATION CHECKLIST

OWNER: _____ PERMIT NO: _____

ADDRESS: _____ LOT: _____ BLOCK: _____

CONTRACTOR: _____ BUSINESS LICENSE NO: _____

-
- This installation is for a solid-fuel-burning space heating appliance (i.e. pellet or wood stove)
 - This installation is for a solid-fuel-burning central heating appliance (i.e. pellet or wood furnace or boiler)
-

Note 1: The 2005 NBC 9.33.5.3 references CAN/CSA B365-01 as the installation standard. 2005 NBC A-9.33.5.3 offers the following additional information: "Standard CAN/CSA-B365 is essentially an installation standard, and covers such issues as accessibility, air for combustion and ventilation, chimney and venting, mounting and floor protection, wall and ceiling clearances, installation of ducts, pipes, thimbles and manifolds, and control and safety devices. But the standard also includes a requirement that solid-fuel-burning appliances and equipment satisfy the requirements of one of a series of standards, depending on the appliance or equipment, therefore also making it a design and construction standard. It is required that stoves, ranges, central furnaces and other space heaters be designed and built in conformity with the relevant referenced standard.

Note 2: The checklist is itemized in the numerical order that the requirement is listed in the CAN/CSA B365-01 Standard

Note 3: Not all items are applicable to every installation. Check off the items that do not apply under the N/A column

Note 4: CAN/CSA B365-01 - 3.2.1 states, "When a difference exists between the manufacturer's installation instructions and the requirements of this Standard, the installation instructions shall govern."

	ITEM	REGULATORY CLAUSE	YES	N/A
1.	The appliance, accessories, components and equipment installed satisfies the requirements of the applicable standard	B365 3.3.1	<input type="checkbox"/>	<input type="checkbox"/>
2.	Where a difference exists between the manufacturer's installation instructions and the requirements of CSA B365-01 the manufacturer's installation instructions governed	B365 3.2.1	<input type="checkbox"/>	<input type="checkbox"/>
3.	The instructions furnished by the manufacturer for the care and operation of the equipment are conspicuously posted?	B365 3.3.3	<input type="checkbox"/>	<input type="checkbox"/>
4.	If the installation is in a mobile home the appliance is certified for such installation	B365 3.2.2	<input type="checkbox"/>	<input type="checkbox"/>
6.	For installations in Part 9 buildings the installation conforms to the requirements of CSA B365-01	B365 3.3	<input type="checkbox"/>	<input type="checkbox"/>
7.	For Part 3 buildings the installation conforms to the requirements of The 2005 NBC	2005 NBC 3.6	<input type="checkbox"/>	<input type="checkbox"/>
8.	Post installation the installer certifies that all safety devices function properly	B365 3.4.2	<input type="checkbox"/>	<input type="checkbox"/>
9.	Where a solid-fuel-burning appliance is added onto an existing oil-or gas-fired appliance the procedures described in CSA B365-01 Annex B have been followed. The appropriate inspection has been performed and the installation is deemed suitable: Note: If the solid-fuel-burning appliance installer is not qualified to perform the safety inspection of the oil-or gas-fired appliance, the installer shall engage the services of a qualified technician to perform the inspection and tests.	B365 3.7.2	<input type="checkbox"/>	<input type="checkbox"/>
10.	The installation provides access for visual inspection and maintenance	B365 3.8	<input type="checkbox"/>	<input type="checkbox"/>
11.	Where a solid-fuel-burning appliance is added onto an existing oil-or gas-fired appliance the modifications followed the add-on manufacturers' instructions and the procedure outlined in CSA B365-01 Annex C	3.10 and Annex C	<input type="checkbox"/>	<input type="checkbox"/>
13.	A spillage detection and alarm system conforming to the requirements of the 2005 NBC has been installed.	B365 4.1.3; 4.1.4 and 2005 NBC 9.	<input type="checkbox"/>	<input type="checkbox"/>
14.	Where a furnace or boiler is installed in a confined space ventilation air has been provided to conform to B365-01	B365 4.3	<input type="checkbox"/>	<input type="checkbox"/>

15.	Combustion air duct from outdoors is connected directly to the air inlet of the appliance that is certified for the connection.	B365 4.2	<input type="checkbox"/>	<input type="checkbox"/>
16.	Where certified for use with a specific chimney or class of venting system, the appliance is Installed with that chimney or venting system	B365 5.2.2	<input type="checkbox"/>	<input type="checkbox"/>
17.	The solid-fuel-burning appliance is not connected to a chimney that serves a natural gas- or	B365 5.2.6	<input type="checkbox"/>	<input type="checkbox"/>
18.	The solid-fuel-burning appliance is not connected to a chimney that serves a natural gas- or propane-fired appliance.	B365 5.2.7	<input type="checkbox"/>	<input type="checkbox"/>
19.	The flue pipe does not pass through an attic, roof space, closet, or similar concealed space or a floor or ceiling of combustible construction	B365 5.4.8	<input type="checkbox"/>	<input type="checkbox"/>
20.	The sidewall venting of pellet-burning appliances conforms to minimum clearances	B365 5.6.1 - 5.6.3.	<input type="checkbox"/>	<input type="checkbox"/>
21.	An automatic fuel-feeding device serving a solid-fuel-burning hot-water boiler conforms to:	B365 6.2.2.	<input type="checkbox"/>	<input type="checkbox"/>
22.	An automatic fuel-feeding device serving a solid-fuel-burning hot-water boiler with a circulating pump conforms to:	B365 6.2.3.	<input type="checkbox"/>	<input type="checkbox"/>
23.	An automatic fuel-feeding device serving a solid-fuel-burning forced-air furnace conforms to:	B365 6.2.4.	<input type="checkbox"/>	<input type="checkbox"/>
24.	The installation of the solid-fuel-burning appliance conforms to the requirements for floor protection.	B365 7.1.1 – 7.1.7.	<input type="checkbox"/>	<input type="checkbox"/>
25.	The wall and ceiling clearances of the solid-fuel-burning appliance conforms to the manufacturer’s specifications as certified or conforms to.	B365 7.2.1. – 7.2.53	<input type="checkbox"/>	<input type="checkbox"/>
26.	Where used the draft regulator or automatic damper has been adjusted and set to maintain flue-outlet pressure or over-fire specified by the manufacturer.	B365 9.2.2.	<input type="checkbox"/>	<input type="checkbox"/>
27.	An automatic fuel-feeding device serving a solid-fuel-burning appliance operates so that the smoke density, of the flue gases, as determined by the Shell Bacharach method, does not exceed the manufacturer’s value where so specified.	B365 9.2.3.	<input type="checkbox"/>	<input type="checkbox"/>
28.	An automatic fuel-feeding device serving a solid-fuel-burning appliance is within the limits of percentage of carbon dioxide in the flue gases where stated by the manufacturer	B365 9.2.4.	<input type="checkbox"/>	<input type="checkbox"/>

29.	The safety and operating controls function within the limits specified by the manufacturer.	B365 9.2.5.	<input type="checkbox"/>	<input type="checkbox"/>
30.	The maximum fuel input for an automatic fuel-feeding device serving a solid-fuel-burning	B365 9.26.	<input type="checkbox"/>	<input type="checkbox"/>
31.	The solid-fuel-burning appliance and equipment has been approved by the manufacturer to be connected to the pipe-work or ductwork of oil- or gas-fired or electrical heating	B365 10.1.	<input type="checkbox"/>	<input type="checkbox"/>
32.	The structure of an existing oil- or gas-fired or electrical heating furnace or boiler has not been modified in any way to accommodate the solid-fuel-burning add-on appliance	B365 10.3	<input type="checkbox"/>	<input type="checkbox"/>
33.	Controls have been provided and wired so that the limit control for either the solid-fuel-burning appliance or the existing oil- or gas-fired or electric appliance will shut down the existing oil- or gas-fired or electric appliance and reduce the firing rate of the solid-fuel-burning appliance to the minimum.	B365 10.7	<input type="checkbox"/>	<input type="checkbox"/>
34.	Where the installation includes provision for the storage of wood the storage shall conform to:	B365 A2.1.1 – A2.2.2	<input type="checkbox"/>	<input type="checkbox"/>
35.	Where the installation includes provision for the storage of pellets the storage shall conform to:	B365 A2.2.1. – A2.2.7	<input type="checkbox"/>	<input type="checkbox"/>
TO THE OWNER/OPERATOR: Please acknowledge by your signature item 36 if the appliance was professionally installed or Item 37 if you as the owner/operator installed the appliance.				
36.	I, the owner/operator of this installation certify that the installer instructed me in the safe and correct operation of the appliance or accessory and I have been provided with a copy of the manufacturer's instructions supplied with the appliance or accessory.			
Print name: _____		Date: _____		
Signed: _____				
37.	I, the owner/operator of this installation certify that I have carefully read the manufacturer's installation, operating and maintenance of the manufacturer's operating and maintenance instructions.			
Print name: _____		Date: _____		
Signed: _____				
Contractor:		Business License No:		
Installer's Name (print) :		Certificate No:		
Installer's Name (print) :		Date:		
Received by Name (print):		Date:		
Received by Name (sign):				

APPENDIX C

DIRECTORY

Community	Name	Phone number	Stoves	Boilers	Furnaces	Bagged pellets	Bulk pellets	Installation & Maintenance
Fort Providence	Aurora Marketing (NWT) Ltd.	699-4321	X			X		
Fort Smith	Freund Building Supplies Ltd.	872- 2155	X			X		
Fort Smith	Home Hardware	872-2121	X					
Fort Smith	Northwood Log Homes Ltd	872-2484						X
Hay River (and South Slave)	Taylor and Company	874-2447	X	X	X	X		X
Hay River	Hay River Home Hardware	874-6722	X			X		
Hay River	Wesclean Northern Sales Ltd.	875-5100				X		
Inuvik	Arctic Rim Distributors Ltd	777-2566	X					
Inuvik	Plumb Crazy Mechanical Ltd	777-3210						X
Inuvik	Rocky's Plumbing & Heating Ltd.	777-2579	X			X		X
Inuvik	Wrangling River Supply	777-3011	X			X		
Norman Wells	Green Energy NWT Inc.	587-3015	X	X	X		X	
Norman Wells	Sahtu Building Supplies	587-2389	X	X	X			
Yellowknife	Arctic Green Energy	873-2504		X	X	X	X	X
Yellowknife	B & C Construction	444-5280	X			X		
Yellowknife	Canadian Tire	873-2403	X			X		
Yellowknife	D&S Mechanical & Thawing Systems	444-9617	X					
Yellowknife	Emco Corporation	920-7617	X			X		
Yellowknife	Fitzgerald Carpeting	873-5768	X			X		X
Yellowknife	Central Mechanical Systems	873-3003	X	X	X	X		X
Yellowknife	Home Building Centre	669-9945	X			X		
Yellowknife	Konge Construction	669-3683				X		
Yellowknife	NAAS Enterprises	445-6337		X	X			
Yellowknife	North of 60 Maintenance	446-5011	X		X			
Yellowknife	True Value Hardware	765-5675	X			X		
Yellowknife	Walmart	873-4545				X		
Yellowknife	Wesclean Northern Sales Ltd.	873-6833				X		

APPENDIX D

GLOSSARY

Accessory building – A shed or other building on the same lot as the main building.

Appliance – Wood pellet appliance – equipment that burns wood pellets to produce heat for space heating - includes stoves, boilers and furnaces.

Auger – A steel coil or screw, which when powered by electricity moves wood pellets into the fire at a consistent rate as determined by the energy demand.

Boiler – An appliance intended to supply hot water or steam for space heating.

Building envelope – The wall and roof systems around your home. Normally the area inside the building envelope is heated and what's outside isn't.

Bulk storage – The storage of loose pellets in large containers, without additional wrapping.

Carbon monoxide (CO) – A poisonous gas without colour or smell, produced by all wood, pellet, gas, propane, oil and coal stoves, furnaces and boilers, it normally leaves with the exhaust gases. Low CO is one of the goals of optimal fuel combustion.

Certified – The appliance has passed a series of tests and meets certain safety requirements, for stoves it's ULC S627 and for boilers and furnaces it's normally CSA B366.1.

Commercial installation – An appliance and all associated equipment and building works in a building other than single-family dwellings and institutions (such as schools and hospitals).

Creosote – A flammable tar deposited on the walls of your chimney when you burn wood.

CSA – Canadian Standards Association – A non-profit organization that develops standards.

Flue – The tube connecting the flue collar on an appliance to the chimney.

Furnace – An appliance that generates heat for distribution through air ducts to provide space heating.

Gigajoule (GJ) – A measure of the energy contained in a fuel.

GNWT – Government of the Northwest Territories

Greenhouse Gases (GHG) – Gases being released into the atmosphere which are thought to be contributing to climate change.

Heat Shield – A permanent barrier placed between the wood pellet appliance and a combustible material such as a wall.

Insurance broker – Insurance agent who works on your behalf to get you insured, will deal with several insurance companies or underwriters.

Local Authority – Your local government, the city, town, village or hamlet government.

Manufacturer's Instructions – An information booklet provided with certified appliances. They are very important and must be followed.

Primary heating system – The heating system responsible for most of the heat load of your home (they're normally automated and controlled by a thermostat).

PWS – Public Works and Services, a Government of the Northwest Territories department.

Regulatory – To do with rules and requirements.

Residential installation – An appliance and associated equipment and works in a single-family dwelling.

Space heater – An appliance for heating the space in which it sits without the addition of a transport system to move the heat to other areas of the house.

Stove – An appliance intended for space heating.

ULC - Underwriters' Laboratories of Canada – an independent, not-for-profit, product safety testing and certification organization.

WETT - Wood Energy Technology Transfer – A non-profit organization that certifies installers, inspectors, chimney sweeps and sales people who work in the wood heating trades.

Wood pellet – small cylinder of compressed sawdust, normally 3 centimetres (1 inch) long or smaller.

APPENDIX E

FOOTNOTES

- ¹ Pellet Fuels Institute, <http://www.pelletheat.org/3/industry/index.html>
- ² Traeger Canada, <http://www.traegercanada.com/tips6index.htm>
- ³ Community Wood Pellet Study - Part 1 Delivered Costs, AEA, September 2009
- ⁴ BioEnergy 2008 Conference, presentation: Production and Market Trends
- ⁵ BioEnergy 2008 Conference, presentation: Canadian Pellet Production for Worldwide Markets
- ⁶ Community Wood Pellet Study - Part 1 Delivered Costs, AEA, September 2009
- ⁷ CanBio Go Pellets - <http://www.gopelletsCanada.com/>
- ⁸ AEA calculation based on Fuel Cost library
- ⁹ Pellet Fuels Institute, <http://www.pelletheat.org/3/industry/index.html>
- ¹⁰ <http://www.pelprostoves.com>
- ¹¹ www.harmanstoves.com
- ¹² Community Wood Pellet Study - Part 1 Delivered Costs, AEA, September 2009



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