



CIPH Information Bulletin

Use of Water Heaters in Hydronic Applications

Information Bulletin to the Hydronic Heating Industry Updated July 2008

Background

The Canadian Institute of Plumbing and Heating (CIPH), on behalf of its heating appliance members (i.e. water heater and boiler manufacturer companies), feels it is necessary to provide an information bulletin on the use of water heaters in hydronic applications. Water heaters are being inappropriately installed in all jurisdictions of Canada. In many instances, this is creating health and safety issues.

Myth	Reality
Any water heater is safe to install in a hydronic application.	Only water heaters that are certified for dual purpose space heating and potable water use may be installed. If the appliance is not certified to one of the three possible Standards (ANSI Z21.10.1-2004/CSA 4.1-2004; ANSI Z21.10.3-2004/CSA 4.3-2004; or CSA B140.12-03) and marked, indicating that it can be used in dual purpose applications, then installing it is an offence—and a safety hazard.
If a water heater can be used solely for domestic hot water, then using it solely for space heating must be safe as well.	There is not a single water heater manufacturer in Canada that allows its product to be used solely for space heating applications. In fact, manufacturers may void the warranty of the appliance if it is not installed appropriately.
Installing the water heater as the sole heating appliance does not violate any provincial/territorial regulations.	CIPH is not aware of a single jurisdiction in Canada that allows non-certified product to knowingly be installed. The one exception is if an Engineer has specified, in writing, that the water heater may be used as the sole appliance and that the engineer will take on the liability of the product's use—and even then some jurisdictions may disallow it.
Certified, dual-purpose water heaters can be used for any size of home.	CSA B214-07 (Installation Code for Hydronic Heating Systems) states that water heaters may be used in combination space and domestic water heating to a maximum space heating load of 75,000 BTU/hr.
Installing a certified dual-purpose water heater is less expensive than installing a boiler.	The homeowner may have to replace several dual-purpose water heaters before a conventional boiler would need to be replaced. Water heaters used for space heating may run more often than boilers, and overuse can cause the heater to fail prematurely. It is advised to check the warranty period on the unit being installed as some manufacturers have a warranty term reduction if the product is applied to a space heating load. In order to supply enough hot water for both space heating and domestic hot water, the homeowner's energy expenses may be higher.
A tankless water heater (sometimes referred to as a "wall-hung" unit) and a tankless boiler are interchangeable.	The functions of these two devices are distinct and therefore the products are certified as either water heaters or boilers respectively. They should not be considered interchangeable.



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Common Questions and Answers

Is it ever appropriate to use a water heater for space heating?

Yes. As long as the appliance is certified for—and used for—both dual-purpose space heating and domestic hot water use, then it should operate safely with no risk to the homeowner. They are best used in supplemental heating applications. You should also ensure it is properly sized according to Annex A in CSA B214-07 (Installation Code for Hydronic Heating Systems).

What's the harm in installing a water heater that isn't certified for dual purpose?

It is a misuse of the appliance. Water heaters are designed to cycle. Water heater manufacturers advise that heat stress loads and enamel formulation are not designed to run continuously. This increases the risk—usually unknowingly—to the homeowners. Water heaters also do not have the heat recovery that most heating systems demand. This places the appliance in jeopardy of not meeting the household demands for hot water. And finally, water heaters are not designed to operate in a closed loop system and safety concerns arise if used in that application.

My local utility is promoting programs that install water heaters as the sole heating appliance. Why would they do that if the practice is not safe?

Utilities may not be familiar with the Installation Code for Hydronic Heating Systems (CSA B214) and as a result, do not realize there are safety issues. If you know of a utility that is undergoing this practice, please forward this bulletin to them immediately.

Why haven't water heater manufacturers had their product certified for sole-source heating applications?

Water heaters do not go through the same testing as a boiler would. In fact, there isn't even a standard or test protocols for them to be certified to for sole space heating purposes. To date, only pressure vessels (i.e. boilers) are properly designed to run at such high temperatures. Until technology changes, it is unlikely that water heaters will ever be able to be used as the sole heating appliance in the home.

How can I purchase a copy of CSA B214?

You can purchase a copy via the Canadian Institute of Plumbing and Heating by visiting:
https://server13.lfchosting.com/hydraulics/chc_orderform_fm.php

Who should I contact if I have further questions on water heaters and if they are appropriate?

From a design perspective (i.e. you want to know if the water heater will supply enough heat for the home), contact the design professional at your local heating wholesaler. They should have a copy of CSA B214 and be able to use the appendix to calculate if the appliance is suitable.

If you need to talk to a building official for installation guidance, CIPH has a list by region on their website: <http://www.ciph.com/Downloads/codesAndStandards/cacpRegulators.php>