T. H. Industrial Solutions

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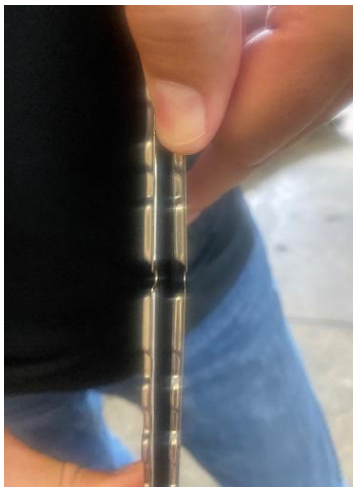
Servicing Double Wall Plate & Frame Heat Exchangers

- Double wall PHEs are commonly used for domestic hot water applications.
- Most municipal building code specify this design to prevent cross contamination of potable water.
- Typically, two 0.3mm thick or 0.4mm plates are welded together. The four ports are fully sealed & most of the perimeter is welded.
- Some OEMs only weld the four ports & the entire perimeter is open.
- If a hole or crack develops, liquid will enter into the cavity between the (2) plates & leak externally preventing cross contamination.
- If a PHE is leaking externally, the causes include: worn gaskets, deformed/fatigued plates i.e. the plate gasket track has dished & the gaskets are shifting, or the plates have holes or cracks.
- The standard process to check the plates for hole or cracks is to perform a dye test. This can be done using a Chromalux dye & a black light test, or using red & white dye penetrant.
- Unfortunately, neither tests work on double wall plates.
- When installing new gaskets, it is very important the plate is extremely clean to ensure the gasket seats properly.
- On domestic hot water applications, the contamination on the plates is usually ferrous oxide (rust) and calcium.
- The most effective option to clean is to fully submerge the plates in an acid bath.
- Since we can not guarantee all of the acid is flushed out of the cavity, we do not acid clean double wall plates.



Note:

- In light of the aforementioned, we recommend installing a new plate pack on any DW PHEs that develop a leak.
- The exception is a PHE that has been in service for only under 1-year.

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Domestic Hot Water Regulations:

Please be informed that, designers and installers are required to conform to the following requirements.

7.6.2.1. Connection of Systems

(1) *Connections to potable water systems shall be designed and installed so that non-potable water or substances that may render the water non-potable cannot enter the system.*

(2) *No connection shall be made between a potable water system supplied with water from a drinking-water system and any other potable water system without the consent of the water purveyor.*

Therefore, if the designers, manufacturers and installers cannot assure that, "non-potable water or substances that will NOT render the water non-potable" (i.e. warranty of a single wall heat exchanger does not work, it only means when there is a break, someone will fix it but the damage has been done), as such, fail safe design must be included within the design and installation.

The local authority having jurisdiction can accept either an applicable Acceptable Solution in Division B, or an applicable Alternative Solution that will achieve the level of performance required by the applicable Acceptable Solution in respect of the Objectives and Functional Statements attributed to the applicable Acceptable Solutions in Supplementary Standard SA-1.

Under the Building Code Act, the local municipality is the authority having jurisdiction for enforcing the Act and its Regulations, and the permit applicants should contact the appropriate official with respect to any specific proposal.

Danny Hui, P.Eng. Building Code Advisor, Building Services Specialist, Code Advisory Unit, Building and Development Branch
Ministry of Municipal Affairs & Housing, Tel: 416-585-7368

Single Wall Plate Dye Testing

After being chemically cleaned, plates are high pressure washed and then plates are hung and sprayed with UV dye. Once sprayed the UV dye is allowed to soak in for 5 to 10 minutes and then using ultraviolet lights plates are inspected in a dark room for cracks, pin holes and deterioration. Any plates that are suspected of failure are then red/white dye penetrant tested so that failure can be confirmed.

Forests Canada

As part of T.H. Industrial Solutions corporate social responsibility, each time an order is placed with our company a tree will be planted by Forests Canada. Over a lifetime, with the addition of each tree, eventually a forest will be created which will help to ensure the health of our environment for future generations to come

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