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Code requirements and related issues for Solar Domestic Hot Water Heating in Canada

Solar water heating (SDHW) is an emerging industry in Canada, and many levels of Government are promoting them as an environmentally friendly technology that can help to cut greenhouse gas emissions, and reduce dependence on burning fossil fuels; however code requirements and approvals are a barrier to the SDHW market. High approval testing costs, long testing times and additional regional variations in requirements for SDHW make it very difficult for solar product manufacturers. USA and European approvals and certifications are generally not accepted in Canada.

Present issues and barriers to the SDHW Industry:

1. Regional Requirements:

Issue: There is no national consensus on SDHW approval requirements. Individual provinces and cities have different / additional requirements.

Solution: National requirements for SDHW systems in Canada should be established quickly. A CSA approved and certified product should not face additional provincial hurdles.

2. Backflow Prevention and SDHW Systems:

Issue: CSA B64 lists the Degree of Hazard listing for "solar energy units" as severe. The realistic hazard in the field is absolutely minimal with a modern solar energy system and should be considered equivalent to any hydronic heating system. Most types of solar DHW systems today are either closed loop systems or drainback systems, which utilize very small quantities of either water or non-toxic propylene glycol/water mixtures as the heat transfer fluid. Across the country plumbing inspectors are enforcing this standard differently, leading to much confusion in the industry. In some instances SDHW systems are being required to install backflow preventers that require annual testing. The annual inspection costs are usually equivalent to 50 to 100% of the fuel savings provided by the SDHW system, completely eliminating any sort of payback from a SDHW system installation. The Canadian Solar Industries Association (CanSIA), also has objected to the severe hazard listing in B64, and has proposed changes to this standard to modify this hazard rating. The CanSIA proposed amendments to the CSA - B64 Committee are available upon request.

Solution: Eliminate the "severe hazard" listing in the CSA B64 as fast as possible. In the interim until the standard has been updated, PTPACC should provide some national guidance to plumbing inspectors on this issue. At most a simple backflow preventer requiring no annual inspection, should be all that is required for a residential or light commercial SDHW system. If a glycol mix is used as a system fill, it must be accompanied by an MSDS sheet and be available for the inspector.

3. Double Wall Heat Exchanger Requirements:

Issue: Single wall heat exchangers are acceptable for SDHW systems under the Solar Keymark in Europe, the SRCC OG-300, and the CSA F379 standards. Single wall heat exchangers are also acceptable by GAMA in the hydronic heating industry (with boilers and indirectly heated DHW tanks). However across the country plumbing inspectors are enforcing this differently, leading to much confusion in the industry. Some jurisdictions will only accept double wall heat exchangers. Double wall heat exchangers reduce system efficiency by as much as 40%, add to installation costs and stretch the payback period for the investment in a SDHW system. There are currently no CSA F379 SDHW systems approved with double wall heat exchangers.

Solution: Eliminate the requirement for double wall heat exchangers for both hydronic heating systems and SDHW systems. Accept single wall heat exchangers, as long as they meet CSA F379 and GAMA requirements, and are CSA tested and certified.

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4. **Training to Become a CanSIA Certified Installer:**

Issue: Lack of certified installers and limited amount of certification classes available. In some areas certification is required (along with two system installs to get certification) to install and be eligible for rebates.

Solution: More training classes. **Prerequisite:** Business license, mechanical contractors license, pipe fitters certificate or equivalency.

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