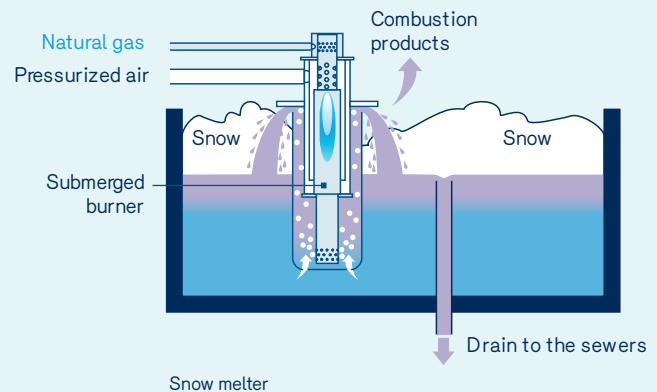
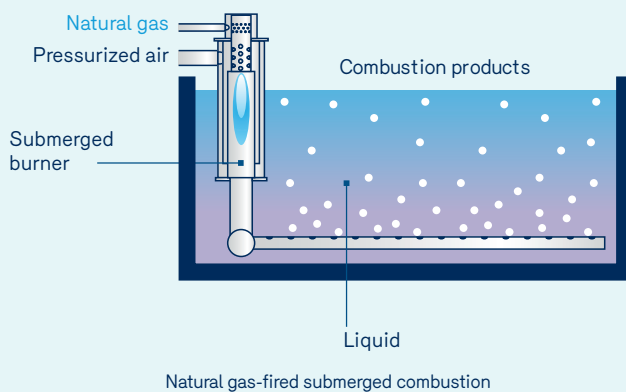


# Submerged combustion

## Concept

Submerged combustion is a technology that produces combustion directly in the fluid to be heated. The combustion gas bubbles escape from the dispersion gradient, rise back into the bath and come into direct contact with the liquid without any heat exchanger. At the outlet above the surface of the bath, the fumes have the same temperature as the bath fluid. If the bath is maintained at 15°C (59°F) or below, the combustion efficiency is 100%. If the bath temperature is 100°C (212°F), all the combustion energy serves to evaporate the bath water. This technology is used more in industrial processes with great volumes of liquid to be heated. This technology is particularly efficient because all the energy is transmitted to the fluid. However, the combustion gases rising to the surface have to be ventilated. Finally, the fluid to be heated must be compatible with the combustion products.



## Advantages

- Very high efficiency of nearly 100%, depending on operating conditions and bath temperature.
- Production costs reduced and energy saved, depending on the process replaced.
- Great heating power means heating time is reduced.
- Easy maintenance.
- Applicable to many liquids.

## Applications

- Phosphate baths
- Bleaching
- Continuous hot water production
- Tanneries
- Slaughterhouse wash water
- Greenhouse heating water
- Solution concentration
- Wash water
- Concrete and plaster batching
- Industrial waste concentration
- Fume treatment
- Melting snow

## Energy Efficiency Financial Assistance\*

Technology eligible for the Feasibility Studies and Implementation of Energy Efficiency Measures Grants, according to defined criteria. See [energir.com](http://energir.com) for more details.

## List of manufacturers\*\*

- Trécan

## Selection criteria

- Combustion products released on the surface of the liquid must be adequately ventilated.
- Burner type must be designed especially for the application.
- Burner power must be chosen according to production needs.
- Burner must be able to be modulated to precisely maintain the temperature.

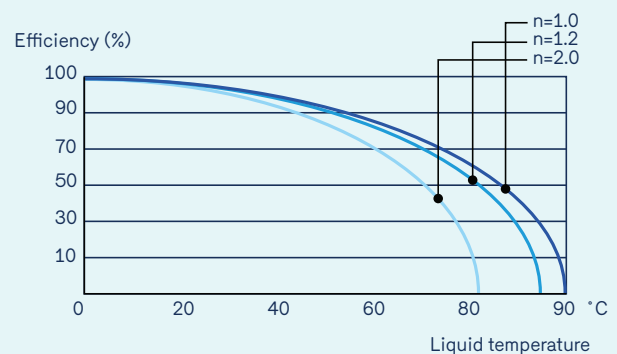
## Installation standards

Installation must comply the CAN/CSA-B149.1 and CAN/CSA-B149.3 gas codes, as well as other codes in force in Québec, and the manufacturer's instructions.

### Submerged combustion

Heating performance (%) as a function of liquid temperature, for different excess air values (n), in relation to stoichiometric value of air.

For example, given 20% excess air and a bath temperature of 50°C, curve n=1.2 shows a 90% efficiency rating.



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\* Certain conditions apply. The financial assistance is subject to change without prior notice.

\*\* Here is a non-exhaustive list of manufacturers.

These data are provided for guidance only. This Information Sheet is for general use and must not be considered advice. Please ask for assistance on the questions that concern you and do not rely only on the text in this Information Sheet.

Last updated December 3, 2010.  
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