

NATIONAL ENERGY CODE OF CANADA: SERVICE WATER HEATING SYSTEM CHECKLIST

PERMIT NUMBER: _____ APPLICANT NAME: _____

PROJECT DESCRIPTION: _____

PROFESSIONAL OF RECORD: _____

Compliance Path Selected: Prescriptive _____ Trade-Off _____ Performance _____

Prescriptive Path (NECB Section 6.2)

NECB Requirement	Compliance Description	Compliance Achieved?		
		Yes	No	N/A
6.2.1.1.	Load calculations have been completed in accordance with relevant regulations.			
6.2.2.1.	Service water heaters, storage tanks and pool heaters comply with the applicable standards.			
6.2.2.2.	Hot service water storage tanks have insulation with a maximum U-value of 0.45 W/(m ² ·K).			
	Tank insulation is protected if there is chance of mechanical damage.			
6.2.2.3.	Solar service water heating equipment meets the manufacturer's design and installation requirements or those stated in CAN/CSA-F379 Series.			
6.2.2.4.	Combination service water heating and space-heating equipment meets the NECB requirements.			
6.2.2.5.	Space-heating equipment used for indirect service water heating meets the NECB requirements.			
6.2.3.	Piping systems are insulated in accordance with the NECB requirements.			
6.2.4.1.	Service water heating systems with storage tanks have adjustable temperature controls that allow the temperature to be adjusted between the lowest and highest settings.			
6.2.4.2.	Service water heating systems with storage capacities of 100 L or more have a readily accessible and visible shut-off device.			
6.2.4.3.	Heating elements installed along service water pipes have automatic controls to maintain the required hot water temperature.			
6.2.5.1.	On a system with two or more discharge temperatures in which less than 50% of the flow from one portion discharges at 60°C or higher, separate remote booster heaters are installed.			
6.2.6.1.	Individual shower heads have a maximum discharge of 9.5 L/min.			
	Where one temperature control services multiple shower heads, each shower head shuts off automatically when not in use.			
6.2.6.2.	Lavatory faucets have a maximum discharge of 8.3 L/min.			
	In a public washroom of an assembly occupancy, the flow of water in each lavatory shuts off automatically when not in use.			

6.2.7.1.	Pool heaters have a readily accessible and visible device to shut off heat and, where applicable, to allow the heater to be restarted without manual relighting of the pilot light.			
	Except for pool pumps operating 24 hours a day as required by public health standards, pool pumps and heaters turn off automatically when not in use.			
6.2.7.2.	Pools and hot tubs are equipped with covers that cover at least 90% of the water surface. For pools and tubs heated above 32°C, the thermal transmittance of the pool cover is no more than 0.48 W/(m ² .°C).			

Is service water heating system compliant with the prescriptive path? YES _____ NO _____

Trade-off Path (NECB Subsection 6.3)

Type of service water heating system _____
(complete a form for each type of SWH system installed)

Service water heating systems to which the trade-off path can be applied:

System Type ID	System Description	Is system installed in this project? Yes/No
SWH-1	Tank Type	
SWH-2	Tankless (Instantaneous)	
SWH-3	Combination	

Type of energy used in service water heating system:

Heating Energy Type	Does SWH system use this energy type? Yes/No
Natural Gas	
Propane	
Fuel Oil	
Electricity	
If heat pump is used, energy type is electricity	

Values of trade-off parameters (see NECB Article 6.3.2.5.):

Trade off Parameter	Description	Value	Unit
ToV ₁	Service water heating equipment efficiency		%
ToV ₂	Tank insulation value		R-value
ToV ₃	Piping insulation value		R-value
ToV ₄	Pump motor efficiency		%
ToV ₅	Pump efficiency		%
ToV ₆	Heat recovery ratio		kW/kW
ToV ₇	Average flow of all faucets		USGPM
ToV ₈	Average flow of all showers		USGPM
ToV ₉	Faucet flow ratio		fraction
ToV ₁₀	Shower flow ratio		fraction

Project Name:

Values of other variables needed to calculate trade-off index (SWH-TOI) of SWH system:

Description	Value
PDR (peak daily flow ratio) (see NECB Article 6.3.2.2.)	
A_{norm} (normalised tank area) (see NECB Article 6.3.2.3.)	
D_{norm} (normalised tank diameter) (see NECB Article 6.3.2.4.)	
η_{ref} (reference heat generator efficiency) (see NECB Article 6.3.2.6.)	

Calculation of trade-off index (SWH-TOI) for each SWH system:

System Type ID	Applicable equation from NECB Article 6.3.2.1.	SWH-TOI
SWH-1	$SWH - TOI = 2.813 \cdot \left\{ \frac{2.813 \cdot PDR}{ToV_1} \cdot \{1 - 0.6514 \cdot ToV_6 \cdot e^{-0.312 \cdot ToV_6}\} + 0.06153 \cdot \left(\frac{A_{norm}}{ToV_2} + \frac{26.180}{ToV_3} \right) + \frac{0.00677}{ToV_4 \cdot ToV_5} \right\}^{-1}$ $- 2.813 \cdot \left\{ \frac{2.813}{\eta_{ref}} + 0.06153 \cdot \left(\frac{A_{norm}}{12.4} + 6.807 \right) + 0.0141 \right\}^{-1}$	
SWH-2	$SWH - TOI = 2.813 \cdot \left\{ \frac{2.813 \cdot PDR}{ToV_1} \cdot \{1 - 0.6514 \cdot ToV_6 \cdot e^{-0.312 \cdot ToV_6}\} + \frac{1.611}{ToV_3} + \frac{0.00677}{ToV_4 \cdot ToV_5} \right\}^{-1}$ $- 2.813 \cdot \left\{ \frac{2.813}{\eta_{ref}} + 0.4329 \right\}^{-1}$	
SWH-3	$SWH - TOI = 2.813 \cdot \left\{ \frac{2.813 \cdot PDR}{\eta_{ref}} \cdot \{1 - 0.6514 \cdot ToV_6 \cdot e^{-0.312 \cdot ToV_6}\} + 0.06153 \cdot \left(\frac{A_{norm}}{ToV_2} + \frac{26.180}{ToV_3} \right) + \frac{0.00677}{ToV_4 \cdot ToV_5} \right\}^{-1}$ $- 2.813 \cdot \left\{ \frac{2.813}{\eta_{ref}} + 0.06153 \cdot \left(\frac{A_{norm}}{12.4} + 6.807 \right) + 0.0141 \right\}^{-1}$	

Is proposed service water heating system compliant with the trade-off path, i.e., SWH-TOI ≥ 0? YES _____ NO _____

Performance Path (NECB Subsection 6.4)

Use the Building Energy Performance Checklist in the Commentary on Part 8