

Recommended Guidelines

Energy Conservation Opportunities for Pools, Spas, and Water Features [G-0310]

Pool & Hot Tub Council of Canada

March 2010

These guidelines are issued by the Pool & Hot Tub Council of Canada as reference documents for consumers and as guiding principles for pool and spa manufacturers, builders, contractors, and regulatory authorities across the country. This series of recommendations, as drafted by the Council's Energy Conservation Committee, identifies potential energy-saving opportunities related to specific pieces of equipment associated with pools, spas and water features. The guidelines should prove useful to the industry in the design, construction and service of products. Moreover, the guidelines provide direction to government agencies in the development of energy conservation programs for both homeowners and public pool operators.

The Pool & Hot Tub Council of Canada is a voluntary, not-for-profit association representing the interests of the pool and hot tub industry. As such, it is not considered a harmonized organization, and therefore does not qualify as an accredited national standards-writing body.

Introduction

The integration of new technologies in this sector has brought about significant improvements to the materials used in the manufacture of pool and spa related equipment. A comprehensive review of swimming pool and hot tub construction practices in Canada has identified several areas in which substantial energy savings can be realized.

NOTE: Some of the energy saving opportunities outlined in this document apply to hydraulic systems. It is imperative that all pools and spas are operated in accordance with design specifications relative to water circulation. A qualified expert in pool operations must be consulted in the conversion, retrofit or installation of any new equipment that will have an impact on the water turnover rate. Similarly, the addition of electrical timers and/or electronic control systems should only be installed after consultation with a pool professional, and must only be installed by an accredited, provincially certified electrical professional. Failure to heed these instructions has the potential to create a health risk.

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Recommendations:

Automation systems – Automatic controls bring together many facets of operating an environmentally friendly pool. These systems promote energy efficiency by providing digital internal time clocks for filtration, water features, pool and landscape lighting and by selecting the most efficient heating method based on ambient conditions. In addition, these controllers can prevent various backyard items such as lights from being left “ON” and thereby wasting energy.

Covers – Close to half of heat losses from pools come off the surface. Cutting off the surface area by deploying solar covers or safety covers on pools can lower costs for heating, filtration and chemical sanitization by up to 50%. Similar results are achievable with thermal insulating covers on hot tubs.

Dehumidification/Energy Recovery Systems – An interior pool of 20 m² can evaporate as much as 12 kg of water per hour. This amounts to more than 5000 kJ/hr of latent energy. If this energy is not captured through heat recovery, it must be expelled from the pool room to keep relative humidity in the room at 60% or less. Indoor pools implementing dehumidification/energy recovery systems can benefit by energy savings of approximately 50%.

Design and Construction – It is advantageous to consult experts in the design and construction of pools and hot tubs in order to minimize environmental impact.

Heaters – (i) It is possible to select a pool heater based specifically on its heat efficiency. (ii) The utilization of multiple heater units in conjunction with a control system will result in the automatic selection of the most efficient heater to use at the appropriate time. (iii) Solar pool heaters installed on rooftops are now commercially available and can reduce heating costs up to 75%.

Lights – Changing from incandescent lighting to LED lighting can reduce electrical consumption from lighting systems by more than 50%.

Mini-recirculation Pumps – Circulating pumps are generally installed to filter water in hot tubs over extended periods. Some models of spas derive additional energy-saving benefits by being outfitted with mini-recirculation pumps.

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Pumps – While timers are an effective way to reduce energy consumption, extreme caution must be taken not to create an unhealthy pool environment. Shutting off a pump for an extended period during the daytime could lead to a build up of algae and/or bacteria since chemicals used to sanitize a pool break down much more quickly under exposure to sunlight. Alternatively, overall energy efficiency can be improved between 60 and 80 percent with the installation of a correctly sized and installed two-speed or variable-speed pump.

Rightsizing of Equipment – Installing the proper size of pump and the appropriate dimensions of piping are major considerations to ensure that energy is not wasted. The power of a pump and the diameter and layout of corresponding piping should be consistent with ideal hydraulic specifications for the swimming pool or spa.

NOTE: Using a lower pump speed will lower energy consumption. A suction velocity of 1.5 metres per second (5 ft/s) with a return flow of 2.1 metres per second (7 ft/s) is usually sufficient. However, it is essential to follow the recommended operating procedures and settings to ensure adequate water turnover in the pool or spa. Homeowners should seek the assistance of a qualified builder or manufacturer in making such determinations.

Robotic Cleaners – Deploying robotic cleaners can lower the cost of cleaning the bottom of a pool in excess of 50%.

Sources of Expertise:

Qualified pool and hot tub installers and service providers are members of the Pool & Hot Tub Council of Canada. A listing by region is posted on the website: www.poolcouncil.ca.

Related Standards:

The Canadian Standards Association is developing two Energy Efficiency Standards, **C374** – Performance of Hot Tubs and Spas and **C840** – Performance of Pool Pumps. Both CSA standards are currently in draft stage and are planned for 2011 release and publication.

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