

# GEW161-14

## 702.10, Chapter 12

**Proponent:** Jeffrey Waterman, representing Liberty Pumps, Inc.  
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### Revise as follows:

**702.10 Water-powered sump pumps.** Water-powered pumps shall not be used as the primary means of removing ground water from sumps. Where used as an emergency backup pump for the primary pump, the primary pump shall be an electrically powered pump and the water-powered pump shall be equipped with an auditory alarm that indicates when the water-powered pump is operating. The alarm shall have a minimum sound pressure level rating of 85 dB measured at a distance of 10 feet (3048 mm). Where water-powered pumps are used, they shall have a water-efficiency factor of pumping not less than ~~2 gallons (7.6 L)~~ 1.4 gallons (5.3 L) of water to a height of ~~8 feet (2438 mm)~~ 10 feet (3048 mm) for every 1 gallon (3.8 L) of water used to operate the pump, measured at a water pressure of 60 psi (413.7 kPa). Pumps shall be clearly marked as to the gallons (liters) of water pumped per gallon (liters) of potable water consumed. Water-powered sump pumps shall comply with IAPMO PS 119.

### Add new standard as follows:

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#### IAPMO PS 119-2012ae1 Water-Powered Sump Pumps

**Reason:** Section 702.10 was rewritten during the last IGCC code cycle, and the changes included allowing water-powered sump pumps if the following criteria was followed: the WPP could only be an emergency pump for use when the primary electrically powered pump fails; they must have an alarm to warn of usage; they need to have a water efficiency factor of pumping not less than 2 gallons ( 7.6 L) of water to a height of 8 feet ( 2438 mm) for every 1 gallon ( 3.8 L) of water used to operate the pump, measured at a water pressure of 60 psi ( 413.7 kPa); and the efficiency factor needs to be marked on the product. The efficiency factor established at that time was just a guess driven primarily from advertising by non-third party listed products.

Shortly after this verbiage was set to be adopted by the IGCC, the topic of water powered pumps was also reviewed by the Plumbing Water Efficiency Task Group for the 2012 code cycle of the IAPMO Green Plumbing and Mechanical Code Supplement (GPMCS), and it was debated whether or not the same criteria should be added to that code. The efficiency ratio adopted by the IGCC was discussed, and there were two issues brought up.

Firstly, the efficiency ratio seemed to be set rather high, and secondly there was no means of insuring whether or not the efficiency factor as marked on the product was truthfullt was suggested that the efficiency ratio could be added to the applicable product standard for these pumps, IAPMO PS 119-2006, "Material and Property Standard for Water Energized Sump Pump." It seemed reasonable since both major plumbing codes -- IAPMO's Uniform Plumbing Code and ICC's International Plumbing Code -- were either written or being revised to make it clear that all plumbing products and materials must be third party listed and must comply with the approved applicable standard (ref. IAPMO 2012 Uniform Plumbing Code, clause 301.1; and ICC 2012

International Plumbing Code, Section 303.4. Several members of the IAPMO GPMCS Water Efficiency Task Group then set out to work with the IAPMO Standards group to set up a separate task group to review and update IAPMO PS 119-2006. The PS 119 task group also included representatives of the three manufacturers of IAPMO/UPC listed water powered sump pumps -- Liberty Pumps, Inc., A.Y. McDonald Mfg. Co., and the Zoeller Pump Company. Representative examples of their products were exchanged between the three companies so they could compare results from their respective WPP test cells for the purpose of determining the best construction of a laboratory test cell and establishment of a testing procedure, and the determination of an appropriate minimum efficiency ratio. A test cell design and procedure was approved, and efficiency ratios were reviewed. It appeared that the IGCC 2:1 @ 8 feet ratio was beyond the current state of the art of WPP design. While a product could be designed to meet this specific set of parameters, the real world usage of these pumps requires them to be effective under a multitude of inlet pressures and discharge heads. Also it also was felt that an efficiency ratio at 10 feet as opposed to 8 feet would be more meaningful since it probably was closer to the average elevation from the bottom of a sump pit to its discharge point. The result of the task group was creation of the revised product standard IAPMO PS 119-2012a(e1), "Water Powered Sump Pumps".

This revised standard established the performance requirement as follows: "The pump efficiency ratio at  $415 \pm 1.4$  kPa ( $60 \pm 0.2$  psi) and at a head of  $3.0 \pm 0.06$  m ( $10 \pm 0.2$  ft), calculated in accordance with Section 5.3.2(h), shall be at least 1.4." Subsequent to the revision of IAPMO PS 119, the 2012 IAPMO Green Plumbing and Mechanical Code

Supplement adopted this efficiency ratio. The IAPMO 2012 GPMCS clause reads as follows:

**412.0 Water-Powered Sump Pumps.** Sump pumps powered by potable or reclaimed (recycled) water pressure shall only be used as an emergency backup pump. The water-powered pump shall be equipped with a battery powered alarm having a minimum rating of 85 dBA at 10 feet (3048 mm). Water-powered pumps shall have a water efficiency factor of pumping at least 1.4 gallons (5.3 L) of water to a height of 10 feet (3048 mm) for every gallon of water used to operate the pump, measured at a water pressure of 60 psi (414 kPa). Pumps shall be clearly labeled as to the gallons of water pumped per gallon of potable water consumed. Water- powered stormwater sump pumps shall be equipped with a reduced pressure principle backflow prevention assembly.

The proposed change to IgCC Section 702.10 will harmonize the green construction codes, permit usage of water powered pumps with efficiency factors at the current state of the art in performance, and with the acceptance of IAPMO PS 119-2012a(e1) into IGCC Chapter 12 ("Referenced Standards") there is a means for third party certification which includes a validation of the required efficiency factor labeling

**Bibliography:**

2012 Green Plumbing & Mechanical Code Supplement, Clause 412.0, pub. The International Association of Plumbing and Mechanical Officials, 2012, Page 14

**Cost Impact:** Will not increase the cost of construction. No impact.

**Analysis:** A review of the standard proposed for inclusion in the code, IAPMO PS 119-2012ae1 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28), will be posted on the ICC website on or before April 1, 2014.

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