



# SWIMMING POOL / SPA SUBMITTAL CHECKLIST

Building Department

390 Towne Centre Dr, Lathrop, CA 95330  
Phone: (209) 941-7270

## RESIDENTIAL SWIMMING POOL, HOT TUB, AND SPA SUBMITTAL CHECKLIST AND REGULATIONS

BASED ON 2022 CALIFORNIA BUILDING CODE (CBC) & 2022 CALIFORNIA RESIDENTIAL CODE (CRC)  
CBC 2022; SECTION 3109; CBC – CALIFORNIA SWIMMING POOL SAFETY ACT

### Submittal Checklist:

The following general compliance requirements for a swimming pool including an in-ground, above ground, on-ground pool, hot tub, or spa submittal checklist for Plan Review. Swimming Pool or Pool means any structure intended for swimming or recreation bathing that contains water over 18 inches deep. Follow our [General Permit Submittal Guidelines](#) for all submissions.

Along with a Completed Permit Application, please submit the following:

1. A true to scale site plan showing the following
  - a. Location of the pool/spa and all pool equipment (pumps, heaters, alarms, etc.).
  - b. Actual setbacks from property lines, house, and other structures. Provide dimensions from heater to openings (windows/doors) into dwelling.
  - c. Location of any overhead electrical conductors or communication cables, setback from the pool, and height above maximum water level.
  - d. Location of a GFCI receptacle between 6 and 20 feet from the water's edge.
  - e. Location and size of electrical panel.
  - f. Location of electrical runs, burial depth, pipe diameter and material.
  - g. Access route for pool construction equipment.
  - h. Location of easements, finished floor elevation, north arrow, address/parcel number, utility box locations, grading/drainage, provide street names, and lots with a grade differential greater than two feet must show contours.
  - i. Location of concrete washout area and all other storm water Best Management Practices (BMPs).
  - j. Location and height of any retaining walls, sound walls, stair or slope cuts.
2. For Gunite Pools/Spas: Submit wet stamped / digitally stamped and signed copies of pool structural plans and calculations. For all non-site specific pool structural plans (i.e. standard plans containing multiple options/details) all conditions, details, and reinforcement schedules that are applicable to the submitted project shall be highlighted, circles, or otherwise identified.
3. For Prefabricated Pools/Spas: Submit the pool design plans and/or manufacturer specifications for the spa/hot tub or above ground pool with the wet signature / digital signature of the person responsible for the plans. If the prefabricated pool has been evaluated by ICC-ES or IAPMO UES please also provide a copy of the evaluation report and report number. Spa information is to include electrical and/or gas requirements/ manufactured spas shall be listed.
4. Submit a completed Erosion Sediment Control Plan (ESCP). Please visit the City of Lathrop, [Public Works Storm Water Program](#) page for additional ESCP Information.
5. Provide the following information:
  - a. Existing electrical service equipment (panel) size, location and residential service load calculations to verify capacity.
  - b. Pool equipment schedule including manufacturer's specifications (cut sheets) for all equipment (pumps, heaters, control panels, lights, etc.).
  - c. Solar rooftop panel heaters require separate permits.
6. A note in the Plans stipulating:  
"Any damage to public property (such as driveway approaches, sidewalk, sound walls, etc.) must be repaired by the permit holder prior to Final Inspection."
7. For pools located in River Islands, A [River Islands Architectural Review Application](#) must first be submitted and approved by the River Islands CC&R Compliance Team before submitting for application at the City. Their approval will include a CC&R Letter, which can be submitted as part of the initial submittal. If the backyard is located within 500' of a levee, the applicant may be subject to review by the Island Reclamation District 2062 (RD2062). If reviewed by RD2062, an approval letter from RD2062 will need to be provided as part of the submittal as well.



# SWIMMING POOL / SPA SUBMITTAL CHECKLIST

## Swimming Pool and Spa Regulations:

### Setbacks:

- The pool and/or spa shall be located:
  - A minimum of 50 feet from the front lot line.
  - A minimum of 3 feet from rear and side property lines measured from edge of water.
  - Outside of any easement.
  - 5 feet from the edge of water to any building. Closer than 5 feet will require additional engineering documentation.
- Pool equipment has no minimum setback from rear or side property line or any structure.
- No equipment or pool shall be within the Public Utility Easement (PUE) area or required front yard. **LMC 17.32.050**

### Safety Glazing:

- New and existing glazing in walls used as a barrier for swimming pools and spas shall be safety glazing when the bottom edge of the glazing is less than 60 inches above the ground and the glazing is within 5 feet horizontally of the swimming pool or spa water's edge. **CBC 2406.4 & CRC R308.4.5**
- Show all windows (openable and fixed) and doors on existing building site plan.

### Heating/Energy:

- Swimming Pool heating must comply with California Building Energy Efficiency Standards. **Section 110.4- Mandatory Requirements for Pool and Spa Systems and Equipment**
- If a pool heater is installed, a cover shall be provided and a gas service meter shall be upsized prior to Final Inspection. Contact PG&E directly.

### California Swimming Pool Safety Act

- At least 2 out of the 7 drowning prevention safety features listed must be used and identified on the plans. Refer to **CBC 3109.2 115922** for the list.
- Applicant shall provide proof of notification to consumer of these safety requirements. **CBC 3109.2 115924**

### Enclosure/Barrier

- Fencing/Enclosures for pools must comply with the California Building Code – Swimming Pool Safety Act. Refer to **CBC 3109 115923**
- If a portion of the house is used as part of the enclosure, that portion must have alarms on all doors giving direct access through that wall to the pool area. Any barrier/fence shall be at least 60 inches above the ground and have a maximum distance of 2 inches from the ground to the bottom of the barrier.
- Access gates and doors shall open away from the pool and have a self-closing and self-latching device located on poolside of barrier and at least 3 inches below the top of gate. All garage man doors opening into the enclosure must be self-closing and latching. **CBC 3109.2**
- The outside surface of the enclosure shall be free of protrusions, hand and footholds, and other characteristics that would aid in climbing.

### Deck

- Deck shall maintain a 2-inch separation below the stucco weep screed to allow trapped water to drain from the exterior walls of the dwelling.

### Electrical

- Equipotential bonding grid shall extend for 3 feet horizontally beyond the inside walls of the pool and shall include unpaved surfaces as well as concrete and other paving materials.
- All fixed metal parts located within 5 feet horizontally from the inside wall of the pool shall be bonded.
- Refer to the California Electrical Code (**CEC**) **Article 680.26** for additional bonding grid specifications.

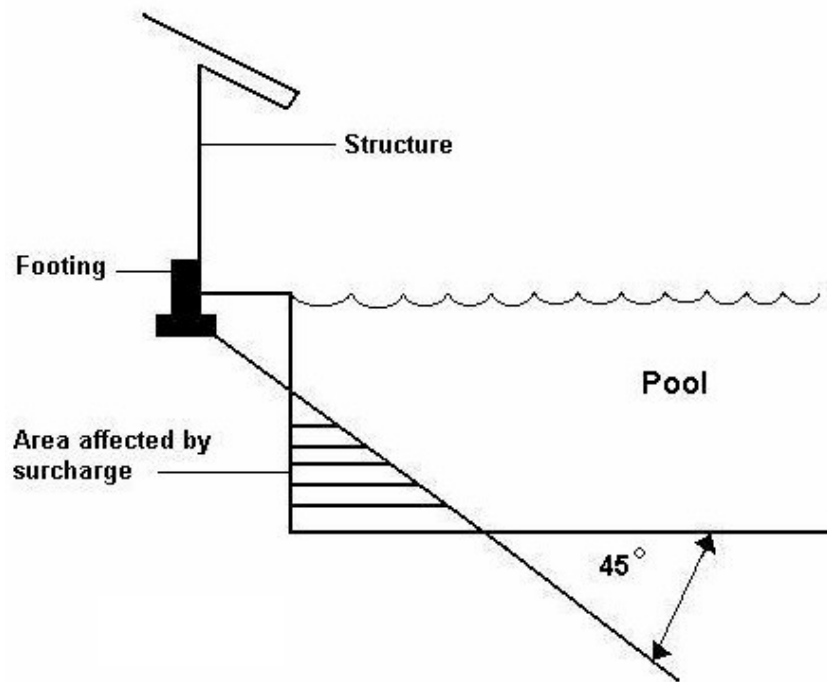


# SWIMMING POOL / SPA SUBMITTAL CHECKLIST

- Provide at least one 125-volt GFCI receptacle located a minimum of 6 feet from, and not more than 20 feet from, the inside wall of the pool. This receptacle shall be located no more than 6'6" above the floor, platform, or grade level. **CEC 680.22**
- Disconnecting means for pool equipment shall be located at a minimum of 5 feet horizontally away from the inside wall of the pool, spa, or hot tub. Disconnecting means shall be accessible and within sight from the pool.
- Contractor shall be responsible for sizing and adequacy of existing electrical and gas service.
- Overhead Conductor Clearances: Pools shall not be paced under existing service-drop conductors or any other open overhead wiring in accordance with **CEC 680.9**. Show all overhead conductors, clearances, and locations in site plans.

## Retaining Walls/Foundation Surcharges

- Cuts into levee slope are not permitted under any circumstance.
- Retaining walls, over 4 feet in height, measured from the bottom of the footing, require engineering.
- The vertical water line of any swimming pool or spa shall be a minimum of 3 feet from any structure that will cause a surcharge load on the pool or spa walls. If located closer than 5 feet from a structure or affected by a surcharge because of pool depth, the plans must include an engineered surcharge schedule. See Figure below.



## Pool Drain (Anti-Entrapment Cover)

- New swimming pools or spas shall meet all of the following requirements:
  - Anti-Entrapment Certification Form must be completed and signed by Property Owner prior to Final Approval.
  - They shall have at least 2 circulating drains per pump that shall be hydraulically balanced and symmetrically plumbed through one or more "T" fittings, and that are separated by a distance of at least 3 feet in any dimension between the drains.
  - Suction outlets that are less than 12 inches across shall be covered with anti-entrapment grates, as specified in the **ASME/ANSI Standard A112.19.8** that cannot be removed except with the use of tools. Slots or openings in the grates or similar protective devices shall be of a shape, area, and arrangement that would prevent physical entrapment and would not pose any suction hazard to bathers.
- Existing swimming pools or spas that are remodeled or modified shall require that the suction outlet of the pool or spa be upgraded to be equipped with an anti-entrapment cover meeting current standards of the American Society of Mechanical Engineers (ASME).



# SWIMMING POOL / SPA SUBMITTAL CHECKLIST

## Inspections Checklist for Swimming Pools and Spas:

### A. Pre-Gunite

- Structural Check
  - Location, excavation, and steel placement.
  - Location of equipment pad.
- Plumbing Check
  - Return line, fill line, and all other piping (minimum 35lb pressure test).
  - Gas piping installation and test (minimum 15lb with approved gauge).
  - All plumbing is required to be under test, full assembly.
- Electrical Check
  - Service drop clearance requirements: 22.5 feet above the pool if within 10 feet horizontal.
  - Bonding of pool or spa steel, underwater light fixture forming shells, diving board, slide, fill line, equipment, and metallic objects located within 5 feet of the inside walls of a pool or spa.
  - Bonding grid.
  - Provide gate requirements to the owner.
  - Specialty Pools such as vinyl liners or fiberglass must have alarms or barriers installed at this time.

### B. Pre-Deck

- Electrical Check
  - Final bonding of diving board, grab rails and slides, disabled access inserts, and rope ties.
  - Bonding Grid.
  - Bonding of pool or spa steel, underwater light fixture forming shells, diving board, slide, fill line, equipment, and metallic objects located within 5 feet of the inside walls of a pool or spa.

### C. Pre-Plaster

- Structural Check
  - Fences, gates or barriers alternates required to be installed at this time.
  - The enclosure fence must be a minimum of 5 feet high and all gates must be self-closing and self-latching or padlocked and swing outward.
- “No-climb fencing” is not an acceptable barrier material.
  - Alarms meeting UL 2017 Standard are required at this time in conjunction with barrier requirements.
- Electrical Check
  - For an underwater light fixture forming a shell, check for proper grounding, listed potting compound, and encapsulating and covering requirements.
  - The required GFCI's must be installed.
  - Light Niche Cord shall be long enough to service outside of the pool.

**ALL INSPECTIONS LISTED ABOVE ARE TO BE SIGNED OFF PRIOR TO PLASTERING OF THE POOL OR SPA**



# SWIMMING POOL / SPA SUBMITTAL CHECKLIST

## D. Final

- Structural Check
  - Final grading.
  - Location of equipment in conjunction with property lines, structures, and windows.
  - General appearance of the pool, spa, and decks.
  - Required barriers.
- Plumbing Check
  - Inspection of all exposed piping for leaks.
  - Approved gas valve.
  - T&P relief valve on the heater (if required) and termination of the drain.
  - Equipment secured to the equipment pad.
  - Proper gas connector.
  - Prepare the PG&E utility tag. (if needed)
  - Paint all PVC plumbing lines exposed to sunlight.
  - Obtain anti-entrapment certification form- signed by owner and contractor- refer to attachment.
- Electrical Check
  - Service Drop Clearance requirements.
  - Grounding and bonding complete.
  - Main panel indexed at breakers.
  - Proper operation of switches and receptacles.
  - Installation of time clocks.
  - Proper wire and breaker sizing.
  - Required circuits GFCI protected.
  - Pool light has low water cutoff.
  - Pool or spa light properly GFCI protected.
  - Lighting fixtures, lighting outlets, and ceiling fans located over the spa or hot tub, or within 5 feet from the inside walls of the spa or hot tub, shall be a minimum of 7'6" above the maximum water level and shall be protected by a ground-fault circuit-interrupter.
  - Alarms or barriers shall be verified to be installed and operational.
- Energy Check
  - Pool Cover Compliance with State Energy laws.
  - Obtain form CEC-CF2R-PLB-03-E Pool and Spa Heating System signed forms.
  - Verify California Appliance Efficiency for Dedicated-Purpose Pool Pumps in accordance with Title 20.

**THE FINAL INSPECTION IS TO VERIFY ALL ITEMS ARE CONSTRUCTED AND INSTALLED COMPLETELY. THE PERMIT HOLDER OR AUTHORIZED AGENT MUST BE PRESENT AT THE FINAL WITH THE JOB CARD AVAILABLE FOR SIGNATURE.**



Building Department

# ANTI-ENTRAPMENT CERTIFICATION FORM

390 Towne Centre Dr, Lathrop, CA 95330  
Phone: (209) 941-7270

## ANTI-ENTRAPMENT CERTIFICATION FORM FOR SWIMMING POOLS & SPAS

The following form is required whenever a building permit is issued to construct or repair (re-plastering) a swimming pool, toddler pool, or spa.

### STATEMENT TO BE SIGNED BY PROPERTY OWNER PRIOR TO FINAL APPROVAL

Verification of Compliance with the "Swimming Pool Safety Act"  
(CA Health & Safety Code 115920 – 115929)

Project Address: \_\_\_\_\_

Property Owner: \_\_\_\_\_ Phone #: \_\_\_\_\_

Property Owner Mailing Address: \_\_\_\_\_

I hereby certify that the swimming pool, toddler pool, or spa located at the above-mentioned address complies with the provisions of the "Swimming Pool Safety Act", has been equipped with an anti-entrapment cover meeting the current ANSI/APSP-16 as required under the provisions of the law, and have received additional information on pool barrier requirements.

Property Owner Signature: \_\_\_\_\_ Date: \_\_\_\_\_

### Contractor Information

Company Name: \_\_\_\_\_

CA Contractor License Number: \_\_\_\_\_ Type: \_\_\_\_\_ Expiration: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Contact Name: \_\_\_\_\_ Phone #: \_\_\_\_\_

E-Mail Address: \_\_\_\_\_

Contractor Signature: \_\_\_\_\_ Date: \_\_\_\_\_



CERTIFICATE OF INSTALLATION

Note: This table completed by HERS Registry.

Table with 4 columns: Field Name, Entry, Field Name, Entry. Rows include Project Name, Dwelling Address, City and Zip Code, Enforcement Agency, Permit Number, and Permit Application Date.

A. Pool and Spa System Type

Table with 3 columns: Field, Field Name, Data Entry. Row 01: Pool and Spa System Type.

B. Pool and Spa Systems and Equipment Requirements

(Section 110.4(a) and 110.5)

Table with 2 columns: Field, Field Name. Rows 01-05 describing requirements for pool/spa heating systems, switches, weatherproofing, insulation, and pilot lights.

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

C. Pool and Spa System Installation Requirements

(Section 110.4(b))

Table with 2 columns: Field, Field Name. Rows 01-04 describing installation requirements for solar heating equipment, covers, directional inlets, and time switches.

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.



D. Pool Pump Sizing and Flow Rate Specification(Section 150.0(p))

Field	Field Name
01	The pool pump that subject to State or federal appliance efficiency standards is listed in the CEC's directory of certified equipment.
02	The pool pump flow rate shall not exceed the maximum pump flow rate calculated based on pool sizing in the table below. The return pipe diameter, suction pipe diameter, and filter area shall be at least as large as the required minimums shown in the table. Alternatively, a flow calculation or flow test result shall be provided to demonstrate that the pump flow rate is less than 6 hour filtration turnover, and the return pipe flow rate does not exceed 8 fps and that the suction pipe flow rate does not exceed 6 fps.

03	An alternative compliance calculation or a flow test result is provided for this pool or spa use (must attach flow calculation or flow test result to this form)	Yes	No
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04	The pump is capable of operating at 2 or more speeds (not applicable if pump is less than 1 horsepower).
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05	Each auxiliary pool load is served by either a separate pump, or the system is served by a multi-speed pump.
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06	Volume of Pool (gallons)	
07	Filter Type (Cartridge, Sand, DE)	

08a Required Min Return Pipe Diameter (inches)	08b Required Min Suction Pipe Diameter (inches)	08c Required Min Filter Area (ft <sup>2</sup> )	08d Required Max Pump Flow (gpm)

09	Return Pipe Diameter (inches)	
10	Suction Pipe Diameter (inches)	
11	Filter Surface Area (ft <sup>2</sup> )	
12	Max Pump Flow Rate (gpm)	
13	Measured Flow Rate Return Line (fps)	
14	Measured Flow Rate Suction Line (fps)	
15	Compliance Statement:	

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.





**E. Pool System Piping** (Section 150.0(p)2)

Field	Field Name
01	The suction side pipe is straight for at least 4 pipe diameters before entering the pump (See table below for the required straight run lengths for various pipe sizes).
02	All elbows are sweep elbows, or an elbow type that has a pressure drop that is less than the pressure drop of a straight pipe with a length of 30 pipe diameters.

**The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.**

**F. Pool Filters and Valves** (Section 150.0(p)3 and 4)

Field	Field Name
01	If a filter is used in a pool intended for public use: The size of the filter is at least the size specified in NSF/ANSI 50.
02	If a backwash valve is used: The diameter of the backwash valve is at least 2 inches, or the diameter of the return pipe, whichever is greater.

**The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.**



### CF2R-PLB-03-E User Instructions

#### A. Pool and Spa System Type

Pick from Pool only, Spa only, or Pool and Spa

#### B. Pool and Spa Systems and Equipment Requirements (Section 110.4(a) and 110.5)

Before any pool or spa heating system or equipment may be installed, the manufacturer must certify to the Energy Commission that the system or equipment complies with §110.4 and §110.5. The requirements include minimum heating efficiency according to Appliance Efficiency Regulations, an on-off switch outside the heater, permanent and weatherproof operating instructions, no continuous pilot light, and no electric resistance heating.

#### C. Pool and Spa System Installation Requirements (Section 110.4(b))

A time switch or similar control mechanism must be installed as part of the pool water circulation control system that will allow all pumps to be set or programmed to run only during the off-peak electric demand period and for the minimum time necessary to maintain the water in the condition required by applicable public health standards.

#### D. Pool Pump Sizing and Flow Rate Specification (Section 150.0(p))

The pool filtration flow rate may not be greater than the rate needed to turn over the pool water volume in 6 hours or 36 gpm, whichever is greater. Calculate Max Flow Rate using the following equation:

$$\text{Max Flow Rate (gpm)} = \frac{\text{Pool Volume (gallons)}}{360\text{min.}}$$

Pool piping must be sized according to the maximum flow rate needed for all auxiliary loads. Show work to calculate return and suction line flow rate, minimum filter area, and the maximum pump flow rate correspond to the pool volume in accordance to section 150.0(p), or refer to Table C below for the prescriptive values. The maximum velocity allowed is 8 fps in the return line and 6 fps in the suction line, and the maximum pump flow rate is less than 6 hour filtration turnover.

3. Select whether the alternative calculation is used.

6. Enter the Pool Volume (gal).

7. Enter Filter Type (Cartridge, Sand, DE).

8a Enter the Required Minimum Return Pipe Diameter (inches).

8b Enter the Required Minimum Suction Pipe Diameter (inches).

8c Enter the Required Minimum Filter Area (ft<sup>2</sup>).

8d Enter the Required Maximum Pump Flow (gpm).

9. Enter Return Pipe Diameter (inches).

10. Enter Suction Pipe Diameter (inches).

11. Enter Filter Surface Area (ft<sup>2</sup>).

12. Enter the Maximum Pump Flow Rate (gpm).

13. Enter the Measured Flow Rate of the Return Line in fps. This is only used if the alternative calculation is used.

14. Enter the Measured Flow Rate of the Return Line in fps. This is only used if the alternative calculation is used.

15. Automatically completed Compliance Statement.

**E. Pool System Piping** (Section 150.0(p)2)

There must be a length of straight pipe that is greater than or equal to at least 4 inches pipe diameters installed before the pump. Refer to Table D below for the required pipe length. Traditional hard 90° elbows are not allowed. All elbows must be sweep elbows or a type of elbow that has a pressure drop less than the pressure drop of straight pipe with a length of 30 pipe diameters.

**F. Pool Filters and Valves** (Section 150.0(p)3 and 4)

Backwash valves must be sized to the diameter of the return pipe or 2 inches, whichever is greater. Multiport backwash valves have a high pressure drop and are discouraged.

### Regulatory Changes for Dedicated-Purpose Pool Pumps

All dedicated-purpose pool pumps (DPPP) (domestic and imported) manufactured on or after July 19, 2021, must meet the efficiency requirements adopted by the U.S. Department of Energy (DOE). The California Energy Commission has adopted the same DPPP regulations as U.S. DOE. [California’s Appliance Efficiency Regulations \(Title 20\)](#) (Sections 1601-1609) will only apply to products manufactured *before* July 19, 2021. For products manufactured on or after that date, the former Title 20 DPPP definitions and regulations will no longer apply.

#### Why Were These Changes Made?

The DPPP standard adopted by the U.S. DOE in January 2017 has similar stringency to the standards previously adopted by California. According to the U.S. DOE, there are an estimated 8.5 million residential swimming pools in the U.S.<sup>1</sup> and the impact on the electrical grid and pool owners is significant. The new U.S. DOE standard will save U.S. consumers over \$11 billion over the next 30 years.<sup>2</sup> For standard size self-priming pool pumps, compliant products save consumers over \$2,000 in lifecycle costs (equipment price, installation and operating costs) over the life of the pump, compared to non-compliant single speed pool pumps. These products are ultimately quieter, have a longer lifetime and provide better filtration performance.



#### Relevant Code Sections

##### California Appliance Efficiency Regulations, Title 20

- Section 1601(g) – Scope
- Section 1602(g) – Definitions
- Section 1605.1(g) – Federal and State Standards for Federally Regulated Appliances
- Section 1606 – Filing by Manufacturers; Listings of Appliances in Database
- Section 1607(b) and (d)(2) – Marking of Appliances

##### Code of Federal Regulations (CFR): Title 10, Energy, Subpart Y (Pumps)

- 10 CFR 431.462 – Definitions
- 10 CFR 431.465 – Energy conservation standards and their compliance dates
- 10 CFR 431.466 – Labeling Requirements
- 10 CFR Appendix C to Subpart Y of Part 431 – Uniform Test Method for the Measurement of Energy Efficiency of Dedicated-Purpose Pool Pumps

DPPP are also referred to as residential and commercial, inground swimming pool filtration pump and motor combinations.

1 U.S. DOE LCC 2015: EERE-2015-BT-STD-0008-0106, Tab Overall Summary, Table Market Share.

2 U.S. DOE 2017-01-18 Energy Conservation Program: Energy Conservation Standards for Dedicated-Purpose Pool Pumps; Direct final rule, Tables V45 and V46.



## New Scope

The scope of the new DPPP standard includes:

- Single-phase pool filtration pumps with a hydraulic horsepower (hhp) less than or equal to 2.5 hhp (this is approximately 5 total horsepower (hp) for smaller pumps)
  - This applies to both residential and commercial DPPP products within the hhp range
  - Note that pool filtration pumps must include a basket strainer or require the connection of a basket strainer for operation, and if distributed with a sand or cartridge filter, this filter must be bypassable and the pump must continue to operate
- Self-priming (i.e., inground), non-self-priming (i.e., above-ground) and pressure cleaner booster pumps
- Integral filter pumps (typically storable/inflatable pool pumps)
  - A filter pump is integral if the filter cannot be bypassed
- Waterfall pumps **do not have performance requirements**, however, they must comply with U.S. DOE freeze protection requirements if equipped with freeze protection and report performance data to the [U.S. DOE's Compliance Certification Management System \(CCMS\)](#)
- Storable spa pumps and rigid electric spa pumps **are defined but not regulated** by the U.S. DOE and the California Energy Commission

## New Definitions

**Weighted Energy Factor (WEF):** This measures the performance of the pump in gallons pumped per watt hour. This weighted measurement is similar to having both city and highway miles per gallon (MPG) values for a car which are then weighted and used to calculate an overall MPG.

- For **variable-** and **multi-speed** pumps, WEF is calculated at 80% low-speed operation (filtration speed) and 20% high-speed operation (cleaning speed), to match how these products are meant to be used in the field
- For **two-speed** products, WEF is calculated at the same low- and high-speed weighting as for variable- and multi-speed pumps (80% low, 20% high), provided the low speed meets minimum U.S. DOE flow requirements
  - If the low speed does not meet flow requirements, it is not tested and the product is treated similarly to single-speed products
- For **single-speed** products, WEF is the performance at maximum speed
- For **pressure cleaner booster pumps**, WEF is measured at an operating flow of 10 gpm and head pressure greater than or equal to 60 feet head of water.
- For **waterfall pumps**, WEF is measured at 17 feet head of water and maximum speed.

**Hydraulic Horsepower (hhp):** This is a measurement of the energy a pump supplies to water that it is pumping at the exit point of the pump (discharge).

- Defined at the maximum speed on PHTA-15 Curve C, at product full impeller size
  - At this load point, hhp is the:  $\text{Flow (gpm)} * \text{Head (ft water)} / 3960$
- Hhp is used to calculate the WEF requirements
- Conventional pool pump motor rated hp includes various service factors (e.g., up-rating versus full rating) whereas hhp is a direct measurement of output power

**Self-priming:** A self-priming pump is capable of repriming with a water lift of five or more feet vertically in under 10 minutes and is not a waterfall pump (defined according to American National Standards Institute (ANSI) / National Sanitation Foundation (NSF) 50-2015).

- Pumps capable of this operation are determined to be self-priming pool pump products, suitable for inground applications, whereas pumps that cannot are non-self-priming and are typically suitable for above-ground pool pump applications
- Some pumps, formerly considered above-ground products, are capable of self-priming, so have been modified to either meet the regulatory requirements for self-priming pumps or no longer prime according to U.S. DOE definitions

### Operating Points: High-speed & Low-speed

The **high-speed operating point** is the closest operating point a pump can use which is at least 80% of maximum flow of the pump on the test system curve. Per the [Pool and Hot Tub Alliance \(PHTA\) Standard 15, Curve C](#):  $\text{Head} = 0.0082 * \text{Flow}^2$ .

The **low-speed operating point** is the lowest speed the pump is capable of operating at which meets minimum U.S. DOE flow requirements. Per [Appendix C to Subpart Y of Part 431, I.D.3 Table 1](#), the low speed flow at tested head  $0.0082 * (\text{Low Speed Flow})^2$  must be at or above 31.1 gpm for products with greater than 0.75 hhp, and at or above 24.7 gpm for products with less than or equal to 0.75 hhp. Variable- and multi-speed products are tested at the lowest speed that can reach this operating point. Two-speed products are tested at high speed only if this flow requirement is met.

# New Requirements

**WEF:** These translate to pool pump technologies such as:

- Standard Size Self-Priming Pumps: Only variable-speed products are likely to meet the standard
- Small Self-Priming Pumps: High-efficiency motor single-speed products can meet the standard
- Non-Self-Priming Pumps: Medium-efficiency motor single-speed products can meet the standard
- Pressure Cleaner Booster Pumps: Medium-efficiency motor single-speed products can meet the standard

Pool Pump Type	Hydraulic Horsepower (hhp)	Phase	Minimum WEF in kgal/kWh
Self-Priming - Standard Size	$0.711 \leq \text{hhp} < 2.5$	Single	$\text{WEF} = -2.30 \times \ln(\text{hhp}) + 6.59$
Self-Priming - Small	$\text{hhp} < 0.711$	Single	$\text{WEF} = 5.55$ , for $\text{hhp} \leq 0.13$ $-1.30 \times \ln(\text{hhp}) + 2.90$ , for $\text{hhp} > 0.13$
Non-Self-Priming	$\text{hhp} < 2.5$	Any	$\text{WEF} = 4.60$ , for $\text{hhp} \leq 0.13$ $-0.85 \times \ln(\text{hhp}) + 2.87$ , for $\text{hhp} > 0.13$
Pressure Cleaner Booster	Any	Any	$\text{WEF} = 0.42$

Table 1: Minimum WEF by Pool Pump Type (based on 10 CFR 431.465)

Note:  $\ln()$  is the natural logarithm

## Freeze Protection

- Eliminates defaults that run the pump too soon and accounts for the fact that not all Climate Zones need freeze protection
- Pumps equipped with freeze protection controls must either ship with freeze protection disabled or with the U.S. DOE defaults specified in 10 CFR 431.465(h)

## Integral Cartridge Filter and Integral Sand Filter Pool Pumps

- Must be distributed in commerce with a pool pump **timer** that is either integral to the pump or a separate component that is shipped with the pump
- A **timer** as defined in 10 CFR 431.462 must turn off a DPPP after a runtime of no longer than 10 hours

## Marking Requirements

- Manufacturers (or third-party test labs) are required to test and ensure that WEF and DPPP motor total horsepower are added to the product nameplate (i.e., product label)
  - U.S. DOE regulations now require that all service factors for DPPP total horsepower are 1.0, thus making rated and total horsepower equal for this value
- Manufacturers have the option to add hydraulic horsepower to the nameplate, but it is not required
- Standard marking requirements in Title 20, Section 1607(b): manufacturer's name or brand name or trademark, model number and date of manufacture (including year and month or smaller (e.g., week) increment)

## Frequently Asked Questions

*How do the regulations handle (formerly) 1 to 1.5 hp inground pool pumps?*

In the regulation, the cut point between large and small pumps is 0.711 hhp, which is approximately 1.2 hp. Some pumps at 1-1.5 motor hp will be above or below the 0.711 threshold depending on the performance of the pump in the test method.

The WEF regulations are all based on the product's hhp and must be rounded to three significant figures.

Pumps which are greater than or equal to 0.711 hhp must meet the WEF requirements of standard-size inground pumps, which is generally met by variable- or multi- speed pumps. Whereas pumps falling below that 0.711 hhp limit may meet the WEF requirements of small inground pumps, which can be generally met by efficient single-speed pumps.

Matching a pump to a pool is still a factor of the unique conditions of the pool, such as medium vs high head installations, flow requirements, turnovers and pool size, plumbing system losses, downstream equipment and distance. Hhp is especially useful for sizing considerations, however, consulting manufacturer system curves is still recommended, especially when replacing a pump with unknown hhp.

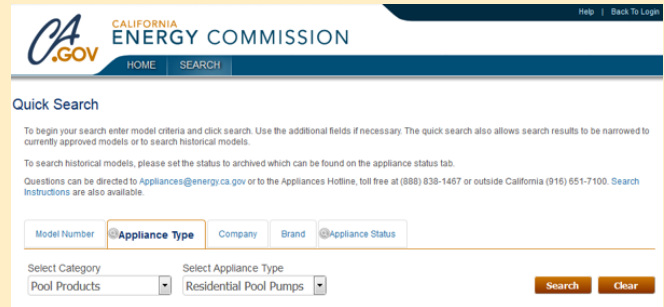
*Are there any residential pool pumps still regulated by Title 20 but not the U.S. DOE DPPP regulations?*

No, all former Title 20 definitions will be preempted for DPPP manufactured on or after July 19, 2021. The California Energy Commission has adopted regulations identical to U.S. DOE for DPPP. However, on July 19, 2021, a separate Title 20 replacement pool pump motor regulation becomes effective.

# How to Comply with Title 20

In addition to being certified to the CCMS, Title 20 requires that both federally and state-regulated products be certified to the California Energy Commission's Modernized Appliance Efficiency Database System (MAEDbS). A product that was previously certified to the MAEDbS and is federally regulated after July 19, 2021 will need to be recertified to the MAEDbS as a federally regulated product.

Everyone in the sales chain – including manufacturers, distributors, retailers, contractors, importers and installers – is responsible for ensuring regulated products are listed in the MAEDbS.



## For More Information

### Primary Documents

- Title 20 Appliance Efficiency Regulations  
[energycodeace.com/content/reference-ace-t20-tool](http://energycodeace.com/content/reference-ace-t20-tool)
- Code of Federal Regulations (CFR): Title 10, Energy, Subpart Y (Pumps)  
[ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=7672fe9b9023da11cc463a5260087d97&mc=true&n=pt10.3.431&r=PART&ty=HTML#sp10.3.431.y](http://ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=7672fe9b9023da11cc463a5260087d97&mc=true&n=pt10.3.431&r=PART&ty=HTML#sp10.3.431.y)

### California Energy Commission Information & Services

- Appliances Hotline: (888) 838-1467 or outside California (916) 651-7100
- Questions may also be emailed to [Appliances@energy.ca.gov](mailto:Appliances@energy.ca.gov)
- California Appliance Efficiency Standards Site  
[energy.ca.gov/rules-and-regulations/appliance-efficiency-regulations-title-20](http://energy.ca.gov/rules-and-regulations/appliance-efficiency-regulations-title-20)
- Modernized Appliance Efficiency Database (MAEDbS)  
[cacertappliances.energy.ca.gov/Login.aspx](http://cacertappliances.energy.ca.gov/Login.aspx)

### U.S. DOE Information and Services

- Office of Energy Efficiency & Renewable Energy Appliance and Equipment Standards Program  
[energy.gov/eere/buildings/appliance-and-equipment-standards-program](http://energy.gov/eere/buildings/appliance-and-equipment-standards-program)
- Compliance Certification Management System (CCMS)  
[www.regulations.doe.gov/ccms](http://www.regulations.doe.gov/ccms)

### Additional Resources

- Energy Code Ace:  
[EnergyCodeAce.com](http://EnergyCodeAce.com)
  - An online “one-stop-shop” providing no-cost tools, training and resources to help appliance and building industry professionals decode and comply with Title 24, Part 6 and Title 20. The site is administered by California’s investor-owned utilities.

*Of special interest:*

- Fact Sheets  
[energycodeace.com/content/resources-fact-sheets/](http://energycodeace.com/content/resources-fact-sheets/)
  - Title 20 Certification Overview, Process and FAQs
- Title 20 On-Demand Video Training:  
[energycodeace.com/content/title-20-training/](http://energycodeace.com/content/title-20-training/)
  - Residential Pool Pumps  
[energycodeace.com/content/training-ace/courseid=44517](http://energycodeace.com/content/training-ace/courseid=44517)

Register with the site and select an industry role for your profile in order to receive messages about all our no-cost offerings and Title 20 news! You can also email us at [Title20@energycodeace.com](mailto:Title20@energycodeace.com).



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