

Department of Energy

§ 431.465

(c) *Circulator pumps*—(1) *Scope*. This paragraph (c) provides the test procedures for determining the circulator energy index for circulator pumps that are also clean water pumps, including on-demand circulator pumps and circulators-less-volute, and excluding submersible pumps and header pumps.

(2) *Testing and calculations*. Determine the circulator energy index (CEI) using the test procedure set forth in appendix D of this subpart Y.

[82 FR 36923, Aug. 7, 2017, as amended at 87 FR 57299, Sept. 19, 2022]

§ 431.465 Pumps energy conservation standards and their compliance dates.

(a) For the purposes of paragraph (b) of this section, “PEI_{CL}” means the constant load pump energy index and “PEI_{VL}” means the variable load pump energy index, both as determined in accordance with the test procedure in § 431.464. For the purposes of paragraph (c) of this section, “BEP” means the best efficiency point as determined in accordance with the test procedure in § 431.464.

(b) Each pump that is manufactured starting on January 27, 2020 and that:

(1) Is in one of the equipment classes listed in the table in paragraph (b)(4) of this section;

(2) Meets the definition of a clean water pump in § 431.462;

(3) Is not listed in paragraph (c) of this section; and

(4) Conforms to the characteristics listed in paragraph (d) of this section must have a PEI_{CL} or PEI_{VL} rating of not more than 1.00 using the appropriate C-value in the table in this paragraph (b)(4):

Equipment class ¹	Maximum PEI ²	C-value ³
ESCC.1800.CL	1.00	128.47
ESCC.3600.CL	1.00	130.42
ESCC.1800.VL	1.00	128.47
ESCC.3600.VL	1.00	130.42
ESFM.1800.CL	1.00	128.85
ESFM.3600.CL	1.00	130.99
ESFM.1800.VL	1.00	128.85
ESFM.3600.VL	1.00	130.99
IL.1800.CL	1.00	129.30
IL.3600.CL	1.00	133.84
IL.1800.VL	1.00	129.30
IL.3600.VL	1.00	133.84
RSV.1800.CL	1.00	129.63
RSV.3600.CL	1.00	133.20
RSV.1800.VL	1.00	129.63
RSV.3600.VL	1.00	133.20

Equipment class ¹	Maximum PEI ²	C-value ³
ST.1800.CL	1.00	138.78
ST.3600.CL	1.00	134.85
ST.1800.VL	1.00	138.78
ST.3600.VL	1.00	134.85

¹ Equipment class designations consist of a combination (in sequential order separated by periods) of: (1) An equipment family (ESCC = end suction close-coupled, ESFM = end suction frame mounted/own bearing, IL = in-line, RSV = radially split, multi-stage, vertical, in-line diffuser casing, ST = submersible turbine; all as defined in § 431.462); (2) nominal speed of rotation (1800 = 1800 rpm, 3600 = 3600 rpm); and (3) an operating mode (CL = constant load, VL = variable load). Determination of the operating mode is determined using the test procedure in appendix A to this subpart.

² For equipment classes ending in .CL, the relevant PEI is PEI_{CL}. For equipment classes ending in .VL, the relevant PEI is PEI_{VL}.

³ The C-values shown in this table must be used in the equation for PER_{STD} when calculating PEI_{CL} or PEI_{VL}, as described in section II.B of appendix A to this subpart.

(c) The energy efficiency standards in paragraph (b) of this section do not apply to the following pumps:

- (1) Fire pumps;
- (2) Self-priming pumps;
- (3) Prime-assist pumps;
- (4) Magnet driven pumps;

(5) Pumps designed to be used in a nuclear facility subject to 10 CFR part 50, “Domestic Licensing of Production and Utilization Facilities”;

(6) Pumps meeting the design and construction requirements set forth in Military Specification MIL-P-17639F, “Pumps, Centrifugal, Miscellaneous Service, Naval Shipboard Use” (as amended); MIL-P-17881D, “Pumps, Centrifugal, Boiler Feed, (Multi-Stage)” (as amended); MIL-P-17840C, “Pumps, Centrifugal, Close-Coupled, Navy Standard (For Surface Ship Application)” (as amended); MIL-P-18682D, “Pump, Centrifugal, Main Condenser Circulating, Naval Shipboard” (as amended); MIL-P-18472G, “Pumps, Centrifugal, Condensate, Feed Booster, Waste Heat Boiler, And Distilling Plant” (as amended). Military specifications and standards are available for review at <http://everyspec.com/MIL-SPECS>.

(d) The energy conservation standards in paragraph (b) of this section apply only to pumps that have the following characteristics:

(1) Flow rate of 25 gpm or greater at BEP at full impeller diameter;

(2) Maximum head of 459 feet at BEP at full impeller diameter and the number of stages required for testing;

(3) Design temperature range from 14 to 248 °F;

- (4) Designed to operate with either:
 - (i) A 2- or 4-pole induction motor; or
 - (ii) A non-induction motor with a speed of rotation operating range that includes speeds of rotation between 2,880 and 4,320 revolutions per minute and/or 1,440 and 2,160 revolutions per minute; and
 - (iii) In either case, the driver and impeller must rotate at the same speed;
- (5) For ST pumps, a 6-inch or smaller bowl diameter; and
- (6) For ESCC and ESFM pumps, specific speed less than or equal to 5,000 when calculated using U.S. customary units.

(e) For the purposes of paragraph (f) of this section, “WEF” means the weighted energy factor and “hhp” means the rated hydraulic horsepower, as determined in accordance with the test procedure in § 431.464(b) and applicable sampling plans in § 429.59 of this chapter.

(f) Each dedicated-purpose pool pump that is not a submersible pump and is manufactured starting on July 19, 2021 must have a WEF rating that is not less than the value calculated from the following table:

Equipment class		Minimum allowable WEF score [kgal/kWh]	Minimum allowable WEF score [kgal/kWh]
Dedicated-purpose pool pump variety	hhp Applicability		
		Motor phase	
Self-priming pool filter pumps ..	0.711 hp ≤ hhp < 2.5 hp.	Single	WEF = $-2.30 * \ln(\text{hhp}) + 6.59$.
Self-priming pool filter pumps ..	hhp < 0.711 hp	Single	WEF = 5.55, for hhp ≤ 0.13 hp $-1.30 * \ln(\text{hhp}) + 2.90$, for hhp > 0.13 hp.
Non-self-priming pool filter pumps.	hhp < 2.5 hp	Any	WEF = 4.60, for hhp ≤ 0.13 hp $-0.85 * \ln(\text{hhp}) + 2.87$, for hhp > 0.13 hp.
Pressure cleaner booster pumps.	Any	Any	WEF = 0.42.

(g) Each integral cartridge filter pool pump and integral sand filter pool pump that is manufactured starting on July 19, 2021 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.

(h) For all dedicated-purpose pool pumps distributed in commerce with freeze protection controls, the pump must be shipped with freeze protection disabled or with the following default, user-adjustable settings:

- (1) The default dry-bulb air temperature setting is no greater than 40 °F;
- (2) The default run time setting shall be no greater than 1 hour (before the temperature is rechecked); and
- (3) The default motor speed shall not be more than ½ of the maximum available speed.

[81 FR 4431, Jan. 26, 2016, as amended at 82 FR 5742, Jan. 18, 2017]

§ 431.466 Pumps labeling requirements.

(a) *General pumps.* For the pumps described in § 431.464(a), the following re-

quirements apply to units manufactured on the same date that compliance is required with any applicable standards prescribed in § 431.465.

(1) *Pump nameplate*—(i) *Required information.* The permanent nameplate must be marked clearly with the following information:

(A) For bare pumps and pumps sold with electric motors but not continuous or non-continuous controls, the rated pump energy index—constant load (PEI_{CL}), and for pumps sold with motors and continuous or non-continuous controls, the rated pump energy index—variable load (PEI_{VL});

(B) The bare pump model number; and

(C) If transferred directly to an end-user, the unit’s impeller diameter, as distributed in commerce. Otherwise, a space must be provided for the impeller diameter to be filled in.

(ii) *Display of required information.* All orientation, spacing, type sizes, typefaces, and line widths to display this required information must be the same as or similar to the display of the other performance data on the pump’s