

(Effective until July 1, 2020)

**WAC 51-11C-40507 Section C405.6—Electrical energy consumption.**

**C405.6 Electrical transformers (Mandatory).** Electric transformers shall meet the minimum efficiency requirements of Table C405.6 as tested and rated in accordance with the test procedure listed in DOE 10 C.F.R. 431. The efficiency shall be verified through certification under an approved certification program or, where no certification program exists, the equipment efficiency ratings shall be supported by data furnished by the transformer manufacturer.

- EXCEPTION: The following transformers are exempt:
1. Transformers that meet the Energy Policy Act of 2005 exclusions based on the DOE 10 C.F.R. 431 definition of special purpose applications.
  2. Transformers that meet the Energy Policy Act of 2005 exclusions that are not to be used in general purpose applications based on information provided in DOE 10 C.F.R. 431.
  3. Transformers that meet the Energy Policy Act of 2005 exclusions with multiple voltage taps where the highest tap is at least 20 percent more than the lowest tap.
  4. Drive transformers.
  5. Rectifier transformers.
  6. Auto-transformers.
  7. Uninterruptible power system transformers.
  8. Impedance transformers.
  9. Regulating transformers.
  10. Sealed and nonventilating transformers.
  11. Machine tool transformer.
  12. Welding transformer.
  13. Grounding transformer.
  14. Testing transformer.

**Table C405.6  
Minimum Nominal Efficiency Levels For 10 C.F.R. 431 Low Voltage Dry-Type Distribution Transformers**

| Single Phase Transformers |                             | Three Phase Transformers |                             |
|---------------------------|-----------------------------|--------------------------|-----------------------------|
| kVA <sup>a</sup>          | Efficiency (%) <sup>b</sup> | kVA <sup>a</sup>         | Efficiency (%) <sup>b</sup> |
| 15                        | 97.7                        | 15                       | 97.0                        |
| 25                        | 98.0                        | 30                       | 97.5                        |
| 37.5                      | 98.2                        | 45                       | 97.7                        |
| 50                        | 98.3                        | 75                       | 98.0                        |
| 75                        | 98.5                        | 112.5                    | 98.2                        |
| 100                       | 98.6                        | 150                      | 98.3                        |
| 167                       | 98.7                        | 225                      | 98.5                        |
| 250                       | 98.8                        | 300                      | 98.6                        |
| 333                       | 98.9                        | 500                      | 98.7                        |
|                           |                             | 750                      | 98.8                        |
|                           |                             | 1000                     | 98.9                        |

<sup>a</sup> kiloVolt-Amp rating.  
<sup>b</sup> Nominal efficiencies shall be established in accordance with the DOE 10 C.F.R. 431 test procedure for low voltage dry-type transformers.

**C405.7 Dwelling unit electrical energy consumption (Mandatory).** Each dwelling unit located in a Group R-2 building shall have a separate electrical meter. A utility tenant meter meets this requirement. See Section C409 for additional requirements for energy metering and energy consumption management.

[Statutory Authority: RCW 19.27A.025, 19.27A.045, 19.27A.160, and 19.27.074. WSR 17-10-062, § 51-11C-40507, filed 5/2/17, effective

6/2/17; WSR 16-13-089, § 51-11C-40507, filed 6/15/16, effective 7/16/16. Statutory Authority: RCW 19.27A.025, 19.27A.160, and 19.27.074. WSR 16-03-072, § 51-11C-40507, filed 1/19/16, effective 7/1/16. Statutory Authority: RCW 19.27A.020, 19.27A.025 and chapters 19.27 and 34.05 RCW. WSR 13-04-056, § 51-11C-40507, filed 2/1/13, effective 7/1/13.]

**(Effective July 1, 2020)**

**WAC 51-11C-40507 Section C405.6—Electrical energy consumption.**

**C405.6 Electrical transformers.** Low-voltage dry-type distribution electric transformers shall meet the minimum efficiency requirements of Table C405.6 as tested and rated in accordance with the test procedure listed in DOE 10 C.F.R. 431. The efficiency shall be verified through certification under an approved certification program or, where no certification program exists, the equipment efficiency ratings shall be supported by data furnished by the transformer manufacturer.

- EXCEPTION: The following transformers are exempt:
1. Transformers that meet the Energy Policy Act of 2005 exclusions based on the DOE 10 C.F.R. 431 definition of special purpose applications.
  2. Transformers that meet the Energy Policy Act of 2005 exclusions that are not to be used in general purpose applications based on information provided in DOE 10 C.F.R. 431.
  3. Transformers that meet the Energy Policy Act of 2005 exclusions with multiple voltage taps where the highest tap is not less than 20 percent more than the lowest tap.
  4. Drive transformers.
  5. Rectifier transformers.
  6. Auto-transformers.
  7. Uninterruptible power system transformers.
  8. Impedance transformers.
  9. Regulating transformers.
  10. Sealed and nonventilating transformers.
  11. Machine tool transformer.
  12. Welding transformer.
  13. Grounding transformer.
  14. Testing transformer.

**Table C405.6  
Minimum Nominal Efficiency Levels  
For 10 C.F.R. 431 Low Voltage Dry-  
Type Distribution Transformers**

| Single Phase Transformers |                             | Three Phase Transformers |                             |
|---------------------------|-----------------------------|--------------------------|-----------------------------|
| kVA <sup>a</sup>          | Efficiency (%) <sup>b</sup> | kVA <sup>a</sup>         | Efficiency (%) <sup>b</sup> |
| 15                        | 97.70                       | 15                       | 97.89                       |
| 25                        | 98.00                       | 30                       | 98.23                       |
| 37.5                      | 98.20                       | 45                       | 98.40                       |
| 50                        | 98.30                       | 75                       | 98.60                       |
| 75                        | 98.50                       | 112.5                    | 98.74                       |
| 100                       | 98.60                       | 150                      | 98.83                       |
| 167                       | 98.70                       | 225                      | 98.94                       |
| 250                       | 98.80                       | 300                      | 99.02                       |
| 333                       | 98.90                       | 500                      | 99.14                       |
|                           |                             | 750                      | 99.23                       |
|                           |                             | 1000                     | 99.28                       |

<sup>a</sup> kiloVolt-Amp rating.

<sup>b</sup> Nominal efficiencies shall be established in accordance with the DOE 10 C.F.R. 431 test procedure for low voltage dry-type transformers.

**C405.7 Dwelling unit electrical energy consumption.** Each dwelling unit located in a Group R-2 building shall have a separate electrical meter. A utility tenant meter meets this requirement. See Section C409 for additional requirements for energy metering and energy consumption management.

EXCEPTION: Dwelling units in other than Group R-2 multi-family and live/work units are not required to provide a separate electrical metering at each dwelling unit where electrical usage is metered separately for each of the following building end uses:

1. Dwelling units.
2. Sleeping units.
3. Commercial kitchens.
4. Central laundries.

[Statutory Authority: RCW 19.27A.020, 19.27A.025, 19.27A.160 and chapter 19.27 RCW. WSR 19-24-040, § 51-11C-40507, filed 11/26/19, effective 7/1/20. Statutory Authority: RCW 19.27A.025, 19.27A.045, 19.27A.160, and 19.27.074. WSR 17-10-062, § 51-11C-40507, filed 5/2/17, effective 6/2/17; WSR 16-13-089, § 51-11C-40507, filed 6/15/16, effective 7/16/16. Statutory Authority: RCW 19.27A.025, 19.27A.160, and 19.27.074. WSR 16-03-072, § 51-11C-40507, filed 1/19/16, effective 7/1/16. Statutory Authority: RCW 19.27A.020, 19.27A.025 and chapters 19.27 and 34.05 RCW. WSR 13-04-056, § 51-11C-40507, filed 2/1/13, effective 7/1/13.]