

(Effective July 1, 2023)

**WAC 51-11C-403325 Table C403.3.2(5)—Minimum efficiency requirements—Warm air furnaces and unit heaters.**

**Table C403.3.2(5)**

**Warm Air Furnaces and Combination Warm Air Furnaces/Air-Conditioning Units, Warm Air Duct Furnaces and Unit Heaters—Minimum Efficiency Requirements**

Equipment Type	Size Category (Input)	Subcategory or Rating Condition	Minimum Efficiency <sup>d,c</sup>	Test Procedure <sup>a</sup>
Warm-air furnace, gas fired for application outside the U.S.	< 225,000 Btu/h	Maximum capacity <sup>c</sup>	80% AFUE (nonweatherized) or 1% AFUE (weatherized) or 80% $E_t^{b,d}$	DOE 10 C.F.R. 430 Appendix N or Section 2.39, Thermal Efficiency, ANSI Z21.47
Warm-air furnace, gas fired	< 225,000 Btu/h	Maximum capacity <sup>c</sup>	80% $E_t^{b,d}$ before 1/1/2023 81% $E_t^d$ after 1/1/2023	Section 2.39, Thermal Efficiency, ANSI Z21.47
Warm-air furnace, oil fired	< 225,000 Btu/h	Maximum capacity <sup>c</sup>	83% AFUE (nonweatherized) or 78% AFUE (weatherized) or 80% $E_t^{b,d}$	DOE 10 C.F.R. 430 Appendix N or Section 42, Combustion UL 727
Warm-air furnace, oil fired	< 225,000 Btu/h	Maximum capacity <sup>c</sup>	80% $E_t$ before 1/1/2023 82% $E_t^d$ after 1/1/2023	Section 42, Combustion UL 727
Electric furnaces for applications outside the U.S.	< 225,000 Btu/h	All	96% AFUE	DOE 10 C.F.R. 430 Appendix N
Warm air duct furnaces, gas fired	All capacities	Maximum capacity <sup>c</sup>	80% $E_c^e$	Section 2.10, Efficiency, ANSI Z83.8
Warm air unit heaters, gas fired	All capacities	Maximum capacity <sup>c</sup>	80% $E_c^{e,f}$	Section 2.10, Efficiency, ANSI Z83.8
Warm air unit heaters, oil fired	All capacities	Maximum capacity <sup>c</sup>	80% $E_c^{e,f}$	Section 40, Combustion, UL 731

For SI: 1 British thermal unit per hour = 0.2931 W.

- a Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the referenced year version of the test procedure.
- b Combination units (i.e., furnaces contained within the same cabinet as an air conditioner) not covered by DOE 10 C.F.R. 430 (i.e., 3-phase power or with cooling capacity greater than or equal to 65,000 Btu/h) may comply with either rating. All other units greater than 225,000 Btu/h sold in the U.S. must meet the AFUE standards for consumer products and testing using U.S. DOE's AFUE test procedure at DOE 10 C.F.R. 430 Subpart B, Appendix N.
- c Compliance of multiple firing rate units shall be at the maximum firing rate.
- d  $E_t$  = Thermal efficiency. Units must also include an interrupted or intermittent ignition device (IID), have jacket losses not exceeding 0.75 percent of the input rating, and have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for those furnaces where combustion air is drawn from the conditioned space.
- e  $E_c$  = Combustion efficiency (100% less flue losses). See test procedure for detailed discussion.
- f Units must also include an interrupted or intermittent ignition device (IID) and have either power venting or an automatic flue damper.
- g This table is a replica of ASHRAE 90.1 Table 6.8.1-5 Warm-Air Furnaces and Combination Warm-Air Furnaces/Air-Conditioning Units, Warm-Air Duct Furnaces, and Unit Heaters—Minimum Efficiency Requirements.

[Statutory Authority: RCW 19.27A.020, 19.27A.025, 19.27A.160 and chapters 19.27A and 19.27 RCW. WSR 22-14-091, § 51-11C-403325, filed 7/1/22, effective 7/1/23.]