

**Environmental Protection Agency**

**§ 87.71**

engine shall be used with all accessories which might reasonably be expected to influence emissions to the atmosphere installed and functioning, if not otherwise prohibited by § 87.62(a)(2). Use of service air bleed and shaft power extraction to power auxiliary gearbox-mounted components required to drive aircraft systems is not permitted.

(e) Other gaseous emissions measurement systems may be used if shown to yield equivalent results and if approved in advance by the Administrator or the Secretary.

[47 FR 58470, Dec. 30, 1982, as amended at 49 FR 31875, Aug. 9, 1984; 62 FR 25366, May 8, 1997]

**§ 87.61 Turbine fuel specifications.**

For exhaust emission testing, fuel meeting the specifications listed in this section shall be used. Additives used for the purpose of smoke suppression (such as organometallic compounds) shall not be present.

*Property and Allowable Range of Values*

- Density kg/m<sup>3</sup> at 15 °C: 780–820.
- Distillation temperature, °C: 10% boiling point, 155–201; final boiling point, 235–285.
- Net heat of combustion, MJ/kg: 42.86–43.50.
- Aromatics, volume %: 15–23.
- Naphthalenes, volume %: 1.0–3.5.
- Smoke point, mm: 20–28.
- Hydrogen, mass %: 13.4–14.1.
- Sulfur, mass %: less than 0.3%.
- Kinematic viscosity at –20 °C, mm<sup>2</sup>/s: 2.5–6.5.

[62 FR 25366, May 8, 1997]

**§ 87.62 Test procedure (propulsion engines).**

(a)(1) The engine shall be tested in each of the following engine operating modes which simulate aircraft operation to determine its mass emission rates. The actual power setting, when corrected to standard day conditions, should correspond to the following percentages of rated output. Analytical correction for variations from reference day conditions and minor variations in actual power setting should be specified and/or approved by the Secretary:

Mode	Class		
	TP	TF, T3, T8	TSS
Taxi/idle .....	(1)	(1)	(1)
Takeoff .....	100	100	100

Mode	Class		
	TP	TF, T3, T8	TSS
Climbout .....	90	85	65
Descent .....	NA	NA	15
Approach .....	30	30	34

<sup>1</sup> See paragraph (a)(2) of this section.

(2) The taxi/idle operating modes shall be carried out at a power setting of 7% rated thrust unless the Secretary determines that the unique characteristics of an engine model undergoing certification testing at 7% would result in substantially different HC and CO emissions than if the engine model were tested at the manufacturers recommended idle power setting. In such cases the Secretary shall specify an alternative test condition.

(3) The times in mode (TIM) shall be as specified below:

Mode	Class		
	TP	TF, T3 or T8	TSS
Taxi/idle (minutes) .....	26.0	26.0	26.0
Takeoff .....	0.5	0.7	1.2
Climbout .....	2.5	2.2	2.0
Descent .....	N/A	N/A	1.2
Approach .....	4.5	4.0	2.3

(b) Emissions testing shall be conducted on warmed-up engines which have achieved a steady operating temperature.

[47 FR 58470, Dec. 30, 1982, as amended at 62 FR 25366, May 8, 1997]

**§ 87.63 [Reserved]**

**§ 87.64 Sampling and analytical procedures for measuring gaseous exhaust emissions.**

The system and procedures for sampling and measurement of gaseous emissions shall be as specified by Appendices 3 and 5 to ICAO Annex 16 (incorporated by reference in § 87.8).

[70 FR 69686, Nov. 17, 2005]

**§§ 87.65–87.70 [Reserved]**

**§ 87.71 Compliance with gaseous emission standards.**

Compliance with each gaseous emission standard by an aircraft engine shall be determined by comparing the pollutant level in grams/kilonewton/thrust/cycle or grams/kilowatt/cycle as

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calculated in § 87.64 with the applicable emission standard under this part. An acceptable alternative to testing every engine is described in Appendix 6 to ICAO Annex 16 (incorporated by reference in § 87.8). Other methods of demonstrating compliance may be approved by the Secretary with the concurrence of the Administrator.

[70 FR 69686, Nov. 17, 2005]

### Subpart H—Test Procedures for Engine Smoke Emissions (Aircraft Gas Turbine Engines)

#### § 87.80 Introduction.

Except as provided under § 87.5, the procedures described in this subpart shall be the test program to determine the conformity of new and in-use gas turbine engines with the applicable standards set forth in this part. The test is essentially the same as that described in §§ 87.60 through 87.62, except that the test is designed to determine the smoke emission level at various operating points representative of engine usage in aircraft. Other smoke measurement systems may be used if shown to yield equivalent results and if approved in advance by the Administrator or the Secretary.

#### § 87.81 Fuel specifications.

Fuel having specifications as provided in § 87.61 shall be used in smoke emission testing.

#### § 87.82 Sampling and analytical procedures for measuring smoke exhaust emissions.

The system and procedures for sampling and measurement of smoke emissions shall be as specified by Appendix 2 to ICAO Annex 16 (incorporated by reference in § 87.8).

[70 FR 69687, Nov. 17, 2005]

#### §§ 87.83–87.88 [Reserved]

#### § 87.89 Compliance with smoke emission standards.

Compliance with each smoke emission standard shall be determined by comparing the plot of SN as a function of power setting with the applicable emission standard under this part. The SN at every power setting must be

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such that there is a high degree of confidence that the standard will not be exceeded by any engine of the model being tested. An acceptable alternative to testing every engine is described in Appendix 6 to ICAO Annex 16 (incorporated by reference in § 87.8).

[70 FR 69687, Nov. 17, 2005]

### PART 88—CLEAN-FUEL VEHICLES

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