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## Nonroad Engines, Equipment, and Vehicles

You are here: [EPA Home](#) [Transportation and Air Quality](#) [Nonroad Engines, Equipment, and Vehicles](#) [Aircraft](#)

### Aircraft

This page provides information about air pollutant emissions from commercial aviation. It includes regulations, guidance, and other information related to aircraft.

- [Friends of the Earth Petition](#)
- [Regulations and Guidance](#)
- [Related Links](#)



For further information or assistance, contact: ASD Information Line, phone: (734) 214-4636 or [email: ASDinfo@epa.gov](mailto:ASDinfo@epa.gov).

#### Friends of the Earth Petition

In 2006, the environmental group, Friends of the Earth petitioned EPA to propose emission standards for lead from piston engine (general aviation) aircraft. The following documents provide background:

- [Petition from Friends of the Earth \(PDF\)](#) (12 pp, 303K, October 3, 2006) to limit emissions of lead from piston engine aircraft.
- [Notice Requesting Public Comment on Petition to Limit Lead Emissions from General Aviation Aircraft | PDF Version](#) (4 pp, 108K, published November 16, 2007) Request for comments as signed by Administrator, Stephen L. Johnson.

NOTE: You will need Adobe Acrobat Reader, available as a free download, to view some of the files on this page. See [EPA's PDF page](#) to learn more about PDF, and for a link to the free Acrobat Reader.

#### Regulations and Guidance

- **Final Rule: Control of Air Pollution from Aircraft and Aircraft Engines; Emission Standards and Test Procedures** (published November 17, 2005) EPA is amending the existing emission standards for oxides of nitrogen (NOx) for new commercial aircraft engines. These standards are equivalent to the NOx emission standards of the United Nations International Civil Aviation Organization (ICAO), and thereby will bring United States aircraft standards into alignment with the international standards. These standards will go into effect on December 19, 2005 and they will apply to new aircraft engines utilized on commercial aircraft that include small regional jets, single-aisle aircraft, twin-aisle aircraft, and 747s and larger aircraft.
  - [Final Rule | PDF Version](#) (24 pp, 240K)
  - [Correction \(typographical\) to Final Rule | PDF Version](#) (1 pg, 40K, published November 25, 2005)
  - [Fact Sheet: Aircraft Engine Emission Standards | PDF Version](#) (3 pp, 51K, EPA420-F-05-015, November 2005)
  - [Emission Standards and Test Procedures for Aircraft and Aircraft Engines: Summary and Analysis of Comments \(PDF\)](#) (55 pp, 477K, EPA420-R-05-004,

November 2005)

- **Proposed Rule: Control of Air Pollution from Aircraft and Aircraft Engines** (published September 30, 2003)
    - [Proposed Rule | PDF Version](#) (26 pp, 612K)
    - [Fact Sheet: Proposed Aircraft Engine Emission Standards \(PDF\)](#) (5 pp, 117K, EPA420-F-03-029, September 2003)
  - [Aircraft Contrails Fact Sheet \(PDF\)](#) (6 pp, 1.6MB, EPA430-F-00-005, September 2000)
  - [Evaluation of Air Pollutant Emissions from Subsonic Commercial Jet Aircraft \(PDF\)](#) (77 pp, 412K, EPA420-R-99-013, April 1999)
    - [Executive Summary 7K TXT](#)
  - **Direct Final Rule: Aircraft Emission Standards Harmonizes US Aircraft Standards with International Standards** (published May 8, 1997)
    - [Direct Final Rule](#)
    - [Direct Final Rule Regulations 13K WP5](#)
    - [Notice of Proposed Rulemaking](#)
    - [Regulatory Support Document \(PDF\)](#) (25 pp, 81K, February 1997)
    - [Fact Sheet: Adopted Aircraft Engine Emission Standards \(PDF\)](#) (5 pp, 17K, EPA420-F-97-010, April 1997)
  - [Fact Sheet: Reducing Aviation Emissions in the South Coast \(PDF\)](#) (3 pp, 10K, EPA420-F-96-010, July 1996, also available as a [5K TXT](#))
  - **Draft Technical Data to Support FAA Advisory Circular on Reducing Emissions from Commercial Aviation** (September 1995)
    - [Abstract 12K TXT](#)
    - [Report \(PDF\)](#) (76 pp, 276K)
    - [Appendices \(PDF\)](#) (33 pp, 221K)
  - For aviation emission inventory analysis, a useful tool is the [Federal Aviation Administration's \(FAA\) Emissions and Dispersion Modeling System \(EDMS\)](#).
- In cases where EDMS does not include necessary emission factors, such as aircraft particulate matter (PM), use the best available information. Available information on particulate matter emission factors includes EPA documentation, available through contacting the ASD information phone number and e-mail address shown above.
- [Aircraft Engine Emissions Data Bank](#) [EXIT Disclaimer](#) A comprehensive database of aircraft engine emissions certification data has been developed during the course of work carried out by the International Civil Aviation Organization (ICAO). This data and related information are available at the ICAO Aircraft Engine Exhaust Emissions Data Bank.
  - November 1991: [Nonroad Engine and Vehicle Emission Study Report \(PDF\)](#) (141 pp, 1.8MB, EPA-21A-2001 or EPA460/3-91-002).
    - [Appendices \(PDF\)](#) (415 pp, 7.7MB)

This "nonroad study" quantifies the contribution of nonroad sources to air pollution, including volatile organic compounds (VOCs), oxides of nitrogen (NO<sub>x</sub>), carbon monoxide (CO), and particulate matter (PM). The study covers 10 equipment categories, including: lawn and garden equipment, farm and construction equipment, recreational vehicles, marine vessels, and airport service equipment.

Paper copies of this study are available from the [National Technical Information Service](#) (NTIS) - Publication #PB-92-126960.

## Related Links

### EPA Link:

- [Voluntary Emission Reduction Program for Airport Ground Support Equipment \(PDF\)](#)  
(144 pp, 736K, EPA420-R-99-007, May 1999)

### External Links:

- [Federal Aviation Administration Environmental Policy](#)
- [Air Force Link -- "Contrails Facts" \(PDF File\)](#)