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Last updated on Thursday, June 21st, 2007.

## Technology Transfer Network Clearinghouse for Inventories & Emissions Factors

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### **Emissions Factors & AP 42**

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An **emissions factor** is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. These factors are usually expressed as the weight of pollutant divided by a unit weight, volume, distance, or duration of the activity emitting the pollutant (e.g., kilograms of particulate emitted per megagram of coal burned). Such factors facilitate estimation of emissions from various sources of air pollution. In most cases, these factors are simply averages of all available data of acceptable quality, and are generally assumed to be representative of long-term averages for all facilities in the source category (i.e., a population average).

The general equation for emissions estimation is:

$$E = A \times EF \times (1-ER/100)$$

where:

- E = emissions;
- A = activity rate;
- EF = emission factor, and
- ER = overall emission reduction efficiency, %

For information about emissions factors from highway vehicles and nonroad mobile sources, visit the **[Office of Transportation and Air Quality](#)** web site.

**AP 42, Fifth Edition**  
**Compilation of Air Pollutant Emission Factors, Volume 1:**  
**Stationary Point and Area Sources**

For current information on AP 42 updates and the activities of the Measurement Policy Group, you can subscribe to the [CHIEF Listserv](#).

<b>AP 42 FAQs</b>	<a href="#">Answers to frequently asked questions about AP 42</a>
<b>Drafts</b>	<a href="#">Draft Sections Under Review</a>
<b>AP 42 listing of supplements and updates.</b>	<a href="#">Supplements A through F (1996 - 2000)</a> <a href="#">Updates 2001 to present</a>
<b>Older Editions of</b>	<a href="#">This information is available for historical purposes only. For the most recent emissions factors,</a>

**AP-42, Volume 1** [supported by the EPA, please see the table of contents below.](#)

**Procedures** The draft version of the document, *Detailed Procedures For Preparing Emissions Factors*, is now available for review and comment. July 3, 2006. (PDF 1.5M)

*Procedures for Preparing Emission Factor Documents* -- Describes procedures for developing and reporting emission factors in EPA publications -- November 1997 (PDF 477K)

**Contents** [Cover page](#), [detailed Table of Contents](#), [Publications in Series](#), [Insertion Instructions](#), and [Key Word Index](#) (PDF 128K). This is current through Fifth Edition, Supplement C of AP 42. For sections and chapters added after November 1997, see the chapter web pages below.

### AP 42, Volume I, Fifth Edition

Introduction	<b><u><a href="#">Introduction to AP 42, Volume I, Fifth Edition</a></u></b> - January 1995 (PDF 40K)
Chapter 1	<b><u><a href="#">External Combustion Sources</a></u></b>
Chapter 2	<b><u><a href="#">Solid Waste Disposal</a></u></b>
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Chapter 14	<b><u><a href="#">Greenhouse Gas Biogenic Sources</a></u></b>
Chapter 15	<b><u><a href="#">Ordnance Detonation</a></u></b>
Appendix A	<b><u><a href="#">Miscellaneous Data &amp; Conversion Factors</a></u></b> -- September 1985 (PDF 103K)
Appendix B.1	<b><u><a href="#">Particle Size Distribution Data and Sized</a></u></b>



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# AP 42, Fifth Edition, Volume I

## Chapter 1: External Combustion Sources

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### 1.0 **Introduction to External Combustion Sources**

#### 1.1 **Bituminous and Subbituminous Coal Combustion**

- [Final Section](#) - Supplement E, September 1998 (PDF 515K)
- [Background Document](#) (PDF 8M)

#### 1.2 **Anthracite Coal Combustion**

- [Final Section](#) - Supplement B, October 1996 (PDF 59K)
- [Background Document](#) (PDF 249K)

#### 1.3 **Fuel Oil Combustion**

- [Final Section](#) - Supplement E, September 1998 (PDF 293K)
- **Errata** - Updated 4/28/00
  1. In table 1.3-1, for boilers > 100 million BTU/hr, the SO<sub>2</sub> emission factor for both no. 2 oil fired and for no. 2 oil fired with LNB/FGR, is 142S, not 157S.
  2. In table 1.3-1, for boilers < 100 million BTU/hr, the filterable PM emission factor for no. 6 oil fired is 9.19(S)+3.22, not 10. The factor for no. 5 oil fired is 10, not 9.19(S)+3.22. These two factors were reversed.
  3. In table 1.3-8, the correct N<sub>2</sub>O factor is 0.53 lb/1000 gal for No 6 oil and 0.26 lb/1000 gal for distillate oil.
- [Background Document](#) - September 1998 (PDF 900K)
- [Related Information](#)

#### 1.4 **Natural Gas Combustion**

- [Final Section](#) - Supplement D, July 1998 (PDF 230K)
- [Background Document](#) (PDF 225K)
- [Related Information](#).

#### 1.5 **Liquefied Petroleum Gas Combustion**

- [Final Section](#) - Supplement B, October 1996 (PDF 18K)
- [Background Document](#) (PDF 129K)

#### 1.6 **Wood Residue Combustion in Boilers**

- [Final Section](#) - Update 2003, September 2003 (PDF 480K)
- [Background Document](#) (PDF 72K)
- [Related Information](#)

#### 1.7 **Lignite Combustion**

- [Final Section](#) - Supplement E, September 1998 (PDF 129K)
- [Background Document](#) (PDF 452K)

## 1. EXTERNAL COMBUSTION SOURCES

External combustion sources include steam/electric generating plants, industrial boilers, and commercial and domestic combustion units. Coal, fuel oil, and natural gas are the major fossil fuels used by these sources. Liquefied petroleum fuels are also used in relatively small quantities. Coal, oil, and natural gas currently supply about 95 percent of the total thermal energy consumed in the United States. Nationwide consumption in 1980 was over  $530 \times 10^6$  megagrams (585 million tons) of bituminous coal, nearly  $3.6 \times 10^6$  megagrams (4 million tons) of anthracite coal,  $91 \times 10^9$  liters (24 billion gallons) of distillate oil,  $114 \times 10^9$  liters (37 billion gallons) of residual oil, and  $57 \times 10^{12}$  cubic meters (20 trillion cubic feet) of natural gas.

Power generation, process heating, and space heating are some of the largest fuel combustion sources of sulfur oxides, nitrogen oxides, and particulate emissions. The following sections present emission factor data on the major fossil fuels and others.