



Emission Facts

Idling Vehicle Emissions

There are situations in which estimates of emissions from idling vehicles are needed. As with driving emissions, idle emissions are affected by a number of parameters. For analyses not requiring detailed specific emission estimates tailored to local conditions, this summary of idle emission factors can be used to obtain first-order approximations of emissions under idle conditions (e.g., drive-thru lanes).

Introduction

The following tables present idle emission factors, in grams per hour (g/hr) and grams per minute (g/min) of idle time, for volatile organic compounds (VOC), carbon monoxide (CO), and oxides of nitrogen (NO_x). Idle emissions of particulate matter (PM₁₀) are provided for heavy-duty diesel vehicles only; PM₁₀ emissions from gasoline-fueled vehicles are negligible, especially when the elimination of lead in gasoline and reductions of sulfur content are accounted for. Emission factors are provided for both summer and winter conditions for VOC, CO, and NO_x. These idle emission factors are from the MOBILE5b highway vehicle emission factor model (VOC, CO, NO_x) and the PART5 model (PM₁₀ for heavy-duty diesel vehicles only). These emission factors are national averages for all vehicles in the in-use fleet as of January 1, 1998 (winter) or July 1, 1998 (summer). PM₁₀ idle emission factors for heavy-duty diesels are as of January 1, 1998.

Acronyms:

- CO: Carbon monoxide
- GVW: Gross vehicle weight
- NO_x: Oxides of Nitrogen (mostly NO and NO₂)
- PM₁₀: Particulate matter, diameter ≤ 10 microns
- psi: Pounds per square inch
- RVP: Reid vapor pressure, a common method of expressing the volatility (tendency to evaporate) of gasoline; RVP is vapor pressure measured at 100°F (38°C).
- VOC: Volatile organic compounds (for vehicles, this refers to exhaust emissions from incomplete combustion of gasoline, which is composed of a blend of hydrocarbon compounds)

Definitions of Vehicle Types:

- LDGV: Light-duty gasoline-fueled vehicles, up to 6000 lb Gross Vehicle Weight (GVW) (gasoline-fueled passenger cars)
- LDGT: Light-duty gasoline-fueled trucks, up to 8500 lb GVW (includes pick-up trucks, minivans, passenger vans, sport-utility vehicles, etc.)
- HDGV: Heavy-duty gasoline-fueled vehicles, 8501+ lb GVW (gas heavy-duty trucks)
- LDDV: Light-duty diesel vehicles, up to 6000 lb GVW (passenger cars with diesel engines)
- LDDT: Light-duty diesel trucks, up to 8500 lb GVW (light trucks with diesel engines)
- HDDV: Heavy-duty diesel vehicles, 8501+ lb GVW (diesel heavy-duty trucks)
- MC: Motorcycles (only those certified for highway use; all gasoline-fueled)

Winter Conditions (30°F, 13.0 psi RVP gasoline)

Pollutant	Units	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
VOC	g/hr	21.1	30.7	44.6	3.63	4.79	12.6	20.1
	g/min	0.352	0.512	0.734	0.061	0.080	0.211	0.335
CO	g/hr	371	487	682	10.1	11.5	94.6	388
	g/min	6.19	8.12	11.4	0.168	0.191	1.58	6.47
NOx	g/hr	6.16	7.47	11.8	6.66	6.89	56.7	2.51
	g/min	0.103	0.125	0.196	0.111	0.115	0.945	0.042

Summer Conditions (75°F, 9.0 psi RVP Gasoline)

Pollutant	Units	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
VOC	g/hr	16.1	24.1	35.8	3.53	4.63	12.5	19.4
	g/min	0.269	0.401	0.597	0.059	0.077	0.208	0.324
CO	g/hr	229	339	738	9.97	11.2	94.0	435
	g/min	3.82	5.65	12.3	0.166	0.187	1.57	7.26
NOx	g/hr	4.72	5.71	10.2	6.50	6.67	55.0	1.69
	g/min	0.079	0.095	0.170	0.108	0.111	0.917	0.028

Particulate Matter Emissions

The only vehicle category for which EPA has idle PM₁₀ emission factors is heavy-duty diesels. Particulate emissions are also observed to be relatively insensitive to temperature, and so “winter” and “summer” emission factors for idle PM₁₀ are the same.

Engine Size	Emissions
Light/Medium HDDVs (8501-33,000 lb GVW)	2.62 g/hr (0.044 g/min)
Heavy HDDVs (33,001+ lb GVW)	2.57 g/hr (0.043 g/min)
HDD buses (all buses, urban and inter-city travel)	2.52 g/hr (0.042 g/min)
Average of all heavy-duty diesel engines	2.59 g/hr (0.043 g/min)

For More Information

Additional documents on emissions from mobile sources are available electronically from the EPA Internet server at:

<http://www.epa.gov/OMSWWW>

Document information is also available by writing to:

U.S. Environmental Protection Agency
Office of Mobile Sources
2565 Plymouth Road
Ann Arbor, MI 48105