

Inventory of Environmental Releases (grams/year) of I-TEQ_{DF}
From Known Sources in the United States for 1995 and 1987

Emission Source Category	Confidence Rating ^a Reference Year 1995				Confidence Rating ^a Reference Year 1987		
	A	B	C	D	A	B	C
Releases (g TEQ/yr) to Air							
WASTE INCINERATION							
Municipal waste incineration		1,100				7,915	
Hazardous waste incineration		5.7				5.0	
Boilers/industrial furnaces			0.38				0.77
Medical waste/pathological incineration			461				2,440
Crematoria			9.1				5.5
Sewage sludge incineration		14.7				6.0	
Tire combustion			0.11				0.11
Pulp and paper mill sludge incinerators ^e							
Biogas Combustion				> 1			
POWER/ENERGY GENERATION							
Vehicle fuel combustion - leaded ^b			1.7				31.9
- unleaded			5.6				3.3
- diesel			33.5				26.3
Wood combustion - residential			62.8				89.6
- industrial		26.2				25.1	
Coal combustion - utility boilers		60.9				51.4	
Coal Combustion - residential				30.0			
Coal Combustion - commercial/Industrial				40.0			
Oil combustion - industrial/utility			9.3				15.5
Oil combustion - residential				6.0			
OTHER HIGH TEMPERATURE SOURCES							
Cement kilns (hazardous waste burning)			145.3				109.6
Lightweight aggregate kilns burning hazardous waste			3.3				2.4
Cement kilns (non hazardous waste burning)			16.6				12.7
Asphalt mixing plants				7			
Petroleum Refining Catalyst Regeneration			2.11				2.14
Cigarette combustion			0.8				1.0
Carbon reactivation furnaces			0.08				0.06
Kraft recovery boilers		2.3				2.0	
MINIMALLY CONTROLLED OR UNCONTROLLED COMBUSTION^d							
Backyard barrel burning ^f			595				573
Combustion of Landfill Gas				7.0			
Landfill fires				1,000			
Accidental Fires (Structural)				> 20			
Accidental Fires (Vehicles)				30.0			
Forest and Brush Fires				200			
METALLURGICAL PROCESSES							
Ferrous metal smelting/refining							
- Sintering plants		25.1					29.3
- Coke production				7.0			
- Electric arc furnaces				40.0			
- Foundries				20.0			

Inventory of Environmental Releases (grams/year) of I-TEQ_{DF}
From Known Sources in the United States for 1995 and 1987 (continued)

Emission Source Category	Confidence Rating ^a Reference Year 1995				Confidence Rating ^a Reference Year 1987		
	A	B	C	D	A	B	C
Nonferrous metal smelting/refining							
- Primary copper		< 0.5				< 0.5	
- Secondary aluminum			27.4				15.3
- Secondary copper			266				966
- Secondary lead		1.63				1.22	
- Primary Magnesium				15.0			
Drum and barrel reclamation			0.08				0.08
CHEMICAL MANUFAC./PROCESSING SOURCES							
Ethylene dichloride/vinyl chloride		11.2					
TOTAL RELEASES TO AIR ^c	2,888				12,331		
<i>Releases (g TEQ/yr) to Water</i>							
CHEMICAL MANUF./PROCESSING SOURCES							
Bleached chemical wood pulp and paper mills	28.0				356		
POTW (municipal) wastewater				10			
Ethylene dichloride/vinyl chloride		0.43					
RESERVOIR SOURCES							
Urban runoff to surface water				190			
Rural soil erosion to surface water				2,700			
TOTAL RELEASES TO WATER ^c	28.43				356		
<i>Releases (g TEQ/yr) to Land</i>							
CHEMICAL MANUF./PROCESSING SOURCES							
Bleached chemical wood pulp and paper mill sludge	2.0				14.1		
Ethylene dichloride/vinyl chloride		0.73					
Municipal wastewater treatment sludge	103				103		
Commercially marketed sewage sludge	3.5				3.5		
2,4-Dichlorophenoxy acetic acid	18.4				21.3		
TOTAL RELEASES TO LAND ^c	127.6				141.8		
OVERALL RELEASES (g/yr) TO THE OPEN and CIRCULATING ENVIRONMENT	3,044 (SUM OF COLUMNS A, B, C)				12,829 (SUM OF COLUMNS A, B, C)		

^{1/} The most reliable estimates of environmental releases are those sources within Categories A, B and C (see footnote 'a' for definitions).

- ^a A = Characterization of the Source Category judged to be **Adequate for Quantitative Estimation with High Confidence** in the **Emission Factor** and **High Confidence** in **Activity Level**.
- B = Characterization of the Source Category judged to be **Adequate for Quantitative Estimation with Medium Confidence** in the **Emission Factor** and at least **Medium Confidence** in **Activity Level**.
- C = Characterization of the Source Category judged to be **Adequate for Quantitative Estimation with Low Confidence** in either the **Emission Factor** and/or the **Activity Level**.
- D = **Preliminary Indication** of the Potential Magnitude of I-TEQ_{DF} Emissions from "Unquantified" (i.e., Category D) Sources in Reference Year 1995. **Based on extremely limited data, judged to be clearly nonrepresentative.**
- ^b Leaded fuel production and the manufacture of motor vehicle engines requiring leaded fuel for highway use have been prohibited in the United States. (See Section 4.1 for details.)
- ^c TOTAL reflects only the total of the estimates made in this report.
- ^d This refers to conventional pollutant control, not dioxin emissions control. Very few of the sources listed in this inventory control specifically for CDD/CDF emissions.
- ^e Included within estimate for Wood Combustion - industrial.
- ^f This term refers to the burning of residential waste in barrels.

Inventory of Environmental Releases (grams/year) of TEQ_{DF}-WHO₉₈
From Known Sources in the United States for 1995 and 1987

Emission Source Category	Confidence Rating ^a Reference Year 1995				Confidence Rating ^a Reference Year 1987		
	A	B	C	D	A	B	C
Releases (g TEQ/yr) to Air							
WASTE INCINERATION							
Municipal waste incineration		1,250				8,877	
Hazardous waste incineration		5.8				5.0	
Boilers/industrial furnaces			0.39				0.78
Medical waste/pathological incineration			488				2,590
Crematoria			9.1 ^e				5.5 ^e
Sewage sludge incineration		14.8				6.1	
Tire combustion			0.11				0.11
Pulp and paper mill sludge incinerators ^f							
Biogas Combustion				< 1			
POWER/ENERGY GENERATION							
Vehicle fuel combustion - leaded ^b			2.0				37.5
- unleaded			5.6				3.6
- diesel			33.5				27.8
Wood combustion - residential			62.8 ^e				89.6 ^e
- industrial		27.6				26.4	
Coal combustion - utility boilers		60.1				50.8	
Coal Combustion - residential				30			
Coal Combustion - commercial/Industrial				40			
Oil combustion - industrial/utility			10.7				17.8
Oil combustion - residential				6			
OTHER HIGH TEMPERATURE SOURCES							
Cement kilns (hazardous waste burning)			156.1				117.8
Lightweight aggregate kilns burning hazardous waste			3.3 ^e				2.4 ^e
Cement kilns (non hazardous waste burning)			17.8				13.7
Asphalt mixing plants				7			
Petroleum Refining Catalyst Regeneration			2.21				2.24
Cigarette combustion			0.8				1.0
Carbon reactivation furnaces			0.08 ^e				0.06 ^e
Kraft recovery boilers		2.3				2.0	
MINIMALLY CONTROLLED OR UNCONTROLLED COMBUSTION^d							
Backyard barrel burning ^g			628				604
Combustion of Landfill Gas				7			
Landfill fires				1,000			
Accidental Fires (Structural)				> 20			
Accidental Fires (Vehicles)				30			
Forest and Brush Fires				200			
METALLURGICAL PROCESSES							
Ferrous metal smelting/refining							
- Sintering plants		28					32.7
- Coke production				7.0			
- Electric arc furnaces				40			
- Foundries				20			

Inventory of Environmental Releases (grams/year) of TEQ_{DF}-WHO₉₈
From Known Sources in the United States for 1995 and 1987 (continued)

Emission Source Category	Confidence Rating ^a Reference Year 1995				Confidence Rating ^a Reference Year 1987		
	A	B	C	D	A	B	C
Nonferrous metal smelting/refining							
- Primary copper		< 0.5 ^e				< 0.5 ^e	
- Secondary aluminum			29.1				16.3
- Secondary copper			271				983
- Secondary lead		1.72				1.29	
- Primary Magnesium				15.0			
Drum and barrel reclamation			0.08				0.08
CHEMICAL MANUFAC./PROCESSING SOURCES Ethylene dichloride/vinyl chloride		11.2 ^e					
TOTAL RELEASES TO AIR ^c	3,125				13,515		
<i>Releases (g TEQ/yr) to Water</i>							
CHEMICAL MANUF./PROCESSING SOURCES Bleached chemical wood pulp and paper mills	19.5				356		
POTW (municipal) wastewater				10			
Ethylene dichloride/vinyl chloride		0.43 ^e					
RESERVOIR SOURCES Urban runoff to surface water				190			
Rural soil erosion to surface water				2,700			
TOTAL RELEASES TO WATER ^c	19.93				356		
<i>Releases (g TEQ/yr) to Land</i>							
CHEMICAL MANUF./PROCESSING SOURCES Bleached chemical wood pulp and paper mill sludge	1.4				14.1		
Ethylene dichloride/vinyl chloride		0.73 ^e					
Municipal wastewater treatment sludge	76.6				76.6		
Commercially marketed sewage sludge	2.6				2.6		
2,4-Dichlorophenoxy acetic acid	28.9				33.4		
TOTAL RELEASES TO LAND ^c	110.23				126.7		
OVERALL RELEASES (g/yr) TO THE OPEN and CIRCULATING ENVIRONMENT	3,255 (SUM OF COLUMNS A, B, C)				13,998 (SUM OF COLUMNS A, B, C)		

^{1/} The most reliable estimates of environmental releases are those sources within Categories A, B and C (see footnote 'a' for definitions).

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B = Characterization of the Source Category judged to be **Adequate for Quantitative Estimation** with **Medium Confidence** in the **Emission Factor** and at least **Medium Confidence** in **Activity Level**.

C = Characterization of the Source Category judged to be **Adequate for Quantitative Estimation** with **Low Confidence** in either the **Emission Factor** and/or the **Activity Level**.

D = **Preliminary Indication** of the Potential Magnitude of I-TEQ_{DF} Emissions from "Unquantified" (i.e., Category D) Sources in Reference Year 1995. **Based on extremely limited data, judged to be clearly nonrepresentative.**

^b Leaded fuel production and the manufacture of motor vehicle engines requiring leaded fuel for highway use have been prohibited in the United States. (See Section 4.1 for details.)

^c TOTAL reflects only the total of the estimates made in this report.

^d This refers to conventional pollutant control, not dioxin emissions control. Very few of the sources listed in this inventory control specifically for CDD/CDF emissions.

^e Congener-specific emissions data were not available; the I-TEQ_{DF} emission estimate was used as a surrogate for the TEQ_{DF}-WHO₉₈ emission estimate.

^f Included within estimate for Wood Combustion - industrial.

^g This term refers to the burning of residential waste in barrels.