Subpart P IVT Equation Inputs Summary

This page lists the variables used in each Inputs Verifier Tool (IVT) equation in subpart P. This information is intended primarily for XML uploaders to enable them to understand how each IVT equation is calculated and to identify sources for the constants, default values, and lookup values needed to solve the equations.

Click the links for the equations below to view the variables used in the IVT calculations:

- Equation P-1: Annual CO2 Process Emissions Arising from Gaseous Fuel and Feedstock Consumption
- Equation P-2: Annual CO2 Emissions Arising from Liquid Fuel and Feedstock Consumption
- Equation P-3: Annual CO2 Emissions Arising from Solid Fuel and Feedstock Consumption

Equation P-1: Annual CO_2 Process Emissions Arising from Gaseous Fuel and Feedstock Consumption

Equation P-1 calculates annual CO_2 process emissions arising from gaseous fuel and feedstock consumption.

$$CO_2 = \left(\sum_{n=1}^{k} \frac{44}{12} * Fdstk_n * CC_n * \frac{MW}{MVC} \right) * 0.001$$

The table below defines the parameters in this equation and provides the values or sources of any constants, default values, and lookup values.

Parameter	Description	Units of Measure	Value or Source
CO_2	Annual CO_2 process emissions arising from gaseous fuel and feedstock consumption	metric tons/yr	Output
$Fdstk_n$	Volume or mass of the gaseous fuel or feedstock used in month n	scf (at standard conditions of 68°F and atmospheric pressure) or kg of fuel or feedstock	User input
CC_n	Average carbon content of the gaseous fuel or feedstock for month n	kg carbon per kg of fuel or feedstock	User input
MW_n	Average molecular weight of the gaseous fuel or feedstock for month n. If you measure mass, the term "MWn/MVC" is replaced with "1".	kg/kg-mole	User input
MVC	Molar volume conversion factor at standard conditions	scf per kg-mole	849.5
k	Months in the year	-	1 to 12
44/12	Ratio of molecular weights, CO_2 to carbon	-	44/12
0.001	Conversion factor from kg to metric tons	kg/metric ton	0.001

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Equation P-2: Annual CO_2 Emissions Arising from Liquid Fuel and Feedstock Consumption

Equation P-2 calculates annual CO_2 emissions arising from liquid fuel and feedstock consumption.

$$CO_2 = \left(\sum_{n=1}^{k} \frac{44}{12} * Fdstk_n * CC_n \right) * 0.001$$

The table below defines the parameters in this equation and provides the values or sources of any constants, default values, and lookup values.

Parameter	Description	Units of Measure	Value or Source
CO_2	Annual CO_2 emissions arising from liquid fuel and feedstock consumption	metric tons/yr	Output
$Fdstk_n$	Volume or mass of the liquid fuel or feedstock used in month n	gallons or kg of fuel or feedstock	User input
CC_n	Average carbon content of the liquid fuel or feedstock, for month n	kg carbon per gallon or kg of fuel or feedstock	User input
k	Months in the year	-	1 to 12
44/12	Ratio of molecular weights, CO_2 to carbon	-	44/12
0.001	Conversion factor from kg to metric tons	kg/metric ton	0.001

Equation P-3: Annual CO_2 Emissions Arising from Solid Fuel and Feedstock Consumption

Equation P-3 calculates annual CO_2 emissions arising from solid fuel and feedstock consumption.

$$CO_2 = \left(\sum_{n=1}^{k} \frac{44}{12} * Fdstk_n * CC_n \right) * 0.001$$

The table below defines the parameters in this equation and provides the values or sources of any constants, default values, and lookup values.

Parameter	Description	Units of Measure	Value or Source
CO_2	Annual CO_2 emissions from solid fuel and feedstock consumption in metric tons per year	metric tons/yr	Output
$Fdstk_n$	Mass of solid fuel or feedstock used in month n	kg of fuel or feedstock	User input
CC_n	Average carbon content of the solid fuel or feedstock, for month n	kg carbon per kg of fuel or feedstock	User input
k	Months in the year	-	1 to 12
44/12	Ratio of molecular weights, CO_2 to carbon	-	44/12
0.001	Conversion factor from kg to metric tons	kg/metric ton	0.001