

MULTIPLE SOURCES, SPECIES AND PARTICLE SIZES

CERC

1. Sources and Groups

1.1 Sources

In ADMS 5 up to 300 sources may be modelled. A source may be continuous or discrete, (plume or puff), and if continuous, may be a point, area, volume, line or jet source. The source is defined by its position, dimensions (e.g. diameter, length, depth), height and emission characteristics, namely:

- velocity, volume flow rate, mass and buoyancy fluxes or mass emission rate
- temperature or density
- molecular mass
- specific heat capacity
- mixing ratio.

A maximum of 30 is placed on the number of each of line, area and volume sources.

1.2 Groups

Up to 20 user-defined groups of sources may be created. Each group may contain any combination of the sources, so that a source may be a member of more than one group, but a source can only appear once in any one group. All of the defined sources can also be modelled together using the 'All sources' output option.

1.3 Emissions

A pollutant emission is defined by a mass emission rate (plume) or total mass emission, start time and duration (puff). Each source may emit up to 10 pollutants or parent isotopes.

1.4 Pollutant species

Particulate pollutant species may include up to 10 different particle size components, whereas gaseous pollutant species only include one component. The particles and gases are defined by their wet and dry deposition characteristics and conversion factor between $\mu\text{g}/\text{m}^3$ and parts per billion (gases only). (Note, however, that the wet and/or dry deposition characteristics are only taken into consideration if the appropriate deposition options are selected by the user.)

The default parameters are given in Table 1.

Table 1 Default dry and wet deposition parameters

| Pollutant type | Deposition velocity (m/s) | Terminal velocity (m/s) | Washout coefficient (s^{-1}) | Conversion factor |
|----------------|---------------------------|-------------------------|---|-------------------|
| Gaseous | 0 | N/A | 0 | 1 |
| *Particulate | 0 | 0 | 0 | N/A |

*1 particle size component

1.5 Output

The user has the choice of output due to a single source or due to any or all of the source groups.

2. Limitations

The following options are only available for a single point source:

- (i) Gamma dose
- (ii) Puff (also available for a single jet source)
- (iii) Plume visibility
- (iv) Temperature and humidity output (temperature output is also available for a single jet source)

The fluctuations option is only used for the first pollutant for which short-term averages are calculated and the first pollutant for which long-term averages are calculated.

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