Abbreviations and glossary

Abbreviations

AC10	The ten Accession Member States that joined the EU in May 2004
ADMS	Atmospheric Dispersion Modelling System
AMS	Aerosol mass spectrometer
APEG	Airborne Particles Expert Group
APHEA	Air Pollution and Health, a European Approach
AQEG	Air Quality Expert Group
AQMA	Air quality management area
AQS	Air Quality Strategy
ATOFMS	Aerosol time-of-flight mass spectrometer
AURN	Automatic Urban and Rural Network (air quality monitoring)
BAM	Met One Beta Attenuation Monitor or BAM 1020
BaP	Benzo(a)pyrene
BAT	Best available techniques
BATNEEC	Best available techniques not entailing excessive cost
BS	Black smoke
BSI	British Standards Institute
BST	British Summer Time
CAFE	Clean Air For Europe
CALINE	California Line Source Model
CAP	Common Agricultural Policy
CCGT	Combined cycle gas turbines
CCS	Congestion Charging Scheme
CEH	Centre for Ecology and Hydrology
CEN	European Committee for Standardisation
CEPMEIP	Coordinated European Programme on Particulate Matter Emission Inventories, Projections and Guidance
CERC	Cambridge Environmental Research Consultants
CI	Confidence interval
CL	Confidence limit
CLRTAP	Convention on long-range transboundary air pollution
CNG	Compressed natural gas
CO	Carbon monoxide
CO_2	Carbon dioxide
COMEAP	Committee on the Medical Effects of Air Pollutants
COPERT III	Computer Programme to Calculate Emissions from Road Transport (version III)
CORINAIR	The air emissions section of CORINE
CORINE	CoOoRdination d'Information Environmentale
CPC	Condensation particle counter
CRT	Continuously regenerating traps
CVS	Constant volume sampler
DA	Devolved Administration
DAPPLE	Dispersion of Air Pollution and Penetration into the Local Environment
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DL	Detection limit
DMA	Differential mobility analyser
DMPS	Differential mobility particle sizer
DMRB	Design Manual for Roads and Bridges

DMS	Dimethyl sulphide
DPF	Diesel particulate filter
DTI	Department for Trade and Industry
EA	Environment Agency
EAF	Electric Arc Furnace
EC	European Community
EEA	European Environment Agency
EFTA4	European Fair Trade Agreement countries
ELR	European load response
EMEP	Cooperative Programme for Monitoring and Evaluation of the Long-Range Transmission of Air Pollutants in Europe
EPAQS	Expert Panel on Air Quality Standards
EPEFE	European Programme on Emissions, Fuels and Engine technologies
EPER	European Pollutant Emissions Register
EPSRC	Engineering and Physical Sciences Research Council
ERG	Environmental Research Group, King's College London
ESI	Electricity supply industry
ESP	Electrostatic precipitators
ETC-ACC	European Topic Centre on Air and Climate Change
EU	European Union
EU15	The 15 countries that were members of the European Union before May 2004
FAS	Free acceleration smoke
FDMS	Filter dynamics measurement system
FGD	Flue gas desulphurisation
FRAME	Fine Resolution Atmospheric Multi-pollutant Exchange
GDI	Gasoline direct injection
GIA	Global irradiation amount
GIS	Geographical information system
GLA	Greater London Authority
GMT	Greenwich Mean Time
HARM	Hull Acid Rain Model
HBAPMN	Hertfordshire and Bedfordshire Air Pollution Monitoring Network
HDV	Heavy duty vehicles – road vehicles greater than 3.5 tonnes weight (GVW)
HGV	Heavy goods vehicles – road vehicle greater than 7.5 tonnes (GVW), where GVW is the gross vehicle weight, i.e. the combined weight of the vehicle and the goods
HIRLAM	High Resolution Limited Area Model
HNO_3	Nitric acid
H_2SO_4	Sulphuric acid
HVS	High volume sampler
ICAO	International Civil Aviation Organisation
ICP-MS	Inductively coupled plasma – mass spectrometry
IGCB	Interdepartmental Group on Costs and Benefits
IIASA	International Institute for Applied Systems Analysis
INAA	Instrumental neutron activation analysis
IPC	Integrated pollution control
IPCC	Intergovernmental Panel on Climate Change
IPPC	Integrated Pollution Prevention and Control
JEP	Electricity Supply Industry Joint Supply Programme
KAQN	Kent Air Quality Network
KFG	Kleinfiltergerat (low volume sampler specified as a reference sampler for PM_{10})

kt	Kilotonne
LAEI	London Atmospheric Emissions Inventory
LAPC	Local air pollution control
LAQM	Local air quality management
LAQN	London Air Quality Network
LCPD	Large Combustion Plant Directive
LDV	Light Duty Vehicles – road vehicles less than 3.5 tonnes weight
LEZ	Low emission zone – a specific type of 'clear zone'
LGV	Light goods vehicles – goods vehicles less than 3.5 tonnes in weight
LNG	Liquid natural gas
LPG	Liquefied petroleum gas
LT	London Transport
LV	Limit value
LVS	Low volume sampler
MAQS	Mayor's Air Quality Strategy
MARPOL	Marine Pollution Convention
MODIS	Moderate resolution imaging spectroradiometer
MSW	Municipal solid waste
mg m^{-3}	Milligrams per cubic metre of air
µm	Micrometres
µg m^{-3}	Micrograms per cubic metre of air
NAEI	National Atmospheric Emissions Inventory
NAME	Numerical Atmospheric Dispersion Modelling Environment
Netcen	National environmental technology centre, part of AEA Technology plc
NH_3	Ammonia
NH_4	Ammonium
Nm	Nanometres
NMMAPS	National Morbidity, Mortality and Air Pollution Study
NMVOC	Non-methane volatile organic compound
NO	Nitrogen monoxide, also termed nitric oxide
NO_2	Nitrogen dioxide
NO_3	Nitrate
NO_X	Nitrogen oxides (NO + NO_2)
NPL	National Physical Laboratory
NRTF	National road traffic forecasts
O_2	Oxygen
O_3	Ozone
OEF	Oxford economic forecasting
OH	Hydroxyl radical
OPG	Other petroleum gas
OSPM	Operational Street Pollution Model
PAH	Polycyclic aromatic hydrocarbon
PAN	Peroxyacetyl nitrate
PCB	Polychlorinated biphenyl
PI	Pollution Inventory
PIXE	Particle-induced X-ray emission
PM	Particulate matter
PM_{10}	Airborne particulate matter passing a sampling inlet with a 50% efficiency cut-off at 10 µm aerodynamic diameter and which transmits particles of below this size
$PM_{2.5}$	Airborne particulate matter passing a sampling inlet with a 50% efficiency cut-off at 2.5 µm aerodynamic diameter and which transmits particles of below this size
PM_1	Airborne particulate matter passing a sampling inlet with a 50%

	efficiency cut-off at 1 µm aerodynamic diameter and which transmits particles of below this size
$PM_{0.1}$	Airborne particulate matter passing a sampling inlet with a 50% efficiency cut-off at 0.1 µm aerodynamic diameter and which transmits particles of below this size
PM_{coarse}	Fraction of the measured particle mass concentration determined from PM_{10} minus $PM_{2.5}$.
Ppb	Parts per billion (1,000,000,000)
PPC	Pollution Prevention and Control
Ppm	Parts per million
PSA	Particle surface area
QUARG	Quality of Urban Air Review Group
R&P	Rupprecht & Patashnick Co., Inc.
RGAR	Review Group on Acid Rain
RMA	Reduced major axis
RMS	Root mean square
ROS	Reactive oxygen species
SAQSG	Sussex Air Quality Steering Group
SCC	Sharp-cut cyclone
SEPA	Scottish Environment Protection Agency
SES	Sequential equilibrium system
SI	Spark ignition
SIA	Secondary inorganic aerosols
SJAC	Steam-jet aerosol collector
SMMT	Society of Motor Manufacturers and Traders Limited
SMPS	Scanning mobility particle sizer
SO_2	Sulphur dioxide
SO_4	Sulphate
SOA	Secondary organic aerosol
SSF	Solid smokeless fuel
TCA	Total cloud amount
TEOM	Tapered Element Oscillating Microbalance
TfL	Transport for London
TRAMAQ	DfT funded, Traffic management and air quality research programme. http://www.roads.dft.gov.uk/roadnetwork/tramaq/
TRL	Transport Research Laboratory
TSP	Total suspended particles
TYP	Ten Year Plan
WHO	World Health Organisation
UK	United Kingdom
UKAS	United Kingdom Accreditation Service
UKIAM	United Kingdom Integrated Assessment Model
UKOOA	United Kingdom Offshore Operations Association
ULSD	Ultra-low sulphur diesel
ULSP	Ultra-low sulphur petrol
UM	Unified model
UNECE	United Nations Economic Commission for Europe
USA	United States of America
USEPA	United States Environmental Protection Agency
VOC	Volatile organic compound
WRAC	Wide range aerosol classifier
WS	Wind speed
XRF	X-ray fluorescence

Glossary

Accumulation mode	Particles from around 0.5 to 1 μm diameter, resulting from primary emissions, condensation of secondary sulphates, nitrates and organics from the gas phase and coagulation of smaller particles. Particles can have a long atmospheric lifetime, typically 7–30 days.
Accuracy	A measure of the closeness of the agreement between the result of a measurement and the true value (see also Uncertainty and Precision).
Acute health effect	Short-lasting or short-term in reference to either duration of exposure or effect of exposure to a pollutant.
Aerosol	A mixture of suspended particulate matter and its gaseous suspended medium.
Air quality objective	Policy targets generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedences within a specified timescale (see also air quality standard).
Air quality standard	The concentration of a pollutant, and associated averaging period, which is without significant effect on human health at a population level.
Ambient air	Outdoor air in the troposphere, excluding workplace air.
Annual mean	The average of the concentrations measured for each pollutant for one year. In the case of the air quality objectives this is for a calendar year.
AQMA	Air quality management area, an area which a local authority has designated for action, based upon predicted exceedences of air quality objectives.
Atmospheric dispersion model	A mathematical, often computer-based method for calculating pollutant concentrations from emissions data and specified meteorological conditions. Models vary from screening models to detailed 'new-generation' types.
AURN	Automatic Urban and Rural Network of air pollution measurement sites, managed by contractors on behalf of Defra and the Devolved Administrations.
Black Smoke	Non-reflective (dark) particulate matter associated with the smoke stain measurement method (BS 1747 pt 2: BSI 1969).
Brownian motion	Constant small movement of suspended particles due to bombardment by surrounding molecules.
Calibration (modelling)	The process of multiplying the output of a model by a fixed correction factor to give, on average, a 1:1 relationship with measured data.
Calibration (monitoring)	The process of reducing the uncertainty of monitoring data by controlled tests on the analyser, normally traceable to internationally accepted measurements standards.
Carcinogenic	Known or believed to cause cancer in humans.
Cardiopulmonary	Pertaining to the heart and lungs.
Cardiovascular	Pertaining to the heart and blood vessel (circulatory) system.
Chronic health effect	Long-lasting or long-term in reference to either duration of exposure or effect of exposure to a pollutant.
Coagulation	Process by which particles collide and coalesce together.
Coarse particle mode	Particles greater than 1 μm diameter, typically generated mechanically rather than through nucleation and condensation processes. Atmospheric lifetimes are much shorter than for the accumulation mode.

Cohort study	Study in which a group or cohort of people are followed over time to see whether they develop a disease in response to exposure to the factor of interest.
Concentration	The amount of a (polluting) substance in a volume (of air), typically expressed as a mass of pollutant per unit volume of air at standard conditions of temperature and pressure (e.g. micrograms per cubic metre, μg m^{-3}) or as the ratio of the number of molecules of the pollutant to the total number of molecules in the volume of air (for example, parts per billion, ppb).
Condensation	A physical process with more vapour molecules arriving at particle's surface than leaving the surface, resulting in a net growth of the particle.
Confounding factor	A condition or variable that is both a risk factor for disease and associated with an exposure of interest. This association between the exposure of interest and the confounder may make it falsely appear that the exposure of interest is associated with the disease.
Correction factor	See scaling factor.
Correlation coefficient	The fraction of the variability in one set of data that is proportional to the value of some other set of data.
Data capture	The percentage of all the possible measurements for a given period that were validly measured.
Elemental carbon	Black, graphitic carbon formed in the high temperature combustion of fossil and contemporary biomass fuels.
Emission	The amount of a (polluting) substance emitted in a certain amount of time, typically expressed as a mass of pollutant per unit time (e.g., grams per second or tonnes per year for a single source). May also be expressed per unit length of a road (e.g., g s^{-1} m^{-1}), or per unit area of an urban area (e.g., t a^{-1} km^{-2}).
Emissions inventory	A quantification and compilation of emission sources by geography and time, usually including data covering one or more years.
Epidemiology	The study of the distribution and determinants of health and disease in populations.
EURO I	Europe-wide vehicle standard that required vehicles manufactured after 1992 to achieve set emissions limits. For petrol cars this was achieved by the fitting of three-way catalysts.
EURO II, III, IV and V	Europe-wide vehicle standards that are progressively stricter for the years 1996, 2000, 2006 and 2008, respectively.
Exceedence	A period of time where the concentration of a pollutant is greater than the appropriate air quality objective.
Endotoxin	Potent inflammatory agents present primarily in the cell walls of Gram-negative bacteria.
Genotoxic	A term used to describe carcinogens that act either directly or after transformation in the body on the genetic material (DNA) of cells.
Heterogeneous nucleation	Process in which newly formed low-volatility substances condense onto existing particles causing the growth of those particles.
Homogeneous nucleation	Process by which newly formed molecules of extremely low vapour pressure condense with one another to form wholly new particles.
In vitro	Taking place in isolation from a living organism.
In vivo	Taking place within a living biological organism.
Mass closure	The concept that sum of the individual chemical components equals the measured mass of particles.

Microgram (µg)	One millionth of a gram.
mg m^{-3}	Milligrams per cubic metre of air. A unit for describing the concentration of air pollutants in the atmosphere as a mass of pollutant per unit volume of air. This unit is one thousand-times larger than the µg m^{-3} unit listed below.
µg m^{-3}	Micrograms per cubic metre of air. A unit for describing the concentration of air pollutants in the atmosphere, as a mass of pollutant per unit volume of air. A concentration of 1 µg m^{-3} means that one cubic metre of air contains one microgram of pollutant.
Micrometre (µm)	One millionth of a metre, also referred to as a micron.
Minor roads	Non A roads or motorways.
Morbidity	Illness.
Mutagenic	Capable of increasing the rate of genetic mutation in living organisms.
Nanometre (nm)	10^{-9} metres.
Nanoparticle	Particle smaller than 50 nm diameter.
Nucleation	Process by which secondary particles are formed: molecules of low volatility condense to form solid or liquid matter (see also heterogeneous nucleation and homogeneous nucleation).
Nucleation mode	Particles smaller than around 50 nm and usually consisting of fresh aerosols created *in situ* from the gas-phase by nucleation. Such particles have a relatively short lifetime in the atmosphere.
Organic carbon	Carbon in the form of organic compounds, either primary from automotive or industrial sources or secondary from the oxidation of VOCs.
Particulate matter	Suspended particulate matter is any non-gaseous material (liquid or solid) that, owing to its small gravitational settling rate, remains suspended in the atmosphere for appreciable time periods.
PM_{10}	Airborne particulate matter passing a sampling inlet with a 50% efficiency cut-off at 10 µm aerodynamic diameter and which transmits particles of below this size.
$PM_{2.5}$	Airborne particulate matter passing a sampling inlet with a 50% efficiency cut-off at 2.5 µm aerodynamic diameter and which transmits particles of below this size.
PM_{coarse}	Fraction of the measured particle mass concentration determined from PM_{10} minus $PM_{2.5}$.
ppb	Parts per billion. The concentration of a pollutant in air in terms of molar ratio. A concentration of 1 ppb means that for every billion (10^9) molecules in a volume of air, there is one molecule of the specified pollutant present. For practical purposes in ambient air, the molar ratio and volume ratio (the volume occupied by the pollutant gas within a given volume of air) are identical.
ppm	Parts per million. The concentration of a pollutant in air in terms of molar ratio. A concentration of 1 ppm means that for every million (10^6) molecules in a volume of air, there is one molecule of the specified pollutant present. For practical purposes in ambient air, the molar ratio and volume ratio (the volume occupied by the pollutant gas within a given volume of air) are identical.
Precision	A measure of the closeness of the agreement between the results of successive measurements where the true value remains constant (see also Accuracy and Uncertainty).

Primary particles Particles emitted directly into the environment. This includes particles from both natural sources, such as the entrainment of soils by the wind, and anthropogenic sources, such as particles arising directly from processes such as combustion and quarrying.

Residual component A component that is commonly incorporated into both semi-empirical and dispersion models to account for primary particulate matter that is not accounted for in the emissions inventory or otherwise included in the calculations. For predictions of PM_{10} concentrations, the residual component will usually be dominated by particles within the PM_{coarse} fraction and will comprise emissions from various sources including sea salt, wind and blown dust and any fraction of non-exhaust road vehicle emissions not otherwise included in the modelling.

Scaling factor Due to the need to eliminate the effect of changing humidity on the mass measurement of PM, TEOMs must maintain the sample filter at an elevated temperature. This has led to reported differences in concentrations of PM between the TEOM and the European reference sampler that is largely attributed to the loss of volatile species such as ammonium nitrate. As an interim measure, a default 'scaling factor' (also known as correction factor) of 1.3 is currently applied to all nationally reported TEOM PM_{10} data in the UK as recommended by the EC Working Group on Particulate Matter.

Secondary particles Particles formed in the atmosphere as a result of chemical reactions leading to the formation of substances of low volatility that consequently condense into the solid or liquid phase.

Stage II indicative limit values The First Air Quality Daughter Directive (1999/30/EC) sets Stage II indicative limit values for both 24 h and annual average PM_{10} to be achieved by 1 January 2010. These Stage II limit values are only indicative and will be reviewed by the EC in light of further information on health and environmental effects, technical feasibility and experience gained in the application of Stage I limit values by Member States. They have no legal standing.

Susceptible group A group of people who, as a result of genetic predisposition, illness or unusual exposure, are more affected by toxic substances than other people.

TEOM Tapered element oscillating microbalance. Equipment used for measuring fine particulate matter such as PM_{10}.

Total suspended particles (TSP) A term describing the mass of airborne particles, usually determined with a high-volume air sampler, which draws air through a filter membrane over a 24-hour period. Includes particles with a wide range of sizes.

True value The value of a concentration, for example, which is entirely consistent with the definition of the units in which it is given. This is the value that would be obtained by a perfect measurement.

Ultrafine particles Particles smaller than 100 nm diameter.

Uncertainty A measure, associated with the result of a measurement, that characterizes the range of values within which the true value is expected to lie. Uncertainty is usually expressed as the range within which the true value is expected to lie with a 95% probability, where standard statistical and other procedures have been used to evaluate this figure. Uncertainty is more clearly defined than the closely related parameter accuracy, and has replaced it on recent European legislation.