



**American Society of
Agricultural and Biological Engineers**

STANDARD

ASABE is a professional and technical organization, of members worldwide, who are dedicated to advancement of engineering applicable to agricultural, food, and biological systems. ASABE Standards are consensus documents developed and adopted by the American Society of Agricultural and Biological Engineers to meet standardization needs within the scope of the Society; principally agricultural field equipment, farmstead equipment, structures, soil and water resource management, turf and landscape equipment, forest engineering, food and process engineering, electric power applications, plant and animal environment, and waste management.

NOTE: ASABE Standards, Engineering Practices, and Data are informational and advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. The ASABE assumes no responsibility for results attributable to the application of ASABE Standards, Engineering Practices, and Data. Conformity does not ensure compliance with applicable ordinances, laws and regulations. Prospective users are responsible for protecting themselves against liability for infringement of patents.

ASABE Standards, Engineering Practices, and Data initially approved prior to the society name change in July of 2005 are designated as "ASAE", regardless of the revision approval date. Newly developed Standards, Engineering Practices and Data approved after July of 2005 are designated as "ASABE".

Standards designated as "ANSI" are American National Standards as are all ISO adoptions published by ASABE. Adoption as an American National Standard requires verification by ANSI that the requirements for due process, consensus, and other criteria for approval have been met by ASABE.

Consensus is established when, in the judgment of the ANSI Board of Standards Review, substantial agreement has been reached by directly and materially affected interests. Substantial agreement means much more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that a concerted effort be made toward their resolution.

CAUTION NOTICE: ASABE and ANSI standards may be revised or withdrawn at any time. Additionally, procedures of ASABE require that action be taken periodically to reaffirm, revise, or withdraw each standard.

Copyright American Society of Agricultural and Biological Engineers. All rights reserved.
ASABE, 2950 Niles Road, St. Joseph, MI 49085-9659, USA, phone 269-429-0300, fax 269-429-3852, hq@asabe.org

Uniform Terminology for Air Quality

Developed by the Environment Air Quality subcommittee and approved by the Structures and Environment Division. Adopted as an ASABE standard July 2012. Approved as an American National Standard July 2012. Revised and approved as an American National Standard November 2016.

Keywords: Air Quality, Dust, Odor, Terminology

1 Purpose and scope

1.1 The purpose of this Standard is to establish uniformity in terms used within the field of outdoor rural air quality. This Standard is also to serve as a focal point for the development of new useful terms associated with air quality in rural areas.

1.2 By these definitions, results from existing and newly developed measurement techniques and equipment can be compared and rated as to intended purpose and performance.

2 Normative references

2.1 The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies unless noted. For undated references, the latest approved edition of the referenced document (including any amendments) applies.

2.2 Standard procedures for the determination of values for many of the terms defined herein may be found in:

ASTM E679-04, Standard Practice for Determination of Odor and Taste Thresholds by a Forced-Choice Ascending Concentration Series Method of Limits

ASTM E253-08, Standard Terminology Relating to Sensory Evaluation of Materials and Products

CEN EN13725, Air Quality — Determination of Odor Concentration by Dynamic Olfactometry

ASAE S292.5, Uniform Terminology for Rural Waste Management

ASAE S582 MAR2005, Cotton Gins — Method of Utilizing Emission Factors in Determining Emission Parameters

ANSI/ASABE S613-1, Tractors and self-propelled machinery for agriculture — Air quality systems for cabs — Terminology and overview

ISO 5492, Sensory analysis — Vocabulary

ISO 5725-1, Accuracy (trueness and precision) of measurement methods and results — Part 1: general principle and definitions

3 Definitions

3.1 abatement: Controlling emissions (ASAE S582).

3.2 adverse health effect: A health effect from exposure to air contaminants that may range from relatively mild temporary conditions (such as eye or throat irritation, shortness of breath, or headaches) to permanent and serious conditions (such as birth defects, cancer or damage to lungs, nerves, liver, heart, or other organs).

3.3 aerobic: In the presence of oxygen.

3.4 aerodynamic equivalent diameter (AED): The diameter of a unit density sphere (i.e. 1.00 g/cm³) that would have the same settling velocity as the particle or aerosol in question (ASAE S582).

3.5 aerosol: Small droplets of liquid or particles of solid matter suspended in air that are fine enough in particle size, 0.01 to 100 µm (aerodynamic diameter), to remain dispersed for a period of time (ANSI/ASABE S613-1). A system of colloidal particles dispersed into air or gas, e.g. smoke or fog (ASAE S292.5).

3.6 agricultural burning: The intentional use of fire for vegetation management in areas such as agricultural fields, orchards, rangelands, and forestlands.

3.7 air: "Pure" air is a mixture of gases containing about 78% nitrogen, 21% oxygen, less than 1% of carbon dioxide and other gases, and varying amounts of water vapor.

3.8 air basin: A land area with generally similar meteorological and geographical conditions throughout. To the extent possible, air basin boundaries are defined along political boundary lines and include both the source and receptor areas.

3.9 air inlet: A passage by which air enters an animal building or other enclosed place.

3.10 air outlet: A passage by which air leaves an animal building or other enclosed place.

3.11 air pollution: The presence in the outdoor atmosphere of any one or more substances or pollutants in quantities, which are or may be harmful or injurious to human health or welfare, animal or plant life, or property (health effects standard), or unreasonably interfere with enjoyment of life or property, including outdoor recreation (nuisance standard) (ASAE S582).

3.12 air pollution abatement system: Devices used to remove pollutants from an exit air stream to bring emissions into compliance with regulations (ASAE S582).

3.13 air pollution control device: An apparatus that is part of an air pollution abatement system (ASAE S582).

3.14 air quality: A term indicative of the quantity of pollutants present to which people, animals, plants, and property are exposed relative to established baseline values (ASAE S582).

3.15 air quality index (AQI): A numerical index used for reporting severity of ambient air pollution levels to the public. The AQI currently incorporates five criteria pollutants (ozone, particulate matter, carbon monoxide, sulfur dioxide, and nitrogen dioxide) into a single index. The AQI also incorporates the 8-hour ozone standard and the 24-hour PM_{2.5} standard into the index calculation. AQI ranges from 0 (good air quality) to 500 (hazardous air quality). The index number increases as air pollution increases, increasing the likelihood of health effects.

3.16 air quality standards: Threshold values that limit either the emission rate, concentration emitted from a source, or the concentration of a pollutant in the ambient air over a given time period (ASAE S582).

3.17 airborne particulates: Solid particles or liquid droplets found in the atmosphere that include, but are not limited to: windblown dust, emissions from industrial processes, and motor vehicle or non-road engine exhausts (ASAE S582).

3.18 ambient air: Any unconfined portion of the atmosphere; open air; outside surrounding air; air that is accessible to the public (ASAE S582).

3.19 ambient concentrations: Concentrations of particulate matter or gaseous atmospheric components in the vicinity of a site that are unaffected by site-related activities. Ambient concentrations are some-times referred to as “local background.”

3.20 ambient monitoring: All forms of monitoring conducted beyond the immediate influence of any single discharge source (ASAE S582).

3.21 ammonia (NH₃): An odorous gas containing one nitrogen and three hydrogen atoms. Ammonia can also contribute to the formation of fine particulate matter. Ammonia is generated naturally by the decomposition of proteins or other nitrogen-containing compounds, or commercially by chemical processes.

3.22 anaerobic: In the absence of oxygen.

3.23 anisokinetic sampling: Non isokinetic sampling. See isokinetic sampling.

3.24 anosmic: Lacking capability to sense or detect odor, as compared to the general population. A person could be anosmic to all odors or have a specific anosmia to some odorants.

3.25 area source: An origin of air pollutant emissions that occur from a definable area or surface that is sufficiently large to exhibit a continuous gradient of source concentrations, and where the physical scale precludes its classification as a point source. Area source in regulatory use defines a facility (collection of sources) that has emissions below the EPA specified major source threshold for pollutants.

3.26 aroma: Perception resulting from stimulating the olfactory receptors; in a broader sense, the term refers to the combination of sensations resulting from stimulation of the nasal cavity (ASTM E253-04).

3.27 atmospheric stability: The tendency of the atmosphere to resist vertical motion, and thus turbulence and dispersion, is termed “stability” and is directly related to the change in temperature and wind speed with height.

3.28 atmospheric stability class: A grouping of meteorological conditions categorized according to their influence on atmospheric stability.

3.29 attainment: The successful achievement of concentration standards (ASAE S582).

3.30 attainment area: A geographic region where levels of a criteria air pollutant meet the health-based primary standard (NAAQS) for that pollutant. An area considered as having air quality as good as or better than the NAAQS as defined in the U.S. Clean Air Act. An area may have an acceptable level for one criteria pollutant, but may have unacceptable levels for others (ASAE S582).

3.31 best available control measures (BACM): The most effective measures for controlling small or dispersed particulates and other emissions from sources such as roadway dust, soot and ash from woodstoves and open burning of brush, timber, grasslands, or trash (ASAE S582).

3.32 best available control technology (BACT): An emission limitation based on the maximum degree of emission reduction (with consideration given to the technical practicability, energy, environmental, and economic reasonableness of reducing or eliminating emissions from the facilities exhausts) achievable through application of production processes and available methods, systems, and techniques. BACT does not permit emissions in excess of those allowed under any applicable Clean Air Act provisions. This is typically defined for cotton gins as high efficiency cyclones (1D3D or 2D2D) on all centrifugal fan exhausts and covered condenser drums with 70-100 fine-mesh screens on all axial fan exhausts (ASAE S582).

3.33 best-estimate criterion: An interpolated odor concentration value equal to the geometric mean of the last concentration at which an assessor makes an incorrect selection and the next higher presentation concentration (a correct selection).

3.34 best management practices (BMP): Procedures or controls that can be implemented to prevent or reduce pollution.