

*Standard Specification
for*



**Terms Relating to Density and Specific Gravity of Solids,
Liquids, and Gases**

AASHTO DESIGNATION: M 132-87 (1999)

AASHTO M 132-87 (1999) is identical to ASTM E 12-70 (1991)^{e1} except that all references to the ASTM standards contained in ASTM E 12-70 (1991)^{e1}, listed in the following table, shall be replaced with the corresponding AASHTO standard.

<i>Referenced Standards</i>	
ASTM	AASHTO
C 127	T 85
C 128	T 84
D 854	T 100
D 2726	T 166



Designation: E 12 - 70 (Reapproved 1991)^{†1}

Standard Terminology Relating to Density and Specific Gravity of Solids, Liquids, and Gases¹

This standard is issued under the fixed designation E 12; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense. Consult the DoD Index of Specifications and Standards for the specific year of issue which has been adopted by the Department of Defense.

^{†1} NOTE—Editorial changes were made throughout in October 1991.

INTRODUCTION

Attention is called to the appendix for information concerning the definitions which follow. Their meanings and their relationships to scientific terms are briefly explained. Some standards in which they are used are compared with standards in which other definitions have been applied.

density (of solids and liquids)—the mass of a unit volume of a material at a specified temperature. The units shall be stated, such as grams per millilitre, grams per cubic centimetre, pounds per cubic foot, or other. If the material is a solid, the volume shall be that of the impermeable portion. The form of expression shall be:

Density at x

where x is the temperature of the material.

density (of gases)—the mass of a unit volume of a gas at a stated temperature and pressure. The units shall be stated. The form of expression shall be:

Density at x, y

where:

x = temperature of the gas, and
 y = pressure of the gas.

density, apparent (of solids and liquids)—the weight in air of a unit volume of a material at a specified temperature. The units shall be stated. If the material is a solid, the volume shall be that of the impermeable portion. The form of expression shall be:

Apparent density at x

where x is the temperature of the material.

density, bulk (of solids)—the weight in air of a unit volume of a permeable material (including both permeable and impermeable voids normal to the material) at a stated temperature. The units shall be stated. The form of expression shall be:

Bulk density at x

where x is the temperature of the material.

NOTE 1—The accuracy of bulk density determinations is so low that corrections for air buoyancy and variations in the value for the

acceleration of gravity are not warranted. Hence, this definition is based on weights in air.

specific gravity (of solids and liquids)—the ratio of the mass of a unit volume of a material at a stated temperature to the mass of the same volume of gas-free distilled water at a stated temperature. If the material is a solid, the volume shall be that of the impermeable portion. The form of expression shall be (see Note 2):

Specific gravity $x/y^{\circ}\text{C}$

where:

x = temperature of the material, and
 y = temperature of the water.

NOTE 2—The term "relative density" with the same meaning as specific gravity is becoming more widely used.

specific gravity (of gases)—the ratio of the density of a gas, under the observed conditions of temperature and pressure, to the density of dry air of normal carbon dioxide content, at the same temperature and pressure. The units shall be stated. The form of expression shall be (see Note 2):

Specific gravity at x, y

where:

x = temperature of the gas, and
 y = pressure of the gas.

specific gravity, apparent (of solids and liquids)—the ratio of the weight in air of a unit volume of a material at a stated temperature to the weight in air of equal density of an equal volume of gas-free distilled water at a stated temperature. If the material is a solid, the volume shall be that of the impermeable portion. The form of expression shall be (see Note 2):

Apparent specific gravity $x/y^{\circ}\text{C}$

where:

x = temperature of the material, and
 y = temperature of the water.

specific gravity, bulk (of solids)—the ratio of the weight in air of a unit volume of a permeable material (including

¹ This terminology is under the jurisdiction of ASTM Committee E-15 on Industrial Chemicals and is the direct responsibility of Subcommittee E15.23 on Physical Properties.

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