



Designation: B354 – 16

# Standard Terminology Relating to Uninsulated Metallic Electrical Conductors<sup>1</sup>

This standard is issued under the fixed designation B354; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## INTRODUCTION

These terminologies relate only to interpretations as applied to uninsulated metallic electrical conductors in specifications under the jurisdiction of ASTM Committee B01 on Electrical Conductors, and do not necessarily correspond to the definitions used in other fields.

### 1. Scope

1.1 This terminology standard defines abbreviations and terms specific to uninsulated electrical conductors. For terms relating to superconductors, see Terminology B713.

### 2. Referenced Documents

2.1 *ASTM Standards*:<sup>2</sup>

**B193** Test Method for Resistivity of Electrical Conductor Materials

**B713** Terminology Relating to Superconductors (Withdrawn 2001)<sup>3</sup>

**E8/E8M** Test Methods for Tension Testing of Metallic Materials

### 3. Abbreviations

**AAAC**—all aluminum alloy conductor

**AAC**—aluminum conductor

**AACSR**—aluminum alloy conductor, steel reinforced

**ACAR**—aluminum conductor, aluminum alloy reinforced

**ACSR**—aluminum conductor, steel reinforced

**ACSS**—aluminum conductor steel supported

**AMC**—aluminum matrix composite

**AW**—old designation for what is now termed AW2

**AW2**—aluminum-clad steel core wire, normal strength

**AW3**—aluminum-clad steel core wire, high strength

**AZ**—old designation (aluminized)

**CCA**—copper-clad aluminum

**CCS**—copper-clad steel

**COMP**—compact construction

**EHS**—extra high strength

**GA**—old designation for what is now termed GA2

**GA2**—zinc coated (galvanized) steel wire, coating class A

**GA3**—zinc coated (galvanized) high strength steel wire, coating class A

**GA4**—zinc coated (galvanized) extra high strength steel wire, coating class A

**GA5**—zinc coated (galvanized) ultra high strength steel wire, coating class A

**GB**—obsolete designation, class B galvanizing is no longer offered

**GC**—old designation for what is now termed GC2

**GC2**—zinc coated (galvanized) steel wire, coating class C

**HS**—high strength

**IACS**—international annealed copper standard, which is 1/58 Ohm-mm<sup>2</sup>/m at 20°C for 100 % conductivity

**LSE**—low stress elongation

**MA**—old designation for what is now termed MA2

**MA2**—zinc-5 % aluminum-mischmetal alloy coated steel wire, coating class A

**MA3**—zinc-5 % aluminum-mischmetal alloy coated high strength steel wire, coating class A

**MA4**—zinc-5 % aluminum-mischmetal alloy coated extra high steel wire, coating class A

**MA5**—zinc-5 % aluminum-mischmetal alloy coated ultra high steel wire, coating class A

**MB**—obsolete designation, class B galvanizing is no longer offered

**MC**—old designation for what is now termed MC2

**MC2**—zinc-5 % aluminum-mischmetal alloy coated steel wire, coating class C

**MS**—old designation for what is now termed MA3

**MM**—mischmetal

**NS**—non-specular

**SD**—self dampening construction

**SIW**—single input wire construction

<sup>1</sup> This terminology is under the jurisdiction of ASTM Committee B01 on Electrical Conductors and is the direct responsibility of Subcommittee B01.01 on Editorial and Records.

Current edition approved Sept. 1, 2016. Published September 2016. Originally approved in 1960. Last previous edition approved in 2012 as B354 – 12. DOI: 10.1520/B0354-16.

<sup>2</sup> For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> The last approved version of this historical standard is referenced on www.astm.org.

**TP**—twisted pair  
**TW**—trapezoidal shaped wire  
**UHS**—ultra high strength  
**UNS**—unified numbering system  
**Zn-5Al-MM**—zinc-5 % aluminum-mischmetal alloy coating

ing

#### 4. Terminology

##### 4.1 Definitions:

**aeolian vibration**—resonant vibration of a conductor caused by the alternate shedding of wind-induced vortices from opposite sides of the conductor. (Frequency is usually less than 200 Hz and amplitude rarely exceeds one conductor diameter.)

**anneal (annealing)**, *n*—a thermal treatment to change the properties or grain structure of the product. When applied to a cold-worked product having a single phase: to produce softening by recrystallization or recrystallization and grain growth with the accompanying changes in properties. When applied to a product having two or more phases: to produce softening by changes in the phase relationship that may include recrystallization and grain growth.

*annealed wire*—see **soft wire**.

**area density**—mass per unit area.

**bare conductor**—a conductor having no nonmetallic covering.

**brazing**—the joining of ends of two wires, rods, or groups of wires with a nonferrous filler metal at temperatures above 800°F (427°C).

**breaking strength**—the maximum load that a conductor attains when tested in tension to rupture.

**bunch-stranded conductor**—a conductor composed of wires twisted together with a given length and direction of lay in such manner that the respective wires at successive cross sections along the length of the conductor do not necessarily form a symmetrical geometric pattern, nor necessarily occupy the same positions relative to each other.

**casting, continuous**, *n*—a casting produced by the continuous pouring and solidification of molten metal through a water-cooled mold which determines the cross-sectional shape. The length of the product is not restricted by mold dimensions.

**circular mil (cmil)**—a unit of area equal to the area of a circle one mil (0.001 in., 0.0254 mm) in diameter. The area of a circle in circular mils is equal to the square of the diameter in mils (area(cmils) = diameter(mils)<sup>2</sup>), 1 cmil = 7.854 × 10<sup>-7</sup> in.<sup>2</sup> (5.067 × 10<sup>-10</sup> m<sup>2</sup>).

**clad wire**—wire comprised of a given metal covered with a relatively thick application of a different metal. The bonding process is normally a combination of heat and pressure and results in a metallurgical bond.

**coated wire**—wire comprised of a given metal covered with a relatively thin application of a different metal. The coating process is normally electroplating or dip coating.

**coil**, *n*—a length of the product wound into a series of connected turns. The unqualified term “coil” as applied to tube usually refers to a bunched coil.

**cold-drawing**—reducing the cross section by pulling through a die or dies, at a temperature lower than the recrystallization temperature.

**cold work**, *n*—controlled mechanical operations for changing the form or cross section of a product and for producing a strain-hardened product at temperatures below the recrystallization temperature.

**combination stranded conductor**—a conductor constructed with wires of different diameters with such differences occurring either within a single layer or from layer to layer.

**compact stranded conductor**—a unidirectional or unilay or conventional concentric conductor, constructed with a central core surrounded by one or more layers of helically laid wires and formed into final shape by rolling, drawing, or other means; and manufactured to a specified nominal diameter, approximately 8 to 10 % below the nominal diameter of a conventional non-compact conductor of the same cross-sectional area.

**compressed stranded conductor**—a unidirectional or unilay or conventional concentric conductor manufactured to a specified nominal diameter 3 % less than the calculated diameter of non-compressed conductor of the same construction and cross-sectional area.

**composite conductor**—a conductor consisting of two or more types of wire, each type of wire being plain, clad, or coated; stranded together to operate mechanically and electrically as a single conductor.

**concentric-lay conductor**—conductor constructed with a central core surrounded by one or more layers of helically laid wires. Several types are as follows:

*compact round conductor*—see **compact stranded conductor**.

*conventional concentric conductor*—conductor constructed with a round central core surrounded by one or more layers of helically laid round wires. The direction of lay is reversed in successive layers, and generally with an increase in length of lay for successive layers.

*equilay conductor*—conductor constructed with a central core surrounded by more than one layer of helically laid wires, all layers having a common length of lay, direction of lay being reversed in successive layers.

*parallel core conductor*—conductor constructed with a central core of parallel-laid wires surrounded by one layer of helically laid wires.

*rope-lay conductor*—conductor constructed of a bunch-stranded or a concentric-stranded member or members, as a central core, around which are laid one or more helical layers of such members.

*unidirectional conductor*—conductor constructed with a central core surrounded by more than one layer of helically laid