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Standard Terminology and Acronyms Relating to Corrosion¹

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1. Scope

1.1 This terminology and acronyms standard covers and defines commonly used terms and acronyms in the field of corrosion. Related terms may be found in Terminologies **D16**, **D4538**, **G40**, or other ASTM terminology standards.

1.2 This terminology and acronyms standard is a result of an agreement between NACE International and ASTM International Committee G01 on Corrosion of Metals and may not reflect the opinions of other ASTM committees.

1.3 In this terminology and acronyms standard, brackets are used for directives that follow a definition and are obviously not part of it, such as, “[see XXX]” and “[also known as XXX].” Brackets can also indicate the field of application or context of the definition or acronym.

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

D16 Terminology for Paint, Related Coatings, Materials, and Applications

D2583 Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor (Withdrawn 2022)³

D4538 Terminology Relating to Protective Coating and Lining Work for Power Generation Facilities

E10 Test Method for Brinell Hardness of Metallic Materials

¹ This terminology and acronyms standard is under the jurisdiction of NACE/ASTM Committee J01, Joint Committee on Corrosion, and is the direct responsibility of Subcommittee J01.02, Working Group on Terminology.

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² 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. For NACE standards, visit the The Association for Materials Protection and Performance (AMPP) website, <https://www.ampp.org/ampp-nace-store>.

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

E18 Test Methods for Rockwell Hardness of Metallic Materials

E92 Test Methods for Vickers Hardness and Knoop Hardness of Metallic Materials

G40 Terminology Relating to Wear and Erosion

2.2 NACE Standards:²

NACE No. 1/SSPC-SP 5 White Metal Blast Cleaning

NACE No. 2/SSPC-SP 10 Near-White Metal Blast Cleaning

NACE No. 3/SSPC-SP 6 Commercial Blast Cleaning

NACE No. 4/SSPC-SP 7 Brush-Off Blast Cleaning

2.3 SSPC Surface Preparation Standards:⁴

SSPC-SP 1 Solvent Cleaning

SSPC-SP 2 Hand Tool Cleaning

SSPC-SP 3 Power Tool Cleaning

SSPC-SP 8 Pickling

2.4 ISO Standards:⁵

ISO 6506-1 Metallic materials -- Brinell hardness test -- Part 1: Test method

ISO 6507-1 Metallic materials -- Vickers hardness test -- Part 1: Test method

ISO 6508-1 Metallic materials -- Rockwell hardness test -- Part 1: Test method (scales A, B, C, D, E, F, G, H, K, N, T)

3. Terminology

3.1 Definitions:

abrasion resistance—the ability of a material to resist being worn away and to maintain its original appearance and structure when subjected to rubbing, scraping, or wear.

abrasive—a solid substance that, owing to its hardness, toughness, size, shape, consistency, or other properties, is suitable for grinding, cutting, roughening, polishing, or cleaning a surface by friction or high-velocity impact.

abrasive blast cleaning—cleaning and roughening of a surface produced by the high-velocity impact of an abrasive that is propelled by the discharge of pressurized fluid from a blast

⁴ Available from The Association for Materials Protection and Performance (AMPP), 800 Trumbull Drive, Pittsburgh, PA 15205, <https://www.ampp.org/ampp-sspc-store>.

⁵ Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <https://www.iso.org>.

nozzle or by a mechanical device such as a centrifugal blasting wheel. [also referred to as **abrasive blasting**]

abrasive blasting—see **abrasive blast cleaning**.

accelerator—a chemical substance that increases the rate at which a chemical reaction (for example, curing) would otherwise occur.

AC impedance—see **electrochemical impedance**.

acrylic—type of resin polymerized from acrylic acid, methacrylic acid, esters of these acids, or acrylonitrile.

activator—a chemical substance that initiates a chemical reaction (for example, curing). Heat and radiation may also serve as activators for some chemical reactions.

active—(1) a state of a metal surface that is corroding without significant influence of reaction product. (2) the negative direction of electrode potential.

active-passive cell—an electrochemical cell in which the anode is a metal in the active state and the cathode is the same metal in the passive state.

adduct curing agent—a material that is formed by prereacting the curing agent with a portion of the resin component of the coating.

adhesion—the state in which two surfaces are held together by chemical interfacial forces, mechanical interlocking forces, or both.

aeration cell—see **differential aeration cell**.

aging—(1) the process of exposing materials to an environment for an interval of time. (2) change in metallurgical properties that generally occurs slowly at room temperature (natural aging) and more rapidly at higher temperature (artificial aging).

air drying—process by which an applied wet coat converts to a dry coating film by evaporation of solvent or reaction with oxygen as a result of simple exposure to air without intentional addition of heat or a curing agent.

airless spraying—process of spraying coating liquids using hydraulic pressure, not air pressure, to atomize.

alkyd—type of resin formed by the reaction of polyhydric alcohols and polybasic acids, part of which is derived from saturated or unsaturated oils or fats.

alligatoring—pronounced wide cracking over the surface of a coating, which has the appearance of alligator hide.

alloy steel—an iron-based alloy containing carbon (usually less than 2.5 mass percent), manganese (usually greater than 0.25 mass percent), and specified minimum quantities of one or more alloying elements other than manganese, silicon, and copper, but does not contain 10.5 mass percent or greater chromium.

alternate immersion—exposure to environmental cycles, each involving immersion in a fluid for a period of time followed by removal from that fluid for another period of time.

amphoteric metal—a metal that is susceptible to corrosion in both acidic and alkaline environments.

anaerobic—absence of air or free (molecular) oxygen.

anchor pattern—see **surface profile**.

anion—a negatively charged ion.

anneal—heat to and hold at a temperature appropriate for the specific material and then cool at a suitable rate, for such purposes as reducing hardness, improving machinability, or obtaining desired properties.

anode—the electrode of an electrochemical cell at which oxidation occurs. (Electrons flow away from the anode in the external circuit. It is usually the electrode where corrosion occurs and metal ions enter solution.)

anode cap—an electrical insulating material placed over the end of the anode at the lead wire connection.

anode corrosion efficiency—the ratio of the actual corrosion (mass loss) of an anode to the theoretical corrosion (mass loss) calculated from the quantity of electricity that has passed between the anode and cathode using Faraday's law.

anodic inhibitor—a corrosion inhibitor whose primary action is to reduce the rate of the anodic reaction, producing a positive shift in corrosion potential.

anodic polarization—(1) the change of electrode potential caused by an anodic current flowing across the electrode/electrolyte interface. (2) a forced noble (positive) shift in electrode potential. [See **polarization**.]

anodic protection—a technique to reduce the corrosion rate of a metal surface by polarizing that surface to a more oxidizing potential.

anodizing—an electrochemical oxidation process that converts the surface of a metal (such as aluminum or titanium) to an oxide coating.

anolyte—the electrolyte adjacent to the anode of an electrochemical cell.

antifouling—preventing fouling. [See **fouling**.]

atmospheric zone—the portion of a marine structure that extends upward from the splash zone and is exposed to sun, wind, water spray, and rain.

attenuation—electrical losses in a conductor caused by current flow in the conductor.

Auger electron spectroscopy—analytical technique in which the sample surface is irradiated with low-energy electrons and the energy spectrum of electrons emitted from the surface is measured.

austenite—the face-centered cubic crystalline phase of iron or iron-based alloys.

austenitic/ferritic stainless steel—see **duplex stainless steel**.