AWS A3.0:2001
An American National Standard

Standard Welding Terms and Definitions

Including Terms for Adhesive Bonding, Brazing, Soldering, Thermal Cutting, and Thermal Spraying

American Welding Society

Approved American National Standard
ANSI

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Including Terms for Adhesive Bonding, Brazing, Soldering, Thermal Cutting, and Thermal Spraying

Supersedes ANSI/AWS A3.0-94

Prepared by
AWS A2 Committee on Definitions and Symbols

Under the Direction of
AWS Technical Activities Committee

Approved by
AWS Board of Directors

Abstract

This standard is a glossary of the technical terms used in the welding industry. Its purpose is to establish standard terms to aid in the communication of welding information. Since it is intended be a comprehensive compilation of welding terminology, nonstandard terms used in the welding industry are also included. All terms are either standard or nonstandard. They are arranged in the conventional dictionary letter-by-letter alphabetical sequence.

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Foreword

(This Foreword is a not part of AWS A3.0:2001, *Standard Welding Terms and Definitions,* but is included for information purposes only.)

The A2 Committee on Definitions and Symbols was formed by the American Welding Society to establish standard terms and definitions to aid in the communication of welding information. This publication is the major product of work done by the Subcommittee on Definitions in support of that purpose.

The first AWS document containing welding definitions was prepared by the Committee of Definitions and Chart and approved by the Executive Committee as Tentative Definitions of Welding Terms and Master Chart of Welding Processes, on January 18, 1940. A revision was approved by the AWS Board of Directors on May 7, 1942.

The next revision, bearing the designation A3.0, was called *Standard Welding Terms and Their Definitions*. This revision, published in 1949, listed the terms alphabetically.

During the late 1950s, the Committee was reorganized as the AWS Committee on Definitions and Symbols, and after several years' work, produced A3.0-61, *AWS Definitions, Welding and Cutting*. Subsequent revisions were published in 1969, 1976, 1980, 1985, 1989, and 1994.

The present publication, A3.0:2001, St*andard Welding Terms and Definitions*, defines 1359 terms, with 58 illustrations to support and clarify the definitions, as well as classification charts and corollary information for the welding processes.

The standard terms and definitions published here are those that should be used in the oral and written language of welding. Since this is intended to be a comprehensive compilation of welding terminology, nonstandard terms used in the welding industry are included. All terms are either standard or nonstandard; standard terms are identified by **boldface** and nonstandard terms are labeled as such.

Standard terms have been approved by the American Welding Society, whereas, nonstandard terms have not. It is recommended that standard terms be used in all welding literature, in particular, documents of a legal nature; for example, standards, contracts, laws, and regulations. Nonstandard terms are not recommended for any purpose.

To make this document most useful, the terms are arranged in the conventional dictionary letter-by-letter alphabetical sequence. It is the policy of the American Welding Society to use only generic terms and definitions in this publication. The numerous proprietary brand and trademark names commonly used to describe welding processes, equipment, and filler metals are not included.

To preserve an understanding of old documents and literature, welding terms believed to be no longer significant in the welding industry are included. Obsolete or seldom used processes are listed separately in Table 5.

The figures have been grouped together, rather than dispersed throughout the text. This grouping is desirable, since several figures illustrate more than one term.

Also, figures concerning related terms have been grouped to illustrate similarities, differences, and interrelationships.

Two classification arrangements are presented in this publication as charts of a hierarchy of welding processes.

The traditional Master Chart of Welding and Allied Processes places the main categories in the center, with the subcategories in boxes around the perimeter.

The Joining Method Chart and corollary classification charts are based exclusively on the physical state of materials at the joint during coalescence. This results in three major classifications of the welding processes; fusion welding for liquid/liquid, solid-state welding for solid/solid, and brazing and soldering for liquid/solid.

Some of the views and intentions of the Definitions Subcommittee are presented in the Definitions Subcommittee Manifesto, included in this document as Annex A.

To improve understanding of the terms and definitions published in A3.0, the Guide to A3.0 is included as Annex B.

Interested readers are encouraged to submit pertinent comments, including new or modified definitions to the Secretary, AWS A2 Committee on Definitions and Symbols, American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

Official interpretations of any of the technical requirements of this standard may be obtained by sending a request, in writing, to the Managing Director, Technical Services, American Welding Society. A formal reply will be issued after it has been reviewed by the appropriate personnel following established procedures (see Annex D).

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Note: Vertical lines preceding terms indicate where changes (additions, modifications, corrections, deletions) from the 1994 edition were made. A single line represents a minor or editorial change. Double lines represent a new term or a major change.

Boldface indicates standard terms, lightface indicates nonstandard terms. Terms for standard welding processes and for standard welding process variations are followed by their standard letter designations.

A

abrasion soldering. A soldering process variation during which the faying surface of the base metal is mechanically abraded.

abrasive blasting. A method of cleaning or surface roughening by a forcibly projected stream of abrasive particles.

absorptive lens. A filter lens designed to attenuate the effects of glare and reflected and stray light. See also **filter plate**.

accelerating potential, *electron beam welding and cutting*. The potential that imparts velocity to the electrons.

acceptable weld. A weld that meets the applicable requirements.

acetylene feather. The intense white, feathery-edged portion adjacent to the cone of a carburizing oxyacetylene flame. See Figure 40.

acid core solder. A solder wire or bar containing acid flux as a core.

activated rosin flux. A rosin base flux containing an additive that increases wetting by the solder.

active flux, *submerged arc welding*. A flux formulated to produce a weld metal composition that is dependent on the welding parameters, especially arc voltage. See also **alloy flux** and **neutral flux**.

actual throat. The shortest distance between the weld root and the face of a fillet weld. See Figure 25. See also **effective throat** and **theoretical throat**.

adaptive control, *adj*. pertaining to process control that automatically determines changes in process conditions and directs the equipment to take appropriate action. See also **automatic**, **manual**, **mechanized**, **robotic**, and **semiautomatic**.

adaptive control brazing. See **adaptive control welding**.

adaptive control soldering. See **adaptive control welding**.

adaptive control thermal cutting. See **adaptive control welding**.

adaptive control thermal spraying. See **adaptive control welding**.

adaptive control welding. Welding with a process control system that automatically determines changes in welding conditions and directs the equipment to take appropriate action. Variations of this term are **adaptive control brazing**, **adaptive control soldering**, **adaptive control thermal cutting**, and **adaptive control thermal spraying**. See Table 4. See also **automatic welding**, **manual welding**, **mechanized welding**, **robotic welding**, and **semiautomatic welding**.

adhesive. A polymeric material having chemical and physical properties differing from those of the base materials, placed at their faying surfaces, to join the materials together as a result of the attractive forces of this polymeric material.

adhesive bond. An attraction, generally physical in nature, between an adhesive and the base materials.