

AWS J1.3/J1.3M:2020
An American National Standard

Specification for Materials Used in Resistance Welding Electrodes and Tooling



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Approved by the
American National Standards Institute
September 27, 2019

Specification for Materials Used in Resistance Welding Electrodes and Tooling

First Edition

Prepared by the
American Welding Society (AWS)
J1 Committee on Resistance Welding Equipment

Under the Direction of the
AWS Technical Activities Committee

Approved by the
AWS Board of Directors

Abstract

This standard specifies essential properties of materials used for resistance welding electrodes and related components, the common applications of these materials, and methods of conformance verification.



ISBN (Print): 978-1-64322-085-7

ISBN (PDF): 978-1-64322-086-4

American Welding Society
8669 NW 36 St, # 130, Miami, FL 33166

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Foreword

This foreword is not a part of this standard, but is included for information purposes only.

Successful application of the resistance welding process involves accurate control of pressure, current and time. During welding the electrodes are subjected to a variety of mechanical loads, high temperatures, and chemical interactions. Specialized materials for resistance welding tooling have been developed over many years to deliver optimum performance, extended service, and cost effectiveness.

This standard builds upon the globally recognized material classification system described in the Resistance Welder Manufacturers' Association (RWMA) Bulletin 16, *Resistance Welding Equipment Standards*, last published in 1996. The standard provides updated and expanded information useful to material and electrode manufacturers, distributors, and end users.

This document describes common materials to facilitate identification and minimize variation. It is not intended to limit the range of resistance welding products or processes in the marketplace.

Comments and suggestions for the improvement of this standard are welcome. They should be sent to the Secretary, AWS J1 Committee on Resistance Welding Equipment, American Welding Society, 8669 NW 36 St, # 130, Miami, FL 33166.

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Specification for Materials Used in Resistance Welding Electrodes and Tooling

1. General Requirements

1.1 Scope. This standard addresses common copper alloy and composite materials employed in the manufacture of resistance welding electrodes, resistance welding dies, and related components such as adapters, holders, and structural components of the welding circuit.

This standard addresses bar, rod (straight lengths and coils), plate, and casting forms of select materials. The standard does not address material in sheet form.

The standard does not include all copper and copper base materials that may be applied in the construction of resistance welding machines or tooling. Examples of materials not currently covered are: electrolytic tough pitch (ETP) copper, brass, and bronze.

Unique, specialized, and new materials exist in domestic and international marketplaces and their absence here should not be interpreted as a commentary on their suitability for a particular application.

1.2 Units of Measurement. This guide makes use of both the U.S. Customary Units and International System of Units [SI]. The latter are shown within brackets [] or in appropriate columns in tables and figures. The measurements may not be exact equivalents; therefore each system must be used independently.

1.3 Safety. Safety and health issues and concerns are beyond the scope of this standard and therefore are not fully addressed herein. Safety and health information is available from the following sources:

American Welding Society:

- (1) ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*
- (2) AWS Safety and Health Fact Sheets
- (3) Other safety and health information on the AWS website

Material or Equipment Manufacturers:

- (1) Safety Data Sheets (SDS), or Product Safety Data Sheets (PSDS), supplied by materials manufacturers.
- (2) Operating Manuals supplied by equipment manufacturers

Applicable Regulatory Agencies

Work performed in accordance with this standard may involve the use of materials that have been deemed hazardous, and may involve operations or equipment that may cause injury or death. This standard does not purport to address all safety and health risks that may be encountered. The user of this standard should establish an appropriate safety program to address such risks as well as to meet applicable regulatory requirements. ANSI Z49.1 should be considered when developing the safety program.