



AWS Amendment Notice

The following Amendment has been made and incorporated into the current edition of this document.

2nd Printing: December, 2022

AWS Standard: C1.1M/C1.1:2019, *Recommended Practices for Resistance Welding*

Item Number: 1

Subject: The minimum weld button shear strength equation found in Tables 1, 4, and 5 (footnote d) has been amended as follows:

$$ST = \frac{(-6.36 \times 10^{-7} \times S^2 + 6.58 \times 10^{-4} \times S + 14.674) \times S \times 4 \times t^{1.5}}{1000}$$

Has been changed to:

$$ST = \frac{(-8.83 \times 10^{-7} \times S^2 + 1.34 \times 10^{-3} \times S + 1.514) \times S \times 4 \times t^{1.5}}{1000}$$

Tables 1, 4, and 5 (footnote d) now reads:

Minimum weld button shear strength determined as follows:

$$ST = \frac{(-8.83 \times 10^{-7} \times S^2 + 1.34 \times 10^{-3} \times S + 1.514) \times S \times 4 \times t^{1.5}}{1000}$$

ST = Shear Tension Strength (kN)

S = Base Metal Tensile Strength (MPa)

t = Material Thickness (mm)

The purpose of this amendment notice is to inform the public that a published standard has been technically corrected. An amendment is the correction of an error in substantive content in a published standard that had been inadvertently approved by the required approval procedures.

(Amendment Notice: October 6, 2022)

Item Number: 2

Subject: Table 1 header has been amended as follows:

- [72 ksi] has been changed to [50 ksi]

Table 1
Spot-Welding Parameters for Bare, Galvanneal, and Galvanized Low-Carbon Steel
<350 MPa [50 ksi] Ultimate Tensile Strength^{a, b, c, d}

Item Number: 3

Subject: Table of Contents: List of Tables: Table 4 title has been amended as follows:

- “350~700 MPa” has been changed to “350-700 MPa”

Title now reads:

“Spot-Welding Parameters for Bare, Galvanneal, and Galvanized Low-Carbon Steel
350-700 MPa [50–100 ksi] Ultimate Tensile Strength”

Item Number: 4

Subject: Table 4 header has been amended as follows:

- “[50–108 ksi]” has been changed to “[50–100 ksi]”

Table 4
Spot-Welding Parameters for Bare, Galvanneal, and Galvanized Low-Carbon
Steel 350–700 MPa [50–100 ksi] Ultimate Tensile Strength^{a,b,c,d,e}

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(Amendment Notice: October 6, 2022)

Item Number: 5

Subject: Table of Contents: List of Tables: Table 5 title has been amended as follows:

- “>700 MPa Ultimate Tensile Strength [<101 ksi]” has been changed to “>700 MPa [>100 ksi] Ultimate Tensile Strength”

Title now reads:

“Spot-Welding Parameters for Bare, Galvanneal, and Galvanized Low-Carbon Steel
>700 MPa [>100 ksi] Ultimate Tensile Strength”

Item Number: 6

Subject: Table 5 header has been amended as follows:

- “[102 ksi]” has been changed to “[>100 ksi]”

Table 5
Spot-Welding Parameters for Bare, Galvanneal, and Galvanized Low-Carbon Steel >700 MPa [<u>>100</u> ksi] Ultimate Tensile Strength ^{a, b, c, d, e}

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Item Number: 7

Subject: Several Table 15 headers have been amended as follows:

- “Base Metal Tensile Strength Below 1.03 MPa [150 ksi]” has been changed to “Base Metal Tensile Strength Below 1030 MPa [150 ksi]”
- “Base Metal Tensile Strength Above 1.03 MPa [150 ksi]” has been changed to “Base Metal Tensile Strength 1030 MPa [150 ksi] and higher”
- “From 480 MPa [70 ksi] Up To 300 MPa [90 ksi]” has been changed to “From 480 MPa [70 ksi] Up To 620 MPa [90 ksi]”
- “From 620 MPa [90 ksi] Up To 1.03 MPa [150 ksi]” has been changed to “Above 620 MPa [90 ksi] Up To 1030 MPa [150 ksi]”
- “1.03 MPa [150 ksi] and Higher” has been changed to “1030 MPa [150 ksi] and Higher”

Table 15
Spot-Welding Parameters for Stainless Steels^a

Electrode Diameter and Shape ^{b, c}					Welding Current [Approx.] Amps ^e		Minimum Contacting Overlap mm [n]	Minimum Weld Spacing ⌀ to ⌀ it mm [in]	Nugget Diameter mm [in.] [Approx.] ^o	Minimum Shear Strength		
Sheet			Net Electrode	Weld Time ^d Single Impulse Cycles ms	Base Metal Tensile Strength	Base Metal Tensile Strength				kN [lb] Ultimate Tensile Strength of Base Metal		
Thickness mm [in.]	mm [in.] min	mm [in.] max								Force kN [lb]	Below 1030 MPa [150 ksi]	From Above 1030 MPa [150 ksi] and Higher

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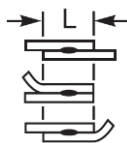
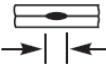
(Amendment Notice: October 6, 2022)

Item Number: 8

Subject: Table 16 values have been amended as follows:

- “Below 1034 MPa [150 ksi]” has been changed to “Below 1030 MPa [150 ksi]”
- “1034 MPa [150 ksi] and Higher” has been changed to “1030 MPa [150 ksi] and Higher”
- “Below 1034 MPa” has been changed to “Below 1030 MPa [150 ksi]”
- “[150 ksi] 1034 MPa [150 ksi] and Higher” has been changed to “1030 MPa [150 ksi] and Higher”

Table 16
Pulsation Spot-Welding Parameters for Stainless Steels^{a, d, e}

Electrode Diameter and Shape ^{d,e}			Net Electrode Force kN [lb]	Weld Time ^f		Welding Current (Approximate) Amps		Minimum Contracting Overlap mm [in.] 	Minimum Weld Minimum Weld Spacing ⌀ to ⌀ mm [in]	Nugget Diameter ^f 	Minimum Shear Strength	
Sheet Thickness Mm [in.]	D. mm [in.] min.	d. mm [in.] max.		Heat	Cool	Base Metal Tensile Strength					Base Metal Tensile Strength	
				15 [250] Cycles [ms]	6 [100] Cycles [ms]	Below 1030 MPa [150 ksi]	1030 MPa [150 ksi] and Higher				Below 1030 MPa [150 ksi]	1030 MPa [150 ksi] and Higher
				Number of Pulsations								

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Item Number: 9

Subject: Note under Table 49 has been amended as follows:

- Figure 29 reference has been changed to Figure 32

Table 49
Data for Flash Welding of Tubing and Flat Sheets
[See Figure <u>32</u> for Assembly of Parts]

Item Number: 10

Subject: Header and note in Table 50 have been amended as follows:

- “Falsh” typo was corrected to “Flash”
- Figure 30 reference has been changed to Figure 33

Table 50
Data for <u>Flash</u> Welding of Solid Round, Hex, Square, and Rectangular Bars
See Figure <u>33</u> for Assembly of Parts

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