



ENGINEERING STAFF
MATERIAL SPECIFICATION

Prepared By: Engineering Staff 
Approved By: Jerome T. Schmitz 

Section No:	MS L-9
Page No.:	1 of 6
Issue Date:	03/01/16
Superseded Date:	01/28/15

CORROSION CONTROL MATERIALS
Thermit Welding

1. SCOPE

This specification is for material and equipment used to attach copper wire to steel pipe, fittings or plate without an external heat source.

2. APPLICABLE DOCUMENTS

2.1 United States Department of Transportation (DOT), Title 49, Code of Federal Regulations (CFR), Part 192 (49 CFR 192), "Transportation of Natural and Other Gas by Pipeline; Minimum Safety Standards."

NOTE: Unless otherwise specified, the editions of the above documents incorporated by DOT 49, CFR 192 are applicable. Documents not incorporated by DOT 49, CFR 192 will be the most recent edition.

3. TERMINOLOGY

3.1 General

- 3.1.1 "Southwest Gas," "Southwest" or "SWG" wherever used in this specification and other related documents will refer exclusively to Southwest Gas Corporation.
- 3.1.2 The terms "approved," "as approved," "satisfactory," "as directed," "or equal" or other similar terms wherever used in this specification and other related documents will mean "as determined by Southwest Gas," unless specifically stated otherwise.
- 3.1.3 "Product Information Package" or "PIP" wherever used in this specification and other related documents will mean the required technical product information that a manufacturer must submit to SWG to determine if the product is suitable for use by SWG, unless specifically stated otherwise.



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Page No.:	2 of 6
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4. MATERIALS AND MANUFACTURING

- 4.1 The Thermit cartridge is to be limited to a No. 15 charge (15 grams) and is to be used with No. 6 and smaller diameter cables for vertical surfaces and No. 4 and smaller diameter cables for horizontal surfaces.
- 4.2 The reusable non-flammable mold is to be sized to hold and position the copper wire, with adapter sleeve where required, and the 15 grams of Thermit weld material.
- 4.3 The mold shall be shaped to the contour of the pipe so as to prevent leakage of the weld material during the welding process.
- 4.4 The mold shall be designed to meet the wire and pipe sizes shown in Table L-9.1 in Appendix A.

5. PERFORMANCE REQUIREMENTS

- 5.1 The Thermit cartridge is to consist of 15 grams of powdered metal and metallic oxides to produce a copper base weld material that is ignitable and will permanently fuse with minimum penetration of Thermit material into the steel and without affecting the strength of the steel.
- 5.2 The igniter gun must be capable of igniting the Thermit cartridge material in the mold.
- 5.3 The Thermit cartridge shall be specifically designed for connection of copper wire to steel pipe.

6. DIMENSIONS AND TOLERANCES

- 6.1 The copper wire adapter sleeve is to fit onto No. 14 through No. 10 copper wire.
- 6.2 The fusible steel disc is to be formed and shaped to fit into the mold cavity.
- 6.3 Charges electronically ignited shall fit into the mold cavity.



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Page No.:	3 of 6
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Superseded Date:	01/28/15

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 Thermit Welding

6. DIMENSIONS AND TOLERANCES (Cont'd)

APPENDIX A

WIRE SIZE	PIPE SIZE	SURFACE ORIENTATION	CADWELD MOLD NO.	THERMOWELD MOLD NO.
#14 to #10 Solid*, #8 Stranded	3/4" to 3 1/2" Pipe	Horizontal	CAHAA-1GA	M-101
#14 to #10 Solid*, #8 Stranded	4" and Larger Pipe	Horizontal	CAHAA-1G	M-100
#6 Stranded	3/4" to 3 1/2" Pipe	Horizontal	CAHAA-1HA	M-103
#6 Stranded	4" and Larger Pipe	Horizontal	CAHAA-1H	M-102
#4 Stranded	3/4" to 3 1/2" Pipe	Horizontal	CAHAA-1LA	M-107
#4 Stranded	4" to 5" Pipe	Horizontal	CAHAA-1LB	M-108
#4 Stranded	6" and Larger Pipe			



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Section No:	MS L-9
Page No.:	4 of 6
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Thermit Welding

7. INSPECTION

- 7.1 Successful review of the Product Information Package (PIP) as well as any future reference by Southwest to the seller's part number or internal code number in any future contract or purchase, will mean only that no conflict with the specification was found and will not relieve the seller from meeting all the requirements of this specification.
- 7.2 Southwest retains the option to inspect the manufacture and testing of any and all materials, products or systems supplied to this specification at the manufacturer's facility.
- 7.3 Southwest will have the right, at their option, to reject any material, which fails to conform to this specification. Any such rejection may take place at the manufacturer's facility; the supplier's warehouse or any subsequent delivery location, before or after Southwest assumes possession. Notice of the rejection will be made promptly to the supplier by SWG. The defective product will be replaced or returned for credit at the manufacturer's expense.
- 7.4 Any changes in manufacturing of previously approved components of the thermit welding process covered under this document for sale to Southwest must be approved by Southwest Engineering Staff. **Failure to obtain Southwest approval may be cause for rejection and disqualification as an approved supplier.**

8. CERTIFICATION

The manufacturer's or supplier's certification shall be furnished to Southwest. This certification shall state that samples representing each lot have been manufactured, tested and inspected in accordance with this specification and that requirements have been met. When requested or specified in the purchase order or contract, a report of test results will be provided.

Upon the request of Southwest, the certification of an independent third party indicating conformance to the specification may be considered at Southwest's expense.



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Section No:	MS L-9
Page No.:	5 of 6
Issue Date:	03/01/16
Superseded Date:	01/28/15

CORROSION CONTROL MATERIALS
Thermit Welding

9. SAFETY DATA SHEETS

In accordance with law, the seller shall supply Safety Data Sheets for all applicable items supplied under this specification to the following:

- 1) The Receiving Location
- 2) Engineering Staff
- 3) Southwest Gas Corporation
Corporate Safety
Mail Station LVA-120
P.O. Box 98510
Las Vegas, NV 89193-8510

10. PRODUCT MARKING

Products shall be marked with the manufacturer's name or trademark.

11. PACKAGING AND PACKAGE MARKING

- 11.1 All products covered in this specification will be packaged to prevent damage during shipping.
- 11.2 Cartridges shall be packaged in moisture resistant containers.
- 11.3 A fusible steel disc is to be supplied with each cartridge.

12. STOCK CLASSIFICATION DESCRIPTION

MOLD, THERMIT WELDING, FOR ATTACHING CATHODIC PROTECTION LEAD WIRES TO STEEL PIPE, _____ CONDUCTOR SIZE TO _____ INCH _____ (HORIZONTAL OR VERTICAL) STEEL PIPE.

CARTRIDGE, THERMIT WELDING, SIZE 15, 20 PER CARTON.

SLEEVE, THERMIT WELDING NO. _____ TO NO. _____ SOLID COPPER WIRE, 100 PER CARTON.