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Arc Welding Power Sources—Energy Consumption Testing and Labeling

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FOREWORD

This is the first edition of this publication and does not replace any other publication. The effective date of this publication is the publication date.

The initial purpose of this publication is to provide the necessary guidance for manufacturers and importers of arc welding power source equipment to meet in a uniform manner the energy consumption reporting requirements of the Mexican “Law for Sustainable Energy Use” published in the Official Gazette of Federation, on November 28, 2008, article 23. The content of this publication is therefore based on:

- a) Official Gazette of the Federation, September 10, 2010, catalog of equipment and appliances for which manufacturers, importers, distributors, and sellers shall include information about their energy consumption.
- b) Official Gazette of the Federation, March 14, 2011, formats and requirements for the information that shall be submitted by manufacturers and importers of equipments and appliances that use energy for their operation.
- c) NMX-J-038/1-ANCE-2005, Equipos de Soldadura Eléctrica por Arco – Parte 1: Fuentes de Poder para Soldadura.
- d) IEC 60974-1:2005, Arc welding equipment – Part 1: Welding power sources.

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While Mexico’s law was the initial motivation for this publication, equipment energy consumption and equipment efficiency are becoming increasingly more important topics for consumers and equipment manufacturers worldwide. Ideally, the content of this publication will contribute to a regional or international standard for arc welding equipment energy consumption testing and labeling. Because of this, the structure and drafting of this publication follows the rules established by the International Electrotechnical Commission for its standards.

This publication was developed within NEMA’s Arc Welding Section by the Welding Apparatus Technical Committee, which at the time of development consisted of the following member companies:

ESAB Welding and Cutting
Hypertherm Inc.
The Lincoln Electric Company
Miller Electric Manufacturing Company
Thermadyne Industries, Inc.

The Mexican subsidiaries/branches of these companies are also among the main users of this publication. As such, the following subsidiaries/branches reviewed this publication prior to its approval by the Arc Welding Section:

ESAB México, S.A. de C.V.
Hypertherm México, S.A. de C.V.
ITW Welding Products Group S. de R.L. de C.V.
Lincoln Electric Manufactura, S.A. de C.V.
Thermadyne de México

This publication will be reviewed periodically by NEMA's Arc Welding Section, taking into account advancing technology and new applications. Proposed or recommended revisions should be submitted to:

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1 Scope

This publication defines test methods and labeling requirements for energy consumption of arc welding power sources. These welding power sources are intended to be either connected to a low-voltage supply network or be driven by a combustion engine.

2 References

IEC 60974-1, *Arc welding equipment – Part 1: Welding power sources*

NMX-J-038/1-ANCE-2005, *Equipos de Soldadura Eléctrica por Arco – Parte 1: Fuentes de Poder para Soldadura*

3 Terms and definitions

For the purposes of this publication the terms and definitions given in NMX-J-038/1-ANCE-2005 and the following apply.

3.1 Energy consumption

Power or other energy consumed by a welding power source for a period of one hour at the conventional welding current and corresponding conventional load voltage at the maximum duty cycle rating of the welding power source

3.2 Standby energy consumption

Power or other energy consumed by a welding power source for a period of one hour under no-load conditions for supply network-connected welding power sources that are not provided with:

- a) a supply circuit on/off switching device that removes all power from ungrounded conductors, or
- b) instructions for a permanent connection to a disconnect device.

NOTE By design, most power sources for manual welding systems do not have any standby energy consumption.

4 Test Conditions

The tests shall be carried out on new, dry and completely assembled welding power sources at an ambient air temperature between 10 °C and 40 °C.

Liquid-cooled welding power sources shall be tested with liquid conditions as specified by the manufacturer.

Engine driven welding power sources shall be tested with fuel conditions as specified by the manufacturer.

The supply voltage of supply-network-connected welding power sources shall be measured at the point of coupling of the welding power source to the supply network.

The test load shall be a practically non-inductive constant resistive load having a power factor not less than 0.99.

The load voltage shall be measured at the welding power source welding circuit connections. For welding power sources that are provided with electrode and work leads, the load voltage shall be measured at the point of connection of the electrode and work leads internal to the welding power source.

NOTE The measurement can be affected by the impedance of the supply network (see Annex A).