NEMA Standards Publication

NEMA HP 8-2009

Electrical and Electronic Crosslinked, Modified Low Smoke Polyolefin (XLPO) Insulated Hook-Up Wire, Types LS (105°C-600 V), ZHDM (90°C-600 V), ZHDH (90°C-600 V), ZH (125°C-600 V), and ZHX (125°C-1000 V)

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CONTENTS

Tables

Foreword

This Standards Publication was developed by the NEMA High Performance Wire and Cable Section to define hook-up cables using low smoke and low or zero halogen insulation materials that could be used as a possible alternative to PVC insulated cables for applications requiring these types of characteristics.

In the preparation of this Standards Publication, input of users and other interested parties has been considered. Inquiries, comments, and proposed or recommended revisions should be submitted to the concerned NEMA product Subdivision by contacting the:

Vice President, Technical Services
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Section approval of the standard does not necessarily imply that all section members voted for its approval or participated in its development. At the time it was approved, the Section was composed of the following members:

AFC Cable Systems—New Bedford, MA
AmerCable—El Dorado, AR
American Insulated Wire Corporation—Pawtucket, RI
Belden CDT, Inc.—St. Louis, MO
Berk-Tek a Nexans Company—Elm City, NC
Cable USA, Inc.—Naples, FL
Coleman Cable Inc.—Waukegan, IL
Draka Comteq USA Inc.—Franklin, MA
Fisk Alloy Conductors, Inc.—Hawthorne, NJ
General Cable—Highland Heights, KY
Harbour Industries, Inc.—Shelburne, VT
Judd Wire, Inc.—Turners Falls, MA
Kaneka High-Tech Materials, Inc.—Pasadena, TX
Leoni Wire, Inc.—Chicopee, MA
Leviton Manufacturing Co., Inc.—Gardena, CA
Phelps Dodge High Performance Conductors—Inman, SC
Quirk Wire Company, Inc.—West Brookfield, MA
Radix Wire Company—Euclid, OH
Rea Magnet Wire Company, Inc.—Fort Wayne, IN
Rockbestos-Surprenant Cable Corporation—East Granby, CT
Southwire Company—Carrollton, GA
Specialty Cable Corporation—Wallingford, CT
The Monroe Cable Company, Inc.—Middletown, NY
The Okonite Company—Ramsey, NJ
Tyco Electronics Raychem Wire & Cable—Menlo Park, CA

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Section 1
GENERAL

1.1 SCOPE

This Standards Publication covers specific requirements for crosslinked, modified polyolefin insulated solid and stranded wire, designed to the internal wiring of high reliability electrical and electronic equipment. This Standards Publication addresses 600 volt (Type LS, ZHDM, ZHDH, ZH), and 1000 volt (Type ZHX) wire and permits continuous conductor temperature ratings of -40ºC to + 90ºC, 105ºC, or 125ºC with either tin- or silver-coated conductors. These types of hook-up wire are used when the following requirements are called for:

- Moderate temperature resistance
- Low temperature resistance
- Good Dielectric Constant (Type ZHDM, and ZHDH)
- Moderate Dielectric Constant (Type LS)
- Good Flexibility and flex life when stranded conductors are used
- Solder iron resistance for easier solder terminations without potential damage
- Low Smoke (Types LS, ZHDM, ZHDH, ZH, ZHX)
- Zero Halogen (Types ZHDM, ZHDH ZH, ZHX)
- Low Toxicity (Types LS, ZHDM, ZHDH, ZH, ZHX)
- Low Acid Gas Generation (Types LS, ZHDM, ZHDH, ZH, ZHX)

1.2 REFERENCE STANDARDS AND SPECIFICATIONS

American Society for Testing and Materials (ASTM)
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

B3-01	*Soft or Annealed Copper Wire*
B33-00	*Tinned Soft or Annealed Copper Wire*
B286-95	*Copper Conductors for Use in Hook-up Wire for Electronics*
B298-99	*Silver Coated Soft or Annealed Copper Wire*
B624-99	*High-Strength, High Conductivity Copper-Alloy Wire for Electronic Application*
D3032-98	*Methods of Testing Hook-Up Wire Insulation*
G21 – 02	*Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi*

American Society for Quality Control
611 E. Wisconsin Ave.
Milwaukee, WI 53202

ANSI/ASQC Z1.4	*Sampling Procedures and Tables for Inspection by Attributes*