SECTION 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

Display hidden notes to specifier. (Don't know how? Click Here)

*Copyright 2015 - 2016 ARCAT, Inc. - All rights reserved*

PART 1 GENERAL

1.1 SECTION INCLUDES

    A.    Equipment Labels and Tags.

    B.    Conduit and Cable Markers and Tags.

    C.    Warning Label Signs and Tags.

    D.    Switch Plates.

    E.    Underground Warning Tape.

1.2 REFERENCES

    A.    ASME A13.1 - Scheme for the Identification of Piping Systems.

    B.    NFPA 70 National Electrical Code.

    C.    NFPA 99 Health Care Facilities Code.

    D.    29 CFR 1910.144 Safety color code for marking physical hazards

    E.    29 CFR 1910.145 Specifications for accident prevention signs and tags.

    F.    ANSI Z535.4 for safety signs and labels.

    G.    NEC 630.31 Photovoltaic Labeling

    H.    NEC 690 Photovoltaic Labeling

1.3 SUBMITTALS

    A.    Submit under provisions of Section 01 30 00 - Administrative Requirements.

    B.    Product Data: Manufacturer's data sheets on each product to be used, including:
        1.    Preparation instructions and recommendations.
        2.    Storage and handling requirements and recommendations.
        3.    Installation instructions.

C.    Shop Drawings: Submit electrical identification schedule including list of wording, symbols, letter size, color coding, tag number, location, and function..

D.    Closeout Submittals: Record actual as built locations of tagged devices and update schedules accordingly.

1.4    QUALITY ASSURANCE

A.    Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience

B.    Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience.

C.    Requirements: Comply with the following Standards:
1.    ASME A13.1 for color scheme, lettering size, length of color field, and viewing angles of identification devices.
2.    NFPA 70 National Electrical Code.
3.    NFPA 99 Health Care Facilities Code.
4.    29 CFR 1910.144 Safety color code for marking physical hazards
5.    29 CFR 1910.145 Specifications for accident prevention signs and tags.
6.    Comply with ANSI Z535.4 for safety signs and labels.
7.    NEC 630.31 Photovoltaic Labeling
8.    NEC 690 Photovoltaic Labeling

1.5    DELIVERY, STORAGE, AND HANDLING

A.    Store products in manufacturer's unopened packaging with labels clearly identifying product name and manufacturer until ready for installation.

B.    Storage: Store materials in clean, dry area indoors until ready for installation.

C.    Handling: Protect materials and finish from damage during handling and installation.

1.6    SEQUENCING

A.    Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied

1.7    PROJECT CONDITIONS

A.    Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2  PRODUCTS

2.1    MANUFACTURERS

A.    Acceptable Manufacturer: Marking Services, Inc. , which is located at: 8265 N. Faulkner Rd. P. O. Box 240027; Milwaukee, WI 53224; Toll Free Tel: 800-234-0135; Tel: 414-973-1331; Email:request info (sales@markingservices.com); Web:www.markserv.com

B.    Substitutions: Not permitted.

C.    Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2   ELECTRICAL IDENTIFICATION GENERAL

A.   General: Provide manufacturer's standard products of categories and types required for each application specified. For each identification type, provide all products from same manufacturer with same text, style, color, shape, and other identification features.
1.   Provide nameplates with the unit number on all electrical equipment.
2.   Provide electrical system identification labels with service indicated. All labels shall have background colors matched with specific service designation.
3.   Coordinate names, abbreviations and other designations used in electrical identification work with corresponding designations shown, specified or scheduled.
4.   Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturer or as required for proper identification and operation/maintenance of electrical system and equipment.
5.   Comply with ANSI A13.1 pertaining to minimum sizes for letters and numbers.

2.3   EQUIPMENT LABELS AND TAGS

A.   Engraved Plastic Electrical Control Panel and Equipment Tags:
1.   Construction: Engraving plastic with either mounting holes or an adhesive backing.
a.   2 ply, 1/16 inch
b.   3-ply 1/16 inch
2.   Colors:
a.   White letters on Black
b.   White letters on Green
c.   White letters on Red
d.   White letters on Blue
e.   Black letters on Yellow
f.   Black letters on Orange
g.   Black letters on White

B.   MS-264 Engraved Plastic Electrical Control Panel and Equipment Tags:
1.   Construction:Fire retardant polymer. Meets 1012 OHMS/square meter electrical resistivity and UL 94 V0. Tags are RoHS compliant and can be used as a replacement for phenolic.
a.   2 ply, 1/16 inch
b.   2 ply, 1/8 inch
c.   3 ply, 1/8 inch
d.   3 ply, 1/16 inch
2.   Colors:
a.   White letters on Black
b.   White letters on Green
c.   White letters on Red
d.   White letters on Blue
e.   Black letters on Yellow
f.   Black letters on Orange
g.   Black letters on White

C.   MS-900 Self-Adhesive Electrical Control Panel and Equipment Labels:
1.   Construction: Premium grade vinyl with acrylic pressure-sensitive adhesive.
2.   Colors: Labels are available in all standard safety colors and a full range of text sizes.
3.   Option: Available with MS-1000 Protective Top Laminate

D.   MS-478 Polyester Electrical Control Panel and Equipment Labels with MS-1000 Protective Top Laminate:
1.   Construction: Labels are 2 mil. thick polyester with a MS-1000 Protective Top Laminate. Labels tare chemical and abrasion resistant, extremely durable.
2.   Colors: Available in a full range of color and quantity options.

3. Labels are guaranteed against fading for five years.

E. MS-215 Max-Tek Rigid or Flexible Electrical Control Panel and Equipment Tags:
1. Construction:
2. Top layer is hard coated polycarbonate that provides excellent resistance to process chemicals, protection from high impact and functions as a UV filter to prevent fading.
3. Colors: Available in a full range of color combinations and text sizes. Tags can be cleaned easily and mount with either pre-applied adhesive or mechanical fasteners. Custom sizes and shapes can be ordered.
4. Thicknesses:
   a. RIgId: .113 inch thick for flat sign requirements
   b. FlexIble: .035 inch thick mounts on curved surfaces

F. Black Enamel Aluminum Electrical Control Panel and Equipment Tags:
1. These highly durable, scratch resistant plates can be used indoors or outdoors and provide superior contrast for maximum legibility. Tags are available with either an adhesive backing or prepunched 3/16 inch mounting holes (two side holes for 1 inch by 3 inch and 2 inch by 4 inch tags; four corner holes for 4 inch by 6 inch size).

G. Type 316 Stainless Steel Electrical Legend Plates, Control Panels, Equipment Tags and Rotary Switches:
1. Construction:
2. Laser-etched stainless steel equipment identification tags. The chemical reaction that takes place during the etching process results in the blackened text becoming part of the tag, eliminating any potential flaking or fading.
3. Tags are available with mounting holes.

H. Legend Plates for Rotary Switches:
1. Construction: 1/16 inch engraved plastic.
2. Colors:
   a. Red with contrasting text.
   b. Black with contrasting text.

2.4 CONDUIT AND CABLE MARKERS AND TAGS

A. General: Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.
1. Provide labels for above ground cable and conduit located indoors, and not exposed to sunlight or a harsh environment.
2. Pre-printed, color-coded, with lettering indicating service, and showing flow direction.
3. Lettering shall be sub-surface printed and protected from direct contact by a layer of plastic. Markers with surface printed lettering will not be accepted.

B. Cable Tray Markers:
1. MS-900 cable tray Markers: Markers conform to the shape of the tray and are made from premium grade vinyl with acrylic pressure-sensitive adhesive
2. MS-478 Polyester with MS-1000 Protective Top Laminate Cable Tray Markers: MS-478 Self-Adhesive Labels for identifying smooth sided cable trays. Constructed of pre-printed 2 mil thick polyester, that are top laminated with clear protective over-laminate film
3. MS-215 Max-Tek cable tray Markers: Constructed of printed graphics sealed between layers of chemical resistant plastic. Top layer is hard coated polycarbonate that provides excellent resistance to process chemicals, protection from high impact and functions as a UV filter to prevent fading of printing and graphics.

C. Coiled Data Cable and Conduit Identification MS-970 Coiled, semi rigid plastic formed to cover full circumference of cable or conduit and to attach without fasteners or adhesive in

contact with the cable or conduit surface.
1. Cable and Conduit Identification Color Schedule:

| Service | Lettering Color | Background Color |
|---|---|---|
| Normal Power | White | Green |
| Critical Branch | Black | Yellow |
| Life Safety | White | Purple |
| Fire Alarm | White | Red |
| Communications | White | Blue |
| Low Voltage | White | Black |

D. Coiled Data Cable and Conduit Identification (Outdoor): Constructed of printed 5 mil (0.005 inch) polyester and top laminated with MS1000 clear ultra violet and chemical resistant plastic film that is pre-applied to an acrylic-faced, co-extruded ABS plastic carrier. Carrier shall have pre-formed legs running the entire length of the part to ensure marker remains straight and aligned. Coils are sized to fit completely around the circumference of the conduit and adhere to themselves.

E. Color Banding Tape:
1. MS-900 Color Banding Tape is a self-adhesive for conduit color coding. Tape is a premium grade vinyl and acrylic pressure-sensitive adhesive.
2. MS-900 TO Color Banding Tape with a protective top laminate for color coding in high sunlight areas.

F. Brass Cable and Conduit Tags:
1. Material: .032 inch (20 gauge) brass with a 3/16 inch hole for mounting. Top line 1/4 inch text with second line 1/2 inch number is standard.
2. Size:
   a. 1-1/2 inches round.
   b. 1-1/2 inches square.
   c. 2 inches round.
   d. 2 inches square.

G. Stainless Steel laser-Etched cable Markers:
1. Material: Laser-etched 316 stainless steel with black text is permanently etched. Markers fasten with stainless steel straps.
2. Size:
   a. 3/8 inch by 2-1/2 inches.
   b. 1/2 inch by 3 inches.
   c. 3/4 inch by 3-1/2 inches.
   d. 1 inch by 4 inches.

H. Anodized or Raw Aluminum Cable and Conduit Tags:
1. Material: Laser-etched anodized aluminum tags of .032 inch (20 gauge) aluminum with a 3/16 inch hole for mounting.
2. Color:
   a. Orange
   b. Red
   c. White
   d. Yellow

  e. Black
  f. Green
  g. Blue
 3. Size:
  a. 1-1/2 inches round.
  b. 1-1/2 inches square.
  c. 2 inches round.
  d. 2 inches square.

I. Engraved Plastic Cable and Conduit Tags:
 1. Material:
  a. 2-ply engraved plastic.
  b. 3-ply engraved plastic.
 2. Thickness:
  a. 1/16 inch.
  b. 1/8 inch.
 3. Color:
  a. White letters on black.
  b. White letters on green.
  c. White letters on red.
  d. White letters on blue
  e. Black letters on yellow.
  f. Black letters on orange.
  g. Black letters on white.
 4. Size:
  a. 1-1/2 inches by 1-1/2 inches.
  b. 2 inches by 2 inches.
  c. 1-1/2 inches by 3 inches.
  d. 2 inches by 4 inches.

J. MS-215 Max-Tek Cable and Conduit Tags:
 1. Material: MS-215 Max-Tek with printed graphics protected by a chemical and UV resistant MS-3000 top laminate.
 2. Letter Color: Black
 3. Background Color: White
 4. Size:
  a. 1-1/2 inch round
  b. 1-1/2 inch square
  c. 2 inch round
  d. 2 inch square

K. Write-On Cable Ties: Provide Write-On Cable Ties for grooming bundles of wires or cables while identifying them.
 1. Loop tensile strength is 50 lbs.
 2. Color:
  a. Red
  b. Orange
  c. Yellow
  d. White
  e. Green
  f. Blue
 3. Size:
  a. 1 inch by 2 inch.
  b. 2 inch by 3 inch.

2.5 DANGER / CAUTION / WARNING LABEL SIGNS AND TAGS

A. General: Provide tags designed to tag equipment for lockout during maintenance, convey characteristics specific to a piece of equipment or detail maintenance instructions and operating procedures.

B. Accident Prevention Tags:
1. Material: 10 mil vinyl with stainless steel grommets to reduce deterioration during use.
2. Letter Color: Black
3. Background Color: White
4. Minimum Label Size: Length and width vary for required label content, but not less than 5-3/4 by 3 inches.
5. Tags provided with 8 inch nylon ties.

C. Premium Self-laminating Accident Prevention Tags: Self-laminating tags with a clear self-adhesive laminating flap to protect all written information from fading due to exposure to moisture, sunlight or harsh chemicals
1. Material: Self-laminating 10 mil vinyl with 2 mil thick laminate that can seal the tag's front, back or both.
2. Letter Color: Black
3. Background Color: White
4. Minimum Label Size: Length and width vary for required label content, but not less than 5-3/4 by 3 inches.

2.6 SWITCH PLATES

A. Laser Evgraved Stainless Steel Switch Plates:
1. Material: Stainless steel. Laser etching that provides a permanent black legend on plain stainless steel.
2. Mark switch plates with equipment or lighting information as indicated on the Drawings.
3. Size:
a. 2-3/4 inch width
b. 4-9/16 inch width

2.7 UNDERGROUND WARNING TAPE

A. Non-Detectable Underground Warning Tape:
1. Description: Color-coded tape designed to be buried above metallic underground piping or cables to warn of utility lines. Formulated to resist degradation due to acidic or alkaline soils.
2. Material: 4 mil plastic film with stock and custom legends.
3. Conforms to the APWA Standard.

B. Detectable Underground Warning Tape:
1. Description: Detectable warning tape allows for the location of buried, non-metallic pipes. Printed tape is formulated for extended use underground and is resistant to acids, alkalis and other destructive agents found in soil. Imprinted message is "encased" to prevent ink deterioration.
2. Material: 4 mil foil tape with stock and custom legends.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Install identifying devices after completion of coverings and painting.

C.  If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2  PREPARATION

A.  Clean surfaces thoroughly prior to installation.

B.  For labels that are installed using pressure-sensitive adhesives, clean conduit and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

C.  For markers that are pre-coiled or strap-on type and do not adhere directly to the conduit, no surface preparation is necessary.

3.3  INSTALLATION

A.  Install in accordance with manufacturer's instructions.

B.  Nameplate Installation:
    1.  Install nameplate for each electrical distribution and control equipment enclosure with corrosive-resistant mechanical fasteners, or adhesive.
    2.  Install nameplates for each control panel and major control components located outside panel with corrosive-resistant mechanical fasteners, or adhesive.
    3.  Secure nameplate to equipment fas recommended by the manufacturer.
    4.  Secure nameplate to inside surface of door on recessed panelboard in finished locations.
    5.  Install nameplates for the following:
        a.  Switchboards.
        b.  Panelboards.
        c.  Transformers.
        d.  Service Disconnects.
        e.  _____.

C.  Label Installation:
    1.  Install label for identification of individual control device stations, and _____.
    2.  Install labels for permanent adhesion and seal with clear lacquer.

D.  Wire Marker Installation:
    1.  Install wire marker for each conductor at panel board gutters, pull boxes, outlet and junction boxes, and each load connection.
    2.  Mark data cabling at each end. Install additional marking at accessible locations along the cable run.
    3.  Install labels at data outlets identifying patch panel and port designation [as indicated on Drawings].

E.  Conduit and Raceway Marker Installation:
    1.  Install conduit and raceway marker for each conduit or raceway longer than 6 feet.
    2.  Conduit and Raceway Marker Spacing: 20 feet (6000 mm) on center.

F.  Underground Warning Tape Installation:
    1.  Install underground warning tape along length of each underground conduit, raceway, or cable 6 to 8 inches (150 to 200 mm) below finished grade, directly above buried conduit, raceway, or cable.

G.  Equipment Labels:
    1.  Install or permanently fasten labels on each major item of electrical equipment.

        2.      Locate equipment labels where accessible and visible.

H.      Mark location of equipment located above ceilings with identifying "buttons" to help in identification for maintenance.

3.4    PROTECTION

A.      Protect installed products until completion of project.

B.      Touch-up, repair or replace damaged products before Substantial Completion.


END OF SECTION