



Marking Services Incorporated

SECTION 26 05 53  
IDENTIFICATION FOR ELECTRICAL SYSTEMS

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Equipment Identification.
- B. Raceway Identification.
- C. Cable and Conductor Identification.
- D. Circuit Identification.
- E. Wiring Device Identification.
- F. Cover Plate Engraving.
- G. Caution / Danger / Warning / Arc Flash Labeling.
- H. 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 70E Standards for Electrical Safety in the Workplace.
- D. NFPA 79 Electrical Standards for Industrial Machinery.
- E. NFPA 99 Health Care Facilities Code.
- F. 29 CFR 1910.144 Safety color code for marking physical hazards
- G. 29 CFR 1910.145 Specifications for accident prevention signs and tags.
- H. ANSI Z535.4 Safety signs and labels.

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 70E Standards for Electrical Safety in the Workplace.
  4. NFPA 79 Electrical Standards for Industrial Machinery.
  5. NFPA 99 Health Care Facilities Code.
  6. 29 CFR 1910.144 Safety color code for marking physical hazards.
  7. 29 CFR 1910.145 Specifications for accident prevention signs and tags.
  8. Comply with ANSI Z535.4 for safety signs and labels.

#### 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 \(sales@markingservices.com\)](mailto:sales@markingservices.com); Web: [www.markserv.com](http://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 IDENTIFICATION

- 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 1/8 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 are chemical and abrasion resistant, extremely durable.
  2. Colors: Available in a full range of color and quantity options.
  3. Expected outdoor durability five years.
- E. MS-215 Max-Tek Rigid or Flexible Electrical Control Panel and Equipment Tags:
1. Construction: Top layer is a 7 mil matte velvet textured film that provides excellent resistance to process chemicals, protection from high impact and functions as a UV filter to prevent fading.
  2. 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.
  3. 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 plates can be used indoors or outdoors and provide superior contrast for maximum legibility.
  2. Tags are available with either an adhesive backing or pre-punched 3/16-inch mounting holes (two side holes for 1 inch by 3 inch and 2 inches by 4-inch tags; four corner holes for 4 inch by 6-inch size).
- G. White Enamel Aluminum Equipment Tags and Signs:
1. These highly durable, plates can be used indoors and are available with MS-1000 for outdoor use.
  2. Tags are available with either an adhesive backing or pre-punched 3/16-inch mounting holes (two side holes for 1 inch by 3 inch and 2 inches by 4-inch tags; four corner holes for 4 inch by 6-inch size).
- H. Type 316 Stainless Steel Electrical Legend Plates, Control Panels, Equipment Tags and Rotary Switches:
1. Construction: Laser engraved stainless-steel equipment identification tags. The chemical reaction that takes place during the engraving process results in the blackened text becoming part of the tag, eliminating any potential flaking or fading.
  2. Tags are available with mounting holes.
- I. 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 RACEWAY IDENTIFICATION GENERAL

- A. General: Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each pipe size. Comply with NFPA 70 for tray label content and spacing requirements.
1. Provide labels cable tray and conduit located indoors and outdoors.
  2. Pre-printed, color-coded, with lettering indicating electrical system, service or showing flow direction.

## 2.5 RACEWAY: CABLE TRAY MARKERS

- A. MS-900 Cable Tray Markers:
1. Markers conform to the shape of the tray and are made from premium grade vinyl with acrylic pressure-sensitive adhesive.

- B. MS-478 Polyester with MS-1000 Protective Top Laminate Cable Tray Markers:
  1. 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 outdoor durable UV resistant over-laminate film.
- C. MS-215 Max-Tek Cable Tray Markers:
  1. Constructed of printed graphics sealed between layers of chemical resistant thermoplastic. Top layer is a 7 mil matte velvet textured film that provides excellent resistance to process chemicals, protection from high impact and functions as a UV filter to prevent fading of printing and graphics.

2.6 RACEWAY: CONDUIT MARKERS

- A. MS-970 Coiled Conduit Markers (Indoor):
  1. Semi rigid plastic formed to cover full circumference of conduit and to attach without fasteners or adhesive in contact with the conduit surface.
  2. 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

3. Conduit Identification (Outdoor): Constructed of printed 5 mil (0.005 inch) polyester and top laminated with MS-1000 clear ultraviolet and chemical resistant plastic film. Coils are sized to fit completely around the circumference of the conduit and adhere to themselves.
- B. MS-900 Color Banding Tape:
    1. Is a self-adhesive for conduit color coding. Tape is a premium grade vinyl with a permanent acrylic pressure-sensitive adhesive.
  - C. MS-900 TO Color Banding Tape:
    1. With a protective MS-1000 top laminate for outdoor use.
  - D. Brass 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.
  - E. Anodized or Raw Aluminum Conduit Tags:
    1. Material: Laser engraved 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.

Size:

- a. 1-1/2 inches round.
- b. 1-1/2 inches square.
- c. 2 inches round.
- d. 2 inches square.

F. Engraved Plastic 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.

G. MS-215 Max-Tek Conduit Tags:

- 1. Material: MS-215 Max-Tek with printed graphics protected by a chemical and UV resistant 7 mil thick matte velvet textured 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.

2.7 CABLE AND CONDUCTOR IDENTIFICATION GENERAL

- A. General: Provide labels and tags designed for identification which shall be permitted to be by separate color coding, marking tape, tagging or other approved means.
  - 1. Alphanumeric labels.
  - 2. Color-coded labels.

2.8 CABLES

- A. Stainless Steel Laser engraved Cable Markers:
  - 1. Material: Laser engraved 316 stainless steel with black text is permanently engraved. 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.
- B. MS-970 Coiled Markers:
- 1. Semi rigid plastic formed to cover full circumference of cable and to attach without fasteners or adhesive in contact with the cable surface.
- C. MS-264 Engraved Plastic Cable Tags:
- 1. Material: 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.
  - 2. Standard thickness:
    - a. 1/16 inch (1.6mm)
  - 3. 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.

## 2.9 CONDUCTORS

- A. Pre-Printed Heat Shrinkable Wire Markers:
- 1. Material: 2:1 polyolefin and printed with abrasion resistant text.
  - 2. Sizes: Cover 8 AWG to 24 AWG
    - a. .250 inch
    - b. .125 inch
- B. MS-1000 Pre-Printed Wire and Terminal Markers:
- 1. Material: MS-1000 self-adhering, pre-printed, self-laminating wrap around markers are premium outdoor grade material with pressure-sensitive adhesive.
  - 2. Custom colors and sizes available.
- C. MS-900 Color Banding Tape:
- 1. Material: is a self-adhesive for conduit color coding. Tape is a premium grade vinyl with a permanent acrylic pressure-sensitive adhesive.
  - 2. Colors:
    - a. Black.
    - b. Red.
    - c. Blue.
    - d. White.
    - e. Green.
    - f. Brown.
    - g. Orange.
    - h. Yellow.
    - i. Grey.
    - j. Purple.
- D. 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. Flag Size:
- a. 1 inch by 2 inches.
  - b. 2 inches by 3 inches.

## 2.10 CIRCUIT IDENTIFICATION

- A. General: Provide labels so as circuits can be legibly identified as to their clear, evident and specific purpose or use. The identification shall include an approved degree of detail that allows circuits to be distinguished from all others.
- B. Engraved Plastic Equipment Tags:
- 1. Construction: Engraving plastic with either mounting holes or an adhesive backing.
    - a. 2 ply, 1/16 inch.
    - b. 3-ply 1/8 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-215 Flexible Equipment Tags:
- 1. Construction: Top layer is a 7 mil matte velvet textured laminate that provides excellent resistance to process chemicals, protection from high impact and functions as a UV filter to prevent fading.
  - 2. 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.
  - 3. Thicknesses:
    - a. Rigid: .113-inch-thick for flat sign requirements.
    - b. Flexible: .035-inch-thick mounts on curved surfaces.
- D. MS-900 Self-Adhesive Electrical Control Panel and Equipment Labels:
- 1. Construction: Premium grade vinyl with permanent 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.

## 2.11 WIRING DEVICE IDENTIFICATION

- A. Engraved Plastic Equipment Tags:
- 1. Construction: Engraving plastic with either mounting holes or an adhesive backing.
    - a. 2 ply, 1/16 inch.
    - b. 3-ply 1/8 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-215 Flexible Equipment Tags:
- 1. Construction: Top layer is a 7 mil matte velvet textured laminate that provides excellent resistance to process chemicals, protection from high impact and functions as a UV filter to prevent fading.
  - 2. 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.
  - 3. Thicknesses:
    - a. Rigid: .113-inch-thick for flat sign requirements.
    - b. Flexible: .035-inch-thick mounts on curved surfaces.
- C. MS-900 Self-Adhesive Electrical Control Panel and Equipment Labels:
- 1. Construction: Premium grade vinyl with permanent 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. Legend Plates for Rotary Switches:
- 1. Construction: 1/16-inch engraved plastic.
  - 2. Colors:
    - a. Red with contrasting text.
    - b. Black with contrasting text.

## 2.12 COVER PLATE ENGRAVING

- A. Laser Engraved Cover Plates:
- 1. Material: Stainless steel. Laser engraving 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.

## 2.13 CAUTION / DANGER / WARNING / ARC FLASH LABELING

- A. General: Provide labels and tags designed to tag electrical equipment.
- 1. For lockout tag out during maintenance.
  - 2. To convey characteristics specific to a piece of equipment or detail maintenance instructions and operating procedures.
  - 3. Voltage Warning information.
  - 4. Arc Flash hazard warning.
- B. Accident Prevention Tags:
- 1. Material: 10 mil polyester reinforced synthetic paper with stainless steel grommets.
  - 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 exposure to moisture or harsh

chemicals

1. Material: 10 mil polyester reinforced synthetic paper with 2 mil thick laminating flap and stainless steel grommet.
  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.
- D. MS-900 Voltage Markers:
1. Construction: Premium grade vinyl with permanent 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.
- E. MS-900 Self-Adhesive Arc Flash Labels:
1. Construction: Premium grade vinyl with permanent 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.
- F. MS-478 Self-Adhesive Polyester Arc Flash Labels with MS-1000 Protective Top Laminate:
1. Construction: Labels are 2 mil. thick polyester with a MS-1000 Protective Top Laminate. Labels are chemical and abrasion resistant, extremely durable.
  2. Colors: Available in a full range of color and quantity options.

#### 2.14 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 polyethylene 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: 5 mil foil tape with stock and custom legends.
  3. Conforms to the APWA Standard.

### 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 or cable, no surface preparation is necessary.

### 3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Equipment 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 as 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. Control Panels.
    - d. Service Disconnects.
    - e. Transfer Switches.
    - f. Transformers.
    - g. Motor Control Centers.
    - h. Variable Frequency Drives.
    - i. \_\_\_\_\_.
- C. Raceway Marker Installation:
  - 1. Install conduit and tray marker for each conduit or raceway longer than 6 feet.
  - 2. Cable tray markers affixed at intervals of 3m (10ft).
  - 3. Install conduit markers at each end of run.
- D. Cable and Conductor / Wire Marker Installation:
  - 1. Install wire marker for each conductor at electrical termination points in equipment such as switchboards, panelboards, control panels, disconnects, junction boxes, power outlets, lighting devices, and any other termination points.
  - 2. Install power cable markers at each end of cable.
  - 3. Mark data cabling at each end. Install additional marking at accessible locations along the cable run.
  - 4. Install labels at data outlets identifying patch panel and port designation [as indicated on Drawings].
- E. Equipment Safety Labels:
  - 1. Install or permanently fasten labels on each major item of electrical equipment.
  - 2. Locate equipment labels where accessible and visible.
  - 3. Install labels for permanent adhesion.
- 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 or as directed as per drawings/specifications) below finished grade, directly above buried conduit, raceway or cable.
- G. 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