MasterFormat® Numbers & Titles

April 2016

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11 74 00  Dental Equipment
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12 56 00  **Institutional Furniture**  
12 56 23  Religious Furniture  
12 56 33  Classroom Furniture  
12 56 33.13  Fixed Classroom Tables  
12 56 33.23  Classroom Computer Furniture  
12 56 39  Lecterns  
12 56 43  Dormitory Furniture  
12 56 51  Library Furniture  
12 56 51.13  Book Shelves  
12 56 51.16  Study Carrels  
12 56 51.19  Index Card File Cabinets  
12 56 52  Audio-Visual Furniture  
12 56 53  Laboratory Furniture  
12 56 70  Healthcare Furniture  
12 56 83  Custom Institutional Furniture  
12 56 86  Institutional Control Room Furniture  

12 57 00  **Industrial Furniture**  
12 57 13  Welding Benches  
12 57 16  Welding Screens  
12 57 19  Laser Containment Screens  
12 57 83  Custom Industrial Furniture  
12 57 86  Industrial Control Room Furniture  

12 58 00  **Residential Furniture**  
12 58 13  Couches and Loveseats  
12 58 13.13  Futons  
12 58 16  Residential Chairs  
12 58 16.13  Reclining Chairs  
12 58 19  Dining Tables and Chairs  
12 58 23  Coffee Tables  
12 58 26  Entertainment Centers  
12 58 29  Beds  
12 58 29.13  Daybeds  
12 58 33  Dressers  
12 58 33.13  Armoires  
12 58 36  Nightstands  
12 58 83  Custom Residential Furniture  

12 59 00  **Systems Furniture**  
12 59 13  Panel-Hung Component System Furniture  
12 59 16  Free-Standing Component System Furniture
12 59 19  Beam System Furniture
12 59 23  Desk System Furniture
12 59 83  Custom Systems Furniture

**12 60 00  Multiple Seating**

**12 61 00  Fixed Audience Seating**
12 61 13  Upholstered Audience Seating
12 61 16  Molded-Plastic Audience Seating

**12 62 00  Portable Audience Seating**
12 62 13  Folding Chairs
12 62 16  Interlocking Chairs
12 62 19  Stacking Chairs
12 62 23  Portable Bleachers

**12 63 00  Stadium and Arena Seating**
12 63 13  Stadium and Arena Bench Seating
12 63 23  Stadium and Arena Seats

**12 64 00  Booths and Tables**

**12 65 00  Multiple-Use Fixed Seating**

**12 66 00  Telescoping Stands**
12 66 13  Telescoping Bleachers
12 66 23  Telescoping Chair Platforms

**12 67 00  Pews and Benches**
12 67 13  Pews
12 67 23  Benches

**12 68 00  Seat and Table Assemblies**
12 68 13  Pedestal Tablet Arm Chairs

**12 90 00  Other Furnishings**

**12 92 00  Interior Planters and Artificial Plants**
12 92 13  Interior Artificial Plants
12 92 33  Interior Planters
12 92 43  Interior Landscaping Accessories

**12 93 00  Interior Public Space Furnishings**
12 93 13  Bicycle Racks
12 93 14  Bicycle Lockers
12 93 23  Trash and Litter Receptacles

**13 00 00  Special Construction**

**13 01 00  Operation and Maintenance of Special Construction**
13 01 10  Operation and Maintenance of Special Facility Components
13 01 11  Operation and Maintenance of Swimming Pools
13 01 12  Operation and Maintenance of Fountains
13 01 13  Operation and Maintenance of Aquariums
13 01 14  Operation and Maintenance of Amusement Park Structures and Equipment
13 01 18  Operation and Maintenance of Ice Rinks
13 01 20  Operation and Maintenance of Special Purpose Rooms
13 01 21  Operation and Maintenance of Controlled Environment Rooms
13 01 23  Operation and Maintenance of Planetariums
13 01 30  Operation and Maintenance of Special Structures
13 01 40  Operation and Maintenance of Integrated Construction
13 01 49  Operation and Maintenance of Radiation Protection
13 01 50  Operation and Maintenance of Special Instrumentation
13 01 51  Operation and Maintenance of Stress Instrumentation
13 01 52  Operation and Maintenance of Seismic Instrumentation
13 01 53  Operation and Maintenance of Meteorological Instrumentation

13 05 00  Common Work Results for Special Construction
  13 05 05  Selective Demolition for Special Construction

13 06 00  Schedules for Special Construction
  13 06 10  Schedules for Special Facility Components
  13 06 20  Schedules for Special Purpose Rooms
  13 06 30  Schedules for Special Structures
  13 06 40  Schedules for Integrated Construction
  13 06 50  Schedules for Special Instrumentation

13 08 00  Commissioning of Special Construction
  13 08 10  Commissioning of Special Facility Components
  13 08 11  Commissioning of Swimming Pools
  13 08 12  Commissioning of Fountains
  13 08 13  Commissioning of Aquariums
  13 08 14  Commissioning of Amusement Park Structures and Equipment
  13 08 18  Commissioning of Ice Rinks
  13 08 20  Commissioning of Special Purpose Rooms
  13 08 21  Commissioning of Controlled Environment Rooms
  13 08 23  Commissioning of Planetariums
  13 08 30  Commissioning of Special Structures
  13 08 40  Commissioning of Integrated Construction
  13 08 50  Commissioning of Special Instrumentation

13 10 00  Special Facility Components

13 11 00  Swimming Pools
  13 11 13  Below-Grade Swimming Pools
  13 11 23  On-Grade Swimming Pools
  13 11 33  Elevated Swimming Pools
  13 11 43  Recirculating Gutter Systems
  13 11 46  Swimming Pool Accessories
  13 11 49  Swimming Pool Cleaning Equipment
  13 11 53  Movable Pool Bulkheads
  13 11 56  Movable Pool Floors

13 12 00  Fountains
  13 12 13  Exterior Fountains
  13 12 23  Interior Fountains

13 13 00  Aquariums

13 14 00  Amusement Park Structures and Equipment
  13 14 13  Water Slides
  13 14 16  Wave Generating Equipment
  13 14 23  Amusement Park Rides

13 15 00  Specialty Element Construction

13 17 00  Tubs and Pools
13 17 13  Hot Tubs
13 17 23  Therapeutic Pools
13 17 33  Whirlpool Tubs

13 18 00  Ice Rinks
13 18 13  Ice Rink Floor Systems
13 18 16  Ice Rink Dasher Boards

13 19 00  Kennels and Animal Shelters
13 19 13  Kennel Enclosures and Gates
13 19 16  Kennel Feeding Devices
13 19 19  Animal Washing Tubs

13 20 00  Special Purpose Rooms

13 21 00  Controlled Environment Rooms
13 21 13  Clean Rooms
13 21 16  Hyperbaric Rooms
13 21 23  Insulated Rooms
13 21 26  Cold Storage Rooms
13 21 26.13  Walk-in Coolers
13 21 26.16  Walk-in Freezers
13 21 29  Constant Temperature Rooms
13 21 48  Sound-Conditioned Rooms

13 22 00  Office Shelters and Booths

13 24 00  Special Activity Rooms
13 24 16  Saunas
13 24 26  Steam Baths
13 24 66  Athletic Rooms

13 26 00  Fabricated Rooms
13 26 13  Storm Shelter Rooms

13 27 00  Vaults
13 27 16  Modular Fire Vaults
13 27 53  Security Vaults
13 27 53.13  Modular Concrete Security Vaults
13 27 53.16  Modular Metal-Clad Laminated Security Vaults

13 28 00  Athletic and Recreational Special Construction
13 28 13  Indoor Soccer Boards
13 28 16  Safety Netting
13 28 19  Arena Football Boards
13 28 26  Floor Sockets
13 28 33  Athletic and Recreational Court Walls
13 28 66  Demountable Athletic Surfaces

13 30 00  Special Structures

13 31 00  Fabric Structures
13 31 13  Air-Supported Fabric Structures
13 31 13.13  Single-Walled Air-Supported Structures
13 31 13.16  Multiple-Walled Air-Supported Structures
13 31 23  Tensioned Fabric Structures
13 31 33  Framed Fabric Structures
13 32 00  Space Frames
   13 32 13  Metal Space Frames
   13 32 23  Wood Space Frames
13 33 00  Geodesic Structures
   13 33 13  Geodesic Domes
13 34 00  Fabricated Engineered Structures
   13 34 13  Glazed Structures
   13 34 13.13  Greenhouses
   13 34 13.16  Solariums
   13 34 13.19  Swimming Pool Enclosures
   13 34 13.23  Sunrooms
   13 34 13.26  Conservatories
   13 34 16  Grandstands and Bleachers
   13 34 16.13  Grandstands
   13 34 16.53  Bleachers
   13 34 18  Post Frame Building Systems
   13 34 19  Metal Building Systems
   13 34 23  Fabricated Structures
   13 34 23.13  Portable and Mobile Buildings
   13 34 23.14  Fabricated Classroom Buildings
   13 34 23.16  Fabricated Control Booths
   13 34 23.19  Fabricated Dome Structures
   13 34 23.23  Fabricated Substation Control Rooms
   13 34 56  Observatories
13 35 00  Rammed Earth Construction
   13 35 13  Rammed Earth Walls
   13 35 13.13  Traditional Rammed Earth Walls
   13 35 13.23  Stabilized Insulated Rammed Earth Walls
13 36 00  Towers
   13 36 13  Metal Towers
   13 36 13.13  Steel Towers
   13 36 23  Wood Towers
13 40 00  Integrated Construction
13 42 00  Building Modules
   13 42 13  Bathroom Unit Modules
   13 42 25  Hospitality Unit Modules
   13 42 33  Apartment Unit Modules
   13 42 43  Dormitory Unit Modules
   13 42 46  Education Unit Modules
   13 42 63  Detention Cell Modules
   13 42 63.13  Precast-Concrete Detention Cell Modules
   13 42 63.16  Steel Detention Cell Modules
13 44 00  Modular Mezzanines
13 47 00  Facility Protection
   13 47 13  Cathodic Protection
   13 47 13.13  Cathodic Protection for Underground and Submerged Piping
   13 47 13.16  Cathodic Protection for Underground Storage Tanks
   13 47 13.19  Cathodic Protection for Concrete Reinforcing
13 48 00  Sound, Vibration, and Seismic Control
13 48 13 Manufactured Sound and Vibration Control Components
13 48 23 Fabricated Sound and Vibration Control Assemblies
13 48 53 Manufactured Seismic Control Components
13 48 63 Fabricated Seismic Control Assemblies

13 49 00 Radiation Protection
13 49 13 Integrated X-Ray Shielding Assemblies
13 49 16 Modular X-Ray Shielding Rooms
13 49 23 Integrated RFI/EMI Shielding Assemblies
13 49 26 Modular RFI/EMI Shielding Rooms

13 50 00 Special Instrumentation
13 51 00 Stress Instrumentation
13 52 00 Seismic Instrumentation
13 53 00 Meteorological Instrumentation
13 53 13 Solar Instrumentation
13 53 23 Wind Instrumentation

14 00 00 Conveying Equipment
14 01 00 Operation and Maintenance of Conveying Equipment
14 01 10 Operation and Maintenance of Dumbwaiters
14 01 10.71 Dumbwaiter Rehabilitation
14 01 20 Operation and Maintenance of Elevators
14 01 20.71 Elevator Rehabilitation
14 01 30 Operation and Maintenance of Escalators and Moving Walks
14 01 30.71 Escalators and Moving Walks Rehabilitation
14 01 40 Operation and Maintenance of Lifts
14 01 40.71 Lift Rehabilitation
14 01 70 Operation and Maintenance of Turntables
14 01 80 Operation and Maintenance of Scaffolding
14 01 90 Operation and Maintenance of Other Conveying Equipment

14 05 00 Common Work Results for Conveying Equipment
14 05 05 Selective Demolition for Conveying Equipment

14 06 00 Schedules for Conveying Equipment
14 06 10 Schedules for Dumbwaiters
14 06 20 Schedules for Elevators
14 06 20.13 Elevator Equipment Schedule
14 06 30 Schedules for Escalators and Moving Walks
14 06 40 Schedules for Lifts
14 06 40.13 Lift Schedule
14 06 70 Schedules for Turntables
14 06 80 Schedules for Scaffolding
14 06 90 Schedules for Other Conveying Equipment

14 08 00 Commissioning of Conveying Equipment
14 08 10 Commissioning of Dumbwaiters
14 08 20 Commissioning of Elevators
14 08 30 Commissioning of Escalators and Moving Walks
14 08 40 Commissioning of Lifts
14 08 70 Commissioning of Turntables
14 08 80 Commissioning of Scaffolding
14 10 00  Dumbwaiters
14 11 00  Manual Dumbwaiters
14 12 00  Electric Dumbwaiters
14 14 00  Hydraulic Dumbwaiters
14 20 00  Elevators
14 21 00  Electric Traction Elevators
   14 21 13  Electric Traction Freight Elevators
   14 21 23  Electric Traction Passenger Elevators
   14 21 23.13  Machine Room Electric Traction Passenger Elevators
   14 21 23.16  Machine Room-Less Electric Traction Passenger Elevators
   14 21 33  Electric Traction Residential Elevators
   14 21 43  Electric Traction Service Elevators
14 24 00  Hydraulic Elevators
   14 24 13  Hydraulic Freight Elevators
   14 24 23  Hydraulic Passenger Elevators
   14 24 33  Hydraulic Residential Elevators
   14 24 43  Hydraulic Service Elevators
14 26 00  Limited-Use/Limited-Application Elevators
14 27 00  Custom Elevator Cabs and Doors
   14 27 13  Custom Elevator Cab Finishes
   14 27 16  Custom Elevator Doors
14 28 00  Elevator Equipment and Controls
   14 28 16  Elevator Controls
   14 28 19  Elevator Equipment
   14 28 19.13  Elevator Safety Equipment
   14 28 19.16  Elevator Hoistway Equipment
14 30 00  Escalators and Moving Walks
14 31 00  Escalators
14 32 00  Moving Walks
14 33 00  Moving Ramps
   14 33 13  Motorized Ramps
   14 33 16  Powered Ramps
14 40 00  Lifts
14 41 00  People Lifts
   14 41 13  Counterbalanced People Lifts
   14 41 16  Endless-Belt People Lifts
   14 41 19  Stairway Chairlifts
14 42 00  Wheelchair Lifts
   14 42 13  Inclined Wheelchair Lifts
   14 42 16  Vertical Wheelchair Lifts
14 43 00  Platform Lifts
   14 43 13  Orchestra Lifts
   14 43 16  Stage Lifts
14 44 00  Sidewalk Lifts
14 45 00  Vehicle Lifts
   14 45 13  Vehicle Service Lifts
   14 45 23  Vehicle Parking Lifts
14 46 00  Material Lifts
14 70 00  Turntables
14 71 00  Industrial Turntables
   14 71 11  Vehicle Turntables
14 72 00  Hospitality Turntables
   14 72 25  Restaurant Turntables
14 73 00  Exhibit Turntables
   14 73 59  Display Turntables
14 74 00  Entertainment Turntables
   14 74 61  Stage Turntables
14 80 00  Scaffolding
14 81 00  Suspended Scaffolding
   14 81 13  Beam Scaffolding
   14 81 16  Carriage Scaffolding
   14 81 19  Hook Scaffolding
14 82 00  Rope Climbers
   14 82 13  Manual Rope Climbers
   14 82 16  Powered Rope Climbers
14 83 00  Elevating Platforms
   14 83 13  Telescoping Platform Lifts
   14 83 13.13  Electric and Battery Telescoping Platform Lifts
   14 83 13.16  Pneumatic Telescoping Platform Lifts
   14 83 16  Scissor Lift Platforms
   14 83 19  Multi-Axis Platform Lifts
14 84 00  Powered Scaffolding
   14 84 13  Window Washing Scaffolding
   14 84 23  Window Washing Hoists
14 90 00  Other Conveying Equipment
14 91 00  Facility Chutes
   14 91 13  Coal Chutes
   14 91 23  Escape Chutes
   14 91 33  Laundry and Linen Chutes
   14 91 82  Trash Chutes
14 92 00  Pneumatic Tube Systems
14 93 00  Slide Pole Systems
   14 93 13  Firehouse Slide Poles
21 00 00  Fire Suppression
21 01 00  Operation and Maintenance of Fire Suppression
   21 01 10  Operation and Maintenance of Water-Based Fire-Suppression Systems
   21 01 20  Operation and Maintenance of Fire-Extinguishing Systems
   21 01 30  Operation and Maintenance of Fire-Suppression Equipment
21 05 00  Common Work Results for Fire Suppression
    21 05 05  Selective Demolition for Fire Suppression
    21 05 13  Common Motor Requirements for Fire-Suppression Equipment
    21 05 16  Expansion Fittings and Loops for Fire-Suppression Piping
    21 05 17  Sleeves and Sleeve Seals for Fire-Suppression Piping
    21 05 19  Meters and Gages for Fire-Suppression Systems
    21 05 23  General-Duty Valves for Water-Based Fire-Suppression Piping
    21 05 29  Hangers and Supports for Fire-Suppression Piping and Equipment
    21 05 33  Heat Tracing for Fire-Suppression Piping
    21 05 48  Vibration and Seismic Controls for Fire-Suppression Piping and Equipment
    21 05 53  Identification for Fire-Suppression Piping and Equipment
21 06 00  Schedules for Fire Suppression
    21 06 10  Schedules for Water-Based Fire-Suppression Systems
    21 06 20  Schedules for Fire-Extinguishing Systems
    21 06 30  Schedules for Fire-Suppression Equipment
21 07 00  Fire Suppression Systems Insulation
    21 07 16  Fire-Suppression Equipment Insulation
    21 07 19  Fire-Suppression Piping Insulation
21 08 00  Commissioning of Fire Suppression
21 09 00  Instrumentation and Control for Fire-Suppression Systems
21 10 00  Water-Based Fire-Suppression Systems
21 11 00  Facility Fire-Suppression Water-Service Piping
    21 11 16  Facility Fire Hydrants
    21 11 19  Fire-Department Connections
21 12 00  Fire-Suppression Standpipes
    21 12 13  Fire-Suppression Hoses and Nozzles
    21 12 16  Fire-Suppression Hose Reels
    21 12 19  Fire-Suppression Hose Racks
    21 12 23  Fire-Suppression Hose Valves
21 13 00  Fire-Suppression Sprinkler Systems
    21 13 13  Wet-Pipe Sprinkler Systems
    21 13 16  Dry-Pipe Sprinkler Systems
    21 13 19  Preaction Sprinkler Systems
    21 13 23  Combined Dry-Pipe and Preaction Sprinkler Systems
    21 13 26  Deluge Fire-Suppression Sprinkler Systems
    21 13 29  Water Spray Fixed Systems
    21 13 36  Antifreeze Sprinkler Systems
    21 13 39  Foam-Water Systems
21 16 00  Fire-Suppression Pressure Maintenance Pumps
21 20 00  Fire-Extinguishing Systems
21 21 00  Carbon-Dioxide Fire-Extinguishing Systems
    21 21 13  Carbon-Dioxide Fire-Extinguishing Piping
    21 21 13.13 High-Pressure, Carbon-Dioxide Fire-Extinguishing Systems
    21 21 13.16 Low-Pressure, Carbon-Dioxide Fire-Extinguishing Systems
    21 21 16  Carbon-Dioxide Fire-Extinguishing Equipment
21 22 00  Clean-Agent Fire-Extinguishing Systems
   21 22 13  Clean-Agent Fire-Extinguishing Piping
   21 22 16  Clean-Agent Fire-Extinguishing Equipment
21 23 00  Wet-Chemical Fire-Extinguishing Systems
   21 23 13  Wet-Chemical Fire-Extinguishing Piping
   21 23 16  Wet-Chemical Fire-Extinguishing Equipment
21 24 00  Dry-Chemical Fire-Extinguishing Systems
   21 24 13  Dry-Chemical Fire-Extinguishing Piping
   21 24 16  Dry-Chemical Fire-Extinguishing Equipment
21 30 00  Fire Pumps
21 31 00  Centrifugal Fire Pumps
   21 31 13  Electric-Drive, Centrifugal Fire Pumps
   21 31 16  Diesel-Drive, Centrifugal Fire Pumps
21 32 00  Vertical-Turbine Fire Pumps
   21 32 13  Electric-Drive, Vertical-Turbine Fire Pumps
   21 32 16  Diesel-Drive, Vertical-Turbine Fire Pumps
21 33 00  Positive-Displacement Fire Pumps
   21 33 13  Electric-Drive, Positive-Displacement Fire Pumps
   21 33 16  Diesel-Drive, Positive-Displacement Fire Pumps
21 34 00  Fire Pump Accessories
   21 34 13  Pressure Maintenance Pumps
21 40 00  Fire-Suppression Water Storage
21 41 00  Storage Tanks for Fire-Suppression Water
   21 41 13  Pressurized Storage Tanks for Fire-Suppression Water
   21 41 16  Elevated Storage Tanks for Fire-Suppression Water
   21 41 19  Roof-Mounted Storage Tanks for Fire-Suppression Water
   21 41 23  Ground Suction Storage Tanks for Fire-Suppression Water
   21 41 26  Underground Storage Tanks for Fire-Suppression Water
   21 41 29  Storage Tanks for Fire-Suppression Water Additives
22 00 00  Plumbing
22 01 00  Operation and Maintenance of Plumbing
   22 01 10  Operation and Maintenance of Plumbing Piping and Pumps
   22 01 10.16 Video Piping Inspections
   22 01 10.51 Plumbing Piping Cleaning
   22 01 10.61 Plumbing Piping Repairs
   22 01 10.62 Plumbing Piping Relining
   22 01 30  Operation and Maintenance of Plumbing Equipment
   22 01 40  Operation and Maintenance of Plumbing Fixtures
   22 01 50  Operation and Maintenance of Pool and Fountain Plumbing Systems
   22 01 60  Operation and Maintenance of Laboratory and Healthcare Systems
22 05 00  Common Work Results for Plumbing
   22 05 05  Selective Demolition for Plumbing
   22 05 13  Common Motor Requirements for Plumbing Equipment
   22 05 16  Expansion Fittings and Loops for Plumbing Piping
   22 05 17  Sleeves and Sleeve Seals for Plumbing Piping
   22 05 19  Meters and Gages for Plumbing Piping
22 05 23  General-Duty Valves for Plumbing Piping
22 05 29  Hangers and Supports for Plumbing Piping and Equipment
22 05 33  Heat Tracing for Plumbing Piping
22 05 48  Vibration and Seismic Controls for Plumbing Piping and Equipment
22 05 48.13 Vibration Controls for Plumbing Piping and Equipment
22 05 53  Identification for Plumbing Piping and Equipment
22 05 73  Facility Drainage Manholes
22 05 76  Facility Drainage Piping Cleanouts
22 06 00  Schedules for Plumbing
22 06 10  Schedules for Plumbing Piping and Pumps
22 06 10.13 Plumbing Pump Schedule
22 06 12  Schedules for Facility Potable Water Storage
22 06 15  Schedules for General Service Compressed-Air Equipment
22 06 30  Schedules for Plumbing Equipment
22 06 30.13 Domestic Water Heater Schedule
22 06 40  Schedules for Plumbing Fixtures
22 06 40.13 Plumbing Fixture Schedule
22 06 50  Schedules for Pool and Fountain Plumbing Systems
22 06 60  Schedules for Laboratory and Healthcare Systems
22 07 00  Plumbing Insulation
22 07 16  Plumbing Equipment Insulation
22 07 19  Plumbing Piping Insulation
22 08 00  Commissioning of Plumbing
22 09 00  Instrumentation and Control for Plumbing
22 09 63  Medical Gas Alarms
22 10 00  Plumbing Piping
22 11 00  Facility Water Distribution
22 11 13  Facility Water Distribution Piping
22 11 16  Domestic Water Piping
22 11 17  Gray-Water Piping
22 11 19  Domestic Water Piping Specialties
22 11 23  Domestic Water Pumps
22 11 23.13 Domestic-Water Packaged Booster Pumps
22 11 23.23 Domestic-Water In-Line Pumps
22 11 23.26 Close-Coupled, Horizontally Mounted, In-Line Centrifugal Domestic-Water Pumps
22 11 23.29 Close-Coupled, Vertically Mounted, In-Line Centrifugal Domestic-Water Pumps
22 11 23.33 Separately Coupled, In-Line Centrifugal Domestic-Water Pumps
22 11 23.36 Separately Coupled, Horizontally Mounted, In-Line Centrifugal Domestic-Water Pumps
22 11 23.43 Domestic-Water, Base-Mounted Pumps
22 11 63  Gray-Water Pumps
22 12 00  Facility Potable-Water Storage Tanks
22 12 13  Facility Roof-Mounted, Potable-Water Storage Tanks
22 12 16  Facility Elevated, Potable-Water Storage Tanks
22 12 19  Facility Ground-Mounted, Potable-Water Storage Tanks
22 12 21  Facility Underground Potable-Water Storage Tanks
22 12 23  Facility Indoor Potable-Water Storage Tanks
22 12 23.13 Facility Steel, Indoor Potable-Water Storage Pressure Tanks
22 12 23.16 Facility Steel, Indoor Potable-Water Storage Non-Pressure Tanks
22 12 23.23 Facility Plastic, Indoor Potable-Water Storage Pressure Tanks
22 13 00  **Facility Sanitary Sewerage**
22 13 13  Facility Sanitary Sewers
22 13 16  Sanitary Waste and Vent Piping
22 13 19  Sanitary Waste Piping Specialties
22 13 19.13  Sanitary Drains
22 13 19.23  Fats, Oils, and Grease Disposal Systems
22 13 19.26  Grease Removal Devices
22 13 19.33  Backwater Valves
22 13 19.36  Air-Admittance Valves
22 13 23  Sanitary Waste Interceptors
22 13 26  Sanitary Waste Separators
22 13 29  Sanitary Sewerage Pumps
22 13 29.13  Wet-Pit-Mounted, Vertical Sewerage Pumps
22 13 29.16  Submersible Sewerage Pumps
22 13 29.23  Sewerage Pump Reverse-Flow Assemblies
22 13 29.33  Sewerage Pump Basins and Pits
22 13 33  Packaged, Submersible Sewerage Pump Units
22 13 36  Packaged, Wastewater Pump Units
22 13 43  Facility Packaged Sewage Pumping Stations
22 13 43.13  Facility Dry-Well Packaged Sewage Pumping Stations
22 13 43.16  Facility Wet-Well Packaged Sewage Pumping Stations
22 13 63  Facility Gray Water Tanks

22 14 00  **Facility Storm Drainage**
22 14 13  Facility Storm Drainage Piping
22 14 16  Rainwater Leaders
22 14 19  Sump Pump Discharge Piping
22 14 23  Storm Drainage Piping Specialties
22 14 26  Facility Storm Drains
22 14 26.13  Roof Drains
22 14 26.16  Facility Area Drains
22 14 26.19  Facility Trench Drains
22 14 29  Sump Pumps
22 14 29.13  Wet-Pit-Mounted, Vertical Sump Pumps
22 14 29.16  Submersible Sump Pumps
22 14 29.19  Sump-Pump Basins and Pits
22 14 33  Packaged, Pedestal Drainage Pump Units
22 14 36  Packaged, Submersible, Drainage Pump Units
22 14 53  Rainwater Storage Tanks
22 14 63  Facility Storm-Water Retention Tanks

22 15 00  **General Service Compressed-Air Systems**
22 15 13  General Service Compressed-Air Piping
22 15 16  General Service Compressed-Air Valves
22 15 19  General Service Packaged Air Compressors and Receivers
22 15 19.13  General Service Packaged Reciprocating Air Compressors
22 15 19.16  General Service Packaged Liquid-Ring Air Compressors
22 15 19.19  General Service Packaged Rotary-Screw Air Compressors
22 15 19.23  General Service Packaged Sliding-Vane Air Compressors

22 30 00  **Plumbing Equipment**
22 31 00  **Domestic Water Softeners**
22 31 13  Residential Domestic Water Softeners
22 31 16  Commercial Domestic Water Softeners

22 32 00  Domestic Water Filtration Equipment
   22 32 13  Domestic-Water Bag-Type Filters
   22 32 16  Domestic-Water Freestanding Cartridge Filters
   22 32 19  Domestic-Water Off-Floor Cartridge Filters
   22 32 23  Domestic-Water Carbon Filters
   22 32 26  Domestic-Water Sand Filters
   22 32 26.13 Domestic-Water Circulating Sand Filters
   22 32 26.16 Domestic-Water Multimedia Sand Filters
   22 32 26.19 Domestic-Water Greensand Filters

22 33 00  Electric Domestic Water Heaters
   22 33 13  Instantaneous Electric Domestic Water Heaters
   22 33 13.13 Flow-Control, Instantaneous Electric Domestic Water Heaters
   22 33 13.16 Thermostat-Control, Instantaneous Electric Domestic Water Heaters
   22 33 30  Residential, Electric Domestic Water Heaters
   22 33 30.13 Residential, Small-Capacity Electric Domestic Water Heaters
   22 33 30.16 Residential, Storage Electric Domestic Water Heaters
   22 33 30.23 Residential, Collector-to-Tank, Solar-Electric Domestic Water Heaters
   22 33 30.26 Residential, Collector-to-Tank, Heat-Exchanger-Coil, Solar-Electric Domestic Water Heaters
   22 33 33  Light-Commercial Electric Domestic Water Heaters
   22 33 36  Commercial Domestic Water Electric Booster Heaters
   22 33 36.13 Commercial Domestic Water Electric Booster Heaters
   22 33 36.16 Commercial Storage Electric Domestic Water Heaters

22 34 00  Fuel-Fired Domestic Water Heaters
   22 34 13  Instantaneous, Tankless, Gas Domestic Water Heaters
   22 34 30  Residential Gas Domestic Water Heaters
   22 34 30.13 Residential, Atmospheric, Gas Domestic Water Heaters
   22 34 30.16 Residential, Direct-Vent, Gas Domestic Water Heaters
   22 34 30.19 Residential, Power-Vent, Gas Domestic Water Heaters
   22 34 36  Commercial Gas Domestic Water Heaters
   22 34 36.13 Commercial, Atmospheric, Gas Domestic Water Heaters
   22 34 36.16 Commercial, Power-Burner, Gas Domestic Water Heaters
   22 34 36.19 Commercial, Power-Vent, Gas Domestic Water Heaters
   22 34 36.23 Commercial, High-Efficiency, Gas Domestic Water Heaters
   22 34 36.26 Commercial, Coil-Type, Finned-Tube, Gas Domestic Water Heaters
   22 34 36.29 Commercial, Grid-Type, Finned-Tube, Gas Domestic Water Heaters
   22 34 46  Oil-Fired Domestic Water Heaters
   22 34 46.13 Large-Capacity, Oil-Fired Domestic Water Heaters
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### 23 83 00 Radiant Heating Units

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### 23 84 00 Humidity Control Equipment

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23 84 13.23 Direct-Steam-Injection Humidifiers
23 84 13.26 Jacketed, Steam Humidifiers
23 84 13.29 Self-Contained Steam Humidifiers
23 84 13.33 Portable Humidifiers
23 84 16 Mechanical Dehumidification Units
23 84 16.13 Outdoor, Mechanical Dehumidification Units
23 84 16.16 Indoor, Mechanical Dehumidification Units
23 84 16.33 Portable Dehumidifiers
23 84 19 Desiccant Dehumidification Units

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25 01 00 Operation and Maintenance of Integrated Automation
25 01 10 Operation and Maintenance of Integrated Automation Network Equipment
25 01 20 Operation and Maintenance of Integrated Equipment
25 01 30 Operation and Maintenance of Integrated Automation Instrumentation and Terminal Devices
25 01 90 Diagnostic Systems for Integrated Automation

25 05 00 Common Work Results for Integrated Automation
25 05 05 Selective Demolition for Integrated Automation
25 05 13 Conductors and Cables for Integrated Automation
25 05 26 Grounding and Bonding for Integrated Automation
25 05 28 Pathways for Integrated Automation
25 05 28.29 Hangers and Supports for Integrated Automation
25 05 28.33 Conduits and Backboxes for Integrated Automation
25 05 28.36 Cable Trays for Integrated Automation
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25 05 53 Identification for Integrated Automation

25 06 00 Schedules for Integrated Automation
25 06 11 Schedules for Integrated Automation Network
25 06 12 Schedules for Integrated Automation Network Gateways
25 06 13 Schedules for Integrated Automation Control and Monitoring Network
25 06 14 Schedules for Integrated Automation Local Control Units
25 06 30 Schedules for Integrated Automation Instrumentation and Terminal Devices

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25 10 00 Integrated Automation Network Equipment

25 11 00 Integrated Automation Network Devices
25 11 13 Integrated Automation Network Servers
25 11 16 Integrated Automation Network Routers, Bridges, Switches, Hubs, and Modems
25 11 19 Integrated Automation Network Operator Workstations

25 12 00 Integrated Automation Network Gateways
25 12 13 Hardwired Integration Network Gateways
25 12 16 Direct-Protocol Integration Network Gateways
25 12 19 Neutral-Protocol Integration Network Gateways
25 12 23 Client-Server Information/Database Integration Network Gateways

25 13 00 Integrated Automation Control and Monitoring
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25 53 00  Integrated Automation Control of Fire-Suppression Systems
25 54 00  Integrated Automation Control of Plumbing
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25 90 00  Integrated Automation Control Sequences
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25 97 00  Integrated Automation Control Sequences for Communications Systems
25 98 00  Integrated Automation Control Sequences for Electronic Safety and Security Systems

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26 01 00  Operation and Maintenance of Electrical Systems
   26 01 10  Operation and Maintenance of Medium-Voltage Electrical Distribution
   26 01 20  Operation and Maintenance of Low-Voltage Electrical Distribution
   26 01 26  Maintenance Testing of Electrical Systems
   26 01 30  Operation and Maintenance of Facility Electrical Power Generating and Storing Equipment
   26 01 40  Operation and Maintenance of Electrical Protection Systems
   26 01 40.13 Operation and Maintenance of Lightning Protection Systems
   26 01 50  Operation and Maintenance of Lighting
   26 01 50.51 Luminaire Relamping
   26 01 50.81 Luminaire Replacement
26 05 00  Common Work Results for Electrical
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26 05 13.13 Medium-Voltage Open Conductors
26 05 13.16 Medium-Voltage, Single- and Multi-Conductor Cables
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26 05 19.13 Undercarpet Electrical Power Cables
26 05 19.23 Manufactured Wiring Assemblies
26 05 23 Control-Voltage Electrical Power Cables
26 05 26 Grounding and Bonding for Electrical Systems
26 05 29 Hangers and Supports for Electrical Systems
26 05 33 Raceway and Boxes for Electrical Systems
26 05 33.13 Conduit for Electrical Systems
26 05 33.16 Boxes for Electrical Systems
26 05 33.23 Surface raceways for Electrical Systems
26 05 36 Cable Trays for Electrical Systems
26 05 39 Underfloor Raceways for Electrical Systems
26 05 43 Underground Ducts and Raceways for Electrical Systems
26 05 44 Sleeves and Sleeve Seals for Electrical Raceways and Cabling
26 05 46 Poles for Electrical Systems
26 05 48 Vibration and Seismic Controls for Electrical Systems
26 05 48.16 Seismic Controls for Electrical Systems
26 05 53 Identification for Electrical Systems
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26 05 73.13 Short-Circuit Studies
26 05 73.16 Coordination Studies
26 05 73.19 Arc-Flash Hazard Analysis
26 05 73.23 Load Flow Studies
26 05 73.26 Stability Studies
26 05 73.29 Harmonic-Analysis Studies
26 05 76 Photometric Studies
26 05 83 Wiring Connections

26 06 00 Schedules for Electrical
26 06 10 Schedules for Medium-Voltage Electrical Distribution
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26 06 20.16 Electrical Panelboard Schedule
26 06 20.19 Electrical Motor-Control Center Schedule
26 06 20.23 Electrical Circuit Schedule
26 06 20.26 Wiring Device Schedule
26 06 30 Schedules for Facility Electrical Power Generating and Storing Equipment
26 06 40 Schedules for Electrical Protection Systems
26 06 50 Schedules for Lighting
26 06 50.13 Lighting Panelboard Schedule
26 06 50.16 Lighting Fixture Schedule

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26 09 00 Instrumentation and Control for Electrical Systems
26 09 13 Electrical Power Monitoring
26 09 15 Peak Load Controllers
26 09 16 Electrical Controls and Relays
26 09 17 Programmable Controllers
26 09 19 Enclosed Contactors
26 09 23 Lighting Control Devices
26 09 26 Lighting Control Panelboards
26 09 33 Central Dimming Controls
26 09 33.13 Multichannel Remote-Controlled Dimmers
26 09 33.16 Remote-Controlled Dimming Stations
26 09 36 Modular Dimming Controls
26 09 36.13 Manual Modular Dimming Controls
26 09 36.16 Integrated Multipreset Modular Dimming Controls
26 09 36.19 Standalone Multipreset Modular Dimming
26 09 43 Network Lighting Controls
26 09 43.13 Digital-Network Lighting Controls
26 09 43.16 Addressable Luminaire Lighting Controls
26 09 43.19 Wireless Network Lighting Controls
26 09 43.23 Relay-Based Lighting Controls
26 09 61 Theatrical Lighting Controls

26 10 00 Medium-Voltage Electrical Distribution

26 11 00 Substations
26 11 13 Primary Unit Substations
26 11 16 Secondary Unit Substations
26 11 16.11 Secondary Unit Substations with Switchgear Secondary
26 11 16.12 Secondary Unit Substations with Switchboard Secondary
26 11 16.13 Secondary Unit Substations with Motor Control Center Secondary

26 12 00 Medium-Voltage Transformers
26 12 13 Liquid-Filled, Medium-Voltage Transformers
26 12 16 Dry-Type, Medium-Voltage Transformers
26 12 19 Pad-Mounted, Liquid-Filled, Medium-Voltage Transformers

26 13 00 Medium-Voltage Switchgear
26 13 13 Medium-Voltage Circuit Breaker Switchgear
26 13 16 Medium-Voltage Fusible Interrupter Switchgear
26 13 19 Medium-Voltage Vacuum Interrupter Switchgear
26 13 23 Medium-Voltage Metal-Enclosed Switchgear
26 13 26 Medium-Voltage Metal-Clad Switchgear
26 13 29 Medium-Voltage Compartmentalized Switchgear

26 15 00 Medium-Voltage Enclosed Bus Assemblies
26 15 13 Medium-Voltage Busways
26 15 16 Medium-Voltage Cablebus

26 16 00 Medium-Voltage Metering

26 18 00 Medium-Voltage Circuit Protection Devices
26 18 13 Medium-Voltage Cutouts
26 18 16 Medium-Voltage Fuses
26 18 19 Medium-Voltage Lightning Arresters
26 18 23 Medium-Voltage Surge Arresters
26 18 26 Medium-Voltage Reclosers
26 18 29 Medium-Voltage Enclosed Bus
26 18 33 Medium-Voltage Enclosed Fuse Cutouts
26 18 36 Medium-Voltage Enclosed Fuses
26 18 39 Medium-Voltage Motor Controllers

26 20 00 Low-Voltage Electrical Distribution

26 21 00 Low-Voltage Electrical Service Entrance
26 21 13 Low-Voltage Overhead Electrical Service Entrance
26 21 16 Low-Voltage Underground Electrical Service Entrance
26 22 00  Low-Voltage Transformers
   26 22 13  Low-Voltage Distribution Transformers
   26 22 16  Low-Voltage Buck-Boost Transformers
   26 22 17  Low-Voltage Transformers for Nonlinear Loads
   26 22 18  Low-Voltage Transformers for Load Centers
   26 22 19  Control and Signal Transformers
26 23 00  Low-Voltage Switchgear
   26 23 13  Paralleling Low-Voltage Switchgear
26 24 00  Switchboards and Panelboards
   26 24 13  Switchboards
   26 24 16  Panelboards
   26 24 16.16  Electronically Operated Circuit-Breaker Panelboards
   26 24 19  Motor-Control Centers
26 25 00  Low-Voltage Enclosed Bus Assemblies
   26 25 13  Low-Voltage Busways
   26 25 16  Low-Voltage Cablebus Systems
26 27 00  Low-Voltage Distribution Equipment
   26 27 13  Electricity Metering
   26 27 16  Electrical Cabinets and Enclosures
   26 27 19  Multi-Outlet Assemblies
   26 27 23  Indoor Service Poles
   26 27 26  Wiring Devices
   26 27 33  Power Distribution Units
   26 27 73  Door Chimes
26 28 00  Low-Voltage Circuit Protective Devices
   26 28 13  Fuses
   26 28 16  Enclosed Switches and Circuit Breakers
   26 28 16.13  Enclosed Circuit Breakers
   26 28 16.16  Enclosed Switches
26 29 00  Low-Voltage Controllers
   26 29 13  Enclosed Controllers
   26 29 13.13  Across-the-Line Motor Controllers
   26 29 13.16  Reduced-Voltage Motor Controllers
   26 29 23  Variable-Frequency Motor Controllers
   26 29 33  Controllers for Fire Pump Drivers
   26 29 33.13  Full-Service Controllers for Fire Pump Electric-Motor Drivers
   26 29 33.16  Limited-Service Controllers for Fire Pump Electric-Motor Drivers
   26 29 33.19  Controllers for Fire Pump Diesel Engine Drivers
26 30 00  Facility Electrical Power Generating and Storing Equipment
26 31 00  Photovoltaic Collectors
26 32 00  Packaged Generator Assemblies
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   26 32 13.16  Gas-Engine-Driven Generator Sets
   26 32 13.26  Gas-Turbine Engine-Driven Generators
   26 32 16  Steam-Turbine Generators
   26 32 19  Hydro-Turbine Generators
26 32 23  Wind Energy Equipment
26 32 23.13  Horizontal-Axis Wind Turbines
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26 32 26  Frequency Changers
26 32 29  Rotary Converters
26 32 33  Rotary Uninterruptible Power Units
26 32 36  Resistive Load Banks

26 33 00  Battery Equipment
26 33 13  Batteries
26 33 16  Battery Racks
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26 33 23  Central Battery Equipment
26 33 23.13  Central Battery Equipment for Emergency Lighting
26 33 33  Static Power Converters
26 33 43  Battery Chargers
26 33 46  Battery Monitoring
26 33 53  Static Uninterruptible Power Supply

26 35 00  Power Filters and Conditioners
26 35 13  Capacitors
26 35 16  Chokes and Inductors
26 35 23  Electromagnetic-Interference Filters
26 35 26  Harmonic Filters
26 35 33  Power Factor Correction Equipment
26 35 33.13  Medium-Voltage Power Factor Correction Equipment
26 35 33.16  Low-Voltage Power Factor Correction Equipment
26 35 36  Slip Controllers
26 35 43  Static-Frequency Converters
26 35 46  Radio-Frequency-Interference Filters
26 35 53  Voltage Regulators

26 36 00  Transfer Switches
26 36 13  Manual Transfer Switches
26 36 23  Automatic Transfer Switches

26 40 00  Electrical Protection
26 41 00  Facility Lightning Protection
26 41 13  Lightning Protection for Structures
26 41 13.13  Lightning Protection for Buildings
26 41 16  Lightning Prevention and Dissipation
26 41 19  Early Streamer Emission Lightning Protection
26 41 23  Lightning Protection Surge Arresters and Suppressors

26 43 00  Surge Protective Devices
26 43 13  Surge Protective Devices for Low-Voltage Electrical Power Circuits

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26 51 00  Interior Lighting
26 51 13  Incandescent Interior Lighting
26 51 16  Fluorescent Interior Lighting
26 51 19  LED Interior Lighting
26 51 23  HID Interior Lighting

26 52 00  Safety Lighting
26 52 13 Emergency and Exit Lighting
26 52 13.13 Emergency Lighting
26 52 13.16 Exit Signs

26 54 00 Classified Location Lighting
26 54 13 Incandescent Classified Location Lighting
26 54 16 Fluorescent Classified Location Lighting
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26 55 00 Special Purpose Lighting
26 55 23 Outline Lighting
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26 55 33 Hazard Warning Lighting
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26 55 39 Helipad Lighting
26 55 53 Security Lighting
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26 55 61 Theatrical Lighting
26 55 63 Detention Lighting
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26 56 00 Exterior Lighting
26 56 13 Lighting Poles and Standards
26 56 17 Fluorescent Exterior Lighting
26 56 18 Incandescent Exterior Lighting
26 56 19 LED Exterior Lighting
26 56 21 HID Exterior Lighting

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27 01 00 Operation and Maintenance of Communications Systems
27 01 10 Operation and Maintenance of Structured Cabling and Enclosures
27 01 20 Operation and Maintenance of Data Communications
27 01 30 Operation and Maintenance of Voice Communications
27 01 40 Operation and Maintenance of Audio-Video Communications
27 01 50 Operation and Maintenance of Distributed Communications and Monitoring

27 05 00 Common Work Results for Communications
27 05 05 Selective Demolition for Communications
27 05 11 Cameras for Audio-Visual Systems
27 05 13 Communications Services
27 05 13.13 Dialtone Services
27 05 13.23 T1 Services
27 05 13.33 DSL Services
27 05 13.43 Cable Services
27 05 13.53 Satellite Services
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27 05 46 Utility Poles for Communications Systems
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**Auxiliary Dam Structures**
- Fish Ladders
- Concrete Fish Ladders

### Process Interconnections

#### Operation and Maintenance of Process Interconnections
- Operation and Maintenance of Gas and Vapor Process Piping
- Operation and Maintenance of Liquids Process Piping
- Operation and Maintenance of Solid and Mixed Materials Piping and Chutes
- Operation and Maintenance of Process Piping and Equipment Protection
- Operation and Maintenance of Process Control and Process Facility Enterprise Management Systems
- Operation and Maintenance of Instrumentation for Process Systems
- Operation and Maintenance of Primary Control Devices

#### Common Work Results for Process Interconnections
- Exposed Piping Installation
- Couplings, Adapters, and Specials for Process Piping
- Hangers and Supports for Process Piping
- Wall Pipes, Floor Pipes, and Pipe Sleeves
- Aluminum Process Pipe
- Brass Process Pipe
- Bronze Process Pipe
- Copper Process Pipe and Tubing
- Ductile Iron Process Pipe
- High-Alloy Nickel Process Pipe and Tubing
- Stainless Steel Process Pipe and Tubing
- Duplex and Super-Duplex Stainless Steel Process Pipe
- 300- and 400-Series Stainless Steel Process Pipe
- Special-Fabrication Stainless Steel Process Pipe and Tubing
- Steel Process Pipe
- Steel Pipe and Tubing for Air and Gas Service
- Steel Pipe for Water Service
- Steel Pipe and Tubing for Process Liquid Service
- Steel Pipe for Bulk Materials Conveyance
- Other Metals Process Pipe
- Titanium Process Pipe
- Tantalum Process Pipe
- Zirconium Process Pipe
- Thermoplastic Process Pipe
- Polyvinyl Chloride Process Pipe
- Chlorinated Polyvinyl Chloride Process Pipe
- ABS Process Pipe
- Polypropylene Process Pipe
- PVDF Process Pipe
- High-Purity Plastic Process Pipe
- Flexible Plastic Tubing
- High-Density Polyethylene Process Pipe
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40 05 81.33 Hose Bibbs
40 05 82 Solenoid Valves for Process Service
40 05 89 Valve Accessories
40 05 89.13 Basket Strainers for Process Service
40 05 89.23 Needle Valves
40 05 89.33 Quick-Connect Couplers
40 05 93 Common Motor Requirements for Process Equipment
40 05 96 Vibration and Seismic Controls for Process Equipment
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40 06 00 Schedules for Process Interconnections
40 06 10 Schedules for Gas and Vapor Process Piping and Ductwork
40 06 20 Schedules for Liquids Process Piping
40 06 30 Schedules for Solid and Mixed Materials Piping and Chutes
40 06 40 Schedules for Process Piping and Equipment Protection
40 06 60 Schedules for Process Control and Process Facility Enterprise Management Systems
40 06 70 Schedules of Instrumentation for Process Systems
40 06 90 Schedules for Primary Control Devices

40 10 00 Gas and Vapor Process Piping and Ductwork

40 11 00 Steam Process Piping
40 11 13 Low-Pressure Steam Process Piping
40 11 16 Intermediate-Pressure Steam Process Piping
40 11 19 High-Pressure Steam Process Piping
40 11 23 Condensate Process Piping for Process Applications

40 12 00 Compressed Air Process Piping
40 12 13 Compressed Air Process Piping for Breathing Service
40 12 23 Low-Pressure Compressed Air Process Piping
40 12 53 High-Pressure Compressed Air Process Piping

40 13 00 Process Ductwork

40 15 00 Combustion System Gas Piping
40 15 13 Combustion Air Piping
40 15 16 Oxygen Combustion System Gas Piping
40 15 19 Flue-Gas Combustion System Piping
40 15 23 Exothermic-Gas Combustion System Piping
40 15 26 Endothermic-Gas Combustion System Piping
40 15 29 Dissociated-Ammonia-Gas Combustion System Piping

40 16 00 Specialty and High-Purity Gases Piping
40 16 13 Ammonia Gas Piping
40 16 16 Boron Gas Piping
40 16 17 Chlorine Gas Piping
40 16 26 Diborane Gas Piping
40 16 29 Fluorine Gas Piping
40 16 33 Hydrogen Sulfide Gas Piping
40 16 36 Nitrous-Oxide Gas Process Piping
40 16 37 Oxygen Gas Process Piping
40 16 39 Ozone Gas Process Piping
40 16 43 Phosphine Gas Piping
40 16 46 Silane Gas Piping
40 16 49 Sulfur-Dioxide Gas Piping
40 16 53 Specialty Gas Mixtures Piping
40 16 56 High-Purity Gas Piping Components

40 17 00 Welding and Cutting Gases Piping
40 17 13 Acetylene Welding and Cutting Piping
40 17 16 Acetylene-Hydrogen Mix Welding and Cutting Piping
40 17 19 Methylacetylene-Propadiene Welding and Cutting Piping
40 17 23 Oxygen Welding and Cutting Piping
40 17 26 Inert Gas Welding and Cutting Piping

40 18 00 Vacuum Systems Process Piping
40 18 13 Low-Vacuum Systems Process Piping
40 18 23 Chlorine Gas Vacuum System Piping
40 18 53 High-Vacuum Systems Process Piping

40 20 00 **Liquids Process Piping**

40 21 00 **Liquid Fuel Process Piping**
40 21 13 Bio Fuels Process Piping
40 21 13.13 Bioalcohols Process Piping
40 21 13.23 Biodiesel Fuel Process Piping
40 21 13.26 Green Diesel Fuel Process Piping
40 21 13.33 Biomass-to-Liquid (BTL) Fuel Process Piping
40 21 13.43 Gas-to-Liquid (GTL) Fuel Process Piping
40 21 16 Gasoline Process Piping
40 21 19 Diesel Process Piping
40 21 23 Fuel-Oils Process Piping
40 21 23.13 No. 1 Fuel-Oil Process Piping
40 21 23.23 No. 2 Fuel-Oil Process Piping
40 21 23.26 Kerosene Process Piping
40 21 23.29 Tar Fuels Process Piping
40 21 23.43 No. 4 Fuel-Oil Process Piping
40 21 23.53 No. 5 Fuel-Oil Process Piping
40 21 23.63 No. 6 Fuel-Oil Process Piping

40 22 00 **Petroleum Products Piping**
40 22 10 Heavy-Fractions Petroleum Products Piping
40 22 13 Liquefied Petroleum Gas (LPG) Process Piping
40 22 16 Lubricating Oils Process Piping
40 22 23 Petrochemicals Process Piping
40 22 50 Light-Fractions Petroleum Products Piping

40 23 00 **Water and Wastewater Process Piping**
40 23 13 Deionized Water Process Piping
40 23 16 Distilled-Water Process Piping
40 23 19 Non-Potable Plant Water Process Piping
40 23 23 Potable Water Process Piping
40 23 29 Recirculated Water Process Piping
40 23 33 Reverse-Osmosis Water Process Piping
40 23 40 Sanitary Wastewater Process Piping
40 23 41 Grit Process Piping
40 23 43 Scum and Floatables Process Piping
40 23 44 Primary Sludge Process Piping
40 23 46 Waste Sludge Process Piping
40 23 48 Thickened Sludge Process Piping

40 24 00 **Specialty Liquid Chemicals Piping**
40 24 13 Alcohol Piping
40 24 14 Liquid Chlorine and Sodium Hypochlorite Piping
40 24 16 Gel Piping
40 24 19 Slurries Process Piping
40 24 23 Thixotropic Liquid Piping

40 25 00 **Liquid Acids and Bases Piping**
40 25 10 Liquid Acids Piping
40 25 50 Liquid Bases Piping

40 26 00 **Liquid Polymer Piping**
40 30 00  Solid and Mixed Materials Piping and Chutes

40 32 00  Bulk Materials Piping and Chutes
  40 32 10  Abrasive Materials Piping and Chutes
  40 32 50  Nonabrasive Materials Piping and Chutes

40 33 00  Bulk Materials Valves
  40 33 13  Airlock Bulk Materials Valves
  40 33 16  Blind Bulk Materials Valves
  40 33 26  Diverter Bulk Materials Valves
  40 33 29  Double or Single Dump Bulk Materials Valves
  40 33 39  Swing Bulk Materials Valves
  40 33 43  Specialty Bulk Materials Valves

40 34 00  Pneumatic Conveying Lines
  40 34 10  Dense Phase Pneumatic Conveying Lines
  40 34 50  Dilute Phase Pneumatic Conveying Lines

40 40 00  Process Piping and Equipment Protection

40 41 00  Process Piping and Equipment Heat Tracing
  40 41 13  Process Piping Heat Tracing
  40 41 13.13  Process Piping Electrical Resistance Heat Tracing
  40 41 13.16  Process Piping Electrical Conductance Heat Tracing
  40 41 13.19  Process Piping Gas Heat Tracing
  40 41 13.23  Process Piping Steam Heat Tracing
  40 41 13.26  Process Piping Thermal Fluids Heat Tracing
  40 41 23  Process Equipment Heat Tracing
  40 41 23.13  Process Equipment Electrical Resistance Heat Tracing
  40 41 23.16  Process Equipment Electrical Conductance Heat Tracing
  40 41 23.19  Process Equipment Gas Heat Tracing
  40 41 23.23  Process Equipment Steam Heat Tracing
  40 41 23.26  Process Equipment Thermal Fluids Heat Tracing

40 42 00  Process Piping and Equipment Insulation
  40 42 13  Process Piping Insulation
  40 42 13.13  Cryogenic Temperature Process Piping Insulation
  40 42 13.16  Low Temperature Process Piping Insulation
  40 42 13.19  Intermediate Temperature Process Piping Insulation
  40 42 13.23  High Temperature Process Piping Insulation
  40 42 13.26  Process Piping Insulation for Specialty Applications
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  40 42 23.16  Low Temperature Process Equipment Insulation
  40 42 23.19  Intermediate Temperature Process Equipment Insulation
  40 42 23.23  High Temperature Process Equipment Insulation
  40 42 23.26  Process Equipment Insulation for Specialty Applications

40 46 00  Process Corrosion Protection
  40 46 16  Coatings and Wrappings for Process Corrosion Protection
  40 46 42  Cathodic Process Corrosion Protection

40 47 00  Refractories
  40 47 13  Silica Refractories
  40 47 16  Alumina Refractories
  40 47 19  Carbon and Graphite Refractories
40 47 23 Castable Refractories
40 47 26 Rammed Refractories
40 47 29 Refractory Concrete

40 60 00 **Process Control and Enterprise Management Systems**

40 61 00 **Process Control and Enterprise Management Systems**
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40 61 13 Process Control System General Provisions
40 61 16 Enterprise Management System General Provisions
40 61 21 Process Control System Testing
40 61 26 Process Control System Training
40 61 93 Process Control System Input/Output List
40 61 96 Process Control Descriptions

40 62 00 **Computer System Hardware and Ancillaries**
40 62 13 Server Computers
40 62 16 Operator Workstation Computers
40 62 19 Industrial Computers
40 62 21 Desktop Computers
40 62 23 Mobile Computers
40 62 26 Laptop Computers
40 62 29 Tablet Computers and Mobile Devices
40 62 33 Printers
40 62 43 Large Display Screens
40 62 63 Operator Interface Terminals (OIT)

40 63 00 **Control System Equipment**
40 63 13 Distributed Process Control Systems
40 63 43 Programmable Logic Controllers
40 63 83 Remote Terminal Units

40 66 00 **Network and Communication Equipment**
40 66 13 Switches and Routers
40 66 16 Firewall Hardware
40 66 19 Media Converters
40 66 23 Frame Relay Equipment
40 66 26 Device Network Equipment
40 66 33 Metallic and Fiber-Optic Communication Cabling and Connectors
40 66 36 Process Instrumentation Networks
40 66 43 Wireless Network Systems
40 66 53 Multiple Address Radio Equipment
40 66 56 Point-to-Point Radio Equipment
40 66 63 Antennas
40 66 66 Monopoles and Towers
40 66 73 Satellite Communication Equipment

40 67 00 **Control System Equipment Panels and Racks**
40 67 13 Computer Equipment Racks
40 67 16 Free-Standing Panels
40 67 19 Wall-Mounted Panels
40 67 23 Control System Consoles
40 67 33 Panel Wiring
40 67 63 Control Panel-Mounted Uninterruptible Power Supply

40 68 00 **Process Control Software**
40 68 13 Process Control (HMI) Software
40 68 23 Reporting Software
40 68 26 Online Performance Monitoring Systems Software
40 68 33 Maintenance Management Software
40 68 36 Laboratory Information System Software
40 68 39 Energy Management Software
40 68 43 Load Management Software
40 68 63 Configuration of HMI Software
40 68 66 Programming of Controller Software
40 68 93 Computer Operating Systems Software

40 69 00 **Packaged Control Systems**
40 69 13 Control System Simulators
40 69 23 Burner Management Systems
40 69 26 Safety Instrumented Control Systems
40 69 33 Fire and Gas Monitoring/Protection Systems for Industrial Applications

40 70 00 **Instrumentation for Process Systems**

40 71 00 **Flow Measurement**
40 71 13 Magnetic Flow Meters
40 71 13.13 Inline Magnetic Flow Meters
40 71 13.23 Insertion-Type Magnetic Flow Meters
40 71 23 Differential Pressure-Type Flow Meters
40 71 23.13 Venturi Flow Meters
40 71 23.16 Flow Tubes
40 71 23.19 Flow Nozzle-Type Flow Meters
40 71 23.23 Orifice Plate Flow Meters
40 71 23.26 Integral Orifice Flow Meters
40 71 23.29 Orifice Meter Runs
40 71 23.33 Elbow Flow Meters
40 71 23.36 Pitot Tube and Averaging Pitot Flow Meters
40 71 23.39 V-Cone Flow Meters
40 71 23.43 Differential Pressure-Type Flow Transmitters
40 71 23.46 Flow Computers
40 71 33 Propeller Flow Meters
40 71 36 Turbine Flow Meters
40 71 43 Variable Area Flow Meters
40 71 46 Target Flow Meters
40 71 49 Vortex-Shedding Flow Meters
40 71 53 Positive Displacement Flow Meters
40 71 63 Doppler Flow Meters
40 71 66 Transit Time Flow Meters
40 71 69 Open Channel Flow Meters
40 71 73 Coriolis Flow Meters
40 71 76 Thermal Flow Meters
40 71 79 Flow Switches
40 71 83 Sight Flow Indicators
40 71 86 Flow Metering Weirs

40 72 00 **Level Measurement**
40 72 13 Ultrasonic Level Meters (Continuous and Point-Type)
40 72 23  Radar Level Meters
40 72 26  Laser Level Meters
40 72 29  Nuclear Level Meters
40 72 33  Capacitance Type Level Meters (Continuous and Point Type)
40 72 36  RF Admittance Level Meters (Continuous and Point Type)
40 72 43  Pressure and Differential Pressure Type Level Meters
40 72 46  Bubbler Systems
40 72 53  Magnetic and Magnetostrictive Level Meters
40 72 63  Displacement-Type Level Meters
40 72 73  Sight Level Gauges
40 72 76  Level Switches
40 72 83  Leak Detection Systems

40 73 00  Pressure, Strain, and Force Measurement
40 73 13  Pressure and Differential Pressure Gauges
40 73 16  Manometers
40 73 23  Absolute-Pressure Transmitters
40 73 26  Gauge-Pressure Transmitters
40 73 29  Differential Pressure Transmitters
40 73 33  Multi-Variable Pressure/Temperature Transmitters
40 73 36  Pressure and Differential Pressure Switches
40 73 43  Force Measurement Devices
40 73 46  Load Cells
40 73 53  Torque Measurement Devices
40 73 63  Diaphragm Seals

40 74 00  Temperature Measurement
40 74 13  Resistance Temperature Devices
40 74 16  Thermocouples
40 74 23  Radiation Pyrometers
40 74 33  Thermistors
40 74 36  Diode Temperature Measurement Devices
40 74 43  Bimetallic Thermometers
40 74 46  Fluid Expansion Thermometers
40 74 49  Change-of-State Temperature Measurement Devices
40 74 53  Cryogenic Temperature Sensors
40 74 63  Temperature Transmitters
40 74 66  Temperature Switches
40 74 69  Thermowells, Protection Tubes, and Test Thermowells

40 75 00  Process Liquid Analytical Measurement
40 75 05  Multi-Parameter Analyzer Systems
40 75 13  pH/ORP Analyzers
40 75 16  Conductivity Analyzers
40 75 19  Moisture Analyzers
40 75 21  Chlorine Analyzers
40 75 21.13  Free-Chlorine Analyzers
40 75 21.23  Residual-Chlorine Analyzers
40 75 23  Chlorine Dioxide Analyzer
40 75 26  Dissolved Chlorine Dioxide Analyzers
40 75 29  Dissolved Ammonia Analyzers
40 75 33  Fluoride Analyzers
40 75 43  Dissolved Oxygen Analyzers
40 75 46  Dissolved Ozone Analyzers  
40 75 53  Turbidity Analyzers  
40 75 56  Suspended Solids/Sludge Density Analyzers  
40 75 59  Liquid Density Analyzers  
40 75 63  Monochloramine Analyzers  
40 75 66  Nitrogen Analyzers  
40 75 69  Phosphorous Analyzers  
40 75 73  Particle Counters  
40 75 76  Total Organic Carbon Analyzers  
40 75 79  Total Organics Analyzers  
40 75 83  Hardness Analyzers  
40 75 86  Alkalinity Analyzer  

40 76 00  Process Gas Analytical Measurement  
40 76 05  Continuous Emissions Monitoring Systems  
40 76 13  Oxygen Gas Analyzers  
40 76 16  Ozone Analyzers  
40 76 23  Combustible Gas Monitors  
40 76 26  Chlorine Gas Analyzers  
40 76 29  Ammonia Gas Analyzers  
40 76 33  Hydrogen Sulfide Monitors  
40 76 36  Sulfur Dioxide Analyzers  
40 76 39  Carbon Dioxide Analyzers  
40 76 43  Carbon Monoxide Analyzers  
40 76 53  Dewpoint/Moisture Analyzers  
40 76 56  Gas Density Analyzers  
40 76 63  Flue Gas Analyzers  
40 76 66  NO/NOX Analyzers  
40 76 73  Hydrocarbon Analyzers  
40 76 76  Gas Chromatograph Analyzers  
40 76 79  Vapor Pressure Analyzers  
40 76 83  Mass Spectrometers  

40 77 00  Position and Motion Measurement  
40 77 13  Acceleration Measurement Devices  
40 77 16  Proximity Measurement Devices  
40 77 19  Vibration Velocity Measurement Devices  
40 77 23  Vibration Monitoring Systems  
40 77 26  Position, Speed, and Motion Measurement Devices  

40 78 00  Panel Mounted Instruments  
40 78 13  Indicators and Meters  
40 78 16  Indicating Lights  
40 78 19  Switches and Push Buttons  
40 78 23  Potentiometers and Manual Controllers  
40 78 26  Chart Recorders  
40 78 33  Annunciators  
40 78 43  Single-Loop Controllers  
40 78 53  Relays  
40 78 56  Isolators, Intrinsically-Safe Barriers, and Surge Suppressors  
40 78 59  Power Supplies  
40 78 63  Alarm Dialers  

40 79 00  Miscellaneous Instruments, Calibration Equipment,
Instrument Valves, and Fittings
- 40 79 13 Nuclear Mass-Measuring Scales
- 40 79 23 Instrument Calibration Equipment
- 40 79 26 Instrument Programming Equipment
- 40 79 33 Current-to-Pressure Converters
- 40 79 36 Voltage-to-Pressure Converters
- 40 79 39 Signal Conditioners and Converters
- 40 79 43 Deadweight Testers
- 40 79 46 Flame Scanners
- 40 79 63 Instrument Tubing
- 40 79 66 Instrument Valve Manifolds, Valves, and Fittings

Commissioning of Process Systems

Primary Control Devices
- 40 90 00 Primary Control Devices
  - 40 91 00 Primary Control Valves
    - 40 91 13 Electrically-Operated Primary Control Valves
    - 40 91 16 Hydraulically-Operated Primary Control Valves
    - 40 91 19 Pneumatically-Operated Primary Control Valves
    - 40 91 23 Solenoid Primary Control Valves
    - 40 91 26 Specialty Primary Control Valves
  - 40 92 00 Self-Contained Flow Controllers
  - 40 93 00 Linear Actuators and Positioners
  - 40 94 00 Self-Contained Pressure Regulators
  - 40 95 00 Rotary Actuators
  - 40 96 00 Saturable Core Reactors
  - 40 97 00 Variable Frequency Drives

Material Processing and Handling Equipment
- 41 00 00 Material Processing and Handling Equipment
  - 41 01 00 Operation and Maintenance of Material Processing and Handling Equipment
    - 41 01 52 Operation and Maintenance of Bulk Materials Storage
    - 41 01 52.13 Storage Bin and Hopper Cleaning
    - 41 01 52.16 Silo Cleaning
  - 41 05 00 Common Work Results for Material Processing and Handling Equipment
    - 41 05 05 Selective Demolition for Material Processing and Handling Equipment
  - 41 06 00 Schedules for Material Processing and Handling Equipment
    - 41 06 10 Schedules for Bulk Material Processing Equipment
    - 41 06 20 Schedules for Piece Material Handling Equipment
    - 41 06 30 Schedules for Manufacturing Equipment
    - 41 06 40 Schedules for Container Processing and Packaging
    - 41 06 50 Schedules for Material Storage
    - 41 06 60 Schedules for Mobile Plant Equipment
  - 41 08 00 Commissioning of Material Processing and Handling
Equipment

41 08 10 Commissioning of Bulk Material Processing Equipment
41 08 20 Commissioning of Piece Material Handling Equipment
41 08 30 Commissioning of Manufacturing Equipment
41 08 40 Commissioning of Container Processing and Packaging
41 08 50 Commissioning of Material Storage
41 08 60 Commissioning of Mobile Plant Equipment

41 10 00 Bulk Material Processing Equipment

41 11 00 Bulk Material Sizing Equipment
41 11 13 Bulk Material Agglomerators
41 11 16 Bulk Material Air Mill Classifiers
41 11 19 Bulk Material Centrifuges
41 11 23 Bulk Material Crushers
41 11 26 Bulk Material Cyclones
41 11 29 Bulk Material Fluid Bed Separators
41 11 33 Bulk Material Grinders
41 11 36 Bulk Material Homogenizers
41 11 39 Bulk Material Lump Breakers
41 11 43 Bulk Material Mills
41 11 46 Bulk Material Pulverizers
41 11 49 Bulk Material Screens
41 11 53 Bulk Material Shredders
41 11 56 Bulk Material Sieves

41 12 00 Bulk Material Conveying Equipment
41 12 13 Bulk Material Conveyors
41 12 13.13 Airslide Bulk Material Conveyors
41 12 13.16 Auger Bulk Material Conveyors
41 12 13.19 Belt Bulk Material Conveyors
41 12 13.23 Container Bulk Material Conveyors
41 12 13.26 Drag Chain Bulk Material Conveyors
41 12 13.29 Hopper Bulk Material Conveyors
41 12 13.33 Reciprocating Bulk Material Conveyors
41 12 13.36 Screw Bulk Material Conveyors
41 12 13.39 Stacking and Reclaim Bulk Material Conveyors
41 12 13.43 Trough Bulk Material Conveyors
41 12 13.46 Tube Bulk Material Conveyors
41 12 13.49 Vibratory Bulk Material Conveyors
41 12 13.53 Weigh-Belt Bulk Material Conveyors
41 12 16 Bucket Elevators
41 12 19 Pneumatic Conveyors
41 12 19.13 Dense Phase Pneumatic Conveyors
41 12 19.16 Dilute Phase Pneumatic Conveyors

41 13 00 Bulk Material Feeders
41 13 13 Bin Activators/Live Bin Bottoms
41 13 23 Feeders
41 13 23.13 Airlock Bulk Material Feeders
41 13 23.16 Apron Bulk Material Feeders
41 13 23.19 Rotary-Valve Bulk Material Feeders
41 13 23.23 Screw Bulk Material Feeders
41 13 23.26 Vibratory Bulk Material Feeders
41 13 23.29 Volumetric Bulk Material Feeders

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41 13 23.33 Weigh Bulk Material Feeders

41 14 00 **Batching Equipment**
- 41 14 13 Bag-Handling Batching Equipment
- 41 14 16 Batch Cars/Transports
- 41 14 19 Batch Hoppers
- 41 14 23 Bulk Bag-Handling Batching Equipment
- 41 14 26 Blenders
- 41 14 29 Drum-Handling Batching Equipment
- 41 14 33 Mixers
- 41 14 36 Weigh Scales

41 20 00 **Piece Material Handling Equipment**

41 21 00 **Conveyors**
- 41 21 13 Automatic Guided Vehicle Systems
- 41 21 23 Piece Material Conveyors
- 41 21 23.13 Belt Piece Material Conveyors
- 41 21 23.16 Container Piece Material Conveyors
- 41 21 23.19 Drag-Chain Piece Material Conveyors
- 41 21 23.23 Hopper Piece Material Conveyors
- 41 21 23.26 Monorail Piece Material Conveyors
- 41 21 23.29 Power and Free Piece Material Conveyors
- 41 21 23.33 Reciprocating Piece Material Conveyors
- 41 21 23.36 Roller Piece Material Conveyors
- 41 21 23.39 Vibratory Piece Material Conveyors
- 41 21 23.43 Walking-Beam Piece Material Conveyors
- 41 21 23.46 Weigh-Belt Piece Material Conveyors
- 41 21 23.53 Postal Conveyors
- 41 21 26 Piece Material Diverter Gates
- 41 21 29 Piece Material Gravity Slides
- 41 21 33 Piece Material Transfer Cars
- 41 21 36 Piece Material Turntables
- 41 21 39 Piece Material Feeders
- 41 21 39.13 Piece Material Vibratory Feeders

41 22 00 **Cranes and Hoists**
- 41 22 13 Cranes
- 41 22 13.13 Bridge Cranes
- 41 22 13.16 Gantry Cranes
- 41 22 13.19 Jib Cranes
- 41 22 13.23 Mobile Cranes
- 41 22 13.26 Tower Cranes
- 41 22 13.29 Specialty Cranes
- 41 22 23 Hoists
- 41 22 23.13 Fixed Hoists
- 41 22 23.16 Portable Hoists
- 41 22 23.19 Monorail Hoists
- 41 22 23.23 Specialty Hoists
- 41 22 33 Derricks

41 23 00 **Lifting Devices**
- 41 23 13 Clamps
- 41 23 16 grabs
- 41 23 19 Hooks
- 41 23 23 Lifts
41 23 26  Slings
41 23 29  Spreader Bars/Beams
41 23 33  Tongs

41 24 00  Specialty Material Handling Equipment
   41 24 13  Aeration Devices
   41 24 16  Bin Vibrators
   41 24 19  Dehydrators
   41 24 23  Hydrators
   41 24 26  Hydraulic Power Systems
   41 24 29  Lubrication Systems
   41 24 33  Magnetic Separators
   41 24 36  Metal Detectors
   41 24 39  Railcar Movers
   41 24 43  Turnheads/Distributors
   41 24 46  Sorting Machines
   41 24 46.13 Postal Sorting Machines

41 30 00  Manufacturing Equipment

41 31 00  Manufacturing Lines and Equipment
   41 31 13  Manufacturing Lines
   41 31 13.13 Assembly Lines
   41 31 13.16 Casting Lines
   41 31 13.19 Coating Lines
   41 31 13.23 Converting Lines
   41 31 13.26 Disassembly Lines
   41 31 13.29 Extrusion Lines
   41 31 13.33 Machining Lines
   41 31 13.36 Molding Lines
   41 31 13.39 Finishing/Painting Lines
   41 31 13.43 Painting Lines
   41 31 13.46 Pickling Lines
   41 31 13.49 Plating Lines
   41 31 13.53 Polishing Lines
   41 31 13.56 Press Lines
   41 31 13.59 Rolling/Calendaring Lines
   41 31 13.63 Web Processing Lines
   41 31 16  Pick and Place Systems
   41 31 19  Manufacturing-Line Robots
   41 31 23  Specialty Assembly Machines

41 32 00  Forming Equipment
   41 32 13  Bending Equipment
   41 32 16  Blow-Molding Equipment
   41 32 19  Brake-Forming Equipment
   41 32 23  Cold-Forming Equipment
   41 32 26  Die-Casting Equipment
   41 32 29  Drawing Equipment
   41 32 33  Electroforming Equipment
   41 32 36  Forging Equipment
   41 32 39  Extruding Equipment
   41 32 43  Metal-Spinning Equipment
   41 32 46  Piercing Equipment
   41 32 49  Powder Metal-Forming Equipment
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41 35 13.26  Rule Dies
41 35 33   Molds

**41 36 00  Assembly and Testing Equipment**

41 36 13   Applicators
41 36 13.13 Adhesive Applicators
41 36 13.16 Lubricant Applicators
41 36 13.19 Sealer Applicators
41 36 16   Fixtures and Jigs
41 36 19   Joining Equipment
41 36 19.13 Adhesive Joining Equipment
41 36 19.16 Arc-Welding Equipment
41 36 19.19 Brazing Equipment
41 36 19.23 Resistance-Welding Equipment
41 36 19.26 Riveting Equipment
41 36 19.29 Sintering Equipment
41 36 19.33 Soldering Equipment
41 36 23   Cutting Equipment
41 36 23.13 Cutting Torches
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41 36 23.19 Laser Cutting Equipment
41 36 23.23 Plasma Cutting Equipment
41 36 26   Process Tools
41 36 26.13 Air Process Tools
41 36 26.16 Electric Process Tools
41 36 26.19 Hydraulic Process Tools
41 36 26.23 Manual Process Tools
41 36 29   Manufacturing Measurement and Testing Equipment
41 36 29.13 Gages, Rules, and Blocks
41 36 29.16 Penetrant Measurement and Testing Equipment
41 36 29.19 Laser Measurement and Testing Equipment
41 36 29.23 Magnaflux Measurement and Testing Equipment
41 36 29.26 Optical Comparators
41 36 29.29 Profilometers
41 36 29.33 Radiograph Measurement and Testing Equipment
41 36 29.36 Surface Tables
41 36 29.39 Ultrasonic Measurement and Testing Equipment
41 36 29.43 Test Weigh Scales

**41 40 00  Container Processing and Packaging**

**41 41 00  Container Filling and Sealing**

41 41 13  Bulk Container Fillers/Packers
41 41 16  Container Cappers
41 41 19  Container Fillers
41 41 19.13 Bag Fillers
41 41 19.16 Box Fillers
41 41 19.19 Bottle Fillers
41 41 23  Container Sealers

**41 42 00  Container Packing Equipment**

41 42 13  Box Packing Equipment
41 42 13.13 Box Makers
41 42 13.16 Box Packers
41 42 16  Bulk Material Loaders
41 42 16.13 Container Bulk Material Loaders
41 42 16.23 Truck Bulk Material Loaders
41 42 16.26 Railcar Bulk Material Loaders
41 42 16.29 Ship Bulk Material Loaders
41 42 16.33 Barge Bulk Material Loaders
41 42 19 Carton Packers
41 42 23 Carton Sealers
41 42 26 Carton Shrink Wrappers
41 42 29 Carton Stackers

41 43 00 Shipping Packaging
41 43 13 Banding/Strapping Equipment
41 43 16 Barcode Equipment
41 43 16.13 Barcode Readers
41 43 16.16 Barcode Printers
41 43 19 Labeling Equipment
41 43 23 Pallet Stacking/Wrapping Equipment

41 50 00 Material Storage
41 51 00 Automatic Material Storage
41 51 13 Automatic Storage/Automatic Retrieval Systems

41 52 00 Bulk Material Storage
41 52 16.13 Concrete Flat-Bottom Silos
41 52 16.16 Concrete Masonry Flat-Bottom Silos
41 52 16.23 Concrete Cone-Bottom Silos
41 52 16.26 Concrete Masonry Cone-Bottom Silos
41 52 16.29 Steel Cone-Bottom Silos
41 52 19 Bulk Materials Storage Tanks
41 52 19.13 Stationary Bulk Materials Storage Tanks
41 52 19.33 Mobile Bulk Materials Storage Tanks
41 52 41 Pneumatic, Block-Distributed Materials Fluidizing System for Flat-Bottom Bins and Silos
41 52 43 Aerated Trough Materials Fluidizing System for Flat-Bottom Bins and Silos
41 52 46 Pad-Mounted Aerated Disc Materials Fluidizing System for Cone-Bottom Bins and Silos

41 53 00 Storage Equipment and Systems
41 53 13 Storage Cabinets
41 53 16 Container Storage Systems
41 53 19 Flat Files
41 53 23 Storage Racks
41 53 23.13 Mobile Storage Racks
41 53 26 Mezzanine Storage Systems

41 60 00 Mobile Plant Equipment
41 61 00 Mobile Earth Moving Equipment
41 61 13 Backhoes
41 61 16 Bulldozers
41 61 19 Compactors
41 61 23 Excavators
41 61 26 Graders
41 61 29 Payloaders
41 61 33 Trenchers

41 62 00 Trucks
| 41 62 13 | Cement Mixer Trucks |
| 41 62 16 | Dump Trucks |
| 41 62 19 | Flatbed Trucks |
| 41 62 23 | Forklift Trucks |
| 41 62 26 | Pickup Trucks |
| 41 62 29 | Tank Trucks |

**41 63 00**  General Vehicles

| 41 63 13 | Bicycles |
| 41 63 16 | Carts |
| 41 63 19 | Maintenance Vehicles |
| 41 63 23 | Utility Vehicles |
| 41 63 26 | Vans |
| 41 63 29 | Wagons |

**41 64 00**  Rail Vehicles

| 41 64 13 | Locomotives |
| 41 64 13.13 | Diesel Locomotives |
| 41 64 13.23 | Electric Locomotives |
| 41 64 16 | Mobile Railcar Movers |

**41 65 00**  Mobile Support Equipment

| 41 65 13 | Mobile Air Compressors |
| 41 65 16 | Mobile Generators |
| 41 65 19 | Mobile Welders |

**41 66 00**  Miscellaneous Mobile Equipment

| 41 66 13 | Mobile Boring and Drilling Rigs |
| 41 66 16 | Mobile Lifts and Cherrypickers |
| 41 66 19 | Mobile Paving Equipment |
| 41 66 23 | Mobile Sweepers/Vacuums |

**41 67 00**  Plant Maintenance Equipment

| 41 67 13 | Plant Lube Oil System |
| 41 67 16 | Plant Fall Protection Equipment |
| 41 67 19 | Plant Safety Equipment |
| 41 67 23 | Plant Maintenance Tools |
| 41 67 26 | Plant Maintenance Washing Equipment |

**42 00 00**  Process Heating, Cooling, and Drying Equipment

**42 01 00**  Operation and Maintenance of Process Heating, Cooling, and Drying Equipment

| 42 01 10 | Operation and Maintenance of Process Heating Equipment |
| 42 01 20 | Operation and Maintenance of Process Cooling Equipment |
| 42 01 30 | Operation and Maintenance of Process Drying Equipment |

**42 05 00**  Common Work Results for Process Heating, Cooling, and Drying Equipment

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42 11 00  **Process Boilers**
42 11 13  Low-Pressure Process Boilers
42 11 16  Intermediate-Pressure Process Boilers
42 11 19  High-Pressure Process Boilers
42 11 23  Specialty Process Boilers

42 12 00  **Process Heaters**
42 12 13  Electric Process Heaters
42 12 16  Fuel-Fired Process Heaters
42 12 19  Thermoelectric Process Heaters
42 12 23  Solar Process Heaters
42 12 26  Specialty Process Heaters

42 13 00  **Industrial Heat Exchangers and Recuporators**
42 13 13  Industrial Gas-to-Gas Heat Exchangers
42 13 16  Industrial Liquid-to-Gas/Gas-to-Liquid Heat Exchangers
42 13 19  Industrial Liquid-to-Liquid Heat Exchangers
42 13 23  Industrial Gas Radiation Heat Exchangers
42 13 26  Industrial Solar Radiation Heat Exchangers

42 14 00  **Industrial Furnaces**
42 14 13  Annealing Furnaces
42 14 16  Atmosphere Generators
42 14 19  Industrial Baking Furnaces
42 14 23  Industrial Brazing Furnaces
42 14 26  Industrial Calcining Furnaces
42 14 29  Industrial Heat-Treating Furnaces
42 14 33  Industrial Melting Furnaces
42 14 33.13  Ceramics and Glass Melting Furnaces
42 14 33.16  Ferrous Melting Furnaces
42 14 33.19  Non-Ferrous Melting Furnaces
42 14 36  Primary Refining Furnaces
42 14 43  Reactor Furnaces
42 14 46  Industrial Reheat Furnaces
42 14 53  Industrial Sintering Furnaces
42 14 56  Industrial Vacuum Furnaces

42 15 00  **Industrial Ovens**
42 15 13  Industrial Drying Ovens
42 15 16  Industrial Curing Ovens
42 15 19  Industrial Specialty Ovens

42 20 00  **Process Cooling Equipment**
42 21 00  **Process Cooling Towers**
42 21 13  Open-Circuit Process Cooling Towers
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43 08 10 Commissioning of Gas Handling Equipment
43 08 20 Commissioning of Liquid Handling Equipment
43 08 30 Commissioning of Gas and Liquid Purification Equipment
43 08 40 Commissioning of Gas and Liquid Storage

43 10 00 Gas Handling Equipment

43 11 00 Gas Fans, Blowers, Pumps and Boosters
43 11 11 Direct Drive Single Stage Centrifugal Blowers
43 11 12 Integrally Geared Single Stage Centrifugal Blowers
43 11 13 Separately Geared Single Stage Centrifugal Blowers
43 11 14 Direct Drive Integral Shaft Single Stage Centrifugal Blowers
43 11 17 Horizontally Split Multistage Centrifugal Blowers
43 11 18 Vertically Split Multistage Centrifugal Blowers
43 11 19 Centrifugal Fans
43 11 23 Axial Blowers
43 11 26 Axial Fans
43 11 31 Rotary Helical Screw Blowers
43 11 33 Rotary Lobe Blowers
43 11 34 Regenerative Rotary Blowers
43 11 36 Rotary Vane Blowers
43 11 41 Gas-handling Venturi Jet Pumps
43 11 43 Gas-handling Vacuum Pumps
43 11 46 Gas Boosters

43 12 00 Gas Compressors
43 12 11 Centrifugal Compressors
43 12 13 Diagonal or Mixed-flow Compressors
43 12 16 Axial-Flow Compressors
43 12 33 Single-acting Reciprocating Compressors
43 12 34 Double-acting Reciprocating Compressors
43 12 37 Diaphragm Reciprocating Compressors
43 12 51 Rotary Screw Compressors
43 12 53 Rotary Vane Compressors
43 12 56 Rotary Liquid-ring Compressors
43 12 57 Rotary Scroll Compressors

43 13 00 Gas Process Equipment
43 13 13 Gas Blenders
43 13 19 Gas Mixers
43 13 23 Gas Pressure Regulators
43 13 31 Gas Separation Equipment
43 13 33 Gas Dehydration Equipment
43 13 36 Combined Gas Separation and Dehydration Equipment
43 13 39 Gas Recovery and Condensing Equipment
43 13 43 Waste Gas Burner System
43 13 46 Gas Control and Safety Equipment

43 15 00 Process Air and Gas Filters
43 15 13 Blower Intake and Turbine Air Filters
43 15 13.13 Static Prefilters
43 15 13.16 Static Final Filters
43 15 13.19 Static HEPA Filters
43 15 13.23 Pulse Filters
43 15 33 Grease Filters
43 15 43 Mist Eliminators
43 15 63 High-temperature Air Filters
43 15 73 Multiple-application Air Filters
43 15 73.11 Air Filter Media
43 15 73.12 Permanent Washable Filters
43 15 73.13 Poly-ring Air Filters
43 15 73.15 Rigid Cell Filters
43 15 73.17 Automatic Roll-type Air Filters
43 15 76 Chemical Media for Air and Gas Filters

43 20 00 Liquid Handling Equipment

43 22 00 Liquid Process Equipment
43 22 13 Liquid Aeration Devices
43 22 16 Liquid Agitators
43 22 19 Liquid Blenders
43 22 23 Liquid Centrifuges
43 22 26 Liquid Deaerators
43 22 29 Drum Handling Liquid Process Equipment
43 22 33 Liquid Emulsifiers
43 22 36 Liquid Evaporators
43 22 39 Liquid Feeders
43 22 56 Liquid Process Mixers
43 22 59 Liquid Process Pressure Regulators
43 22 63 Liquid Separation Towers
43 22 66 Liquid Weigh Systems
43 22 69 Liquid Grease Receiving and Dewatering Systems
43 22 73 Liquid Fillers
43 22 76 Liquid Screeners
43 22 79 Liquid Clarifiers
43 22 83 Liquid Classifiers
43 22 86 Liquid Homogenizers
43 22 89 Liquid Presses
43 22 96 Liquid Versators
43 22 99 Liquid Votators

43 23 00 Dry Location Liquid Pumps
43 23 13 Overhung Horizontal Centrifugal Pumps
43 23 13.13 Overhung Flexibly-coupled Horizontal Axial Flow Centrifugal Pumps
43 23 13.14 Overhung Flexibly-coupled Horizontal Frame-mounted Centrifugal Pumps
43 23 13.17 Overhung Flexibly-coupled Horizontal Foot-mounted Centrifugal Pumps
43 23 13.19 Overhung Flexibly-coupled Horizontal Foot-mounted Self-priming Centrifugal Pumps
43 23 13.21 Overhung Flexibly-coupled Horizontal Centerline-mounted Centrifugal Pumps
43 23 13.23 Overhung Flexibly-coupled, Magnetic Drive, Sealless Horizontal Centrifugal Pumps
43 23 13.24 Overhung Close-coupled High-speed Integral Gear Centrifugal Pumps
43 23 13.27 Overhung Close-coupled Horizontal Centrifugal Pumps
43 23 13.29 Overhung Close-coupled Sealless with Canned Motor Horizontal Centrifugal Pumps
43 23 21 Between-Bearings Impeller Centrifugal Pumps
43 23 21.13 Between-bearings Impeller, One- and Two-stage Axially-split Centrifugal Pumps
43 23 21.14 Between-bearings Impeller, One- and Two-stage, Radially-split Centrifugal Pumps
43 23 21.17 Between-bearings Impeller, Multiple-stage, Axially-split Centrifugal Pumps
43 23 21.19 Between-bearings Impeller, Multiple-stage, Radially-split Centrifugal Pumps
43 23 21.21 Between-bearings Impeller, Multiple-stage, Radially-split, Single Casing Centrifugal Pumps
43 23 21.23 Between-bearings Impeller, Multiple-stage, Radially-split, Double Casing Centrifugal Pumps
43 23 31 Vertical Centrifugal Pumps
43 23 31.13 Overhung Flexibly-coupled Vertical Centrifugal Pumps
43 23 31.14 Overhung Flexibly-coupled Vertical Inline Centrifugal Pumps
43 23 31.17 Overhung Flexibly-coupled Vertical End-suction Centrifugal Pumps
43 23 31.19 Overhung Flexibly-coupled, Magnetic Drive, Sealless Vertical Centrifugal Pumps
43 23 31.21 Overhung Close-coupled Vertical Inline Centrifugal Pumps
43 23 31.23 Overhung Close-coupled Vertical End Suction Centrifugal Pumps
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43 23 31.27 Overhung Rigidly-coupled Vertical Inline Centrifugal Pumps
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43 23 53.33 Circumferential Single-Piston Rotary Pumps
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43 23 73.23 Air-Operated Piston Simplex Double-Acting Reciprocating Pumps
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43 23 73.43 Air-Operated Piston Duplex Double-Acting Reciprocating Pumps
43 23 74 Steam Horizontal Reciprocating Pumps
43 23 74.13 Steam Horizontal Double-Acting Piston Simplex Reciprocating Pumps
43 23 74.23 Steam Horizontal Double-Acting Piston Duplex Reciprocating Pumps
43 23 74.33 Steam Horizontal Double-Acting Plunger Simplex Reciprocating Pumps
43 23 74.43 Steam Horizontal Double-Acting Plunger Duplex Reciprocating Pumps
43 23 75 Steam Vertical Reciprocating Pumps
43 23 75.13 Steam Vertical Double-Acting Piston Simplex Reciprocating Pumps
43 23 75.23 Steam Vertical Double-Acting Piston Duplex Reciprocating Pumps
43 23 75.33 Steam Vertical Double-Acting Plunger Simplex Reciprocating Pumps
43 23 75.43 Steam Vertical Double-Acting Plunger Duplex Reciprocating Pumps
43 23 76 Power Horizontal Reciprocating Pumps
43 23 76.11 Power Horizontal Single-Acting Piston Simplex Reciprocating Pumps
43 23 76.12 Power Horizontal Single-Acting Piston Duplex Reciprocating Pumps
43 23 76.13 Power Horizontal Single-Acting Piston Multiplex Reciprocating Pumps
43 23 76.21 Power Horizontal Single-Acting Plunger Simplex Reciprocating Pumps
43 23 76.22 Power Horizontal Single-Acting Plunger Duplex Reciprocating Pumps
43 23 76.23 Power Horizontal Single-Acting Plunger Multiplex Reciprocating Pumps
43 23 76.31 Power Horizontal Double-Acting Piston Simplex Reciprocating Pumps
43 23 76.32 Power Horizontal Double-Acting Piston Duplex Reciprocating Pumps
43 23 76.33 Power Horizontal Double-Acting Piston Multiplex Reciprocating Pumps
43 23 76.41 Power Horizontal Double-Acting Plunger Simplex Reciprocating Pumps
43 23 76.42 Power Horizontal Double-Acting Plunger Duplex Reciprocating Pumps
43 23 76.43 Power Horizontal Double-Acting Plunger Multiplex Reciprocating Pumps
43 23 77 Power Vertical Reciprocating Pumps
43 23 77.11 Power Vertical Single-Acting Piston Simplex Reciprocating Pumps
43 23 77.12 Power Vertical Single-Acting Piston Duplex Reciprocating Pumps
43 23 77.13 Power Vertical Single-Acting Piston Multiplex Reciprocating Pumps
43 23 77.21 Power Vertical Single-Acting Plunger Simplex Reciprocating Pumps
43 23 77.22 Power Vertical Single-Acting Plunger Duplex Reciprocating Pumps
43 23 77.23 Power Vertical Single-Acting Plunger Multiplex Reciprocating Pumps
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43 23 77.32 Power Vertical Double-Acting Piston Duplex Reciprocating Pumps
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43 23 77.41 Power Vertical Double-Acting Plunger Simplex Reciprocating Pumps
43 23 77.42 Power Vertical Double-Acting Plunger Duplex Reciprocating Pumps
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43 23 78.12 Controlled Volume Horizontal Packed Plunger Duplex Reciprocating Pumps
43 23 78.13 Controlled Volume Horizontal Packed Plunger Multiplex Reciprocating Pumps
43 23 78.21 Controlled Volume Horizontal Packed Piston Simplex Reciprocating Pumps
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43 23 78.23 Controlled Volume Horizontal Packed Piston Multiplex Reciprocating Pumps
43 23 78.31 Controlled Volume Horizontal Mechanically-Coupled Diaphragm Simplex Reciprocating Pumps
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44 01 20 Operation and Maintenance of Noise Pollution Control
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44 21 00 **Noise Pollution Control Equipment**
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44 21 16 Flexible Noise Abatement Barriers
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44 41 31 Spill Decks
44 41 32 Drum Containment Units
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44 41 34 Prefabricated Spill Containment Curbing
44 41 36 Prefabricated Spill Containment Berms
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46 31 16  Ammonia Gas Feed Equipment
46 31 23  Gas Storage, Weighing, and Leak Detection Equipment
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