SECTION 464146 - PORTABLE TANK MIXERS

Note that this section has only been edited for NYSOGS standardization and has not been technically edited. The designer shall make all technical edits specific to the project for this section.

This Section specifies portable mixers and accessories for mixing of liquids in field applications, such as tanks and open-channel basins.

Permanent-style mixers are specified in Division 46:

- Rapid Mixers: Section 464111.

- Inline Static Mixers: Section 464117.

- Jet Mixing Equipment: Section 464121.

- Submersible Mixers: Section 464123.

- Floating Mechanical Mixers: Section 464126.

- Paddle Mixers: Section 464127.

When selecting materials in contact with corrosive fluids, consult manufacturer and select materials based on specific application.

1. GENERAL
   * + 1. SUMMARY
          1. Section Includes: Portable tank mixers and accessories.
          2. Related Requirements:

List other Sections directly related to or affecting Work of this Section. Include Sections specifying information expected to be found in this Section as well as Sections required to describe complete system or assembly requirements.

Section 033000 - Cast-in-Place Concrete: Equipment foundation pads.

Section 055000 - Metal Fabrications: Miscellaneous metalwork and fasteners as required by this Section.

Section 262923 - Variable-Frequency Motor Controllers: Variable-speed drives if selected as an accessory.

Section 400593 - Common Motor Requirements for Process Equipment: Basic requirements for motors as required under this Section.

* + - 1. DEFINITIONS

Limit list of definitions to terms unique to this Section and not provided elsewhere.

* + - * 1. LCD: Liquid crystal display. A visual display for electronic devices, using the light modulating properties of liquid crystals.
      1. REFERENCE STANDARDS

List reference standards included within text of this Section, with designations, numbers, and complete document titles.

* + - * 1. ASME International:

ASME B41.6 - Surface Texture (Surface Roughness, Waviness, and Lay).

* + - * 1. ASTM International:

ASTM A182 - Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service.

ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

* + - * 1. National Electrical Manufacturers Association:

NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

* + - * 1. NSF International:

NSF 61 - Drinking Water System Components - Health Effects.

NSF 372 - Drinking Water System Components - Lead Content.

* + - 1. SUBMITTALS

Only request submittals needed to verify compliance with Project requirements.

* + - * 1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
        2. Manufacturer’s installation instructions shall be provided along with product data.
        3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
        4. Product Data:

Submit manufacturer information for drive assemblies, mixer components, panels, and other system components.

Submit schematics and ladder diagrams.

* + - * 1. Shop Drawings:

Indicate assembly, installation, and connection details.

Indicate critical dimensions, sizes, and support locations.

* + - * 1. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

Include separate Paragraphs for additional certifications.

* + - * 1. Manufacturer Instructions: Submit special procedures and assembly of components.
        2. Source Quality-Control Submittals: Indicate results of [**shop**] [**factory**] tests and inspections.
        3. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
        4. Qualifications Statement:

Coordinate following Subparagraph with requirements specified in QUALIFICATIONS Article.

Submit qualifications for manufacturer.

* + - 1. MAINTENANCE MATERIAL SUBMITTALS
         1. Extra Stock Materials:

Furnish [**one**] <**\_\_\_\_\_\_\_\_**> impeller(s) for each type and size of mixer specified.

* + - * 1. Tools: Furnish special [**wrenches**] <**\_\_\_\_\_\_\_\_**> and other devices required for Director’s Representative to maintain <**\_\_\_\_\_\_\_\_**>.
      1. QUALITY ASSURANCE

Include this Article to specify compliance with overall reference standards affecting products and installation included in this Section.

* + - * 1. Materials in Contact with Potable Water: Certified to NSF 61 and NSF 372.

In following Paragraph insert "State of New York Department of Transportation," "Municipality of \_\_\_\_\_\_\_\_ Department of Public Works," or other agency as appropriate.

* + - * 1. Perform Work according to <**\_\_\_\_\_\_\_\_**> standards.

Include following Paragraph only when cost of acquiring specified standards is justified.

* + - * 1. Maintain <**\_\_\_\_\_\_\_\_**> [**copy**] [**copies**] of each standard affecting Work of this Section on Site.
      1. QUALIFICATIONS

Coordinate following Paragraph with requirements specified in SUBMITTALS Article.

* + - * 1. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum [**three**] <**\_\_\_\_\_\_\_\_**> years' [**documented**] experience.
      1. DELIVERY, STORAGE, AND HANDLING
         1. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
         2. Store materials according to manufacturer instructions.
         3. Protection:

Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.

Provide additional protection according to manufacturer instructions.

* + - 1. WARRANTY

This Article extends warranty period beyond one year. Extended warranties may increase construction costs and Owner enforcement responsibilities. Specify warranties with caution.

* + - * 1. Furnish [**five**] <**\_\_\_\_\_\_\_\_**>-year manufacturer's warranty for portable tank mixers.

1. PRODUCTS
   * + 1. MIXERS
          1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=12715&mf=04&src=wd):

DESIGNER TO PROVIDE TWO MANUFACTURER’S AND APPROVED EQUIVALENT FOR ALL LISTED PRODUCTS.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

In following Subparagraph insert "State of New York Department of Transportation," "Municipality of \_\_\_\_\_\_\_\_ Department of Public Works," or other agency as appropriate.

Furnish materials according to <**\_\_\_\_\_\_\_\_**> standards.

Insert descriptive specifications below to identify Project requirements and to eliminate conflicts with products specified above.

* + - * 1. Description:

Motorized mixer for mounting atop a tank or basin to provide chemical mixing [**as indicated on Drawings**].

Drive: [**Gear**] [**Worm gear**] [**Direct**] [**Air**] <**\_\_\_\_\_\_\_\_**>.

Mounting: [**Flanged**] [**Threaded, female**] [**Quick release**] [**Adjustable, indexed clamp**] <**\_\_\_\_\_\_\_\_**>.

Bearings: Permanently lubricated.

Gear Lubrication: [**Self-lubricating with mixing fluid**] [**Nontoxic grease**] [**Nontoxic oil**] <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Impeller:

Type: [**Pitch**] [**Radial**] [**Propeller**].

Position: Adjustable.

* + - * 1. Supports:

Material: [**Steel members**] [**Formed steel channels**] [**Steel pipe and fittings**] <**\_\_\_\_\_\_\_\_**>.

As specified in Section 055000 - Metal Fabrications.

Fabricated Metal Supports Exposed to Chemical Spillage:

Type 316 stainless steel or enameled steel.

Anchor Bolts, Nuts, and Washers: Type 316 stainless steel.

* + - * 1. Performance and Design Criteria:

Corrosion Resistance: Furnish materials resistant to corrosive attacks from process chemicals being handled.

Maximum Working Temperature: [**200**] <**\_\_\_\_\_\_\_\_**> degrees F

* + - * 1. Operation:

Electrical Characteristics:

[**<\_\_\_\_\_\_\_\_> hp**] [**<\_\_\_\_\_\_\_\_> RLA].**

Voltage: <**\_\_\_\_\_\_\_\_**> V, [**single**] [**three**] phase, 60 Hz.

Maximum [**Fuse Size**] [**Circuit-Breaker Size**] [**Overcurrent Protection**]: <**\_\_\_\_\_\_\_\_**> A.

Minimum Circuit Ampacity: <**\_\_\_\_\_\_\_\_**>.

Minimum Power Factor: <**\_\_\_\_\_\_\_\_**> percent at rated load.

Control Panel: NEMA 250 Type [**4X**] <**\_\_\_\_\_\_\_\_**>.

Motors:

As specified in Section 400593 - Common Motor Requirements for Process Equipment.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

Consider specifying an air motor in hazardous environments.

Air motor.

* + - * 1. Materials:

Housing: [**Aluminum, ASTM B209]** <**\_\_\_\_\_\_\_\_**>.

Flanges: [**Type 316 stainless steel, ASTM A182**] <**\_\_\_\_\_\_\_\_**>.

Consult manufacturer, and select shaft and blade materials based on specific application.

Shaft and Impeller:

[**Type 316 stainless steel**] <**\_\_\_\_\_\_\_\_**>.

Coating: [**Rubber**] [**PVC**] [**PTFE**] <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Accessories:

Remote Tachometer:

Display: LCD.

Input: 4- to 20-mA dc.

Variable-Speed Drive: As specified in Section 262923 - Variable-Frequency Motor Controllers.

An angle riser may be used on open-tank mounting configurations for off-center positioning of mixer.

Angle riser.

* + - * 1. Finishes:

Machine Finish: Comply with ASME B46.1.

* + - 1. SOURCE QUALITY CONTROL
         1. Provide shop inspection and testing of completed assembly.

Include one or both of following Paragraphs to require Director's inspection or witnessing of test at factory.

* + - * 1. Director’s Inspection:

Make completed mixers available for inspection at manufacturer's factory prior to packaging for shipment.

Notify Director’s Representative at least [**seven**] <**\_\_\_\_\_\_\_\_**> days before inspection is allowed.

* + - * 1. Director’s Witnessing:

Allow witnessing of factory inspections and test at manufacturer's test facility.

Notify Director’s Representative at least [**seven**] <**\_\_\_\_\_\_\_\_**> days before inspections and tests are scheduled.

Include following Paragraph if reliance on manufacturer's approved quality-control program is sufficient for Project requirements.

* + - * 1. Certificate of Compliance:

If manufacturer is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at manufacturer's facility conforms to Contract Documents.

Specified shop tests are not required for Work performed by approved manufacturer.

1. EXECUTION
   * + 1. EXAMINATION
          1. Verify that designated areas, clearances, structural requirements, utility connections, and electronic signals are ready to receive equipment.
       2. INSTALLATION
          1. According to manufacturer instructions.
       3. FIELD QUALITY CONTROL
          1. Inspect for proper alignment.
          2. Testing:

Demonstrate operation without undue noise, vibration, or overheating.

[**Director’s Representative**] <**\_\_\_\_\_\_\_\_**> will witness field testing.

* + - * 1. Equipment Acceptance: Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.
      1. DEMONSTRATION
         1. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Director’s Representative.
      2. ATTACHMENTS

When relying on separate schedules, tables, illustrations, or forms to specify product requirements, include list of each attachment. Include identical list of attachments in Project Manual table of contents.

Consider including schedule if Project includes more than one portable tank mixer.

Insert attachments following END OF SECTION. Consider following example when developing Project schedule.

* + - * 1. Portable Tank Mixer Schedule:

MXP-1:

Location: <**\_\_\_\_\_\_\_\_**>.

[**Manufacturer: <\_\_\_\_\_\_\_\_>.**]

[**Model: <\_\_\_\_\_\_\_\_\_>.**]

Blades:

Number: <**\_\_\_\_\_\_\_\_**>.

Diameter: <**\_\_\_\_\_\_\_\_**>.

Angle: <**\_\_\_\_\_\_\_\_**>.

Shaft Length: <**\_\_\_\_\_\_\_\_**>.

Motor:

Hp: <**\_\_\_\_\_\_\_\_**>.

Speed: <**\_\_\_\_\_\_\_\_**>.

Voltage/Phase: <**\_\_\_\_\_\_\_\_**>/<**\_\_\_\_\_\_\_\_**>.

MXP-2:

Location: <**\_\_\_\_\_\_\_\_**>.

[**Manufacturer: <\_\_\_\_\_\_\_\_>.**]

[**Model: <\_\_\_\_\_\_\_\_\_>.**]

Blades:

Number: <**\_\_\_\_\_\_\_\_**>.

Diameter: <**\_\_\_\_\_\_\_\_**>.

Angle: <**\_\_\_\_\_\_\_\_**>.

Shaft Length: <**\_\_\_\_\_\_\_\_**>.

Motor:

Hp: <**\_\_\_\_\_\_\_\_**>.

Speed: <**\_\_\_\_\_\_\_\_**>.

Voltage/Phase: <**\_\_\_\_\_\_\_\_**>/<**\_\_\_\_\_\_\_\_**>.

END OF SECTION 464146