

1. GENERAL

- 1.1 The following specifications direct attention to certain features of the design package, but do not purport to cover all details entering into the design, construction, and/or installation of the equipment.
- 1.2 Furnish _____ hydraulic horizontal mixers. Each mixer shall consist of a hydraulic motor, gear reducer, propeller and appropriate mounting device. Furnish _____ hydraulic power unit(s) to power _____ hydraulic motor(s) of variable speeds.

2. PERFORMANCE

- 2.1 At _____ horsepower per mixer unit, the mixing rate shall be a minimum of _____ gallons per minute.

3. MIXER DRIVE SYSTEM**3.1 GENERAL**

- A. Mixer drive system shall be capable of infinitely variable speeds, in the range of zero to _____ rpm. No component in the system other than the electric motor shall have a service factor of less than four (4).

3.2 HYDRAULIC POWER UNIT**3.2.1 ELECTRIC MOTOR****A. GENERAL**

1. Motors are design for continuous duty for 3 phase, 60 HZ, 230/460 volt operation, NEMA design B.
2. Motors to be furnished with Class F insulation, 1.15 service factor, but shall be selected for operation within their full load rating without applying the service factor.

B. MECHANICAL

1. Bearings shall be selected to provide B-10 rating life of 100,000 hours minimum direct coupled applications.

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2. Motor lubrication system shall consist of a grease inlet on motor bracket with capped grease fitting on inlet, grease relief plug 180 degrees from inlet, grease reservoir in bracket and grease reservoir in cast inner cap.

C. ENCLOSURES

1. Motor enclosure including frame with integrally cast feet, end brackets, bearing inner caps, fan guards, and conduit box and cover shall be cast iron, ASTM type A-48, Class 25 or better.
2. Corrosion resistant stainless steel nameplate shall be affixed to motor frame with stainless steel or brass drive pins. Nameplate(s) shall include all required NEMA data connection diagram(s) for dual voltage motors.

D. ELECTRICAL

1. All motors shall successfully operate under power supply variations per NEMA MG1-14.30.
2. Motor insulation system shall be Class F minimum, utilizing material and insulation system evaluated in accordance with IEEE 117 classifications test.
3. Entire wound and insulated stator shall receive additional coating of epoxy on all surfaces to protect against moisture and corrosion.

E. NOISE

1. The no-load sound pressure level, based on the A-weighted scale at three (3) feet when measured in accordance with IEEE std. 85 shall not exceed 85DBA.

F. EFFICIENCY

1. All motors shall be of an energy-efficient design different from manufacturer's standard product through the use of premium materials, design and improved manufacturing process that reduces motor losses approximately 40% from standard efficient designs.

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2. Motor efficiency shall be determined in accordance with NEMA standard MG1-2.53A and full load efficiency labeled on motor nameplate in accordance with NEMA standard MG1-2.53B.

3.2.2 HYDRAULIC PUMP

- A. The hydraulic pump will be enclosed in the hydraulic reservoir, which will be mounted rigidly and directly to the electric motor adapter through the reservoir top and secured to the reservoir top.
- B. The hydraulic pump will be of the high pressure, variable volume, vane type.
- C. The hydraulic pump will be direct pressure and flow compensated.
- D. The hydraulic pump will have a rated pressure, continuous, of 2,000 psi.

3.2.3 FLOW CONTROL

- A. The flow control shall be pressure compensated, adjustable flow type.
- B. The flow control pump will have a maximum pressure rating of 3,000 psi.

3.2.4 PRESSURE GAUGE

- A. The pressure gauge will be of the glycerin-filled, bottom mounted type, with shut off valve.
- B. The pressure gauge will read in PSI and BAR.

3.2.5 FILTER

- A. The filter will be of the return line type and will be tank mounted for ease of service.
- B. The filter will incorporate a not greater than 10-micron throwaway element.

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- C. The filter element medium will be pleated, resin-impregnated paper, placed around a steel center tube. End caps to be metal and firmly bonded to element pleats with cured adhesive. End gaskets to be rubber grommet style.

3.2.6 HYDRAULIC RESERVOIR

- A. The hydraulic reservoir will be constructed of aluminum, not less than 10 gauge.
- B. The hydraulic reservoir will incorporate a filler/breather assembly on the top. Fluid level temperature gauge is located on the front side of the reservoir.
- C. The hydraulic reservoir will incorporate a hinged top, which will be gasketed. The hinged top design will provide easy access to all hydraulic components. A drain plug will be located at or near the bottom of the reservoir.

3.2.7 QUICK DISCONNECT COUPLINGS

- A. The quick disconnect coupling will be poppet type with ball-type locking mechanism.
- B. The O-ring seal on the poppet will permit zero leakage of the uncoupled half.

4. HYDRAULIC MOTOR

- 4.1 The hydraulic motor shall be of the fixed displacement type.
- 4.2 The hydraulic motor shall be capable of withstanding end thrust loads either into or out from the motor of not less than 1,000 pounds.
- 4.3 The hydraulic motor shall be rated for a B-10 life of not less than 100,000 hours.
- 4.4 The hydraulic motor shall be connected to the hydraulic power unit by suitable flexible and rigid hydraulic hose of not less than 2,750 psi, continuous duty hose/pipe.

5. SUBMERSIBLE GEAR REDUCER

- 5.1 The gear reducer shall be housed in corrosive resistant Class 30 cast iron.
- 5.2 The output shaft shall be 18-8 stainless steel.
- 5.3 The output shaft shall be supported by two (2) heavy duty, single row bearings, rated for 100,000 hours.
- 5.4 The gear reducer shall be protected from liquid intrusion by a special heavy duty Type 21 mechanical seal of converted silicone carbide. For superior corrosive resistance and wear, any combination of lip seal/mechanical seals shall not be considered equal.
- 5.5 The gear reducer shall provide a oil level gauge, oil drain plug and fill plug. Gear reducer oil reservoir shall hold not less than 4 quarts of 90W gear lube.
- 5.6 All external hardware shall be 304 stainless steel.

6. MOTOR MOUNT FRAME

- 6.1 The motor mount frame and propeller shroud shall be 3/16", type 304 stainless steel.
- 6.2 The motor mount frame shall be provided with LPE liner, affording a non-sparking contact between frame and mount.

7. PROPELLER

- 7.1 The propeller shall be of one piece cast _____, hydraulically and dynamically balanced, three vane, non-clogging backward curve design. The high thrust propeller shall be capable of handling solids and fibrous materials.
- 7.2 Propeller blades shall be _____ diameter.

8. HARDWARE

- 8.1 The exposed nuts and bolts shall be 316 stainless steel.
- 8.2 Bolts and nuts shall be American Standard. No special metric tools shall be required.

9. MIXER SUPPORT SYSTEM

9.1 GENERAL

- A. The support system shall consist of a mast, base plate, upper support and winch.
- B. The support system shall be used for mounting the mixer(s) during operation and as a guide for mixer installation and removal.

9.2 MAST

- A. The upper support shall provide the mast support at the walkway.
- B. The support shall be made of 304 stainless steel tube.

9.4 BASE PLATE

- A. The base plate shall be bolted to the basin floor.
- B. The plate shall be .250 thick 304 stainless steel plate.

9.5 WINCH

- A. A manual winch shall be provided to raise and lower the mixer(s).
- B. The winch shall have a rate capacity of 2,000 lbs.