

**PUMP SPECIFICATION**

**SKF NON-CLOG SHREDDER  
HIGH TEMPERATURE PUMPS**

**PUMP REQUIREMENTS**

Supply (qty) \_\_\_\_\_, \_\_\_\_\_ inch discharge electric submersible non-clog shredder pump(s). The pump shall be driven by a close coupled \_\_\_\_\_ HP, submersible electric motor with a nominal rating of \_\_\_\_\_ volts, 3 phase, 60 HZ, \_\_\_\_\_ RPM.

The pump shall be capable of pumping fluids up to 200°F. The pump shall be capable of delivering \_\_\_\_\_ US GPM flow at \_\_\_\_\_ FT TDH. The pump shall also be able to deliver \_\_\_\_\_ US GPM at \_\_\_\_\_ FT TDH. The pump shutoff head shall be at least \_\_\_\_\_ FT TDH. The pump shall be capable of a maximum submergence depth of 65 ft.

**DESIGN AND CONSTRUCTION**

The pump shall be designed and constructed to pump liquids containing solids up to \_\_\_\_\_ inch spherical diameter, and to shred solids so they do not clog inside the pump or the discharge pipe.

**Impeller**

The pump shall be supplied with a dynamically balanced (choose one) single / double vane non clog impeller made of (choose one) cast iron / chrome iron (550 BHN) on 1-5HP models and cast iron (only) on 7-20HP models. The impeller is to have a Tungsten Carbide cutting tooth welded to the leading edge tip of the pump impeller vane(s).

The impeller shall be affixed to the motor rotor shaft on (choose one)

3 phase motor pumps by placing the impeller onto a shaft , locking it into place with an impeller key, and tightening it to the shaft with an impeller lock washer and nut screwed onto machined threads at the end of the motor shaft.

The space between the impeller vanes and the suction cover shall not exceed 0.02" to avoid recirculation and prevent the loss of hydraulic efficiency.

**Suction Plate**

The pump shall be fitted with a replaceable suction cover bolted directly to the volute. The suction cover shall be made of (choose one) cast iron / chrome iron (550 BHN) on 1-5HP models and cast iron (only) on 7-20HP models. Suction plate is to have an irregular opening with engineered cutting slots to help grab debris and aid the impeller with its shredding action.

**Volute**

The volute shall be made of cast iron and bolted directly to the pump's seal housing. The volute shall have a flanged discharge (choose one):

2 and 3 inch pumps: square 4 bolt flange, (choose, if applicable) with an ANSI 4 bolt adapter flange

4 inch pumps: square 4 bolt flange (choose, if applicable) with an ANSI 8 bolt adapter flange.

6 inch pumps: ANSI 8 bolt flange

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**Discharge Elbow**

The pump shall be supplied with a 90 degree discharge elbow flanged at one end bolted to the pump and with a \_\_\_\_\_ (choose from below) discharge.

- |                     |                    |
|---------------------|--------------------|
| 2" and 3" discharge | male NPT           |
| 4" discharge        | female NPT         |
| 6" discharge        | ANSI 8 bolt flange |

**Seals**

The pump shall be supplied with two independent mechanical seals designed to prevent fluid from entering the motor housing. The lower seal faces shall be made of silicon carbide vs. silicon carbide. The upper seal faces shall be carbon and ceramic. The seal elastomers shall be made of Fluorelastomer (FKM). The seals shall be held in contact by a common 304SS spring between the lower and upper seals.

The pump seal chamber shall be isolated from the pumped liquid by a lip seal constructed from Fluorelastomer (FKM) rubber.

The two mechanical shaft seals shall be lubricated by Shell FM 32 – food grade NSF approved, non toxic oil, in a seal chamber separate from the volute and motor pump housing.

**Seal Minder®**

The pump shall be supplied with a **Seal Minder®**; to detect the presence of water in the seal oil chamber. The probe is connected to a 24VAC power source (by operator). The probe in the seal chamber measures the resistance in the fluid (oil). If the resistance drops below a preset amount, an alarm is triggered in the control panel.

**Motor**

The pump motor shall be a NEMA design B oil filled motor designed specifically for submersible pump usage and continuous duty of pumped liquid up to 200 degrees F.

The stator windings and leads shall be insulated with moisture resistant Class R insulation rated for 428 degrees F and surrounded by Shell FM 32 – food grade NSF approved non toxic oil.

The motor horsepower shall be non-overloading over the full range of the performance curve, from shut-off to full flow. The combined service factor (frequency, voltage and liquid specific gravity) of the motor shall be 1.10.

The motor shall be protected from failure from overheating by three thermal sensor switches wired in series and imbedded in each phase winding for final connection to motor control. The sensors are set to open when the stator winding reaches 300°F.

The motor design is capable of inverter duty operation with a turn down ratio that will allow a frequency operation range from 60Hz to 30Hz.

The motor housing shall be constructed of corrosive resistant 304SS for superior heat transfer.

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The motor cover shall be constructed of cast iron and have a threaded fitting to permit air testing of the motor cover and power cord inlet seal against leakage.

Optional: *(delete above and insert)*: The pump shall be supplied with a \_\_\_\_\_foot power cord.

The power cord shall be protected by a strain relief, attached to the motor cover. The strain relief will be sized to absorb the load and prevent the power cord leads from being separated from their connection to the motor lead wires, if the power cord is pulled, as in the act of attempting to lift the pump by the cord.

The power cord entry shall be sealed by a gland fitted with a BUNA rubber molded power cord sleeve, attached to the pump cover, and the power wire leads shall be independently connected to the motor wire leads in an epoxy potting.

**Power Cord**

The pump shall be supplied with a 33 foot power cord (alternative lengths optional) connected to the motor lead wires in a water and oil resistant sealed epoxy potting. The power cord shall be sized in accordance with NEC standards. The outer jacket of the power cord shall be oil resistant and capable of submergence in water up to 200°F.

**Rotor / Pump Shaft**

The rotor (pump) shaft shall be constructed of corrosive resistant 304SS and be of sufficient diameter to handle radial loads over the full range of the pump's performance curve while pumping high concentrations of solids.

Rotor shall be made of steel with cast aluminum insulation and shall be dynamically balanced.

**Bearings**

The upper bearing shall be a single deep groove row ball bearing.

The lower bearing shall be single row deep groove ball bearing for 2, 3, 5, 7.5, and 10 HP model pumps

Tandem deep groove bearing set for 15 and 20 HP model pumps

The upper and lower bearings shall be lubricated by the Shell 32 dielectric motor oil. Minimum bearing L10 life shall be 30,000 hours.

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**Supporting the Pump**

The pump shall be mounted on an integral stand constructed of cast iron that may be removed by loosening bolts when the pump is mounted on a slide rail.

The pump shall be fitted with (choose one) 2 lift rings / handle, screwed into the pump cover. Lifting chains shall be supplied by others.

**TESTING**

The pump shall undergo the following tests, which shall be recorded and certified.

Air pressure	Winding: phase angle and impedance tests
Noise	Insulation to ground
Vibration	

A copy of the test record tag shall be attached to the pump when delivered to the customer or job site.

**OVERALL**

The pump shall be a BJM Pumps® SKF series model \_\_\_\_\_.

The pump shall be \_\_\_\_\_ inches in height; \_\_\_\_\_ inches in diameter and shall weigh \_\_\_\_\_ lbs.