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# PUMPS, INC. NEWS

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**“We take pride in ensuring that you have the proper equipment for your specific application”**

## **DID YOU KNOW???**

Pumps, Inc. is the designated authorized distributor for all EBARA stainless steel products and all HOMA standard pump division products for the state of Arizona.

## **TECH TALK 1...**

Some of the outstanding design features of the HOMA submersible pump are:

**\*Heavy Duty, High Efficiency, Air Filled Motor, Class F Insulation,** offers lower operating costs and longer service life. Thermal protection embedded in each phase of the windings protects the motor from overload problems avoiding expensive motor repairs. Some motor sizes can be labeled FM explosion proof, class 1, division 1, groups C and D are available as an option.

**\*Self-Cooling Jacket** utilizes pumpage for cooling in dry pit configurations, eliminating the need for external pumping devices or special heat transfer fluids. This system offers simplicity and high reliability by effectively dissipating heat.

**\*Single and Double Row Anti Friction Ball Bearings** are deep groove bearings and the upper bearing floats axially to sustain radial loads only, while the lower bearing is axially retained and is designed to sustain both axial and radial loads, thus ensuring a long dependable operation.

**\*Seal Fail Probe** provides positive advance warning of mechanical seal failure avoiding costly motor repairs.

**\*Double Mechanical Seal System** prevents leakage into the motor offering reliability and long service life. The lower seal utilizes hard face materials operating in the pumpage. The upper seal, with face materials of carbon and ceramic

operating in an oil bath, act as a secondary barrier between the pumpage and the motor.

### **\*High Efficiency Impellers**

pass large solids with high outputs while reducing power consumption hence lowering operating costs. Open multi channel impellers are utilized with grinder pumps and enclosed single or multi channel impellers are available depending on the design conditions. Each impeller is optimized for its hydraulic coverage.

### **\*Replaceable Wear**

**Components** maintain working clearances while reducing costly casing and volute costs. Open impellers utilize adjustable suction covers while enclosed impellers utilize case wear rings. Grinder attachments are also field replaceable.

## **TECH TALK II...**

In this section we will discuss common submersible pump problems that could cause premature pump failure and HOMA's solutions:

### **(1) Cable and cable entrance failure**

A major submersible pump manufacturer offers the following cautionary instruction in their O & M manual. "Pay special attention to unprotected open cable ends: seal them off and make sure that they are not submerged or exposed to moisture and liquid. Penetration of moisture ("wicking") thru the cable may cause breakdown of the insulation, arcing at the pump terminal board, destruction of the junction chamber and serious damage to the pump." This caution shouldn't be taken lightly as a pump can fail easily due to even a small amount of water penetration. Obviously a nicked or otherwise damaged cable would also allow water penetration into the junction chamber, this is why it is critical to avoid damage to the cable and seal the open end if possible. HOMA pumps are shipped with the cable end protected to prevent any kind of wicking into the motor from occurring. Do not remove the cable

protection until you are ready to wire it to the panel.

### **2) Vibration – mechanical seal failure**

**Vibration in submersible pumps can be caused by the following conditions:**

1. **Incorrect rotation** – 3 phase units – Solution: Correct by switching motor leads in control panel. REFER TO THE INSTRUCTION MANUAL SUPPLIED WITH THE UNIT. **CAUTION** BE SURE POWER IS **TURNED OFF**.
2. **Cavitation**, usually accompanied by a noise that sounds like the unit is pumping rocks. – **Cause** – Improper selection or clogged suction port – **Diagnoses:** If the installation is equipped with a valve on the discharge, slowly start closing the valve. If the unit stops vibrating and quiets down, this diagnosis is correct. If the unit fails to quiet down until the valve is almost closed or completely closed, chances are the unit has a clogged suction port – Solution: Pull the unit and check for clogging. If the unit is not clogged then more than likely you may have to trim the impeller to fit the pumping condition. Your local HOMA Distributor is qualified to help in solving this problem.
3. **Imbalance in rotating element.** **Cause** – Worn or chipped impeller vanes, also can be caused by an object stuck in the impeller. – **Solution:** Pull the unit and inspect for the above causes and if needed, repair as required.

## **THE HOMA SOLUTION**

The above problems along with the causes and solutions apply to all submersible pumps in general.

HOMA, through it's many years of experience and testing has tried to eliminate some of the above problems. HOMA has designed a unit that has been proven through testing to be the

most trouble free for the application. The basic design criteria and explanations for the reasons HOMA incorporates a different design than our competitors will be shown in the following paragraphs. The problem of vibration in a submersible pump due to clogging cannot be completely eliminated. As anyone knows that has had to maintain a submersible pump installation no matter how large a diameter solids handling pump you install, someone will find a way to get a larger solid in to the sewer system and in turn into the sump. This situation, it seems cannot be avoided and this is one of the reasons that most submersible pumps should be installed with guide rail systems.

It is commonly found that the majority of the cases involving a clogged pump, the clog was not caused by a large diameter solid, but was instead caused by fibrous or stringy material. It is for this reason that HOMA can incorporate vortex, grinder, a cutter option and multi channel impellers as choices for their submersible pumps, however not all applications would require the same style. The use of enclosed impellers would allow a higher hydraulic efficiency but because the bottom of the vane is also enclosed on this type of impeller this could provide a place for fibrous material to get trapped and build up. However we are not suggesting that a single vane impeller is a bad choice, there simply is a slightly higher risk of this becoming a problem, (under the right circumstances any impeller can become clogged).

Vibration due to chipped impeller vanes causing imbalance of the impeller is also hard to avoid and there is little that the manufacturer can do to prevent this.

Vibration due to worn tips on the impeller vane, however is a different story. As we stated before, solids handling capabilities of a unit does not necessarily mean that the higher rated solids handling pump will not clog more often than a unit than has a lower rated diameter solids handling capability. How many vanes should an impeller have in order to pump sewage and wastewater? Some of the other manufacturers of submersible pumps also incorporate the single vane

impeller design. Engineers go to great lengths to ensure that piping systems are designed so that velocities are in the proper ranges. HOMA also goes to great lengths to ensure that velocities through their pumps are within the proper ranges.

We realize that this was a long and involved discussion, however the problem of imbalance and the resulting vibration it causes is a major reason for pump failure.

As you can see it is not an easy task to decide what type of design to choose, therefore it is always a good idea to provide as much information as possible when choosing a pump to ensure that the pump will provide long reliable service for your application.

### **“SPEC SMARTS”** **“Consulting Engineers”** **Corner”**

**Q: Spare Parts?** – Should I specify they be furnished with the equipment or should the owner purchase separately at a later time?

**A: Put in the Specs.**

Why: At bid time, all bidders will discount the spare parts as part of the equipment. If purchased by the Owner at a later date, he will probably pay list price or higher.

**Q: Noise?** – Should I specify Factory or Field test?

**A: Field Test.**

Why: All noise testing is in comparison to a background dBA. The background dBA encountered in the Factory Test is invariably different from that at the jobsite. However, by stating that the acceptance of the equipment is dependent upon compliance to OSHA Noise Criteria as determined by Field Testing, most manufacturers will make sure that they can meet this requirement prior to shipping their product to the jobsite.

**Q:** The Owner has stated his preference for Brand “A”. However, Brands “B” & “C” have comparable quality, service and good reputations. In this instance, both Brand “B” & “C”

are a much better process fit than Brand “A”. How should I approach the technical/political aspects of this problem?

**A: Advise Owner of your research.** Support your work with cost savings, installation lists, references, etc if “preference” changes to “directive”, the owner should be made aware that a proprietary spec will result. If the Owner agrees to “or equal”, and then the specifications can be enhanced to include the more technically correct equipment to meet process equipment.

Caution: If you include all features of all manufacturers, it is possible that you will write a spec that nobody can meet.

Why: For every application there is the best available selection of equipment. However, the best selection for every application does not necessarily come from the same manufacturer.

Contact Ethan or Doug at (520) 628-1534 or (888) 74PUMPS with any questions or comments you may have.