



**PUMPS THAT EXPERTS SELECT.**

# **Technical Talk: Mechanical Seal Technology Update**

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In an effort to improve the mean time between planned maintenance (MTBPM) of chemical process pumps, most major process pump manufacturers have introduced enlarged seal chambers as an option to conventional box stuffing. LaBour Taber is no different. We manufacture the Max-Life seal chamber. In most applications, single seals can be used in the Max-Life seal chambers without a flush plan.

According to a study conducted by Durametallic, over 10,000 enlarged seal chambers have now been installed in industrial pumps, with unbelievable improvements in seal life. This is not surprising, as one of the critical factors that affect seal life is the temperature of the seal faces. With conventional stuffing boxes, there is hardly any fluid in the box. As a result, seal generated heat is not removed adequately. However, lack of understanding when applying the Max-Life seal chamber may result in problems other than cool running of the mechanical seal.

One of the problems reported in enlarged seal chambers is erosion, which is usually associated with abrasive products or debris, commonly found at process start-up. Erosion affects can be reduced by using wear resistant seal chambers and seal glands, and/or decreasing the seal chamber fluid velocity by reducing the chamber throat diameter below the diameter of the back vane of the impeller. Pumps that have balance holes in the impeller do have fluid exchange between the two sides of the impeller, which might cause the fluid to swirl in the seal chamber and should therefore be used with caution in abrasive fluids.

Another commonly known problem is fluid with entrained gases. These gases have the tendency to collect around the rotating shaft and seal, resulting in seal faces running dry. Fluids that are pumped close to their vapor pressure should be looked at closely before it is decided which seal chamber to use.

LaBour currently offers three types of Max-Life seal chambers

- Standard straight bore.
- Tapered bore.
- Non-cartridge double seal or throat bushing installation.

On the next page is a table showing which Max-Life seal chamber to use in different service conditions.

**MAX-LIFE SEAL CHAMBERS**

Service Condition	Conventional Stuffing Box	Straight Bore	Tapered Bore	Non-Cartridge Double Seal
-No gas or vapor likely -Solids <10% by volume	-Bypass or external flush	-No flush required -Erosion possible	- No flush required -Erosion possible	-Bypass or external flush
-Gas ingestion likely -Solids <10% by volume	- Bypass or external flush	-No flush required -Quench recommended -Erosion possible	- No flush required -Quench recommended -Erosion possible	-Bypass or external flush
-Light HC or other low boiling point fluid -Chamber within 25 PSIG of boiling point -Chamber >25 PSIG of boiling point	-Bypass flush with throat bushing -Bypass flush	-Not recommended	-Not recommended	-Bypass flush with throat bushing -Bypass flush
-Solids >10% by volume	-External flush or double seal	*No flush required -Erosion possible	*No flush required -Erosion Possible	-External flush or double seal
-Gas ingestion likely -No solids	-Bypass flush	-No flush required	-No flush required	-Bypass flush

\* Some slurries, such as lime, may require an external flush\*

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