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### You have choices

In the horizontal pump world of **ANSI**, the (14) mid frame pump sizes offer you a choice of selecting an **MTO** (medium) or an **LTO** (large) frame size. See *sidebar* below for more info.

Most often your competitor will choose the MTO over the LTO version because it is **less expensive**. They often choose the least expensive version because they don't know or aren't sure how to sell reliability, durability and the lower total cost of ownership (TOC).

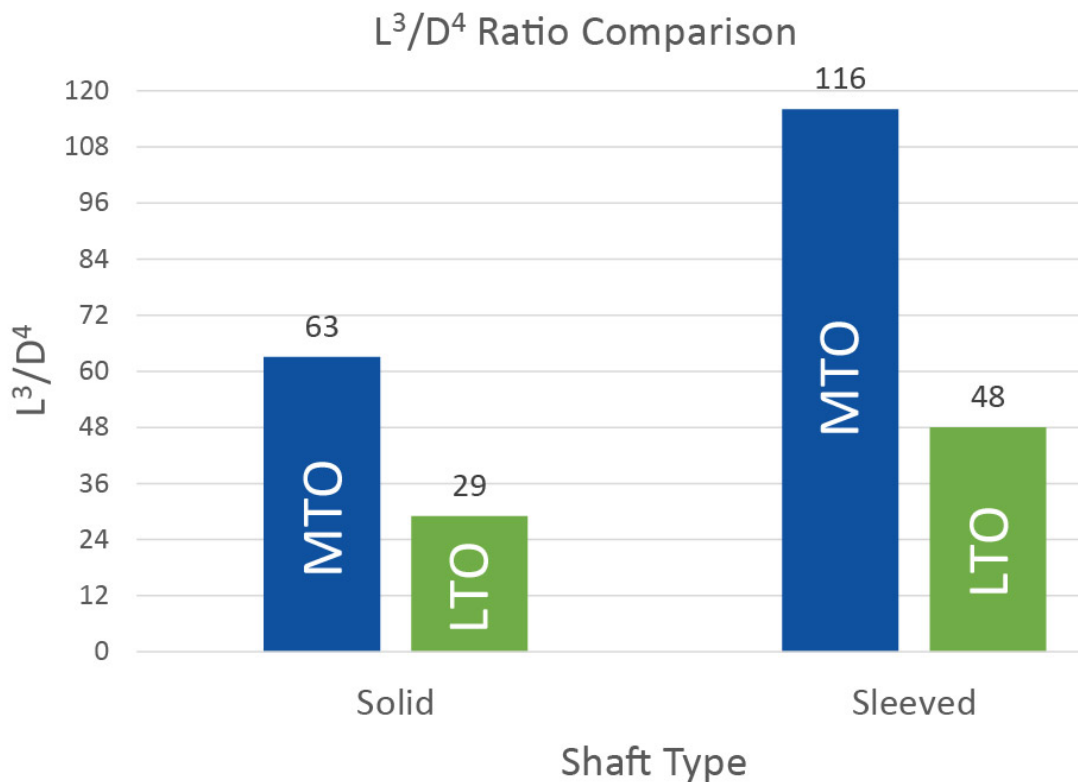
I will acquiesce that some people will never be convinced regarding the "*upsell*". At times I agree, depending on the pump duty and the duty cycle, that sometimes going cheap is indeed acceptable.



### What is the difference?

The main difference between an MTO and LTO pumps ARE the shaft diameters. The MTO uses a 1-3/4” mechanical seal, whereas the LTO uses a 2-1/8” mechanical seal. Of course, this also affects the bearing sizes, both inboard (radial) and outboard (thrust), coupling hub size, and consequently the stuffing box size.

The larger shaft diameter directly correlates to a lower Shaft Deflection Index ( $L^3/D^4$ ) rating as well. The lower the number, the less likely the shaft will deflect. See below chart:



All these “bigger sizes” do add up to more cost and a higher price, but they can also translate directly to higher reliability; meaning longer intervals between maintenance and lower total cost overall.

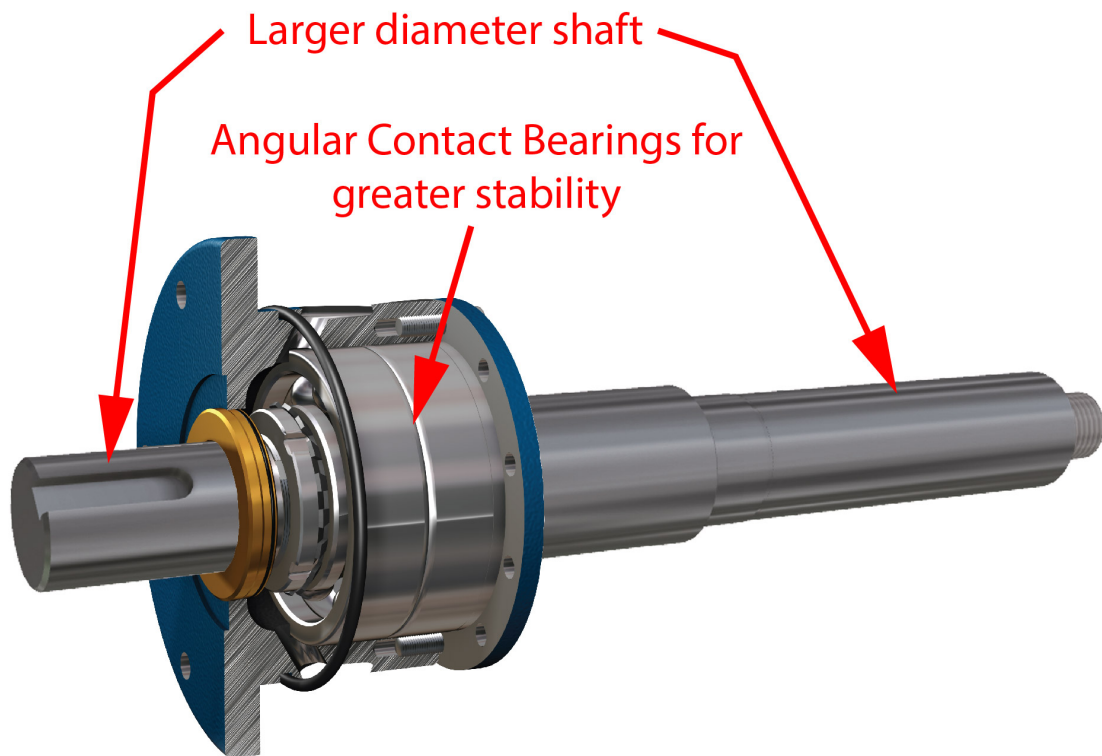
### When and How do you decide to offer the LTO?

Before you decide, first consider some of the conditions the pump will experience. Look at the application, the fluid, the curve, the design point(s) and the duty cycle. Discuss with your customer where and for how long they will operate on the curve. Also ask if the customer had previous issues due to operations away from BEP?

Does the pump operate 24/7 or 5 minutes a month?

What is the energy level involved? (More important on a 50 HP application than 5 HP.)

Is the duty critical? Is there a backup pump in place?



LTO Shaft Kit (Less IB Bearing, Laby Seal & Key)

**We always recommend LTO over MTO when the following conditions exist:**

- Engine driven (intermittent torque application from combustion engine)
- Belt drive (high cyclic stresses)
- Operations away from BEP and approaching minimum flows or end of curve.
- Conditions (fluids) that push the pump into a sleeved shaft configuration (higher  $L^3/D^4$ ).
- Applications with fluids that are viscous, non-Newtonian or high Specific Gravity (approach shaft BHP limits)
- Fluid conditions /properties that push for a more sophisticated mechanical seal application (bigger seal).
- Extreme temperature applications; over 325 F or under minus 20 F.
- Variable speed applications; especially if it will run at low speeds at or below 900 RPM or has abrupt changes in speed. (Torque varies inversely with speed)
- Applications with very low suction pressures or abrupt fluctuating changes in suction pressure. (Axial thrust increases as suction pressure decreases on end suction pumps.)

Sidebar: This covers pump sizes 2x3-8 thru 4x6-13 (ANSI dimensional designations A05 - A80). There are 15 sizes if you count the 3x4-7. For the reverse vane impeller world this is also known as Group 2, but the two shaft size (MT versus LT) choice does not apply.

-The Summit Pump Team

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