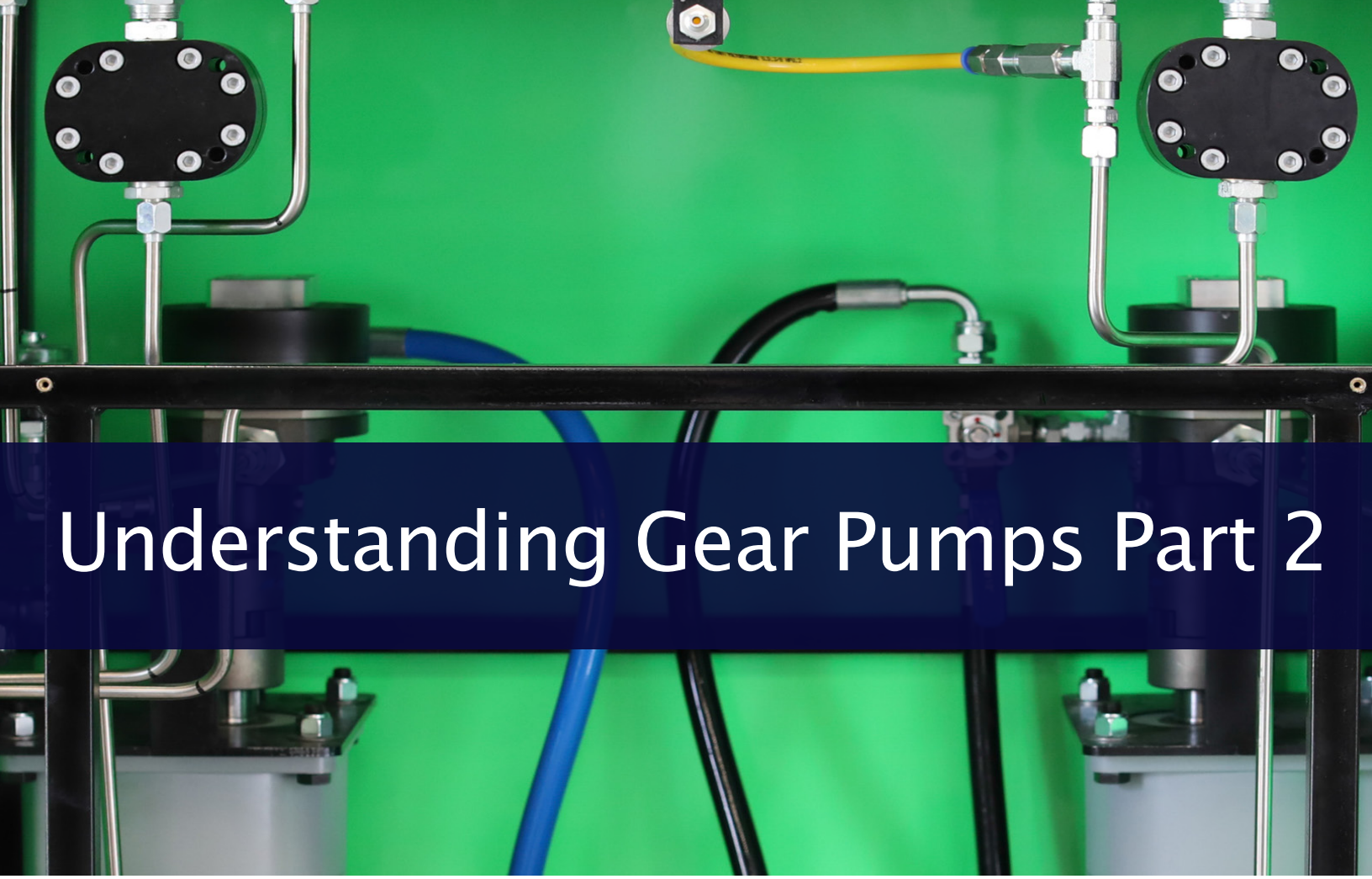

Understanding Gear Pumps Part 2

AKURATE DYNAMICS

This is the second article in our three-part series on gear pumps. As in our previous post, we are addressing some inaccuracies in a competitor publication regarding gear pumps. This article will address topics including material viscosities, triggering patterns and the effects of isocyanates.

The purpose of this response is to provide you with accurate data and information so that you can make your own informed decisions on what's right for you and your business. We are open to dialogue so if you have any questions, please feel free to ask.

Competitor Statement:

4. Able to handle a wide range of material viscosities

Gear Pumps	Piston Pumps

• Fluid slip is not constant in gear pumps
• There are several contributing factors that can change the amount of fluid slip for a given pump:
  • Differential pressure between inlet and outlet fluid pressures
  • Fluid viscosity
  • Clearance dimensions
• A key variable that changes throughout a typical spray day effecting fluid slippage is material viscosity; less viscous fluids will have more fluid leakage and thicker fluids will have less fluid leakage
	• Piston pumps are designed to handle a wide range of viscosities.
	• The changing of viscosity throughout the day or from chemistry to chemistry has little to no effect on the performance of piston pumps

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Akurate Response:

- Agree, therefore Akurate flow meters measure and calculate allowing the system to self-adjust.
- Gear pumps have maximum and minimum allowed inlet and outlet pressures which are continuously monitored in the Akurate system.
- Clearance dimensions are designed and engineered; it is not by accident. Clearly, this is what is being accounted for.
- Stabilizing your system and compensating for this process is critical in your design. The pre-heating system, the pumping system, the flow meters, are all working together to continuously measure and adjust to ensure you are addressing the dynamic spraying environment in an Akurate system.

  This is exactly why we believe in pre-heating, not post-heating.

- True, a piston pump is designed to handle a wide range of viscosities. Continuous maintenance, temperature management, and other key variables need to be accounted for so that statement remains true.
- Temperature impacts viscosity. Is the process not impacted by the ability for the feed system to feed the proportioner, and for the proportioner to compensate for any issues? (See page 21, Graco's Ratio Assurance White Paper)

Refer to page 5, Graco's Ratio Assurance White Paper and you decide whether single point variables are valid or not.

Competitor Statement:

5. Able to handle varying triggering patterns and speeds

Gear Pumps	Piston Pumps
• Due to fluid slippage inherent in gear pumps, every time the trigger is released fluid slippage occurs	• Piston pumps are accurate for use in start and stop applications, and are designed to provide repeatable and predictable results
• Once the trigger is pulled again it takes some time for the system to self-adjust and attempt to correct ratio	• The design of a piston pumps utilizes ball checks to maintain stall pressure when not triggering
• This effect is exaggerated in periods of rapid triggering and it may be very difficult for the system to maintain an accurate ratio	• By being able to maintain stall pressure, piston pumps maintain consistent ratio, without the need for correction

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Akurate Response:

- Not all the facts are presented, systems with a torque motor and have a check valve, no problem.
- We make 10 speed adjustments per flow second. "It takes some time for the system to self adjust" is a loose statement, is unmeasurable, and in comparison to our system, simply not true.
- Poll your chemical manufacturer and ask them how many of them train you to constantly trigger. This can impact an Akurate system when consistently done. Also, it will negatively impact your project profitability, it will kill your yield.
- Again, how systems are designed vs. how they are managed and operated in the real-world are two different things. Maintenance, calibration, multiple points of potential failure can all happen.
- Per our prior response on stall pressure, and addressing this repetitive point:

  "This is misleading. Piston pumps hold stall pressure if designed to do so. Gear pumps also hold stall pressure if the system is designed with a check valve. Our system does have a check valve (input and output side), therefore making it a non-issue for comparison purposes."

Competitor Statement:

6. Capable of handling the effects of isocyantes

Gear Pumps	Piston Pumps
• Isocyanates are dilatant liquids, meaning that when they are subjected to high shear and agitation, their viscosity tends to increase • Gear pumps shear more than piston pumps, which makes them more susceptible to causing the ISO to thicken, gum-up and eventually even lock up the pump	• Piston pumps are capable of moving viscous fluids, slurries, and abrasives with proper valve design • Piston pumps are regarded as low shear pumps, as they transfer fluids in and out of a chamber with the help of ball checks

Akurate Response:

- That is correct.
- Akurate is well aware of this. Gear pumps are used to move isocyanates in other industries as transfer systems, so this is not a new concept. As even Graco pointed out, gear pumps are not new technology. If the gear pump is engineered and designed properly, the RPM's are managed to ensure this "thickening" is managed appropriately to ensure proper spraying conditions.
- So, basically we agree with the statement scientifically. In comparison to an Akurate system it is a complete misstatement. This potential issue was accounted for in the design of our gear pump.
- As stated above, and addressing this repetitive point. Temperature of materials can impact the viscosity of material, impacting the feed system, ultimately impacting the proportioner. (See page 21 of Graco's Ratio Assurance White Paper)
- True, ensuring that all of the moving pieces, points of calibration, and proper, routine maintenance is done, there should be no problem. (See page 4 of Graco's Ratio Assurance White Paper)