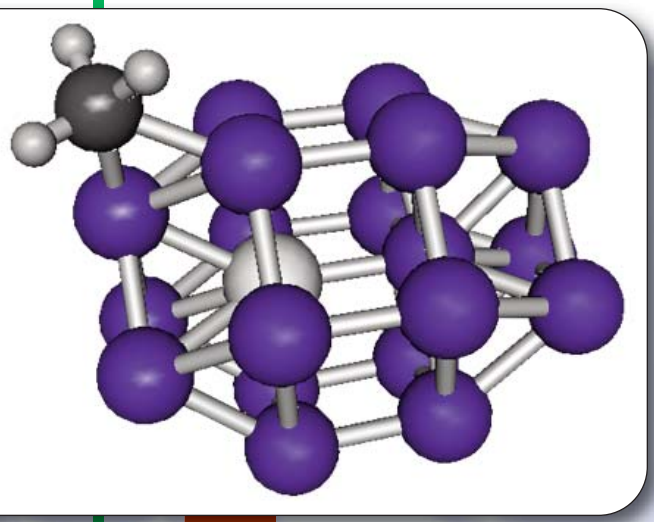
# High Viscosity Applications with High Precision Syringe Pumps



**High Viscosity applications using Isco pumps today:**

- Duplication of fluid and pressure conditions within underground geologic formations
- Pumping biomass slurry into a bioreactor for breakdown and conversion into biofuel
- Producing synthetic fuel from fats, oils, and grease using Fisher-Tropsch process
- Polymer or gel injection for analysis of core permeability and rheology at extremely low flow rates

## High Viscosity Fluids Pose Challenges

Large Ports Prevent Plugging

500HV Syringe Pump

Highly viscous fluid applications present special challenges to researchers. System components must handle a varying range of viscosities and particulate content. Issues such as inlet plugging and reduced flow rates can adversely affect pilot plant and bench scale development efforts.

Examples of common applications using high viscous fluids include:

- **Transesterification of oils and fats**
- **Gasification of coal or biomass**
- **Core Analysis**

## 500HV Overcomes Problems

Isco's 500HV Syringe Pump solves high viscosity fluid problems by offering large inlet and outlet ports (⅜" diameter) and pump pressures up to 3,750 psi, thereby enabling increased fluid flow. The dual pump system uses large ball valves (⅜" diameter) for rapid refills. The 500HV eliminates the need for costly fluid delivery techniques such as pressure pots and heating.

Isco's rugged, high-pressure pumps can effectively pump a wide range of viscous fluids including:

- **Aqueous and organic liquids**
- **Biomass**
- **Heavy oil**
- **Slurries and pastes**

Isco pumps can be customized for your particular application. For guidance in selecting a pump to meet your needs, visit us on the web at:

**www.isco.com/pumpselector1**

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**More information on side two!**

## Reliable and Programmable

For nearly 40 years, Teledyne Isco has provided customers with pumps that are unmatched in reliability and flexibility. Programmable flow rates or pressures, either constant or ramping, offer pump users new research capabilities. From single pumps for batch applications to dual pumping systems for nonstop pumping, each system provides pulseless flows and reliable operation.

## Precision Fluid Delivery

Isco's precision syringe pumps provide flow and pressure control with a remarkable operating range, minus the pulsation or flow anomalies associated with other pump types.

- **Continuous, pulseless feeds at precise flow rates from sub-microliter to 204 ml/min**
- **Accuracy of ± 0.5% or better**
- **High temperatures up to 200° C**
- **Pressures from atmospheric to 3,750 psi**

## Control:

- **Constant flow or pressure**
- **Flow or pressure programming**
- **Independent control of up to three pumps**
- **Continuous flow or pressure with dual pumps**
- **Serial communication or analog I/O for external control/readout**

**500HV**
**Single Pump System**

### Specifications
### 500HV Syringe Pump

| | |
|---|---|
| Nominal syringe capacity: | 500 mL |
| Maximum pressure: | 3,750 psi |
| Flow rate, ml/min: | |
| Minimum settable: | 0.001 |
| Maximum: | 204 (single pump)<br>132 (dual system) |
| Plumbing Ports: | 3/8" NPT |

**A500HV Dual Pump**
**Continuous Flow System**

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