MANSCO PRODUCTS

tov viscometer system

focus

Value Considerations

LOW SHEAR RATE
The TOV System, has the lowest shear rate of measurement available. Low shear rate means sensitivity that can detect small viscosity changes simply due to the physics of the measurement. The end result is a more meaningful viscosity measurement. For plant managers and process engineers, this translates into value.

FEEBACK CONTROL
The TOV is most effective when used as a part of the control loop. For example, in many synthetic fibers, the TOV is used to control the vacuum of the final polymerization vessel. In a continuous polymerization, a TOV exit the finisher provides real-time proportional control.

VISCOSITY MEASUREMENT
Compared to Capillaries, the TOV is much more responsive because it is directly installed in the main process and measured at the same temperature. The only changing parameter in TOV operation is the force to overcome the molecules surrounding the sensor. In other words, the TOV does not calculate viscosity, it MEASURES the viscosity.

LOW MAINTENANCE
With no gears, pumps, or motors, the TOV requires little to no maintenance.

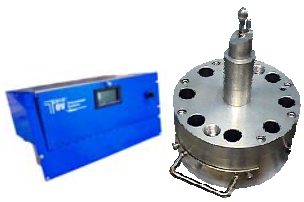
IMPROVED QUALITY
With great sensitivity, the TOV can help to improve your product. For synthetic fibers, this means reduction in breaks, better dye properties and more uniform product. The TOV Advantage means better overall quality.

TOV System Advantage:
Installation into existing process lines

In many processes, improper measurement and control of molecular weight (melt viscosity) can lead to a significant decline in quality. For example, in synthetic yarn production, inconsistent uniformity and molecular weight can effect downstream quality all the way to the fabric including:

- increased breaks
- dyeing problems
- denier problems
- shrinkage variation
- orientation inconsistency
- missing filaments, etc. etc.

The TOV System for in-line viscosity measurement can help to reduce and even eliminate many of these issues. The TOV provides the most sensitive and repeatable measurement of viscosity for use in real quality control. By measuring the viscosity in the main process line, at the process temperature, and in real-time, automatic feedback control can be realized resulting in higher quality product.



Plants may shut down for many reasons including revamp projects to increase capacity, product changes, maintenance, or for other quality improvement projects. These shut down periods are ideal times to install the TOV system. Once the line is restarted, the TOV Advantage will be able to provide a valuable tool to achieve a higher quality product.

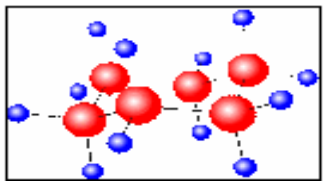
To be successful in today's market, plants must strive to increase their quality, often while increasing capacity and/or manufacturing higher value added products. Installing the TOV system into the process will give plants the means and the opportunity to achieve higher quality levels. Whether manufacturing in batches, continuous polymerization, or simply re-melting (extruder), the TOV can assure better downstream processing and quality.

TOV System Advantages

The **TOV System** is an in-line viscosity measuring solution designed for tight process-control. The TOV has over 40 years of field experience and is used in many applications all over the world. It is the most effective stand-alone viscosity measurement available:

- In-Line, Real-time viscosity measurement
- Ability and reliability for use in automatic feedback control
- Most sensitive dynamic measurement available
  …shear rate of 700 sec-1
- Measurement of main process viscosity….not in a bypass or lab
- Temperature and/or Pressure Compensated…measure real process changes not apparent viscosity

Applications

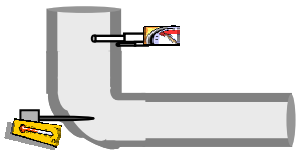


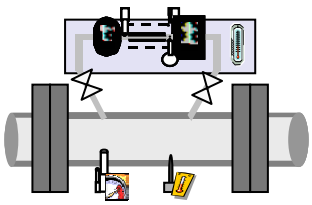
The general rule is that: If the fluid can be pumped, then it can be measured using the TOV System. Applications include, but are not limited to:

- ✓ ***Polyester***
- ✓ ***Nylons***
- ✓ ***Acrylic***
- ✓ ***Polyethylene***
- ✓ ***Polyurethane***
- ✓ ***Polypropylene***
- ✓ ***Viscose***
- ✓ ***Polycarbonate***
- ✓ ***Polysulfone***
- ✓ ***Spandex***
- ✓ ***Rubber***
- ✓ ***Specialty Polymers***
- ✓ ***High and Low Viscosity Applications***

Each TOV System is custom designed to meet each applications needs and specifications. The TOV sensor is selected and designed for optimal viscosity measurement

Adaptor Design



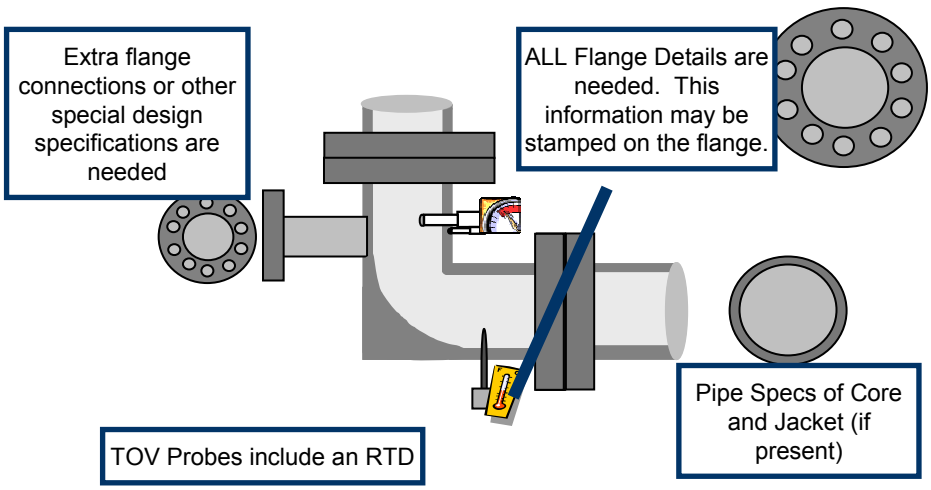


The TOV Adaptor can be designed to replace main process pipeline sections:

- Elbow locations
- Straight-line Locations
- Flange to Flange
- Special Designs
  - Extra ports for Process Measurements such as Pressure
  - Special flange connections (ex. Bypass lines)
- Can be designed to replace existing equipment such as Capillary bypass-lines, other in-line instruments

What information is needed

Mansco Products needs your help in designing a TOV Adaptor to meet your needs. We ask our customers to complete a TOV Survey and provide any sketches, drawings, or specifications that are available to ensure the best design possible.



For more information, please contact:

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TOV Viscometer System™