



Dynisco Product Portfolio

From lab to production providing a window into the process



Polymer manufacturers need to create new materials and deliver high quality to meet ever changing end-use requirements.

Precise testing and analysis is mandatory to ensure quality and to stay competitive. Rely on Dynisco's solutions to gain a window into your process and speed the development, production, quality testing and analysis of polymers.



Material Analysis

Dynisco™ analyzers, including melt flow indexers, and rheometers, are recognized for testing the physical, mechanical, and thermal properties of polymers. Offering worldwide support and innovative instruments that span the complete life cycle of a polymer, Dynisco's material analysis solutions range from the analysis of a polymer in the laboratory, to online quality control in production, to processing small quantities of special polymers or composites.



Pressure & Temperature

Designed specifically for the rugged environment of the plastic industry, Dynisco has developed some of the most innovative measurement solutions for plastic extrusion, molding and process control applications. Manufacturing a wide range of robust mV/V, mA, VDC and HART-compatible melt pressure sensors, through engineering excellence built on expertise and experience



Sustainability

Sustainability is more than just protecting the environment. We want to lead the way to the future and empower you with sensors, controls, and analytical instruments that offer maximum control, reduce downtime, minimize scrap, and promote environmental consciousness. The ability to feed used plastic into the supply chain to manufacture new materials, with less costs and without compromises in material specifications, is the goal and has to be realized through objective measurements and analysis.



Return on Investment (ROI)

Many polymer production processes go through numerous transitions throughout the day. Dynisco's line of pressure and temperature sensors along with our extensive line of polymer analyzing equipment provide information that is vital to the success of your operation. Whether you are checking material before it is received in your plant, measuring pressure, temperature or rheological data Dynisco provides a "window into your process". Dynisco's product portfolio give the processor the tools required to ensure your process is operating at peak efficiency. As a result our products provide your company a fast return on investment allowing you to focus on other important business conditions while knowing your process is in control.

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The Dynisco Difference

Dynisco has more than 6 decades of commitment to helping customers provide a true “**window into the process**” with our leading edge quality products and award winning innovated solutions for indication and control critical plastic process measurements including, pressure, temperature and polymer rheology. Harnessing these critical parameters allow the plastic processor to reduce lot-to-lot variations, reduce scrap, improve productivity, and integrate recycled materials into their process without sacrificing product quality.

From breakthrough technology in the industry’s most complete line of sensors to renowned quality and performance in indicators, controls, and analytical instruments Dynisco has demonstrated the skill, experience and know-how that not only deliver the right solution for your unique application, but also provide unparalleled customer support.

■ **Dedication to the Plastics Industry**

Guarantees you will be working with people who understand your applications, your business, and your markets.

■ **Customer-first Commitment**

Our approach is customer-focused, and we surround you with a global network of sales, distribution, and service offices that can provide consultation, repair and equipment calibrations to maintain top operating efficiencies.

■ **Experienced, Expert Staff**

Technical personnel who average more than 20 years’ experience and a wealth of expertise and knowledge that is unmatched in the industry.

■ **Global Reach**

Offers you an extensive worldwide network of experts and local sales contacts – close, single source, knowledgeable, responsive liaisons to help you select the best options for your application.



Polymer manufacturers need to create new materials and deliver high quality to meet ever changing end-use requirements.

Precise testing and analysis is mandatory to ensure quality and to stay competitive. Rely on Dynisco's solutions to gain a window into your process and speed up the development, production, quality testing and analysis of polymers.

Dynisco analyzers are recognized and used around the world for testing the physical, mechanical and thermal properties of polymers. Our processing instruments are used to prepare test specimens or evaluate the processability of materials. All Dynisco instruments conform to the strictest industry, national and international standard test methods.



NEW!
ViscoIndicator
Online Rheometer



LCR:
Laboratory Capillary
Rheometer

LME:
Laboratory Melting
Extruder

TUS:
Take Up System

LEC:
Laboratory Extruder
Chopper

LMI:
Laboratory Melt Flow
Indexer

CMR:
Continuous
Melt Rheometer

ViscoSensor



Benefits of online rheology measurement

Maximize Extrusion Efficiency

- Adjust your parameters to adapt to changing conditions while processing
- Provides material genealogy histograms for continuous quality measurement

Decrease Scrap Rate

- Process improvement begins with understanding material and adjusting accordingly

Increase Regrind & Wide-Spec Raw Materials Usage

- Use regrind and wide-spec materials with confidence knowing that the finished product is to specification

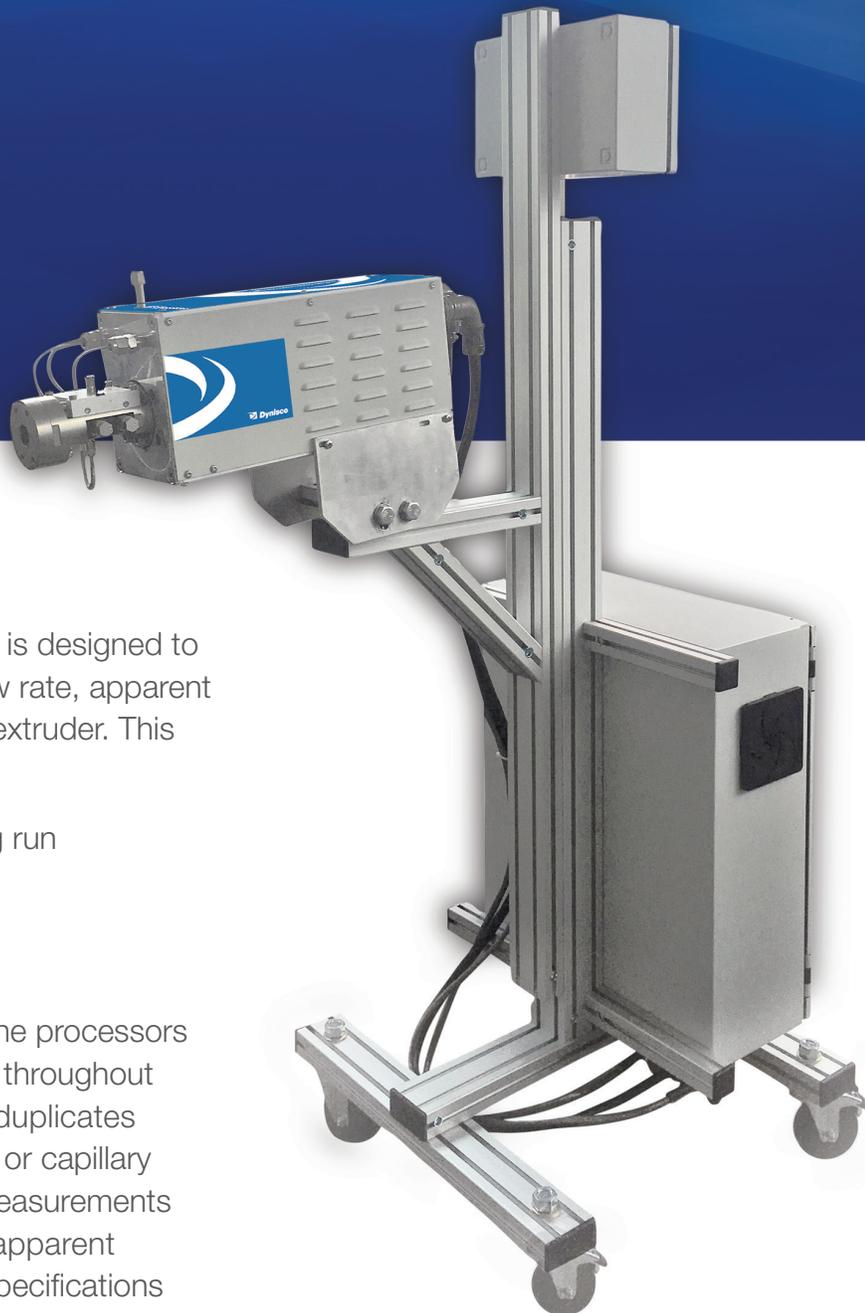


Now comes
standard with our
Vertex Mercury Free
Pressure Sensor



Dynisco ViscoIndicator Online Rheometer

Simplified Rheology for the Masses



The Dynisco ViscoIndicator Online Rheometer is designed to provide continuous measurements of melt flow rate, apparent viscosity, and intrinsic viscosity directly on an extruder. This allows for a processor to:

- Monitor critical polymer specifications during run
- Correlate the value to their laboratory
- Adjust parameters as needed

Additionally, this data can be used to ensure the processors end customer's material is within specification throughout the entire production run. The ViscoIndicator duplicates test conditions of a laboratory melt flow tester or capillary rheometer, gathering data on melt viscosity measurements (such as melt flow rate, intrinsic viscosity, or apparent viscosity). These measurements are primary specifications of thermoplastic resins, so the measurements give some measure of the physical properties of the resulting product and the polymers processability.

The ViscoIndicator has three main parts



Rheological Sensing Unit (RSU):

samples conditions and measures the properties of the resin, by connecting directly to the process. The ViscoIndicator can be mounted on extruders, reactors, or molten polymer transfer lines.

Rheological Control Unit (RCU):

controls measurement parameters (the temperature, pressure, flow rate). Also it provides communications to the Human Machine Interface (HMI).

Human Machine Interface (HMI):

manages test parameters and provides measured and computed material properties. The HMI shows melt flow rate, intrinsic viscosity, or apparent viscosity with a numeric value or on a trend graph with high/low limits, on a simple intuitive display. The data can be exported for further analysis or for quality control purposes, this data can be viewed on the machine or by a remotely connected windows 10 device.

Features and Benefits:

- Based on the proven technology of the ViscoSensor and CMR IV series
- 1/2"-20 Mounting Port , compatible with standard pressure ports on extruders
- User interface based on Windows™ 10 IoT
- Continuous indication of Melt Flow Rate, Apparent and/or Intrinsic viscosity
- Variety of heated material transfer line options
- One cable power cord and simple cable bundle (connecting RSU, RCU, and HMI) ideal for self installation
- Material is not returned to the process
- Dynisco Vertex™ Mercury Free Pressure transducer comes standard for high accuracy (done as a call out as seen on page 5 of the current version)
- Small footprint leads to easy set up and integration into existing and/or new machinery
- Capillaries can be changed quickly



Get more insight into Dynisco's ViscoIndicator

and see how it is economical, easy to install, and applicable to all extrusion processors. The webinar also addresses issues such as the need to test polymers; the correlation of lab values to online production; and the impact of melt flow index and viscosity on part quality and profitability.

Dynisco ViscoSensor Online Rheometer

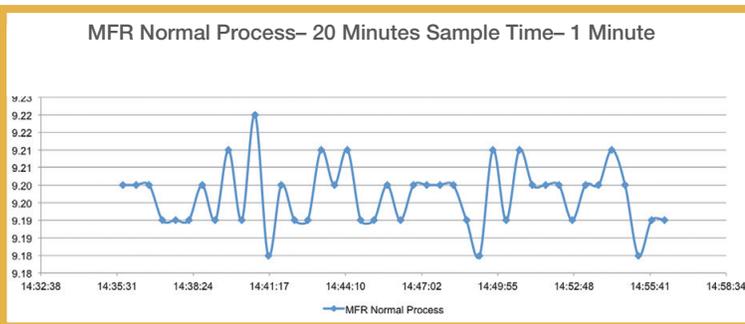
Experience the Benefits of
Online Rheology Measurement



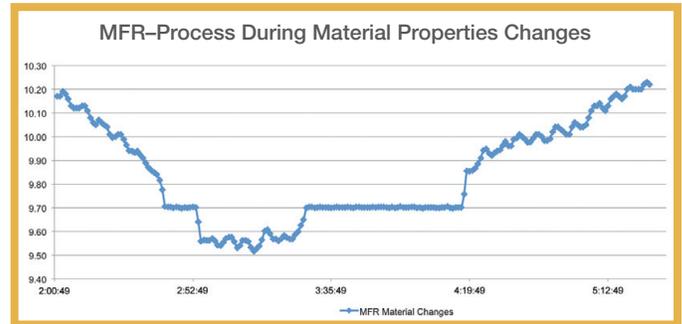
A capillary viscometer forces material through a small diameter capillary die creating a pressure drop across the die. By controlling the material's shear rate through the die or shear stress across the die, apparent viscosity or melt flow index is obtained. The ViscoSensor uses differential pressure across the capillary die for either a control point for melt flow index measurement or as a measurement point for apparent viscosity calculations.

The ViscoSensor Online Rheometer is specifically suited for all "return to process" looking to improve quality of their process and product by ensuring the rheological properties continuously in their production line. The ViscoSensor allows the processor to not only monitor the data, but provide

control signals based on the rheologic data retrieved to change the needed parameters, bringing their process back in line. During this time recording the data automatically providing a rheological history for material and product traceability for the processor and the end-user. The ViscoSensor provides confidence to processors and end-users, reduces scrap, and improves overall quality of a product.



The above graph shows process readings taken by the ViscoSensor during relatively consistent material processing. With consistent Melt Flow Ratio (MFR), one knows the material is homogenous as well as molecular weight concluding that polymer chain branching is staying constant.



The above graph shows process readings taken by the ViscoSensor during material processing that is in flux. The stock material has fundamentally changed or a contamination has entered the process. For example, the flux could be a result of a change in molecular weight/branching or a different material grade being mixed in. The process metric was recovered by addressing the cause of the change measured by the ViscoSensor.

Two modes to meet your application needs

The ViscoSensor can be operated in either a shear stress control mode to monitor melt flow or in a constant shear rate mode to continuously measure apparent viscosity.

Principals of Operation ViscoSensor system consists of two parts:

1. ViscoSensor Head

- Connects directly to the process and samples, conditions, and measures the properties of the resin
- Can be mounted on extruders, reactors, or molten polymer transfer lines in vertical or horizontal orientations

2. ViscoSensor e-RCU and RCU Control Units

- Remotely manages test parameters and provides measured and computed material properties



Dynisco's e-RCU Performance Simplified

Provides simplified rheological data for processors

or



Dynisco's RCU Ultimate Performance

Combines rheological properties of a Laboratory Capillary Rheometer with MFI readings delivered by a Melt Flow Indexer

ViscoSensor RCU: Ultimate Performance

Our high performance RCU combines the rheological properties of a Laboratory Capillary Rheometer with MFI readings delivered by a Melt Flow Indexer. It has been updated with a Siemens S7-1500 PLC with a Siemens 7" (178mm), Comfort Panel Touch Screen HMI. This combination provides increased processing power and hi-end graphics enabling the RCU to provide +/- .5% Full Scale Accuracy. This allows the RCU to better align measurements with those taken from laboratory instruments. Furthermore, it is certified for hazardous environments as needed. The RCU will allow for up to 7 analog outputs and 8 digital outputs- see more information in specification chart.

ViscoSensor e-RCU: Performance Simplified

The e-RCU offers a simplified PLC with the digital and analog I/O that most plants would need for a cost effective approach to measuring online rheology. It has a Siemens S7-1200 PLC with a Siemens 7" (178mm) Comfort Panel Touch Screen HMI. This combination provides the system with processing power and hi-end graphics allowing the e-RCU to provide +/- 2% Full Scale Accuracy. The e-RCU provides the processor the ability to measure Melt Flow Ratio, Relative Viscosity, Intrinsic Viscosity, and Melt Viscosity in typical end-user environments.



Dynisco Continuous Melt Rheometers: CMR IV

Monitoring your Conditions for Consistent Results

With similar features and benefits to the ViscoSensor, including the high performance Rheologic Control Unit (RCU) and new Entry Level Rheologic Control Unit (e-RCU), the Dynisco CMR IV and FCR-R are specifically suited for material processors and compounders who are running a variety of materials that require multiple capillary changes. Simple threaded capillary dies can be easily changed to match the requirements of a specific polymer.

Does the CMR IV help when running regrind polymer?

Processors gain the ability to evaluate and address the changes in rheology that occur using regrind from both in-house scrap and that purchased from toll-grinders. With today's sustainability needs, we understand how using regrind will affect your process today and in the future. The CMR IV not only tells when the rheological properties are not in specification, but will allow control signals to bring the process back in line.

Ideal CMR IV Capillary Rheometer Applications

- Resin/Compounders who want to verify MFR after pelletizing
- Processor manufacturing materials with varying MFR conditions that require special capillaries
- Processors who cannot have material returning to their process stream

Features and Benefits

- Continuous "Real-Time" data
- Multiple shear stresses or shear rates
- Simple "In The Field" calibration
- Measurement temperatures up to 400°C
- Easy-to-change interchangeable capillary for monitoring varying material runs
 - High sensitivity over entire MFI range
 - Fast Response



NEW!

CMR IV has been updated to include Dynisco's advanced-performance Vertex, mercury free sensors offering longer life, faster response, and mercury free operation. By updating the Rheologic Sensing Unit (RSU) with Vertex the processor will have longer life, and higher accuracy (especially at low pressure requirements). The Vertex unit is fitted to the CMR IV with a M18 to 1/2-20 adapter which enables us provide a retrofit kit to existing units in the field.



Dynisco Flow Characterization Rheometer: FCR-R For Synthetic Fiber Applications

The Dynisco FCR-R measures the flow of molten resin through two separate dies. The FCR can be configured to measure dual melt flow rates, simultaneous MFR and apparent viscosity, a range of apparent shear viscosity, and extensional viscosity using the Cogswell Equations.

The measurement head samples molten polymer from the process through a heated transfer line. A three gear metering pump then drives the polymer melt through two separate capillary dies at a precisely controlled rate.

When the system is run at constant pressure (stress) and the flow rate is determined, continuous measurements of the MFR or MFR/ viscosity may be obtained. When it is run at constant rate the simultaneous calculation of apparent viscosities at different shear rates are possible. Extensional viscosities can be obtained when a "zero length" die is used as one of the capillaries.

FCRR Features and Benefits

- Continuous "Real-Time" data
- Two independent cavities containing separate pressure transducers, thermocouples and capillaries
- Able to run constant shear stress or simultaneous MFI & high rate viscosity
- Constant Shear Rate- Continuous measurement of viscosity at two different shear rates at a time
- With two different capillaries installed the FCRR can generate curves over a wide range of shear rates



Dynisco Laboratory Melt Flow Indexer: LMI5000 Series

Set the Standard for Accuracy and Reliability When Evaluating Polymer Melt Flow Characteristics

- Get quick and accurate measurement of melt flow characteristics to determine:
 - > Material quality
 - > Lot to lot consistency
 - > Ensure what you are buying is in fact what you need
- Identify if your material meets the flow ratings required to fill your mold effectively
- Understand impact of recycled material in your process
- Meets or exceeds both of the relevant ASTM and ISO Standards
- Verification of incoming polymers
 - > All polymers are not the same... the Dynisco LMI5000 can tell the difference

Features and Benefits

- NEW! Automatic Sample Cutter (Autocutter) for ease and consistency in sample cutting (see details below for call out)
- Performance meets international standards: A2LA Accreditation, ASTM D1238 & D3364, ISO 1133, BS2782, DIN 53735 JIS K7210
- Force Packer option for consistent material packing
- USB connectivity for data storage, scale integration, networking and printing capabilities
- Melt Flow Rate to Intrinsic Viscosity correlation for PET

Dynisco's LMI5000 Autocutter allows automated cutting of polymer samples with benefits like:

- Keeps users away from hot barrel when retrieving samples
- Increased repeatability of sample size
- Increased automation with ability to run more than one LMI at a time
- Easy retrofit into existing machines

INTELLIGENCE AND CONTROL FROM PELLET TO PART

REJECTED



APPROVED



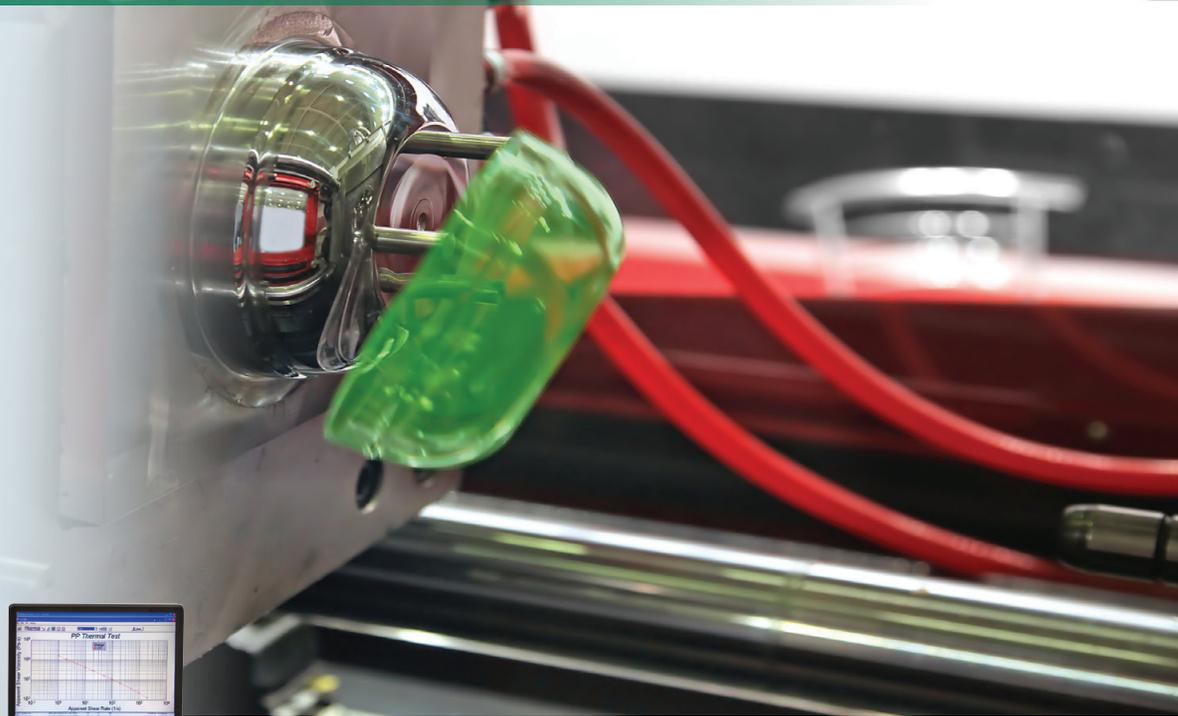
**Dynisco's LMI 5000
can tell the difference.
Can you?**

NEW! Automatic Sample Cutter

Dynisco's LMI5000 Autocutter allows automated cutting of polymer samples with benefits like:

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Dynisco Laboratory Capillary Rheometers: LCR7000 Series

Offering Sophisticated Materials Characterization

The Dynisco LCR7000 Series Capillary Rheometers offer many new features and meets the demands of a 24-hour-a-day shop floor operation while maintaining the highest possible level of accuracy, repeatability and sensitivity. The LCR series rheometers are versatile and easy to use yet offer the most sophisticated materials characterization, data analysis, and reporting capabilities. The LCR series can be used with a standard load cell and a barrel mounted pressure transducer.

Sophisticated Software

LAB KARS ("Kayeness Advanced Rheology Software") is the most powerful and easy to use rheological Windows™-based software package available. Just a few of its easily usable features include: Bagley and Rabinowitsch Corrections plus power law, Carreau, Modified Cross and polynomial viscosity models. With this software users can merge multiple data files from shear stress, shear rate, or thermal stability tests. The resident KARS SQC module can be used to quickly identify viscosity variations in different lots of material. A program for the correlation of melt viscosity to intrinsic viscosity, for PET and Nylon, is also included.

Fully control your process by simulating:

- Injection Molding
- Extrusion
- Blow Molding

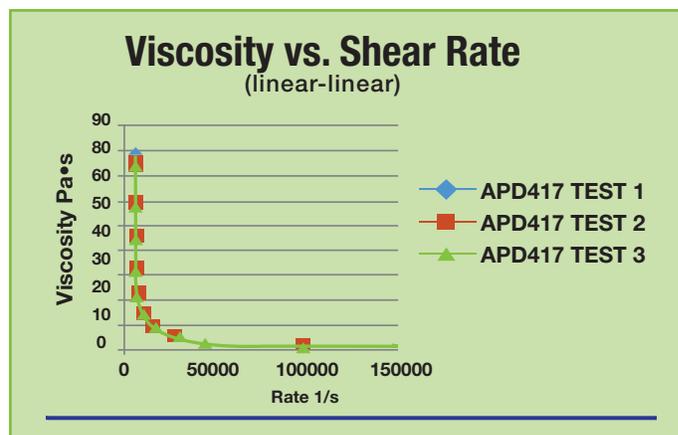




Factors that Affect Polymer Melt Viscosity

Understanding These Conditions Allows for Consistent Results

- Shear Rate
- Shear Stress
- Temperature
- Pressure
- Molecular Weight
- Molecular Weight Distribution
- Polymer Thermal Stability
- Fillers and Additives
- Moisture or Residual Monomer



LCR7000 Series helps to:

- Setup and validate quality control specifications
- Measure how material's viscosity changes as a function of temperature and pressure
- Understand the impact of recycled material in your process

Features and Benefits

- Advanced electronics and software enable up to 45 shear stress or shear rate data points per test
- Unique algorithms for polymer melt stability
- Bi-directional communications enable test parameters to be downloaded from the PC
- Multiple barrel heating zones and adaptive PID temperature control algorithm provide precise and uniform heat up to 430C (500C optional for Model 7000 and 7001 only)
- Precision servo-drive motor and transducers enable tight control of stress and rate mode tests



Laboratory Mixing Extruder (LME), Take Up System (TUS) and Pelletizing Chopper (LEC)

Creating Small Batch Custom Polymers. Verification before Mass Production.

Laboratory Mixing Extruder

The Dynisco LME is a unique laboratory tool developed to evaluate the processability of a variety of plastics and rubbers prior to production. From very fine powders to coarse materials, the LME will meet many extruding needs. The LME possesses a movable header and dial gage that allows for constant mixer adjustability. While in operation, the rotational shearing (mixing) is controlled by adjusting the distance between the end of the rotor and the inside header.

- Two separate temperature controls
- Rotor heater
- Header heater
- Short residence time
- Minimal thermal degradation during mixing process
- Complete processing instrument
- Mixing, compounding and extrusion
- Unique, screw-less design. Extrusion heads available for applications including:
 - > Various strand diameters
 - > Multiple strands
 - > Ribbons
 - > Tubing
 - > Wire coating

Take Up System: TUS

The Dynisco TUS is an important accessory to the LME. The dual purpose machine draws material from the LME into fibers. The fiber is wound onto the spindle with a variable speed drive to produce the desired fiber diameter. The two lower rollers of the TUS pull the extrudate from the LME to form a strand that can be cut into pellets with the LEC Pelletizing Chopper.

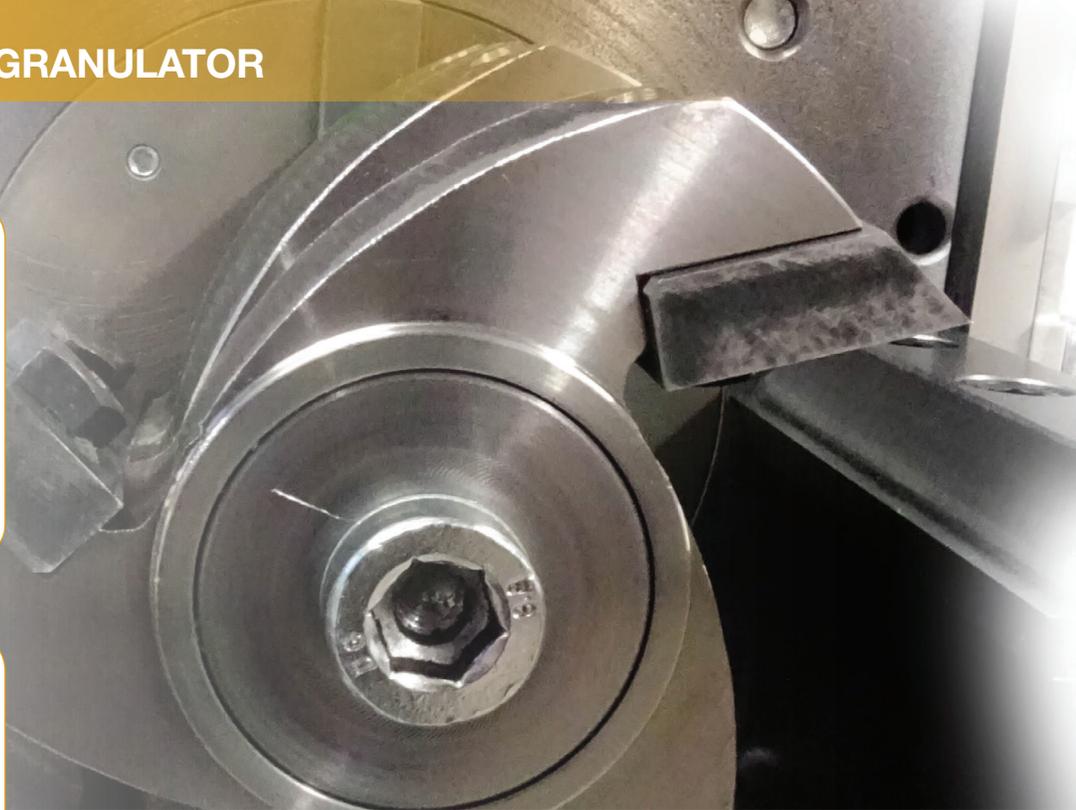
- Pulls fibers into smaller diameters wrapping them around a spindle, creating a pelletizable strand
- Variable speed drive
- Two lower rollers pull the extrudate from the LME to form a strand which can be cut into pellets with the LME Chopper

Pelletizing Chopper: LEC

The Chopper pelletizes the extrudate from the LME. Pellet size is determined by the feed rate to the cutter from the Take Up System.

- The LEC pelletizes the extrudate from the LME
- Extrudate feeds into the feed inlet
- The size of the pellet can be varied by the feed speed to the cutter

MINIGRAN BENCHTOP GRANULATOR



The Dynisco MiniGran Benchtop Granulator provides a quiet and compact means to reprocess small parts, runner systems, and single small pre-forms into granular form. Suited for size reductions often required by laboratory conditions, it also acts as an excellent complement to the Dynisco LMI 5000 Melt Flow Indexer or Dynisco LCR700 Capillary Rheometer.

The cutting chamber (including rotor and screen) is made from stainless steel. To prevent the regrind from being contaminated by incoming air or dust the cutting chamber is hermetically sealed when extracted by suction, making it possible to use the MiniGran in clean room conditions. Using a cascaded rotor in chevron design gives it an optimized cutting geometry guaranteeing a very effective granulating process, while also reducing energy consumption.

Features/ Benefits:

- Compact dimensions and footprint
- Low speed (112 rpm)
- Easy-access cutting chamber
- Effort-less cleaning and maintenance
- Chevron-type cutting blades for high quality and low dust regrind
- Low noise generation
- Material collection drawer or suction port discharge
- Low energy consumption



Standard available screen sizes for the unit are 4mm, 5mm, or 6mm, however others are available upon request.

Dynisco has developed some of the most innovative measurement solutions for plastics extrusion, molding, and process control applications offering hundreds of models of transducers and transmitters with the latest sensing technologies.

Dynisco manufactures a wide range of robust mV/V, mA, VDC and HART-compatible melt pressure sensors (transducers and transmitters) designed specifically for the harsh, rugged environments of the extrusion and polymer processing industries.

From our revolutionary Vertex™ sensors, to the core product offering of BenchMark™, to the reliable yet economical Echo™ series, Dynisco is dedicated to ensuring your sensor solution is the most cost-effective possible for your operation.

Vertex™
MERCURY FREE SENSORS



Vertex™ Mercury Free Sensors

Vertex sensors are our most robust, advanced-performance sensors offering longer life, faster response, and mercury free operation. Their revolutionary, reinforced diaphragm design using DyMax® coated Inconel delivers significantly longer working life than traditional sensors, more corrosion resistance than stainless steel, with an operating temperature range from -40°C to 400°C.

BenchMark™



BenchMark™ Sensors: PTx, MDx, SPX, and Guardian Series

Benchmark is our flagship sensor line, renowned for reliability, precision, and long life. Offering $\pm 0.15\%$ to $\pm 0.5\%$ combined error, simple installation, and repeatability, the Benchmark line includes SPX smart industrial transmitters for use in hazardous locations, and Guardian sensors with built-in relays that signal when the process becomes unsafe.

ECHO™
MELT PRESSURE SENSORS



Echo™ Melt Pressure Sensors

Trusted for quality, reliability, and accurate performance at an affordable price, Echo melt pressure sensors are the perfect choice for less demanding applications. With stainless-steel wetted parts, accuracy to within 0.5% and 1.5M to 10M psi pressure range capability, Echo sensors offer performance features other economically priced sensors can't match.



Vertex Mercury Free Pressure Sensors A New Standard in Durability, Environmental Safety and Reliability

Dynisco's Vertex™ melt pressure sensor innovation matches or exceeds the performance of the traditional sensor. The big differences are that Vertex is more robust, much faster, and significantly friendlier to the environment. Vertex is the first-and-only mercury free hazardous location safe pressure sensor from Dynisco.

The diaphragm thickness is pressure range dependent and can be up to 7.5 times thicker than a traditional sensor. Add to these features, a diaphragm composition of Inconel 718 coated with the corrosion and abrasion resistant properties of DyMax® and experience the true definition of a robust sensor that has proven to increase the life of the sensor and significantly lowers the cost of ownership

Vertex sensors are designed to work with universal pressure indicators. HART digital communication is available for more extensive diagnostics and remote configuration. **(M18 to 1/2-20 adaptors are available too!)** Vertex is equipped with a 1/2-20 UNF for installation in standard transducer mounting holes. An adapter is also available to install 1/2-20 UNF units into a Button Seal application.

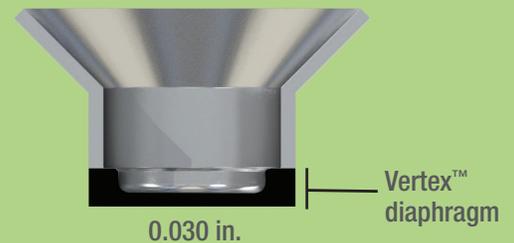
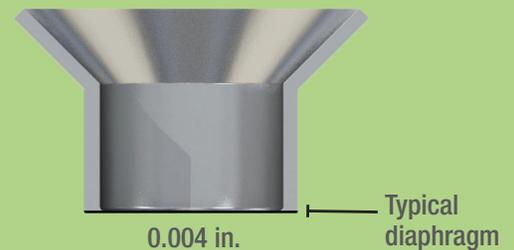
NEW! Expanded pressure ranges

The Vertex series has become even more useful for industrial applications with its expanded 0-250 PSI configuration. These enhanced sensors will be able to operate safely when utilized in the extreme cold, around food products, in non-Mercury hazardous locations, and in environments where quick response is necessary. Legacy solutions such as fluid-filled or pushrod-based sensors can't compete in a 0-250psi range configuration. With Vertex, pressure is converted to deflection then measured right at the process interface rather than transferred to a remote sensor.

With its thicker diaphragm and fortified sidewall structure, our new sensor offers longer life.

The key to outstanding toughness is in the construction.

Comparison of a typical diaphragm and that of Vertex™



There is simply nothing like it on the market today!

- Mercury free/no fill
- Extra-thick DyMax® coated inconel diaphragm
- Higher accuracy and faster response

M18 to 1/2-20 adaptors are available too!



Did you know?

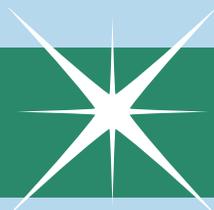
- **Now available in Washdown.** While we offer the standard 1/2-20 UNF process connection, we also offer Vertex with a Standard Small Flange Process Connection.
- **Standard snout lengths** offered are 3", 6", 9" or 12" snout length, but can be customized to tenth inch increments are available to meet your specific need.
- **Vertex** can be ordered with various Voltage output options. Voltage outputs include:
 - > 0-10 VDC
 - > 0-5 VDC
 - > 1-11 VDC
 - > 1-6 VDC



Other Features and Benefits

- No fill material
- RoHS compliant for sustainability programs
- Robust, thicker Inconel diaphragm is coated with Dymax®
- Available with a thermocouple temperature output
- HART™ digital communication available

Custom configurations are available to meet your specific needs.





BenchMark Melt Pressure Sensors: SPX, Guardian and PTx/MDx Series

Trusted for Reliability, Precision and Longevity

The SPX family of sensors reliably withstands the rigors of process measurement, where higher accuracy and tighter control is required.

SPX 2 Series

The Dynisco SPX 2-Series is a smart 4-20mA pressure transmitter designed for use in hazardous locations and are available with a variety of different process and electrical connections. The SPX 2-Series is an all welded construction.

SPX -T (3-Series)

The SPX-T (3-Series) is a smart 4-20mA pressure transmitter that includes Temperature Compensation and DynaLarity™, a Dynisco innovation that uses an advanced algorithm that will linearize offsets due to process effects on the sensor. The SPX-T delivers the best spec performance in the line.

SPX 4 Series

These amplified transmitters eliminate the need for external signal conditioning. All models can interface directly with distributed control systems, PLC's, computers, and similar high level control devices. Optional thermocouple or RTD configurations are available to provide melt temperature.

SPX 5 Series

The Dynisco SPX 5-Series is a smart 4-20mA pressure transmitter that includes Dynalarity™. The SPX 5-Series is an all welded construction designed for use in hazardous locations and is available with a variety of process and electrical connections.

SPX 2, 3, 4 and 5 Series now SiL2 and PL'c' rated

Dynisco's SPX 2, 3, 4, & 5 models are now certified by TÜV Rheinland to meet the SIL2/ PL 'c' rating. This certification confirms that our SPX product

- Pressure output is SIL2 Certified
- Relay output (Guardian units) is PL 'c' certified
- Applies to most models and configurations
- Includes the ATEX IS Configurations



What is SiL2?

Safety integrity level (SIL) is defined as a relative level of risk-reduction provided by a safety function, or to specify a target level of risk reduction. In simple terms, SIL is a measurement of performance required for a safety instrumented function (SIF).

In the European functional safety standards based on the IEC 61508 standard four SILs are defined, with SIL 4 the most dependable and SIL 1 the least. A SIL is determined based on a number of quantitative factors in combination with qualitative factors such as development process and safety life cycle management.

BenchMark

Guardian: PL'c' compliant pressure sensors for safety assurance applications

Guardian Series

Dynisco offers its popular pressure sensors with an internal relay switch that serves as a safety backup as well as being compliant to the directive through an extension of the line called Guardian Series.

Features & Benefits

- Integral relay switch for redundant safety and future compliance
- 3rd-party agency analysis (exida™) and self-certified based on FMEDA analysis and internal audit.
- Meets Performance Level 'c' as defined by the Machinery Directive (single sensor installed per Category 1)
- Meets Performance Level 'd' as defined by the Machinery Directive (two sensors installed per Category 3)
- Meets the following compliance directives, when properly installed and used:
 - > Machinery Directive 2006/42/EC
 - > NFPA 79 clauses A.9.2, A.9.4.1, A.9.4.3.2
 - > EMC Directive 2004/108/EC
 - > PED 97/23/EC
- Available on popular mV/V (PT, MDA, mA SPX Series) models



BenchMark™

PTx/MDx Series

PT460E/MDA460 Series

Features & Benefits ($\pm 0.5\%$ Combined Error)

- Outputs including 3.33mV/V, 4–20mA, 0–5Vdc and 0–10Vdc for user-defined compatibility
- 500 to 30,000 psi versions for range-specific extrusion processes
- Variety of rigid and flexible stem lengths allows for customer-defined configuration
- Several diaphragm materials for increased corrosion or abrasion protection
- Thermocouple and RTD configurations available for dual pressure and 4634/5/6 temperature measurement
- Available in Bar and kg/cm² (other ranges available)

PT420A/MDA420 Series

Features & Benefits ($\pm 0.25\%$ Combined Error)

- 3.33mV/V output provides industry standard low-level output
- 500 to 30,000 psi versions for range-specific extrusion processes
- Variety of rigid and flexible stem lengths allows for customer-defined configuration
- Several diaphragm materials for increased corrosion or abrasion protection
- Thermocouple and RTD configurations available for dual pressure and temperature measurement
- Available in Bar and kg/cm² (other ranges available)



PT46XX/MDT460 Series

Features & Benefits ($\pm 0.5\%$ Combined Error)

- Outputs including 4–20mA, 0–5Vdc, 1–6Vdc, 0–10Vdc and 1–11Vdc for user-defined compatibility
- 500 to 30,000 psi versions for range-specific extrusion processes
- Variety of rigid and flexible stem lengths allows for customer-defined configuration
- Several diaphragm materials for increased corrosion or abrasion protection
- Thermocouple and RTD configurations available for dual pressure temperature measurement
- Available in Bar and kg/cm² (other ranges available)



ECHO Melt Pressure Sensors

Trusted for Quality, Reliability, and Accurate Performance at an Affordable Price

Not every extrusion operation requires extreme temperatures and pressures. Not every production budget demands sensors with the tightest tolerances. Even in these less demanding operations, Dynisco can provide pressure sensors that you can trust for accuracy, reliability, and long life.

Dynisco's Echo™ Series of melt pressure sensors offer quality performance and value for plastic processing utilizing standard configurations and pressure ranges. Use Echo Series sensors when the application requires a quality measurement for optimized control, but not the costs of all the extra features.

Like all Dynisco sensors, Echo sensors are designed first and foremost to deliver the reliable, accurate performance any application needs – but do so at a price that makes business sense. So while they are economical, Echo sensors offer a number of performance features often found on more expensive sensors, including:

- Outputs including 3.33mV/V, 4–20mA, 0–5Vdc and 0–10Vdc for user-defined compatibility
- Four pressure options from 3M to 10M psi versions for range-specific extrusion processes
- Defined 6", 9" or 12" stem length availability
- 18" or 30" flexible stem lengths allows for customer-defined configuration
- Thermocouple and RTD configurations available for dual pressure and temperature measurement
- Available in PSI, Bar, MPa and kg/cm2



Sensors for Injection Molding

PT100 and PT46xxXL Series

Dynisco injection molding sensors measure polymer melt and hydraulic pressure on injection molding machines. Our injection molding sensors withstand cyclic pressure and provide outstanding performance under the severe demands of measuring the injection ram and clamp pressure of injection molding machines. Variations in the hydraulic pressure profile allow the PT100 series to indicate irregularities during the injection and feeding stages of the molding operation and provide information about the stability of the injection ram system. The PT46xxXL series measures polymer melt pressure in an injection molding machine nozzle or a hot runner mold

PT100 Features & Benefits ($\pm 0.15\%$ or $\pm 0.25\%$ Combined Error)

- Rugged, stainless steel construction
- Contoured diaphragm
- Greater accuracy, repeatability, fatigue strength
- Internal shunt calibration (PT130, PT150, PT160)
- Easy setup
- Potted hybrid electronics and flex-print wiring
- Resists shock and vibration
- 3mV/V, 5Vdc, 10Vdc or 4–20mA outputs
- Choice of outputs
- Fully temperature compensated
- Ideal for high temperature processes
- Ranges from 0–500 psi to 0–10,000 psi
- Choice of ranges



Industrial Sensors

As with all Dynisco products, we look to optimize your process. We have designed pressure sensor for thousands of industrial and process applications such as hydraulic and pneumatic, injection molding, test and control, hazardous locations and general purpose. All are available with special pressure fittings, various electrical terminations and corrosion resistant alloys. Our sensors are renowned for their rugged, hermetic, all stainless design featuring a complete array of quality certifications. Select from one of our many robust and reliable products. No matter what your pressure requirement, whether it's for safety reasons or extrusion optimization, Dynisco has an intelligent solution for you.

PT46xxXL Features & Benefits:

- 1" flex bend radius
- Minimum mounting space design
- Inconel 718 diaphragm
- Extra abrasion/corrosion resistance
- Free spinning jam nut
- Ease of installation and calibration
- Accurate measurement
- Up to 750°F (400°C) melt temperatures
- Ideal for high temperature processes
- Adjustable zero and span
- 0 to 5 Vdc, 1 to 6 Vdc, 0 to 10 Vdc or 1 to 11 Vdc outputs
- Choice of voltage or current outputs



Dynisco PolyClean Fluidized Temperature Baths

Safe and Effective Cleaner for Transducer Tips & Extrusion Tools

Both models of the Dynisco PolyClean Fluidized Temperature Baths provide a cost effective, fast, and safe way to clean a variety of plastic processing components. It is designed to be used in any polymer production or laboratory facility that requires minimal operator interface and low risk of damage to critical design specifications of a part in the cleaning process of components. Available with the bases units are a variety of optional baskets, lids, and cleaning options. Most parts require 30-60 min for all material to be removed from the tooling. However, the cleaning time for a sensor is 8 min and must be done in a sensor support tray to protect any electronic components. The PolyClean's thermal cleaning method is not only 2-3 times faster than traditional ovens, but also leaves your part clean without damaging its critical design specifications.

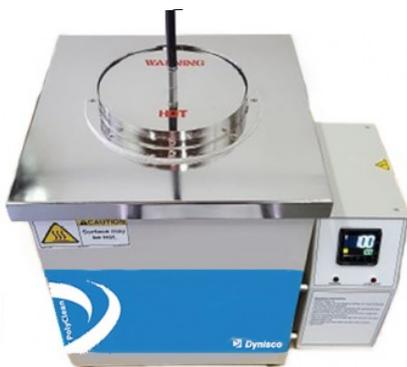
CHOOSE FROM 3 MODELS:

PolyClean Model 6L

Designed for cleaning small tooling from laboratory extruders or injection molding machines. Including such parts as, capillary rheometer and melt flow indexer dies, or other small components utilized in polymer testing or small part production.

Features/Benefits:

- Fully automate fluidizing air control
- Compact working volume
- Cover and lid design to minimize media loss
- Independent over-temperature protection
- Fast heat up
- Small footprint
- Interface for PC connection and downloadable Windows software



PolyClean Model 12L & 26L

Designed to clean tooling from all extrusion, injection molding, blow molding, and laboratory applications. The 12L and 26L offer deep baskets that make it easier to handle a large variety of components.

Features/Benefits:

- Fully automate fluidizing air control
- Independent over-temperature protection
- Advanced PID temperature controller
- Removes all types of polymer, paint, adhesives, and resins
- Large working volume
- Fast heat up





Dynisco is renowned for robust performance, precision accuracy, and user-friendly design. Our indicators, controllers and signal conditioners for pressure or temperature monitoring are highly intuitive and easily configurable to meet specific processing needs.

Dynisco indicators, controllers and signal conditioners for pressure or temperature monitoring offer you exceptional reliability, quick setups and user-friendly interfaces to suit virtually any need.

- Process controllers ideal for managing critical process parameters featuring exceptionally bright displays with large readouts for easy visibility.
- Process indicators capable of displaying a range of engineering units with the option of displaying pressure and temperature simultaneously.

Dynisco instruments adhere to international DIN panel standards and can be supplied with transmitter power supply, one or more alarms, auto retransmission and control capabilities, digital communications, process and instrumentation diagnostics and other advanced features

Melt Pressure Gauges and Burst Plugs

Dynisco offers a variety of additional economical solutions that include mechanical and electrical pressure gauges as well as rupture disks (burst plugs). Our pressure gauges are designed to provide simple, maintenance-free pressure indication. Indication and alarms provide a warning for over-pressure situations. Dual pressure and temperature models are available. Burst plugs are designed to instantaneously rupture when excess pressure occurs in the extrusion process.

Mechanical Gauges

Features & Benefits

- Mechanical gauge requires no maintenance or electrical power
- Stem up and stem down versions available for quick and easy viewing and flexible mounting
- 5,000 and 10,000 psi versions provide added safety in the extrusion process
- Variety of rigid and flexible stem lengths allows for customer-defined configuration
- Thermocouple and RTD configurations available for dual pressure and temperature measurement
- Available in Bar and kg/cm² (other ranges available)

Melt Monitor

Features & Benefits

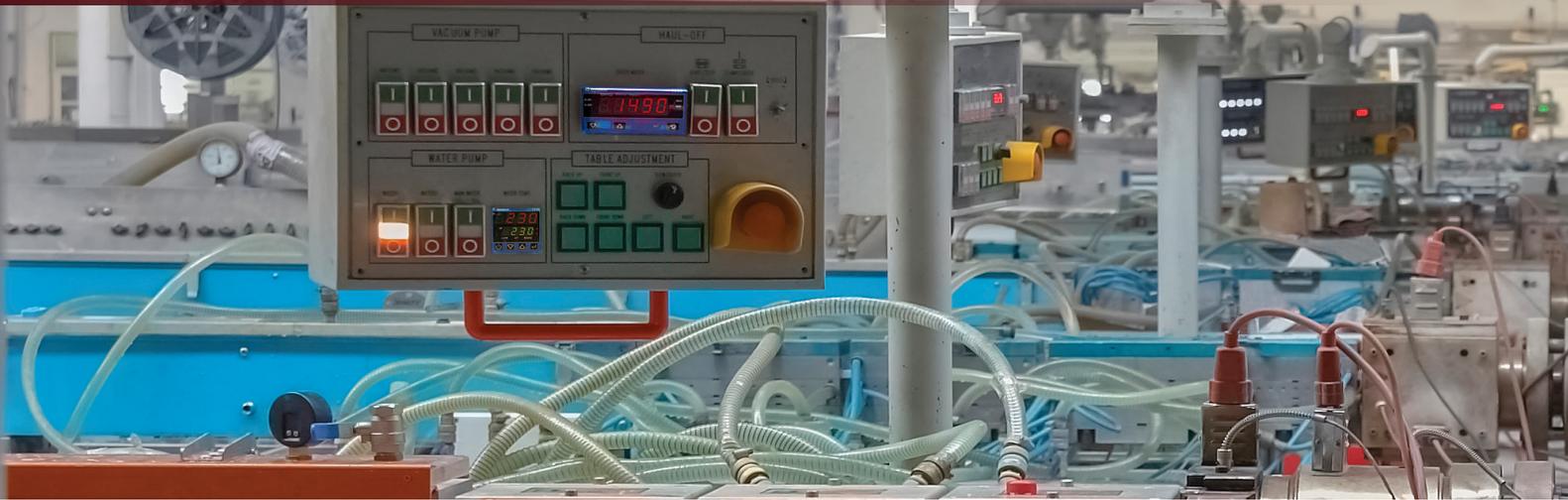
- Dual digital display can provide pressure and temperature measurement
- Customer-defined alarms with LCD display for critical pressure warning or machine shutdown
- Peak display and digital auto zero through easy-to-use push buttons
- Optional analog retransmission and Modbus communications
- Variety of rigid and flexible stem lengths allows for customer-defined configuration
- Available in Bar and kg/cm² (other ranges available)

Burst Plugs

Features & Benefits

- Burst pressure of 1,500 to 15,000 psig
- Simple, intrinsically safe design
- Leak-tight seal
- Low installation and maintenance costs
- Up to 750°F melt temperatures
- Accuracy of $\pm 5\%$
- Inconel disc





1480 – 1/8 DIN Panel Indicator

Features & Benefits

- Universal input (strain gauge, voltage, current, thermocouple or RTD)
- Min/max value hold
- 2 alarm outputs
- Retransmission



1490 – 5 Digit 1/8 DIN Panel Indicator

Features & Benefits

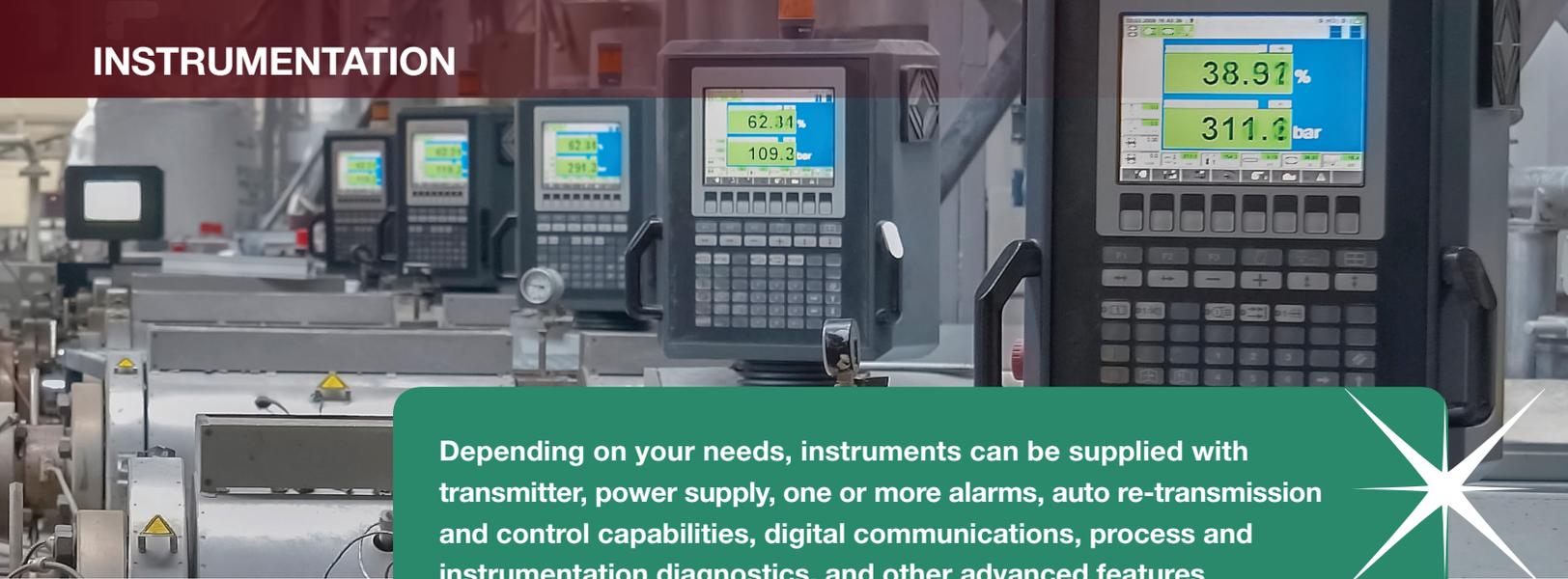
- Universal input
- 2 alarm outputs
- Retransmission
- Min/max valuehold
- Modbus communications
- Transmitter power supply



1496 & 1498 Temperature Controllers

Features and Benefits

- Easy to configure, simple to operate
- Single device for heat control-only, heat/cool control, or indicator-only
- Universal input
- Selectable controller or indicator modes
- Heat only or heat/cool control type
- Process & loop alarms
- Available in 1/16 & 1/8 DIN formats
- Modbus RS485 communications
- Ramping setpoint



Depending on your needs, instruments can be supplied with transmitter, power supply, one or more alarms, auto re-transmission and control capabilities, digital communications, process and instrumentation diagnostics, and other advanced features

UPR900 – Process Indicator

Features & Benefits

- Display pressure, temperature, or even differential pressure
- Optional second input/output for cost-effective single instrument
- Analog retransmission of process variable allows signal to be sent to other devices
- USB port option for access to configuration and log files
- Modbus RS-485 and Modbus TCP Ethernet supported

UPR900 Enhancements

- Data logging option logs process values, set points and alarms to .csv file for use with spreadsheets
- Easy-to-use Setup Wizard Graphical/text LCD display with color change LED backlight on alarm (red/green)
- Graphical trend view of process, alarms and events as standard



ATC990 – Process Controller

Features & Benefits

- Auto-tuning control in a discrete 1/4 DIN package
- Single loop control
- Display and control of differential pressure is available
- USB port option for access to configuration and log files
- Modbus RS-485 and Modbus TCP Ethernet supported
- BlueControl configuration and commissioning software option

ATC990 Enhancements

- Data logging option logs process values, set points and alarms to .csv file for use with spreadsheets
- Easy-to-use Setup Wizard
- Graphical/text LCD display with color change LED backlight on alarm (red/green)
- Graphical trend view of process, alarms and events as standard





Dynisco has an extensive worldwide network of experts with thousands of years of combined pressure and application experience whose mission is to partner with you to optimize your system, solve problems and keep your operations efficient and cost-effective.

Our experienced staff and expansive sales network can provide you with important information including pricing, part and model numbers, stock availability and quotes. They can arrange sample trials to determine the suitability of Dynisco equipment for your application. Perhaps most important, they can communicate clearly and effectively in your native tongue.

The result? Our in-depth technical expertise and total support get you up and running faster and with less stress and expense. After all, why try to navigate the entire complex process all by yourself when you have a trustworthy, knowledgeable guide to lead the way?

Known for product innovation, Dynisco also offers a full range of global service and technical support services. Our highly skilled, technical support personnel are stationed internationally, ready to provide:

- Expert consultation
- Custom design solutions
- On-site equipment diagnostics and trouble-shooting
- Repair and maintenance
- Installation service
- Operator training for equipment

 **Dynisco** *global locations include:*

Franklin, MA

Sales, Engineering, Testing,
Manufacturing & Aftermarket Support

Heilbronn Germany

Paris, France & Milan, Italy
Sales, Engineering, Testing &
Aftermarket Support

Shanghai China

Sales, Engineering, Testing,
Manufacturing & Aftermarket Support



Perak, Malaysia

Sales, Engineering & Manufacturing

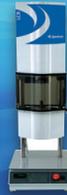
In addition to the above factory locations, Dynisco has local Direct Regional Sales Managers around the world and a World-Class group of Factory Authorized Dealers and Aftermarket Support Team

Advanced Solutions for Plastic Extrusion and Injection

> SENSORS



> ANALYZERS



> INSTRUMENTATION



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