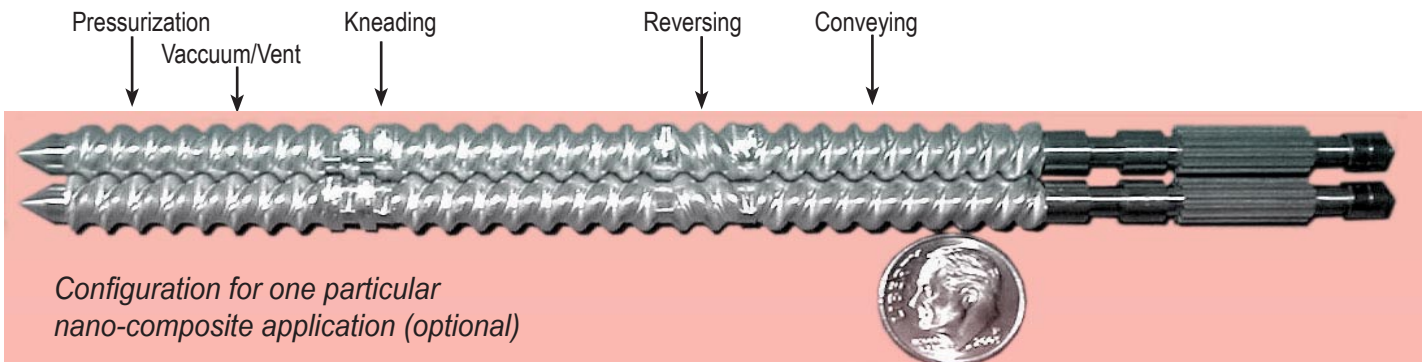
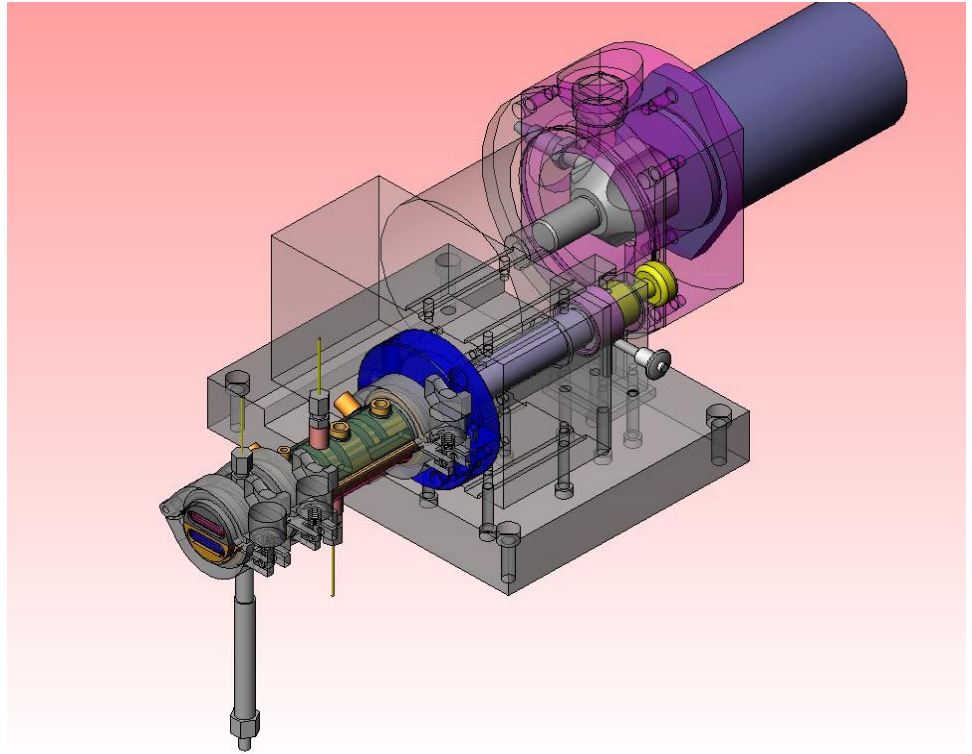


## Technical specifications:

Designed using mathematical modeling and built for the distribution and coating of energetic nanoparticles. The twin screws have a diameter of 7.5 mm, are co-rotating, fully intermeshing and self wiping with an L/D of 15/1. The barrel is horizontally split and held together with quick release clamps, allowing quick opening and easy access to the agitators. The barrel and die are cored and zoned for circulation of heating or cooling fluid. It is constructed of 17-4 ph stainless steel in condition H-1150 and is ferritic nitro carburized yielding a surface hardness of 62 RC and a low coefficient of friction. The standard model contains two main feed ports (for feeding solids and/or liquids) and a vent port for drawing vacuum. The system is capable of temperatures up to 450° F and pressures of 1500 psig.



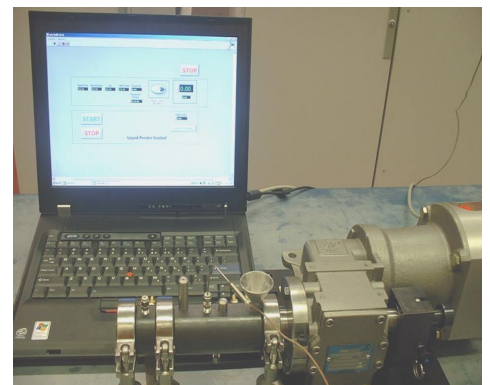
The solid agitator screws can be designed and built on a custom basis for each application via mathematical modeling (optional). The standard configuration supplied is twin lead feed screw agitator design. The screws are precision tooled from solid bar stock thereby yielding better torsional and bending strengths versus segmented designs for these small diameters. Screw to barrel clearance is less than .002 inches. The ME7.5 has a novel agitator shaft arrangement which can be quickly removed without tools. The agitators are driven either by a variable speed electric drive system or a hydrostatic drive system for non explosion proof or explosion proof applications.

The in-line die is cored and zoned for temperature control and instrumented with a control thermocouple and combination pressure/temperature transducer. The standard die is a slit design, but the die geometry can be designed via mathematical modeling and rheological characterization of the material to generate the desired extrudate shape.

### Data Acquisition:

A data acquisition and control system is provided. This state-of-the art open architecture PC based system includes instrumentation to monitor and control zone temperatures and screw speed, and monitor product temperatures,

process pressures and screw torque. The software allows remote operation of the unit as well as remote data collection; either wireless or via the internet.



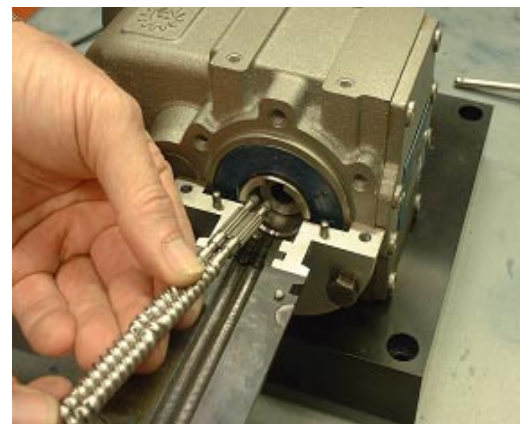
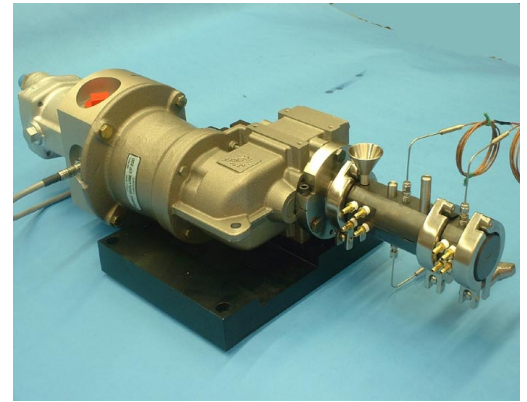


## World's Smallest Twin Screw Extruder 7.5 mm Co-rotating and Fully-intermeshing

MODEL ME7.5

### BENEFITS & FEATURES:

- Use for twin screw testing, sample production, research, instruction and training.
- Realistic and scaleable co-rotating twin screw operation.
- Low volume materials requirements - 50 to 200 g/hr.
- Fully configured co-rotating twin screw - many screw geometries and materials of construction available.
- Control system - wireless../internet/..remote.
- Barrel and die are jacketed for thermal process conditioning [heating or cooling].
- Multiple solids feed ports, liquid injection port and vent / vacuum port.
- Quick open, easily cleaned and disassembled.
- Portable - can be placed in hood - weighs about 40 lbs.-ex remote hydraulic power unit.
- Multiple extrusion die configurations available.
- Available auxiliaries:
  - Micro solids & liquid feeders
  - Mini vacuum systems
  - Mini heating and/or cooling units



Custom configurable for your processing and testing application

### Material Processing & Research, Inc.

MP&R is a privately owned company, specializing in computer modeling/simulation and design of equipment for highly filled materials used in energetics, ceramics, magnetics, pharmaceutical, personal care, composites, polymers, rubber, batteries and food industries. Since 1992 MP&R has completed numerous government and commercial contracts to supply computer modeling, rheological characterization, design methodologies for dies and mixer/extruders for processing of highly filled materials. MP&R has also supplied custom equipment, including specialized continuous processors and parts, dies for extrusion and co-extrusion, rheometers and other related hardware.

MP&R's technology strengths include rheological characterization of complex fluids, computer modeling/simulation of continuous mixers/extruders and extrusion dies. MP&R's *'Universal'* is a highly flexible 40mm extrusion system that incorporates co and counter rotation with single or twin screws.....on a common platform. MP&R's *'Mini'* 7.5mm mixer/extruder is the world's smallest co rotating twin screw. MP&R also supplies on-line and off-line rheometers including the squeeze flow rheometer, capillary and slit rheometers.

All can be customized to meet specific customer requirements.

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