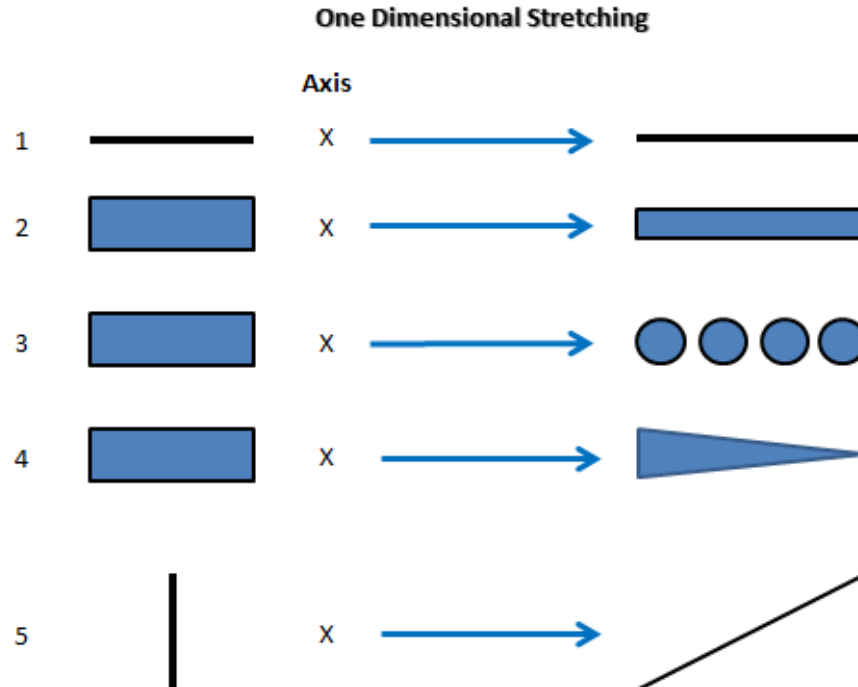


Compounding & Pelletizing

- Compounding:
 - Pages 2 to 5: Brief graphic explanation of how our patented compounding screws work.
 - All our extruders are available with this technology so that you can mix while making film, 3D printer filament, tubing, sheet, etc.
 - This technology is available for all extruder brands as replacement screws.
- Machinery For Pelletizing and Compounding:
Pages

3D Compounding

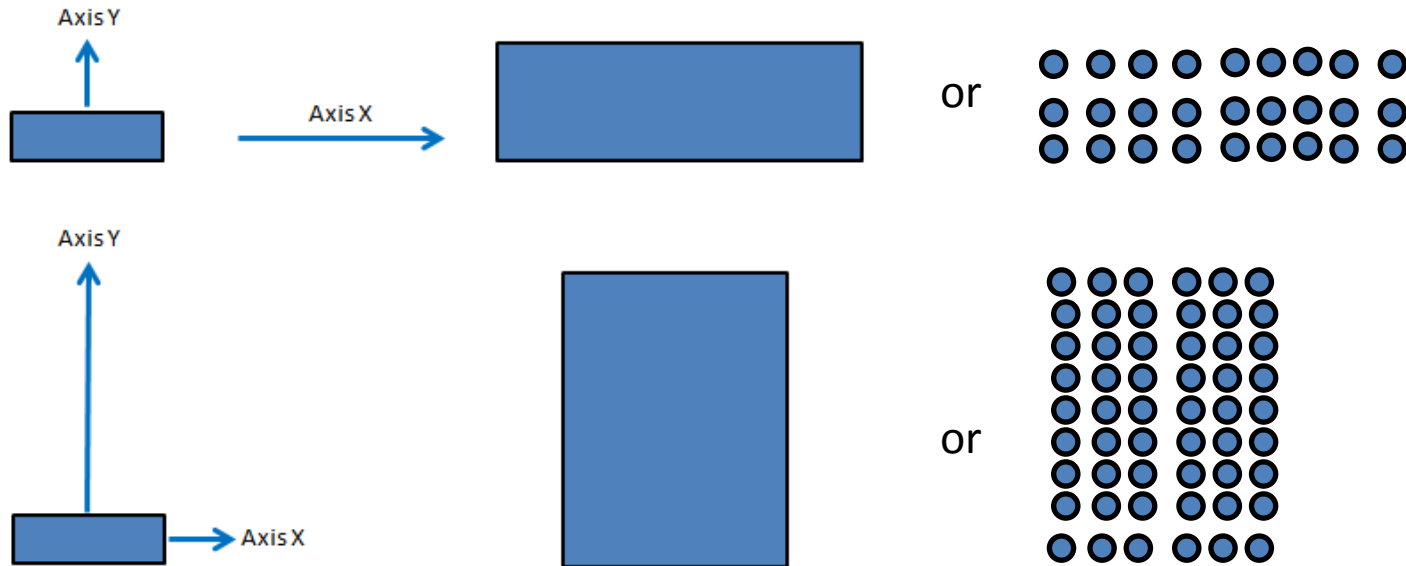
The latest in compounding technology from Randcastle gives you the power of mixing three dimensionally. People ask, “Doesn’t all mixing occur in 3 dimensions?” Sure. But almost all single screws mixers *act in just one dimension* like this:



Picture these shapes anchored on the left and stretched to the right. This is stretching in one dimension is along the x axis but it can be along any axis or combination. Shear (5) is one dimensional mixing. It’s linear with a linear effect. Most mixers are shear mixers (UC and spiral UC or barrier mixing screws i.e. Barr, double wave, Davis, etc..) Linear stretching through elongation (3) may break a strand into droplets. Even so, it’s just a one dimensional stretch like shear.

3D Compounding

It's much better to stretch in two dimensions. The area increase (or the droplet increase) is exponential. Obviously, this stretching is much more powerful than a simple linear stretch.

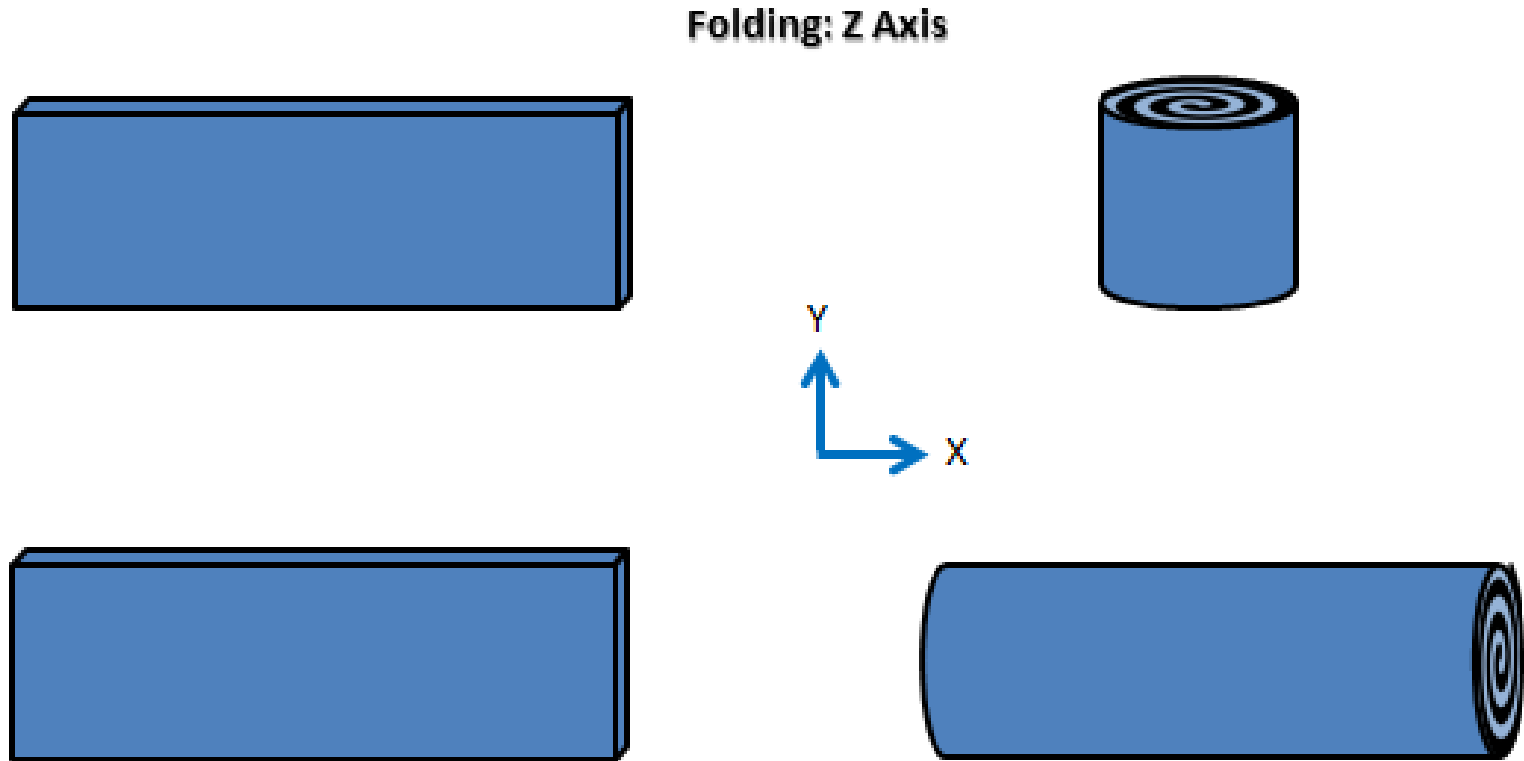


Two dimensional stretching is exponentially more powerful than linear stretching whether into a plane or into droplets. Droplets become exponentially smaller and more numerous.

A useful way to visualize the mixing of fine particulate is to imagine that the left (unstretched) surface is densely populated with particles. As the plane is stretched along the two axes, particles move further apart from each other.

Folding

Another thing our 3D mixer does is fold a previously stretched plane. The plane could also be broken into droplets and then rolled. The plane could be covered with particulate.

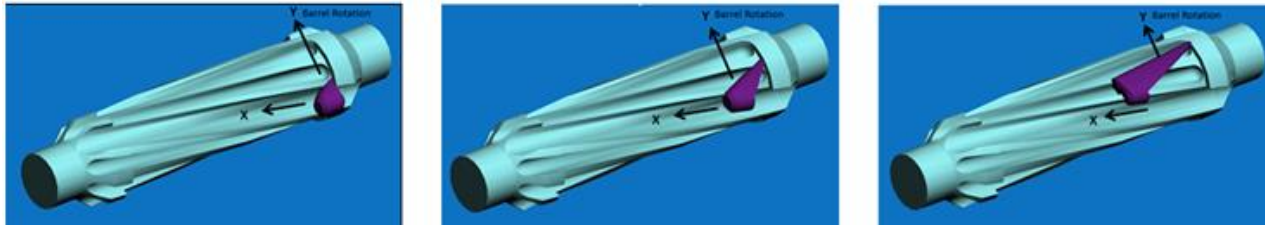


When a previously stretched plane is folded, it is better mixed. First two dimensional stretching, moves all the particles further apart from each other and then when you fold them back into each other, they are more evenly distributed.

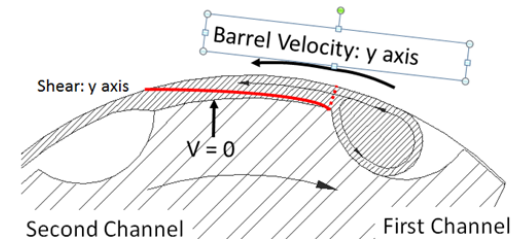
Four Steps

Our 3D mixers combine four steps using these principles.

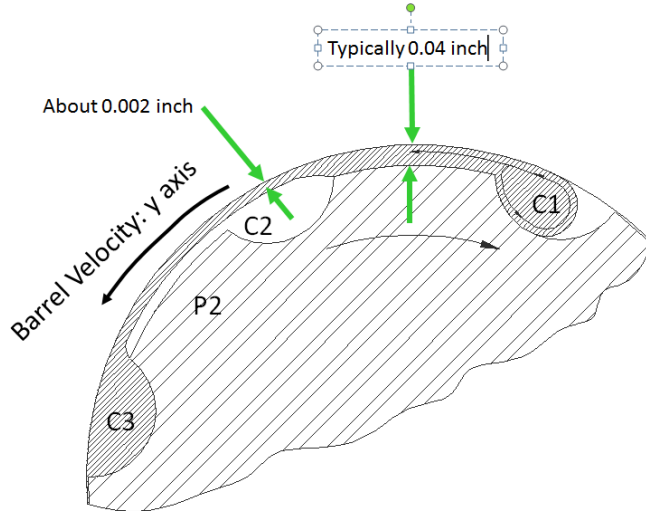
Step 1: x-y Stretch:



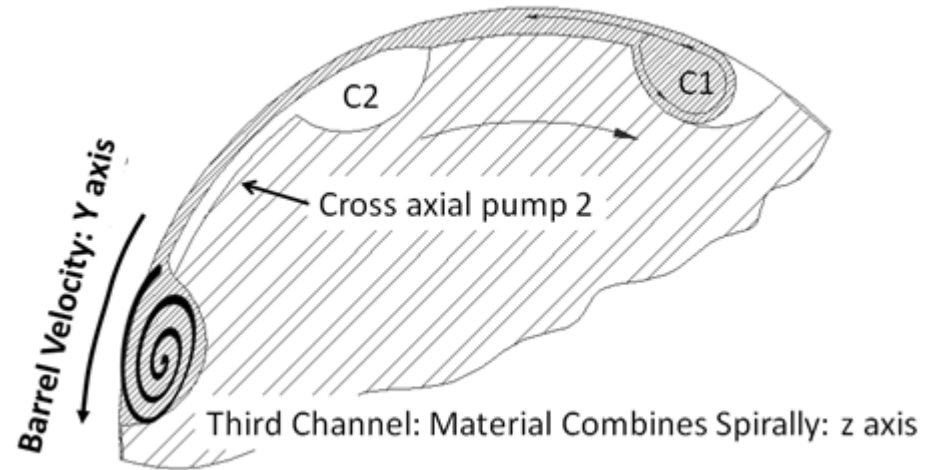
Step 2: y axis Shear:



Step Three: y axis Stretch:



Step Four: x-z axis Folding:

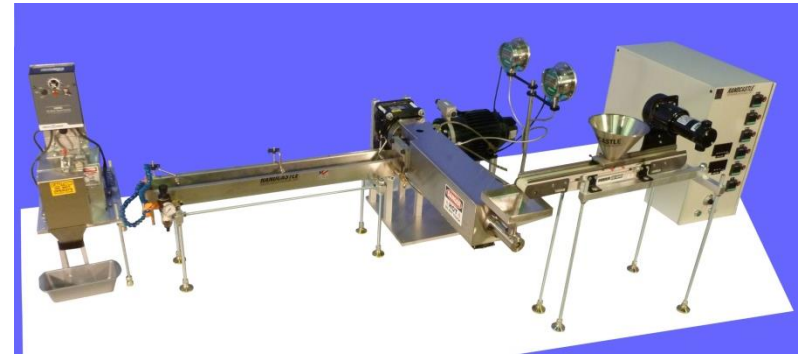


For a more in depth explanation, for examples of mixing 8 times better than a twin screw and particulate (CNTs) at 200nm scale, see <http://www.randcastle.com/techspt.html> and "3 Dimensional Mixing."

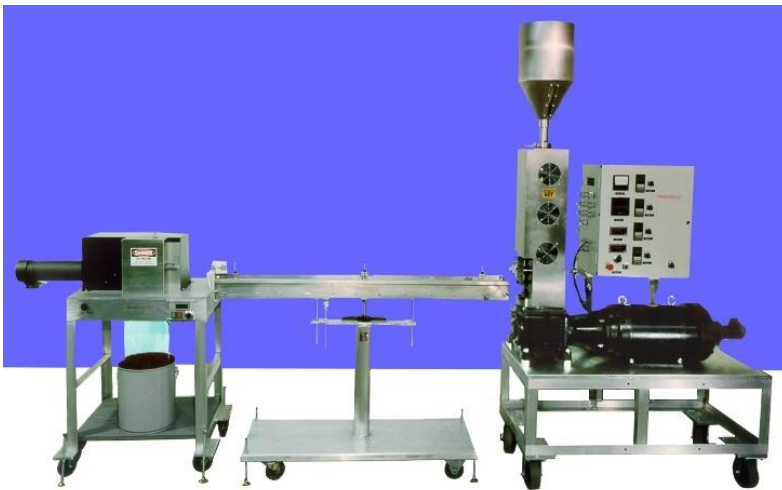
Randcastle Compounding Lines



Floor Model
1 Inch Horizontal Taskmaster



Bench Model
0.625 Inch Horizontal Microtruder



Floor Model
1.25 Inch Vertical Microtruder



Bench Model
0.250 Inch Vertical Microtruder

Bench Model Compounder 0.250 Inch Vertical Microtruder



RCP-0250 Microtruder 24/1 L/D
Two Patented Elongator Mixers For 125 Times Better Mixing
12 inch water trough and RCP-1.0 pelletizer

Bench Model

0.375 Inch Vertical Microtruder



RCP-0375 Microtruder 24/1 L/D
Two Patented 3D Elongator Mixers For 125 Times Better Mixing
Air Cooling Conveyor

Bench Model Compounder 0.500 Inch Vertical Microtruder



RCP-0500 Microtruder 24/1 L/D
Two Patented 3D Elongator Mixers For 125 Times Better Mixing
18 inch water trough and RCP-1.0 pelletizer

Bench Model Compounding Line 0.625 Inch Vertical Microtruder



RCP-0625 Microtruder 24/1 L/D

With A Feed Channel Depth Of 0.180 Inches, it's can accept almost any pellet.

Two Patented 3D Elongator Mixers For 125 Times Better Mixing

18 inch water trough and RCP-1.0 pelletizer

Bench Model Compounding Line 0.625 Inch Vertical Microtruder



RCP-0625 Microtruder 24/1 L/D

With A Feed Channel Depth Of 0.180 Inches, it's can accept almost any pellet.

Two Patented 3D Elongator Mixers For 125 Times Better Mixing

45 Degree Die, 18 inch water trough and RCP-1.0 pelletizer

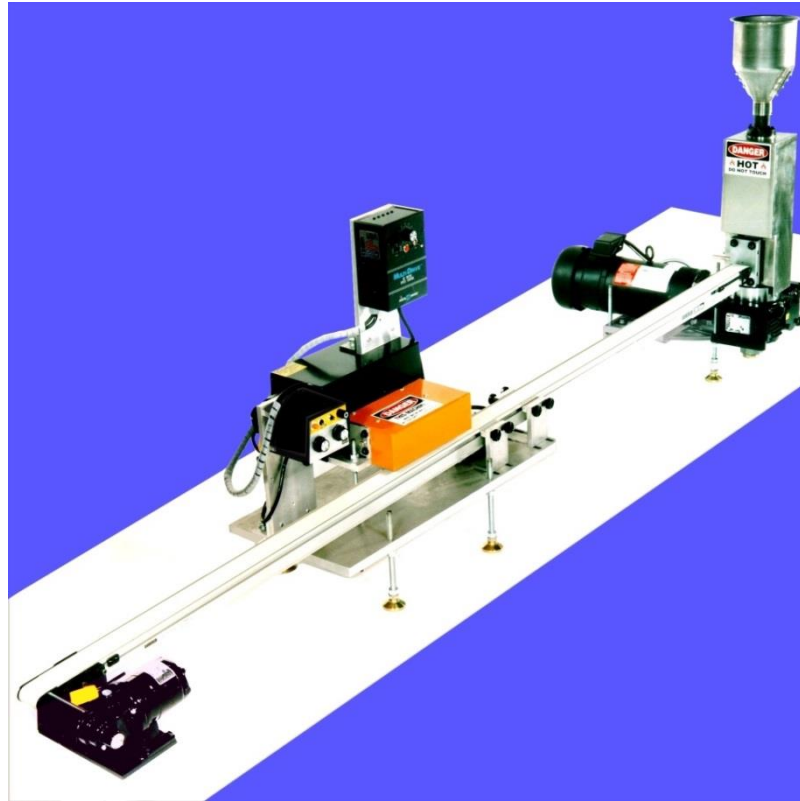
Bench Model Compounding Line 0.625 Inch Vertical Microtruder



This compact line includes an RCP-0625 Microtruder 24/1 L/D with two patented 3D Elongator mixers. In customer tests, it performed as well as a twin mixing reactor grade fluff. The line was custom engineered to fit into a tight space. This line includes our RCPB-2.0 bench model pelletizer for this 24/7 quality control application.

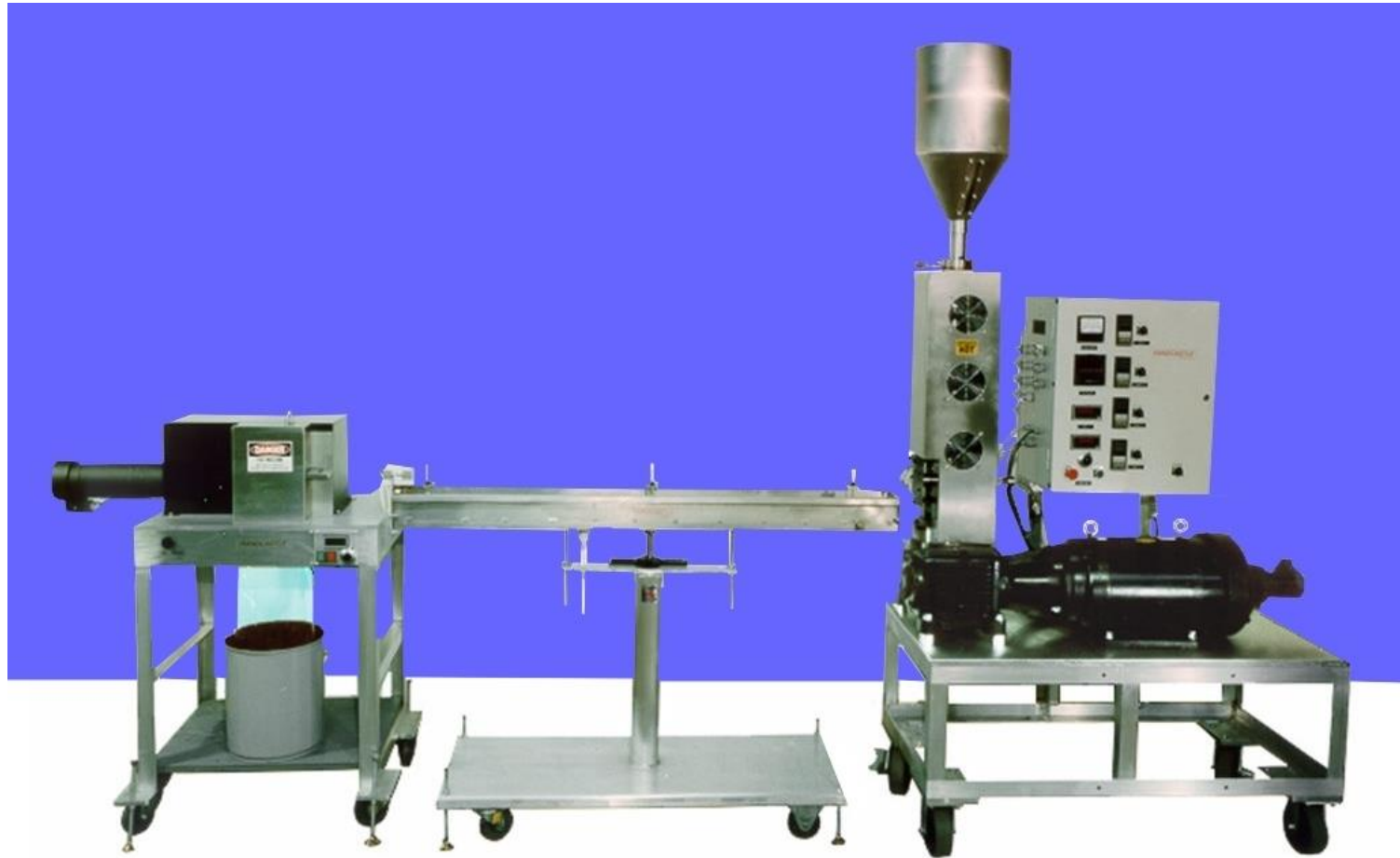
Bench Model Pelletizing Line

0.750 Inch Vertical Microtruder



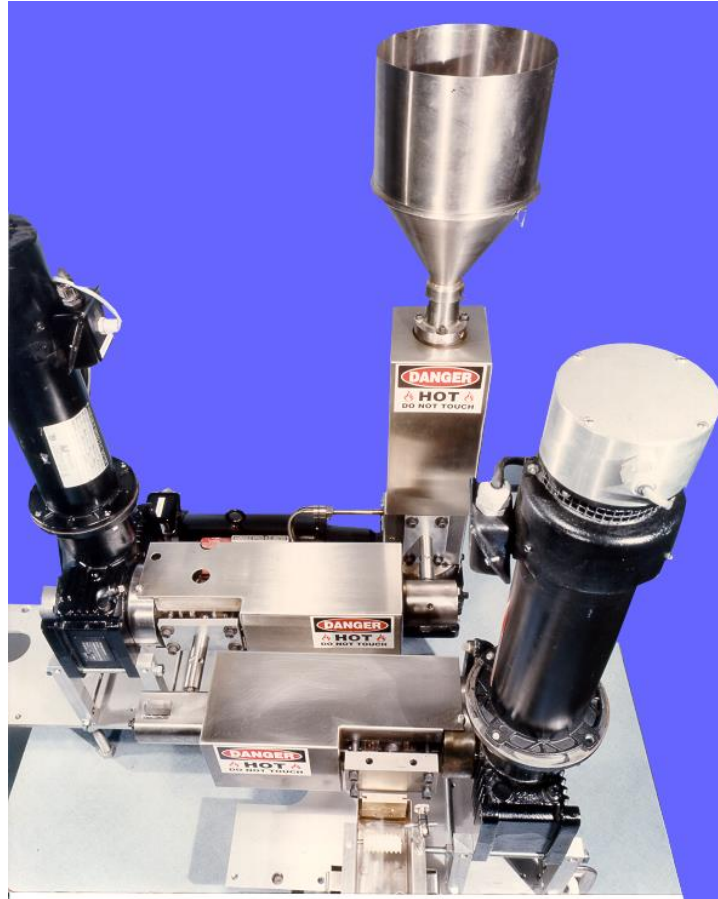
This RCP-0750 Microtruder 24/1 L/D was designed to process a low molecular weight material at 137F. The material contained an active pharmaceutical that could not be water cooled, hot face cut or strand pelletized as the strand was so fragile it could be nipped. We combined an air cooling conveyor with a unique, custom designed, razor blade pelletizer to cut the strand into pellets for subsequent molding.

Floor Model Compounder 1.25 Inch Vertical Microtruder



Two Patented 3D Elongator Mixers For 125 Times Better Mixing
5 Foot Water Trough And RCP-2.0 Pelletizer

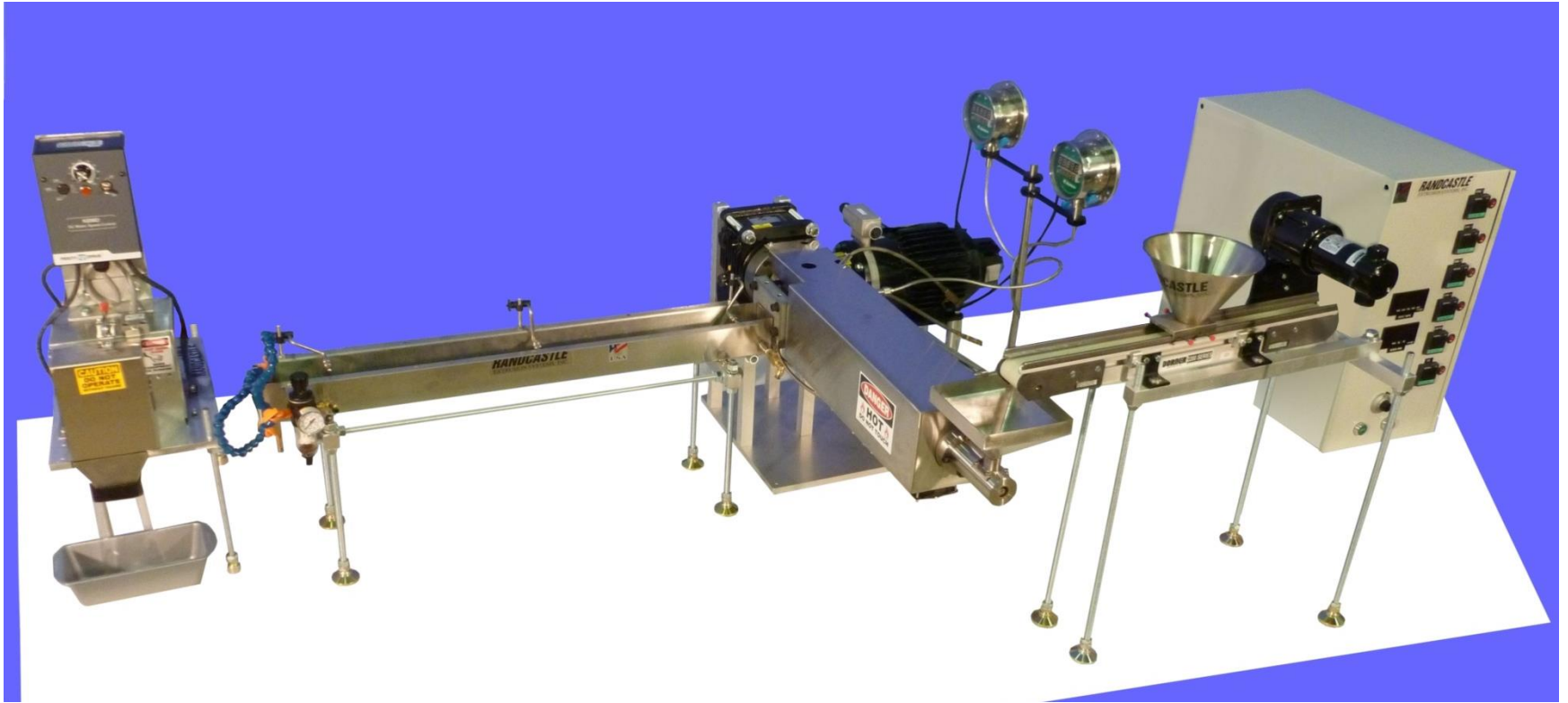
Bench Model Compounding Tandem Microtruders



Three RCP-0625 Microtruder 24/1 L/D for 72:1 L/D.

The ultimate in versatile compounding and venting with up to six patented 3D (three dimensional) compounding elements. See <http://www.randcastle.com/techspt.html>

Bench Model Compounding Line 0.625 Inch Horizontal Microtruder



RCP-0625 Microtruder 36/1 L/D

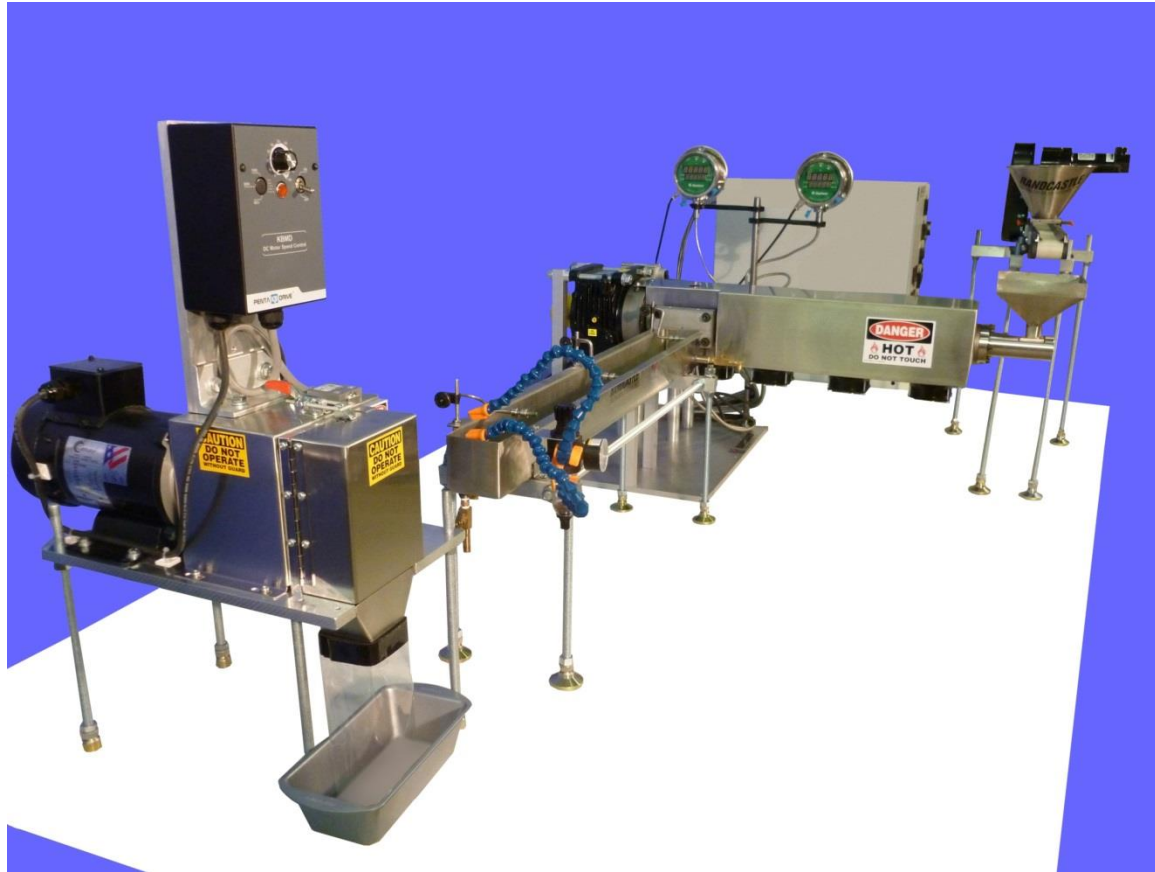
Three Patented Elongator Mixers For 1,000 Times Better Mixing
Starve Feeder For Particulate Mixing, 24 inch Water Trough And RCP-1.0 Pelletizer

Bench Model Compounder 0.625 Inch Horizontal Microtruder



RCP-0625 Microtruder 36/1 L/D
Three Patented Elongator Mixers For 1,000 Times Better Mixing
Starve Feeder For Particulate Mixing, 24 inch Water Trough

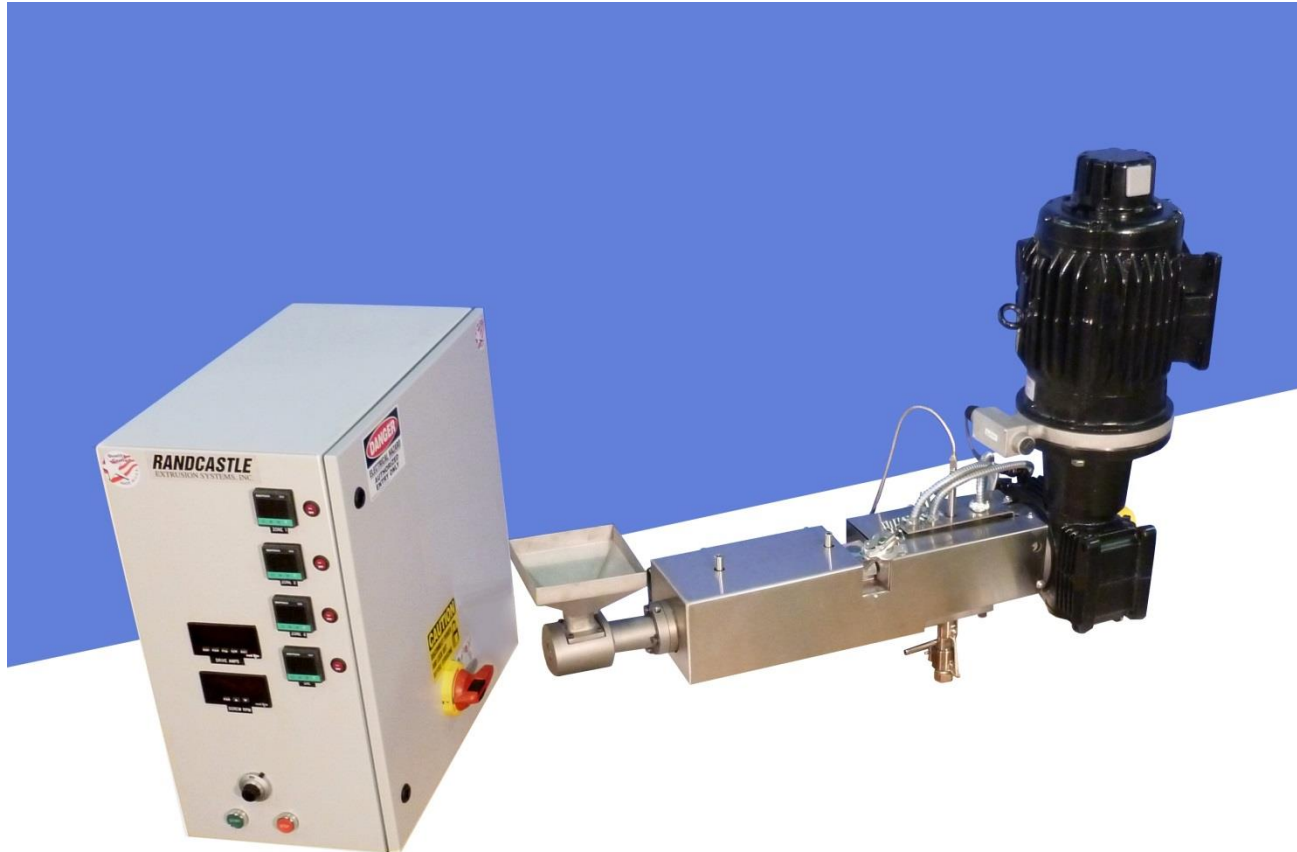
Bench Model Compounding Line 0.625 Inch Horizontal Microtruder



RCP-0625 Microtruder 36/1 L/D

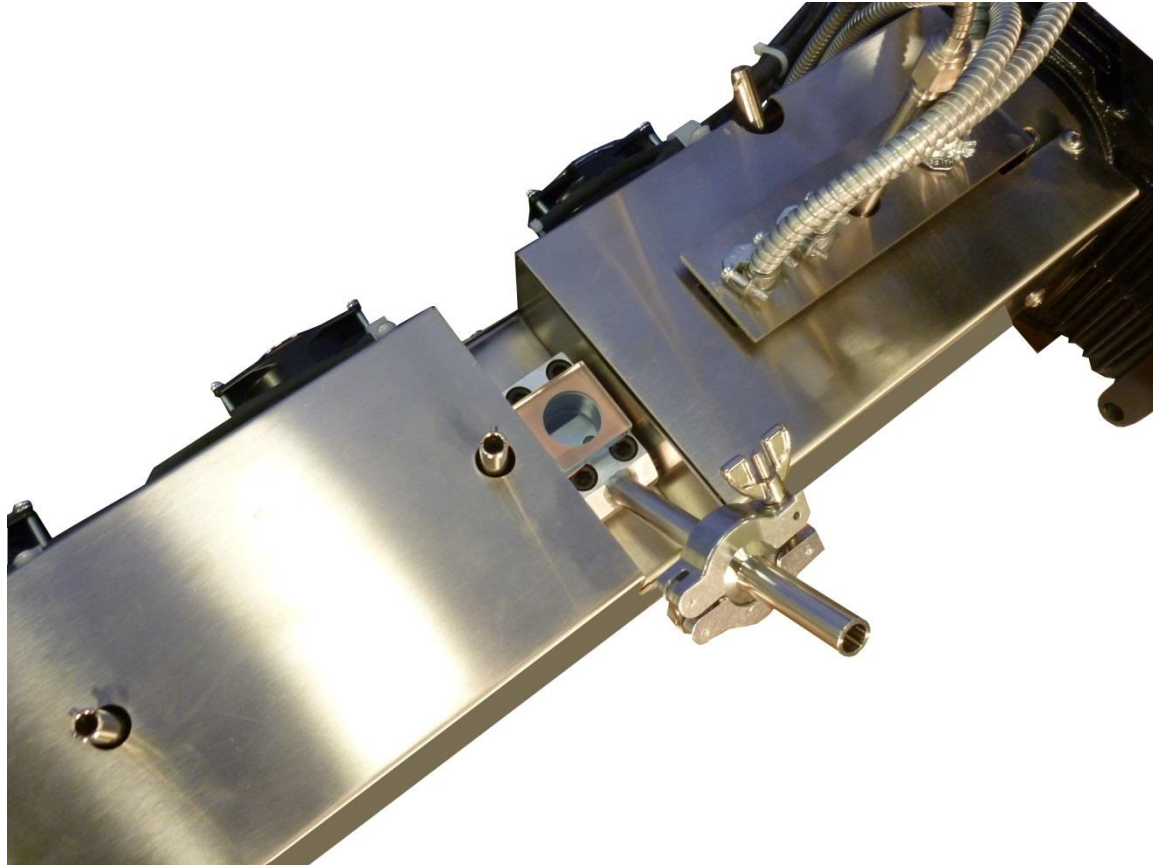
Three Patented Elongator Mixers For 1,000 Times Better Mixing
Starve Feeder For Particulate Mixing, 24 inch Water Trough, RCP-1.0 Micro-Pelletizer

RCP-1000 24/1 Compounder 1.0 Inch Horizontal Microtruder



This Microtruder has a patented thin film vent and vertical down die in a space saving design.

RCP-1000 24/1 Compounder Vent Close Up



Excellent degassing is provided by Randcastle's patented thin film degassing technique .

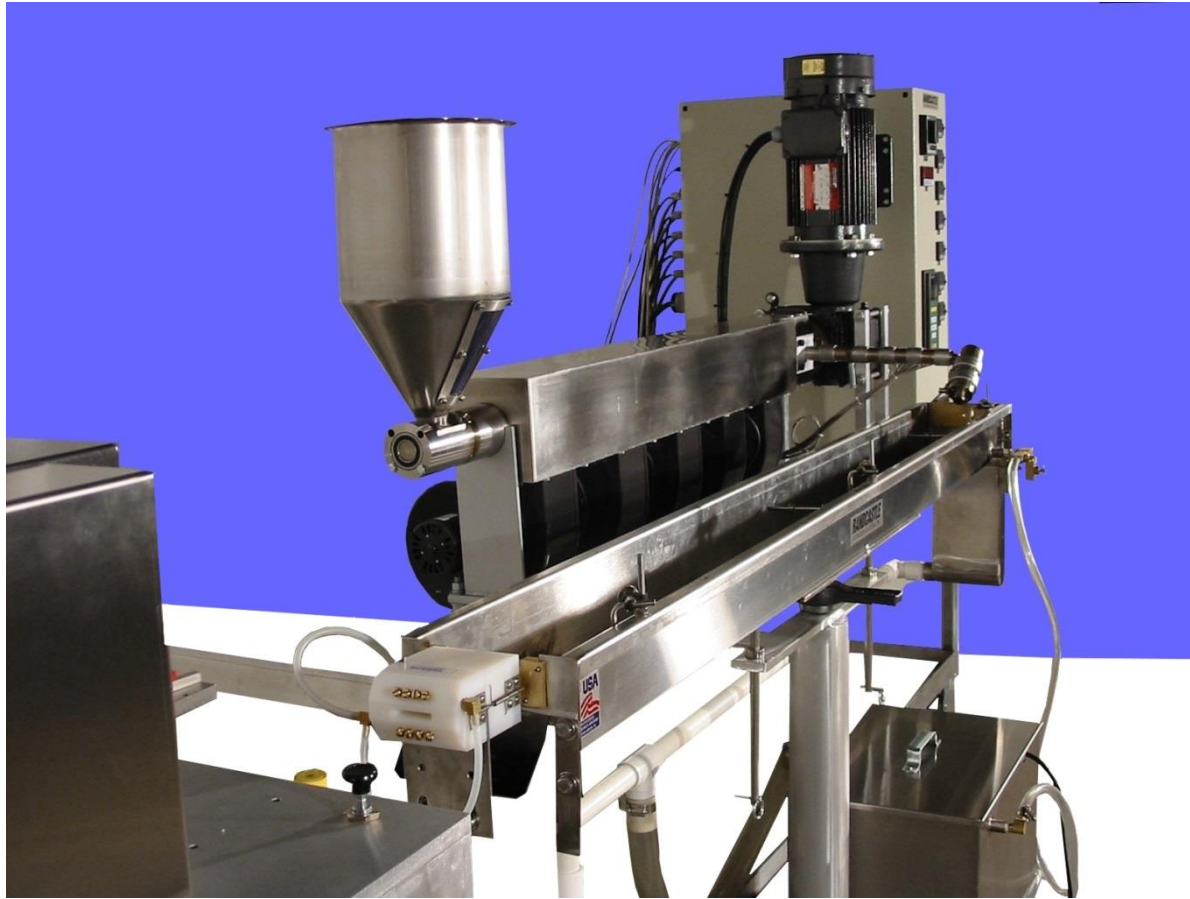
Venting over a thin film is exponentially better than venting over the conventional large mass plug on the pushing side of the flight. Multiple vents are possible with this technique.

Floor Model Compounder 1.0 Inch Horizontal Microtruder



RCP-1000 Microtruder 50/1 L/D
Four Patented 3D Elongator Mixers For > 1,000 Times Better Mixing
7 Foot Water Trough and RCP-2.0 Pelletizer

Floor Model Compounder 1.0 Inch Horizontal Microtruder



End View Of Space Saving RCP-1000 Microtruder 50/1 L/D
Four Patented Elongator Mixers For > 1,000 Times Better Mixing
7 Foot Water Trough and RCP-2.0 Pelletizer

Floor Model For Melt Reactor 0.75 Inch Horizontal Microtruder

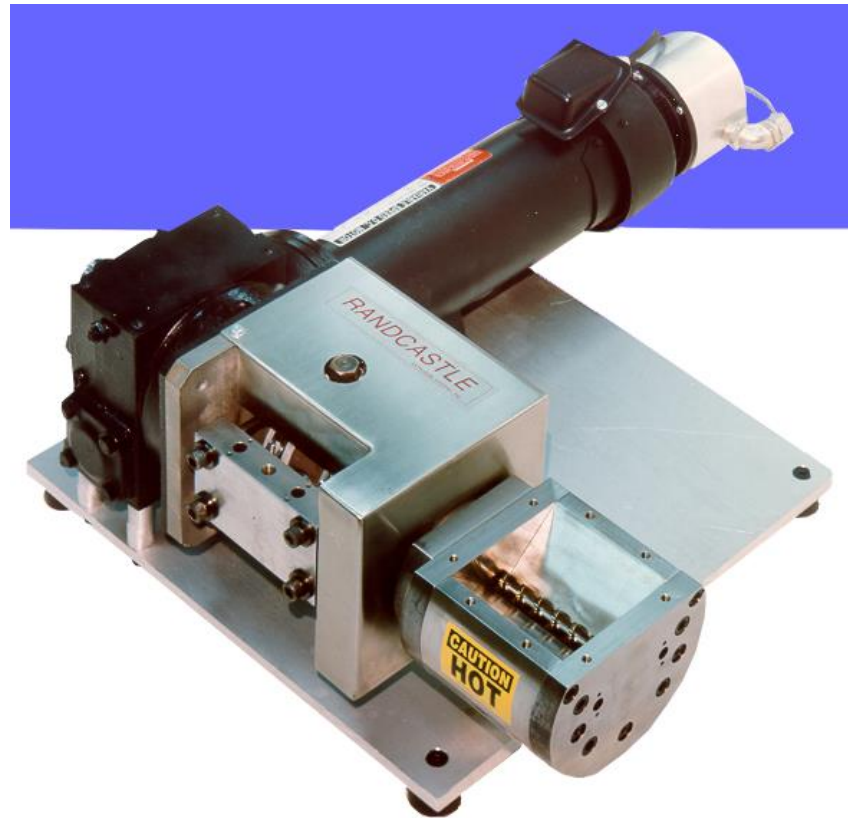


RCP-0750 Microtruder 24/1 L/D Attaches To Reactor Using Adjustable Height Base
Two Patented Elongators For Thin Film Degassing
7 Foot Water Trough and RCP-2.0 Pelletizer

Bench Model RCP-0750

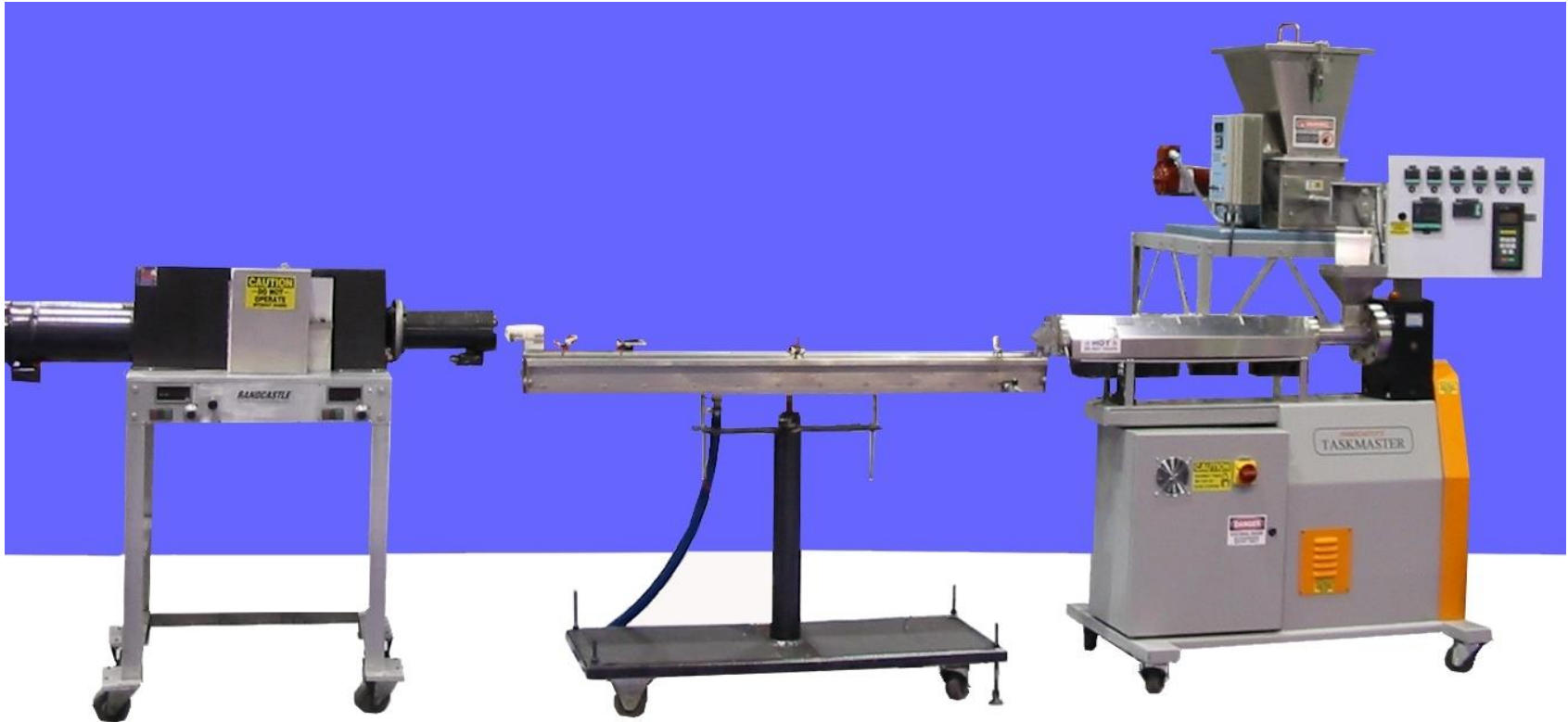
0.75 Inch Horizontal Extruder

For Use With Reactor



**RCP-0750 Microtruder 10/1 L/D attaches to reactor top pump and degas.
This extruder is equipped with a single strand die for pelletizing.
The large, heated, inlet area optimizes flow into the screw.**

Floor Model Compounding Line 1.0 Inch Horizontal Taskmaster



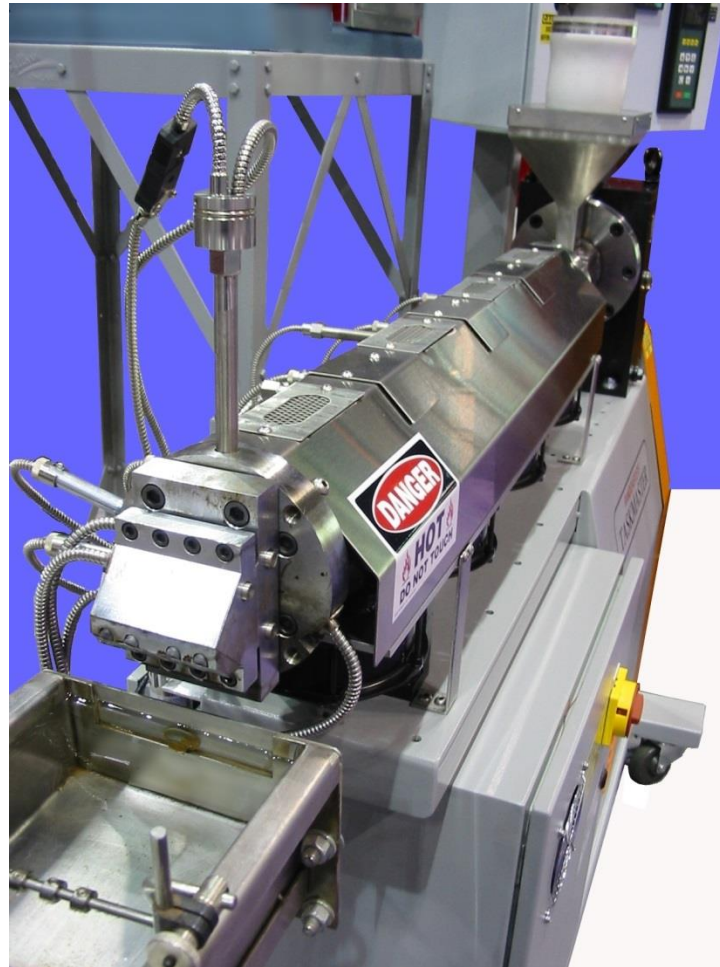
TM-1000 Microtruder 36/1 L/D With Three Vents And Starve Feeder
Three Patented Elongators For Thin Film Degassing And 1,000 Times Better Mixing
5 Foot Water Trough and Dual Drive RCP-2.0 Pelletizer To Make All Pellet Lengths

Floor Model Compounder 1.0 Inch Horizontal Taskmaster



A volumetric feeder for particulate mixing is emphasized in this picture.

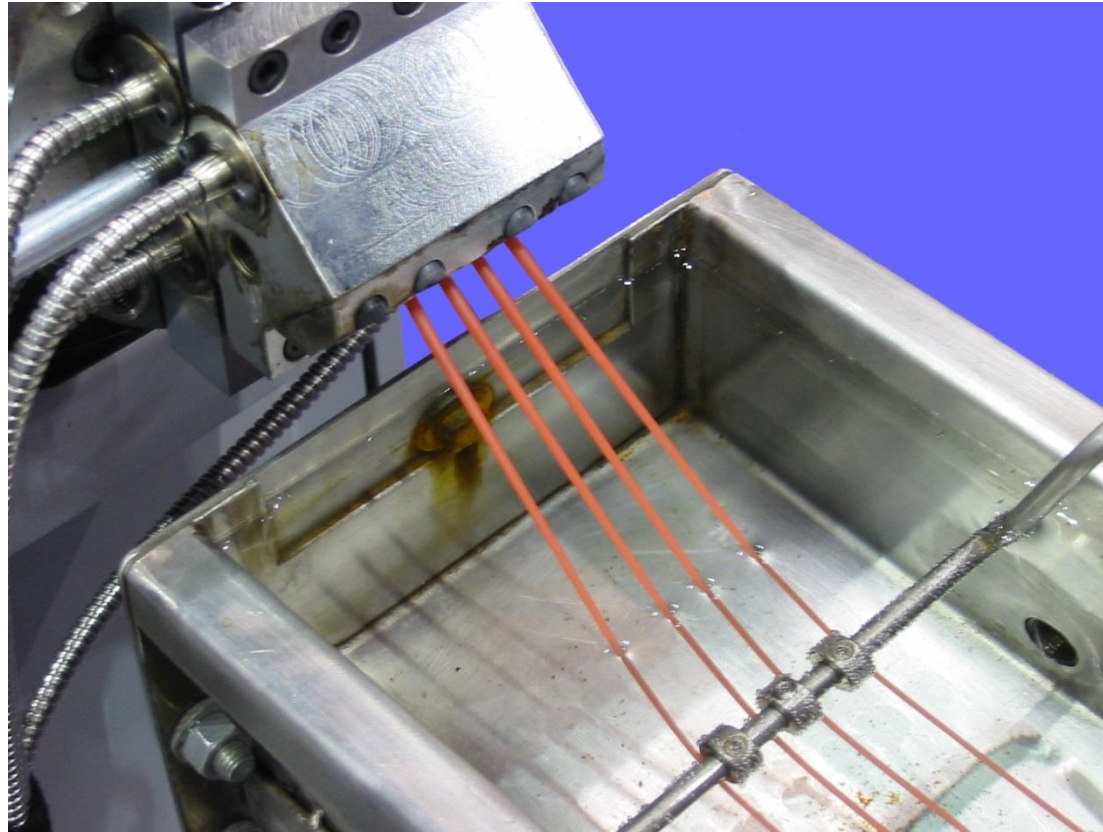
Floor Model Compounder 1.0 Inch Horizontal Taskmaster



Show here with close up of four strand die and water trough

Four Strand Die

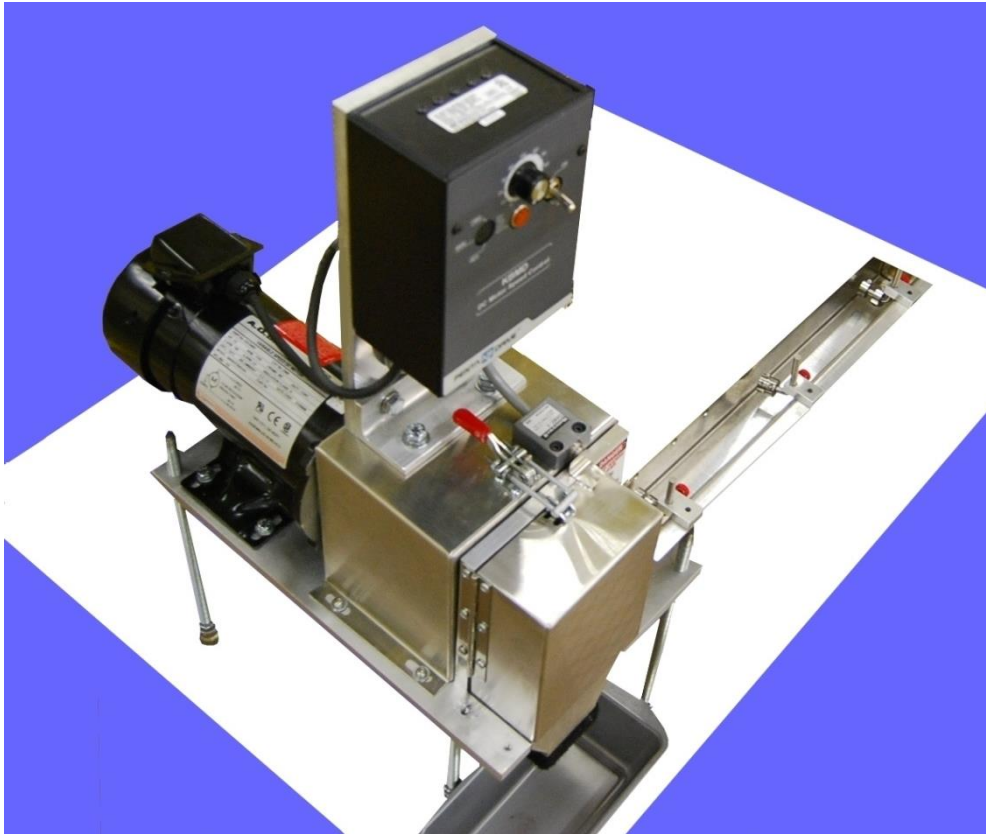
1.0 Inch Horizontal Taskmaster



The four strand die features uniform heating with three heaters and an interchangeable die plate to allow for various draw downs, diameters and easy flow balancing.

RCP-1.0 Bench Pelletizer

With 12 Inch Water Trough



This little bench pelletizer is ideal for low output applications. The cantilevered components make it easy to clean and maintain. Available for pellet cut lengths: 0.01, 0.02, 0.04, 0.06 and 0.08 inches.

RCP-1.0 Bench Pelletizer

With Air Cooling Rollers



Sometimes, a product cannot be water cooled.
When the extrudate has sufficient melt strength, this roller system can be best.

RCP-2.0 Floor Pelletizer

With Dual Drive



This 2 inch wide pelletizer had dual drives to vary the pellet length, FPM indicator and rotor indicator for easy dial in lengths. The cantilevered design makes for easy cleaning and maintenance. The support table height is variable for different sized collection bins.