

## Break Through in Drug Delivery and Formulation

with RONDOL's

# VERTICAL ALL-IN-ONE Twin-Screw Extruder

*Optimum Performance, Cost and Resource Management in Drug Delivery and Formulation*

Our unique set-up **improves material flow**, **facilitates smoother mixing**, provides **superior temperature management** and **preserves the integrity of sensitive components** with varying melt degradation properties, enhancing your medicines and medical devices performance. Additionally, the vertical design decreases the machine's footprint and minimizes cross-contamination risk, offering you a high-quality manufacturing solution with **lower capital and operational expenses**.

**RONDOL's patented vertical twin-screw extruder further enhances the proven performance of hot melt extrusion technology for producing the next generation of medicines and medical devices:**

- Solid oral dosage forms (tablets, hard and soft capsules)
- Orodispersible drugs (film granules, tablets)
- Semi solids (ointments, creams, pastes, gels, suppositories)
- Transdermal (implants, films)
- Extrudates for injection molding, calendaring or 3D printing
- Implants (ophthalmic, transdermal, vaginal)
- Medical plastics (strip, straps)
- Co-crystals
- Dry and wet granulations
- Amorphous solid dispersions
- Solid lipid nanoparticles
- Plant extractions
- Cyclodextrins
- Bioavailability enhancement
- Active pharmaceutical ingredients (APIs)

### Key Benefits of our Vertical Extruder:

**Compact and efficient design:** Maximize productivity and space utilization with our innovative vertical orientation which reduces the extruder footprint and allows for low capital intensity.

**Durable material contact parts:** Experience minimal abrasion extended machine life span with our optimized components.

**Easy to clean barrel:** Ensure traceability with different sources of critical materials thanks to inside liners easy to disassemble and clean.

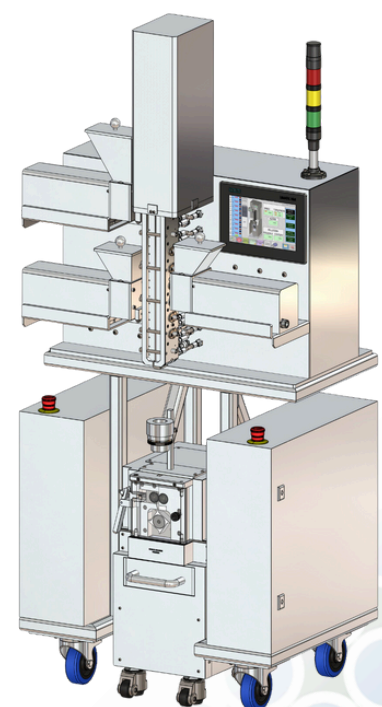
**Smooth mixing** of fragile active pharmaceutical ingredients (APIs).

**Versatile screw design and die options:** Cater to diverse R&D and production applications with our flexible design features.

**Scalability of our continuous manufacturing process:** Seamlessly transition from lab testing to industrial production with our scalable geometric proportions.

**Precise monitoring of process temperature** with autonomous control for each of the 8 zones.

**Integrated controls for feeders:** Enhance operational convenience with our advanced control panel and compatible feeders.



# VERTICAL ALL-IN-ONE

## SPECIFICATION SHEET: PHARMA

<b>Screw diameter</b>	10.5mm
<b>Length / Diameter</b>	40:1 (adjustable with side feeding option)
<b>Machine material</b>	Full stainless steel
<b>Screw speed</b>	0-300rpm (or 0-600rpm optional)
<b>Screw configuration</b>	Segmented screw design fully interchangeable
<b>Footprint</b>	0.497m <sup>2</sup> / 5.350sq.ft
<b>Dimensions</b>	828.5mm x 600mm x 1960mm (1.97ft x 2.72ft x 6.43ft)
<b>Motor power</b>	1.45KW (or 2.85KW optional)
<b>Electrical consumption</b>	1.89kWh (standard's maximal temperature and speed: feeder + extruder + pelletizer)
<b>Torque output</b>	14N.m per shaft maximum
<b>Number of barrel zones</b>	8 temperature-controlled zones (heating / cooling)
<b>Temperature range</b>	15-300°C (or 15-450°C optional)
<b>Dies</b>	Standard: strand die Options: cast film, strip, co-extrusion, swan-neck dies
<b>Plug-and-play feeding</b>	Standard: top powder or pellet feeder Options: side powder, pellet, liquid and/or gas feeders
<b>Minimum lot size</b>	50g (or less with the side feeding option)
<b>Maximum output</b>	Up to 1kg/hr (up to 2kg/hr optional)
<b>Maximum pressure</b>	100 bars
<b>Product cooling systems</b>	Standard: air cooling ring Options: stainless steel cooling system
<b>Plug-and-play downstream equipment</b>	Standard: varicut pelletizer Options: haul off winder (filament, film or strip), calendaring, implant cutting system
<b>Human machine interface</b>	10.1" touch screen with PLC-controlled data logging and audit trail, remote diagnostic tool Option: controlled by PC or Tablet
<b>Electrical power Requirements</b>	30amp, 110Vx2 + 1PE, 50/60Hz (North America) 32amp, 230V 1ph.1N+1PE, 50/60Hz (Europe)
<b>Water supply requirements</b>	4-6 bars
<b>GMP Package (Option)</b>	SAT, IQ/OQ, FDA and EMA compliant, Materials certificates, Login etc.