

1FRE Laboratory Compounding Line Smaller Lot Sizes for High-Cost Material Additives

TPEI's 1FRE laboratory compounding line is specifically engineered to serve the diverse technology needs of plastics and rubber processors who require lab technology for trials, small runs, and product development.

Research and development into new materials, such as bio-plastics and nano-composites, can require numerous trials to prove a material's property requirements. Additives such as nano-materials, bio-polymers, and medical grade compounds can cost up to several hundred dollars per gram. Because of the high-cost of additives and the expense of multiple trials, end-users are ordering small lot sizes.

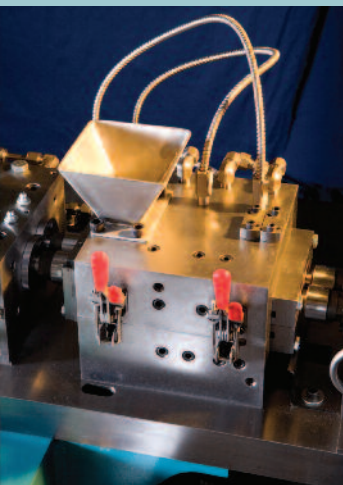
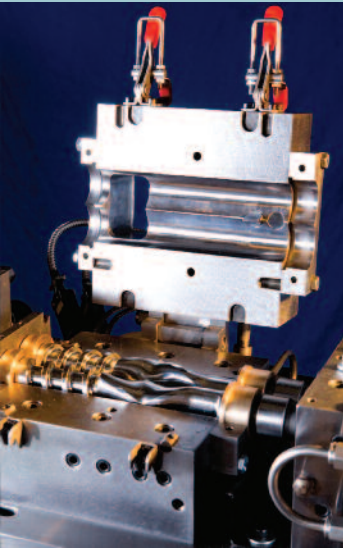
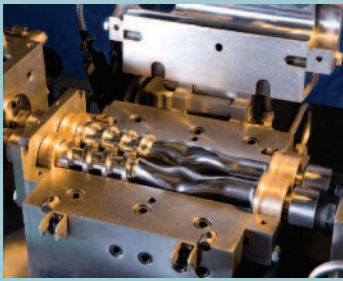
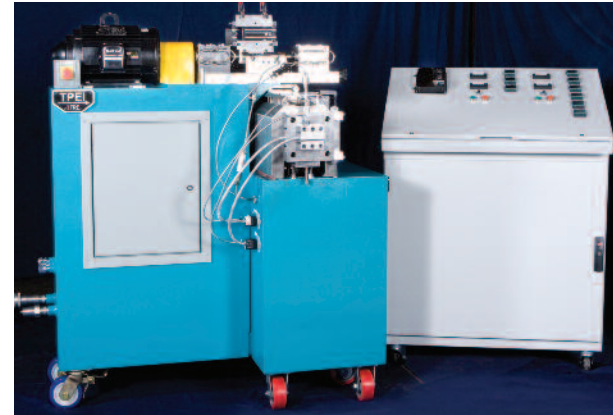
Economic Solution for Testing New Materials

TPEI designed and manufactured the high-precision 1FRE lab compounding line in response to the requests for smaller lot sizes. The line has the ability to run a 1-2 lb sample, making it highly economical for proving the property requirements of a new material. And, because it has sustained production rates of up to 50 lbs per hour, the 1FRE serves dual purposes. It has direct scale-up to larger compounding systems up to 15,000 lbs per hour.

Key Features and Benefits

The 1FRE is engineered for precision compounding of thermoplastics and some types of rubbers. It incorporates a TPEI extended body E-mixer and J-Block feed throat extruder and can be configured for strand or underwater pelletizing, or material can be taken from the mixer discharge to be molded into plates.

- **Extended Body E-Mixer** — has a larger feed throat capacity, which solves the problem of feeding fluffy or hard-to-feed materials that may want to bridge on smaller feed throat openings. It has a T-orientation, which aligns the mixer discharge to the extruder screw.
- **J-Block Feed Throat Extruder** — is specifically designed to accept the hot feed strip discharge from the mixer. This allows the extruder to receive a more uniform material feed and makes a more uniform pressure at the die end of the extruder producing a more uniform pellet, which is critical for a superior end product.
- **Patented Sealing Arrangement** — keeps powdery materials from flowing out of the end of the mixer. It introduces an air flow to keep the powder out of the seals, thereby greatly increasing the seals' useful life. It eliminates both a maintenance clean-up problem and a safety hazard.
- **High Fill Rates** — unlike other compounding methods that are limited to 30 to 40% fill rates, the 1FRE is excellent at fill rates as high as 90%.
- **Multiple Temperature Control Zones** — three heating and cooling zones for the mixer, two for the extruder, allow for superior residence time control.
- **Quick Configuration Changes** — can be done in ½ hour for multiple trial setups.
- **No Special Power Hook-Up Required** — unlike other lab compounding lines that use 480 volt three-phase power, the 1FRE runs with 240 volt single-phase power, which means it can be plugged into a standard 240 volt outlet. Requiring no special power hook-up makes installation easier and cheaper.
- **Can Be Wheeled Into Position** — fitted with casters for easy orientation in the lab environment.



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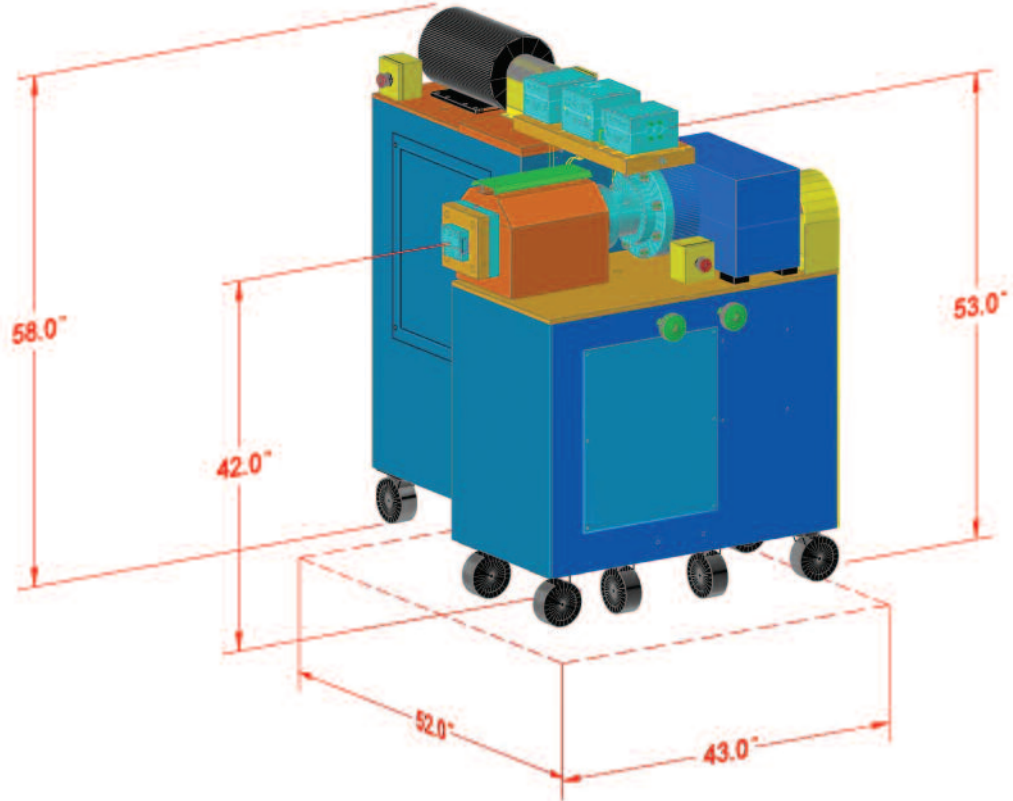
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1FRE Laboratory Compounding Line Smaller Lot Sizes for High-Cost Material Additives

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- J-Block Feed Throat Extruder
- Patented Sealing Arrangement
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1FRE Laboratory Compounding Line



Overall installation dimensions for mixer and extruder. Does not include control panel.

Compounds Both Thermoplastics and Rubbers

The 1FRE can compound both thermoplastics and some types of rubbers, including: PE, PP, PS, SAN, ABS, FPVC, TPE, TPO, PET, PC and PA. Compounding rates for these materials will vary, depending on additives, but rates of 30 to 50 lbs per hour are achievable.

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Technical Process and Engineering, Inc. (TPEI)

TPEI is a major manufacturer of compounding equipment for the plastics and rubber processing industries. From compounding lines capable of processing a wide variety of thermal plastics and rubber polymers, to rotor repairs and restacking, machine alterations and rebuilds, and the design and fabrication of complete turnkey systems, TPEI is the single source supplier for processing facilities looking to keep their equipment running profitably.