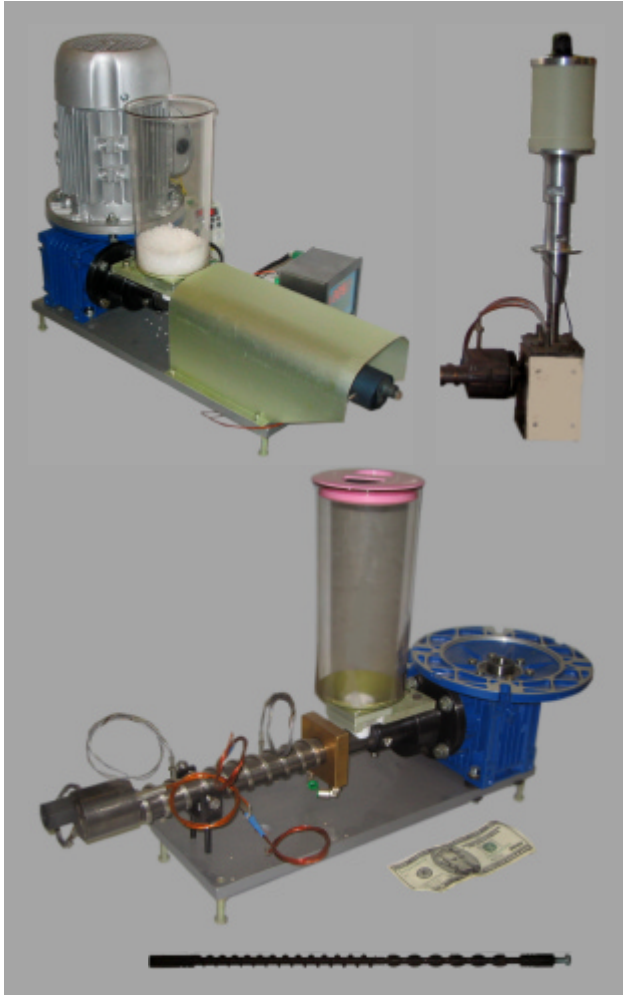


ISM-US-01 --- Laboratory Polymer Extruder with an Ultrasonic Head

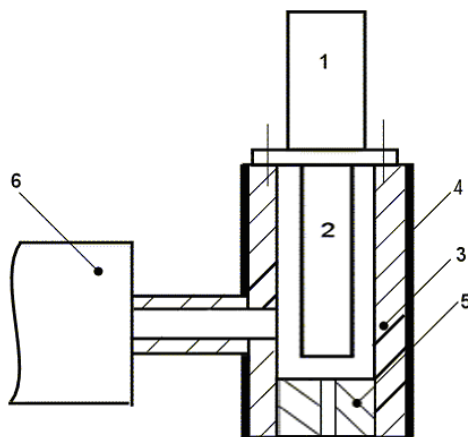
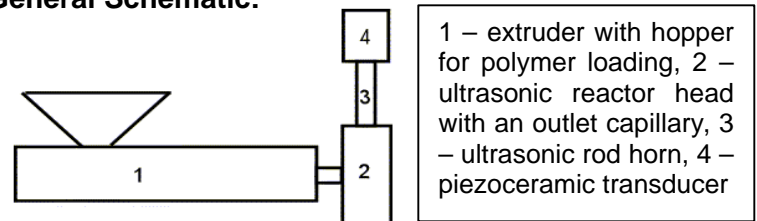


Apparatus consists of a laboratory polymer extruder with a feedscrew of 12 mm in diameter and an ultrasonic head with a replaceable outlet capillary. The apparatus is ideal for studying the effects of powerful ultrasound on polymer melts, vulcanized and virgin rubbers, etc.

The equipment includes:

1. Laboratory extruder with a feedscrew of 12 mm in diameter. Its capacity is 1 kg/hour of polyethylene. Extruder is equipped with a temperature control unit and thermocouples. Extruder may be supplied with additional feedscrews specially designed for different materials, such as vulcanized rubber, etc. Additionally, extruder may be supplied with an exiting string granulation device.
2. Ultrasonic polymer processing head. The head is supplied with piezoceramic transducer, booster and a titanium alloy acoustic horn. Working frequency is 20 kHz. Maximum output oscillation amplitude is 20 μm . 500 W ultrasonic generator is used to drive the transducer. The ultrasonic head includes a set of replaceable capillary outlets and an entrance pressure gauge.

General Schematic:



Ultrasonic Head Schematic and Operation:

Polymer melt from extruder, 6, is directed under pressure into the ultrasonic reactor head, 3, equipped with a temperature control unit, 4. In the ultrasonic reactor head, the polymer melt flows into the spacing between the outlet capillary, 5, and the ultrasonic rod horn, 2, where it becomes exposed to ultrasonic vibrations excited by piezoceramic transducer, 1. The ultrasonic head includes a set of replaceable outlet capillaries and an entrance pressure gauge. During high-intensity ultrasonic treatment, the physical/chemical properties of the polymers change, along with their molecular structures. Various chemical reactions, copolymerization, devulcanization, side chain aggregation and other modifications take place.

Please Note: The design of the ultrasonic head and the feedscrew is specially adapted to the processed materials. Please let us know what you plan to work with to get the optimal selection.