Leistritz

Micro-18 ZSE-27

Modular/multi-mode twin-screw compounding and research extruders

CO-ROTATION
INTERMESHING
LABORATORY
PELLETS
DISTRIBUTIVE
REACTING
FIXED

COUNTERROTATION
NON-INTERMESHING
PRODUCTION
PARTS
DISPERSIVE
DEVOLATILIZING
SEGMENTED

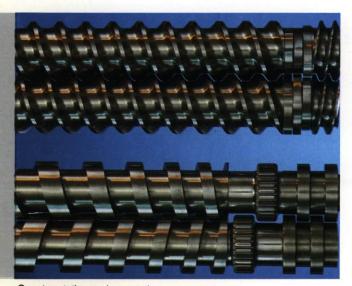
Micro-18 and ZSE-27 modular/multi-mode twin screw extruder systems - extremely flexible and versatile additions to the laboratory or small production environment

The Micro-18 and ZSE-27 modular/multi-mode twin screw extruders (18 and 27 mm screw diameters) are quickly and easily converted between co-rotation and counterrotation to facilitate economical multi-mode research. Total building block construction includes segmented screws that are user programmed on high torque shafts, and modular barrels with a quick change flangeless design. The Micro-18 and ZSE-27 are compatible with a wide range of support devices, such as volumetric and loss-in-weight feeders, strand pelletizing, hot face pelletizing, gear pumps, and various other die and downstream equipment.

Commodity and engineering thermoplastics may be processed in alloyed, filled, reinforced and pigmented compositions. Feedstocks can be pellets, powders, reactor melts, strips, liquids, gases, and fibers. Machine configurations are also available for pharmaceutical products, elastomerics, foods, powder coatings and other thermosets.

The Micro-18 and ZSE-27 are designed to support the entire Leistritz line of twin screw extruders with screw diameters from 18 to 135 mm, as well as other make and model co-rotating and counterrotating production twins.

Micro-18 or ZSE 27? - The Micro-18 and ZSE-27 are similar in design and process capabilities, with the major difference being the comparative throughput rates - typically 1 to 15 lbs/hr. for the Micro-18, and 10 to 80 lbs/hr. for the ZSE-27. Below 10 lbs/hr. the ZSE-27



Counterrotating and co-rotating segmented screws assembled on shafts.

and other industry 30 mm class machines simply have too much free volume to be practical.

The Micro-18 is preferred when only research quantities are available for sampling - as little as a one pound batch or less can be processed. The ZSE-27 performs laboratory work, small production and customer sampling where higher throughputs are desired.

Co-rotation or counterrotation? - The choice between co-rotation and counterrotation is not always straightforward. Each competes against and complements the other, and has been proven in extensive production to have technical merit. The Leistritz multi-mode design concept for the Micro-18 and ZSE-27 allows both to be tested to optimize the process.

New high speed counterrotating technologies use the same drive power and screw speeds as traditional corotating twins. Counterrotation is often better at performing dispersive mixing with a lower melt temperature, processing formulations with high liquid or slippery phases, and directly making a part from the twin using classical pumping elements without a gear pump frontend. Traditional counterrotating geometries are widely used for color masterbatch and vinyl applications.

Co-rotation is highly developed and successful due to excellent self wiping and shear management properties that make this mode ideal for engineering polymers, powder coatings, adding fillers and fibers into the process melt, and many other applications. All classical screw and barrel elements are employed in the Leistritz execution of co-rotation, as well as novel elements drawn from counterrotation experience.

Mode convertibility - The Micro-18 and the ZSE-27 operate in co-rotation and counterrotation with fast change over capabilities. Since the same barrel sections are used, only screws and gearing rotation need to be changed. Mode conversion kits can be specified initially, or retrofitted in the future as required or as funding allows.

To convert the Micro-18 the distribution gearing module and screws need to be changed. The heaviest component, the distribution gear, weighs only about 70 pounds.

The ZSE-27 offers an even simpler conversion because the same distribution gear supports operation in both corotation and counterrotation. Only screws are changed for conversion - normally in less than 1/2 hour. By repositioning a mode engagement gear on a shaft to the co-rotating or counterrotating position, the desired twin screw mode is chosen. The ZSE-27 may also be retrofitted to operate in the single screw mode.

Pellets or parts? - The Micro-18 and ZSE-27 are adaptable to make pellets and/or parts. Processes typically performed include compounding - dispersive and distributive mixing, reactive extrusion, and devolatilization. These twin screw extruders can also combine these processes in a one-step operation, and extrude a finished product such as film, sheet, fibers, tubes, profiles, and other special purpose parts.

E.M.C.S. Computer Option - The Micro-18 and ZSE-27 may be interfaced with the Leistritz Extrusion Monitor and Control System, or E.M.C.S., for detailed analysis and control of the process. Man-Machine Interface (MMI) software displays object oriented graphics, real time and historical trending of all process parameters, data/alarm logging, recipe management, and report generation. The software operates in a Windows environment that has been applied specifically to extrusion and compounding applications.

The E.M.C.S. graphically displays the extruder, upstream/downstream equipment, and related auxiliaries. Process information, both quantitative and qualitative, may be printed on demand or cyclically, and saved to a floppy in a standard spreadsheet format. SPC may also be integrated into the package.

Segmented

Base mounted

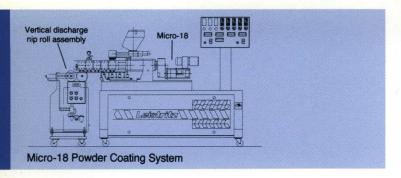
vacuum pump

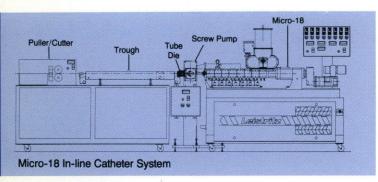
Sheet die

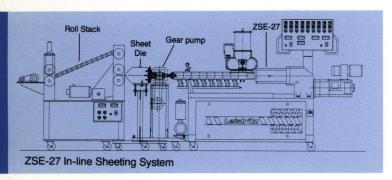
Other Leistritz laboratory and small production twins - The

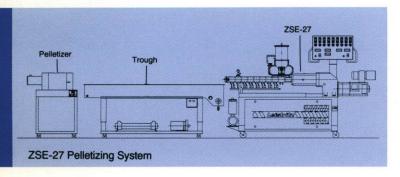
proven Leistritz LSM 30.34 guadra-mode extruder with 34 mm diameter screws is the only extruder in the world that can operate in the three commercial twin screw modes: co-rotating intermeshing, counterrotating intermeshing, and counterrotating non-intermeshing, as well as single screw. The ZSE-40 mm and ZSE-50 mm twins are also mode convertible and designed to meet small to midsize production needs, and pilot plant development.











Leistritz

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Micro-18 Technical data:

Screws diameter 18 mm Flight depth 3.1 mm

Screws shafts High torque round keyway
Torque 2 x 20 Nm each shaft

 Barrels
 5 D each

 L/D typical
 20 - 40 L/D

 Screws speed
 50 - 500 rpm

 Drive power
 2.2 KW/3 HP

Est. throughputs 1-15 lbs/hr., varies with application
Dimensions 65 L x 18 W x 75 H inches (approx.)

Hook-up 208, 240, or 480 V/3P/60 Hz -

approx. 12 KVA

ZSE-27 Technical data:

Screws diameter 27 mm Flight depth 4.3 mm

Screws shafts High torque splined
Torque 2 x 100 Nm each shaft

 Barrels
 4 D each

 L/D typical
 20 - 48 L/D

 Screws speed
 50 - 500 rpm

 Drive power
 11 KW/15 HP

Est. throughputs 10 - 80 lbs/hr., varies with application Dimensions 98 L x 31 W x 75 H inches (approx.) Hook-up 208, 240, or 480 V/3P/60 Hz -

approx. 23 KVA

Screws are assembled on high torque shafts and constructed of high alloy nitrided steel, stainless steel, and special purpose metals for high abrasion and corrosion resistance. An infinite range of co-rotating and counterrotating geometries is available.

Barrels are flangeless and held together via strain bars, heated by electric cartridge heaters, and cooled through internal cores by air or liquid. Types include feed, plain, vented, injection, side stuffing, and special purpose. Materials of construction include high alloy nitrided steel, stainless steel, bi-metallic and special purpose metals for high abrasion and corrosion resistance.

Process laboratory facility

Jersey process laboratory offers a wide range of technical support services. On-site are various size corotating and counterrotating twin screw extruders, and extensive upstream and downstream equipment, including pelletizing, sheet/film and other in-line product extrusion capabilities.

Leistritz background and product line

Leistritz manufactures on an equal basis twin screw extruders in the three commercial modes: co-rotating intermeshing, counterrotating intermeshing, and counterrotating non-intermeshing. Screw diameters range from 18 to 135 mm. Complete systems that include feeders, downstream equipment, and system controls may be specified.

American Leistritz Extruder Corporation, established in 1976, is a subsidiary of Leistritz A.G., established in 1905 in Nuremberg, Germany. American Leistritz Extruder Corporation has since been involved in more than 500 machine installations into North America.