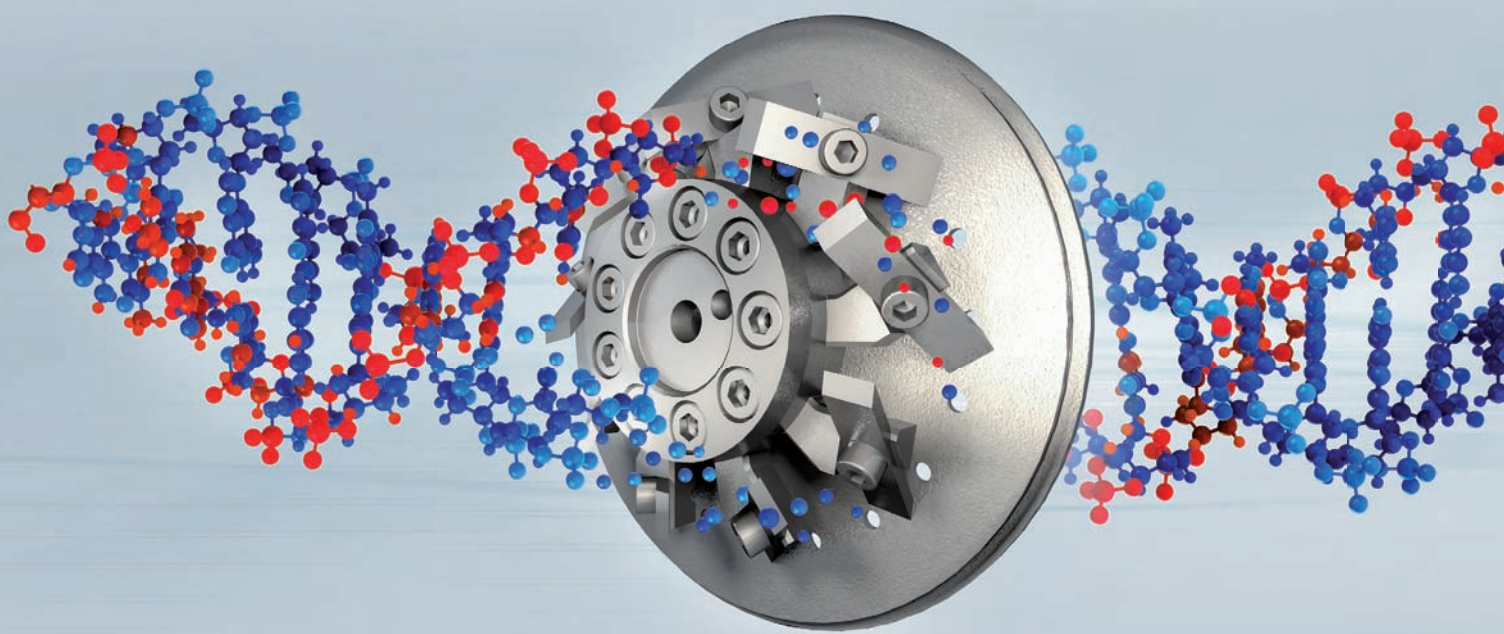


PELLETIZING IS IN OUR DNA



UNDERWATER PELLETIZING SYSTEMS | SCREEN CHANGERS | PYROLYSIS FURNACES
PELLET & BULK MATERIAL DRYERS | AIR PELLETIZING SYSTEMS



TECHNOLOGY
LEADERSHIP



PELLETIZING IS IN OUR DNA

For more than ten years, ECON has been THE specialist for underwater pelletizing systems. The continuous development of our technology has made us the innovation leaders in underwater pelletizing, especially with our patented thermal insulation technology. Just as important as continuing to develop innovations is our focus on finding the right solution to optimize the production processes of every individual customer. We are ECON – the innovation leader with

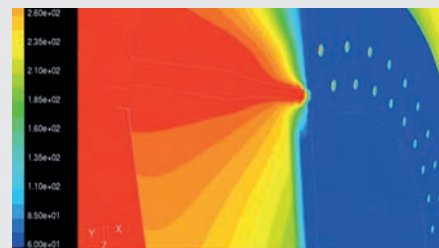
unique ideas, easy-to-operate machinery and a distinctive sense of responsibility for our environment. This mission is reflected in our successful invention, development, manufacturing and worldwide marketing of innovative solutions for screen changers and underwater pelletizing systems. For us, "Pelletizing is in our DNA" and our passion for technology is only surpassed by our passion for your success and enabling you to achieve the impossible.

LEADING ECON TECHNOLOGY FOR YOUR ADVANTAGE

- » thermal insulation
- » patented technology
- » innovation management
- » testing environment



ECON: full thermal insulation



Competition: permanent energy transfer to the process water

PATENTED THERMALLY INSULATED DIE PLATE

**Thermal insulation:**

die holes will not freeze during start-up and operation.

Constant melt temperature over the complete length of the nozzle: no overheating of the melt.

Constant temperature profile in the die plate unit:

minimal heat flow to the process water.

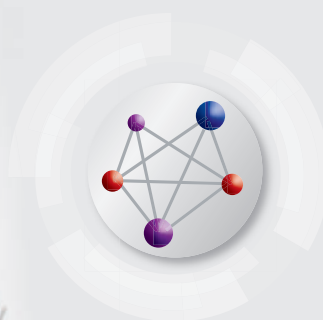
Consistent quality:

large throughput range per hole (approx. 1:4), uniform pellet shape.

The ECON underwater pelletizing systems differ from the competition by providing efficient insulation of the die plate. This patented thermal insulation concept prevents the freezing of the die holes. In addition, ECON's technology eliminates the need for bypass piping, not only making pelletizing more efficient, but also provid-

ing significant energy savings. We attach great importance to the continuous improvement of all our products and consider this an important part of innovation management. Our on-site technical center provides the ideal testing environment to develop and test new products.

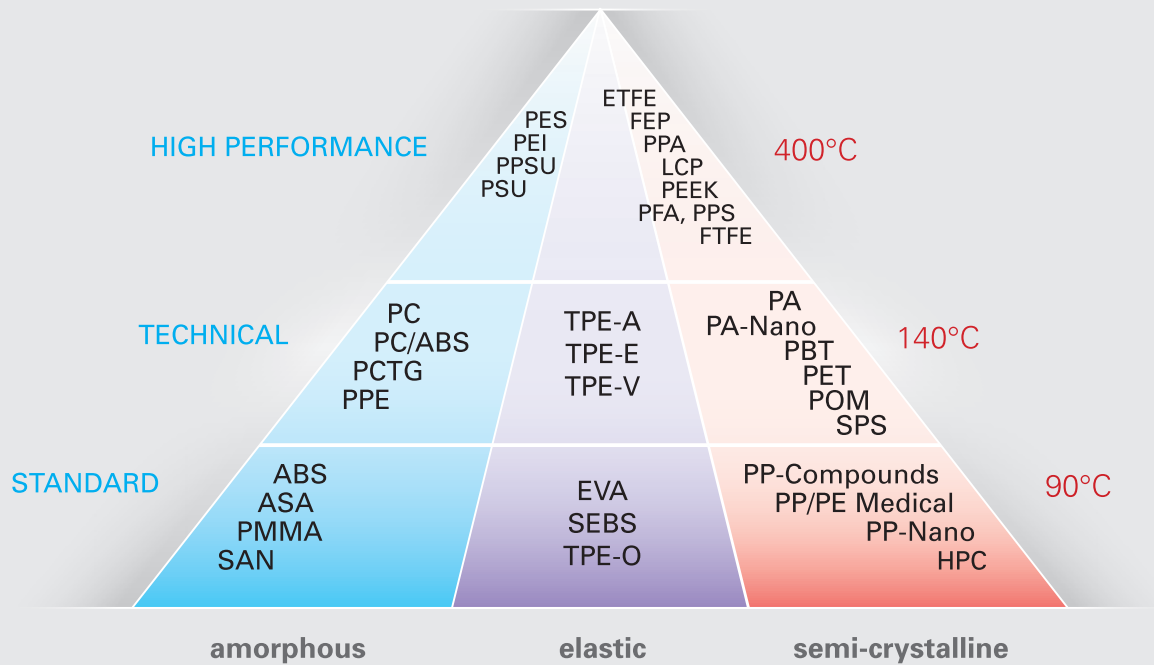
UNIQUE CONCEPTS PROVIDE BEST **PROCESSING** SOLUTIONS



- » high temperature ranges
- » suitable for compounds with high filler content
- » high MFR (melt flow rate)
- » rubber-like, adhesive and viscous materials



HIGHEST PELLET QUALITY FOR ALL THERMOPLASTIC MATERIALS



ECON's innovative technology enables the pelletizing of plastics that could not be processed with conventional methods. The patented ECON die plate in combination with the underwater pelletizer makes it possible to process plastics at high temperatures or with high filler content. The machines can even pelletize materials with highest melt flow rates (e.g. PP up to MFR 2400). Excellent results are also achieved when proces-

sing viscous materials (such as elastomers, natural resins, silicones or hot melt adhesives). In addition to handle difficult materials such as liquid crystal polymer (LCP), we are able to produce micro pellets < 1 mm.

We invite you to come to our technical center and work with one of our process engineers to test and adjust any compound you need pelletized. Put us to the test – we accept the challenge!

SMART OPERATION ENABLES EASY & QUICK START-UP

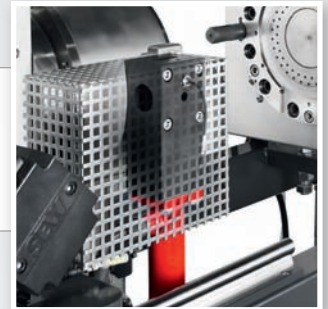
- » simple operation
- » fast material changes
(e.g. masterbatch)
- » smooth start-up
- » highest operational safety



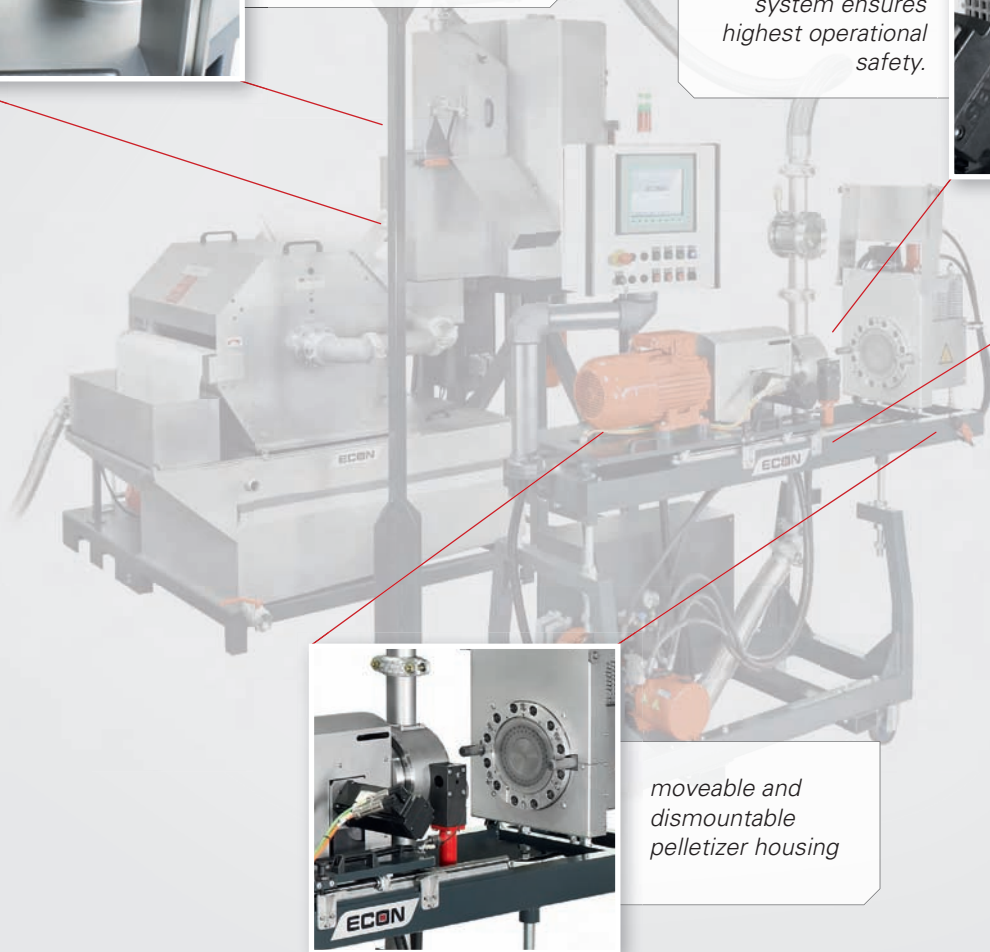
EASY HANDLING FOR SAFER OPERATION



no dead spots, completely accessible for visual inspection, 100% free of residues



The hydraulic locking system ensures highest operational safety.



moveable and dismantable pelletizer housing

By making our machines easy to operate, we combine two essential requirements: ease of handling and highest operational safety. With precision linear bearings, hydraulic locks, freely accessible die plates and residue-free material changes, the ECON system is guaranteed to be easy and safe to operate. In addition, ease of operation means shorter training times and lower personnel costs.

easy and safe operation:

- **precision-fit linear bearings**
- **freely accessible die plate**
- **hydraulic locking system**

quick and convenient material changes:

- **100 % free of residues**
- **complete insight for inspection**
- **cleaning time < 15 min possible**

ENERGY EFFICIENT ENGINEERING ENSURES YOUR **BENEFIT**



- » energy-efficient engineering
- » realization of potential savings
- » ecological concepts
- » minimized emissions

Energy Balance ECON Underwater Pelletizer

yearly consumption (300 days x 24 hrs.)	1,360 kW/year
yearly cost	€ 204.12

Based on: PP, output 1,000 kg/hr, electricity price of 0.15 €/kW

ECON OFFERS SUSTAINABLE GREEN SOLUTIONS



Saves energy

The thermal insulated die plate transfers almost no energy to the process water.

- the process water is hardly heated
- less energy is required to cool the water



Low extrusion pressure

With the patented ECON technology, the extruder consumes less energy at the same level of output.

- lower extrusion pressure (up to 1/3 less pressure)
- less energy input required



Conserve resources

ECON's pyrolysis furnace works with an oil lubricated vacuum pump with an activated carbon filter.

- no water consumption
- no afterburner required
- no emissions

Green, sustainable concepts are better for the environment, show a sense of responsibility to future generations and, honestly, are good for a company's image. But just as important, green solutions result in a lower energy balance and consequently lower production costs.

ECON has many ideas to be green and save

production costs. For example, our thermal insulated die plate saves energy twice. On the one hand, process water is hardly heated up and less cooling energy is required. On the other hand, less extrusion pressure is required, which means less energy consumption and lower costs.

UNDERWATER PELLETIZER, EUP WATER TREATMENT AND DRYING SYSTEM, EWT



ECON is the leading provider of underwater pelletizing technology with thermally insulated die plates. The die plate is fixed on the heated carrier body. The thermal insulation ensures that the melt in the die holes will not “freeze.” ECON pelletizers are not sensitive to fluctuations in output, thus making the pelletizing process extremely reliable and guaranteeing high operating efficiency.

In addition, the compactly and clearly designed ECON water

treatment and drying system is an effective solution for drying the pellets. The continuous filtration of process water ensures low maintenance requirements. Because the pellet dryer is easily accessible and free of dead spots, material or color changes can be done quickly. The complete pelletizing line can be easily adapted to different production conditions, thus increasing your flexibility.

UNDERWATER PELLETIZING SYSTEM

The underwater pelletizing system consists of a polymer diverter valve, a pelletizing unit, a water treatment and drying system and an electrical control system.

1. When started, the melt flow is directed downwards by the polymer diverter valve. Once a constant melt flow is given, the stream is redirected and the die plate is rinsed with melt.
2. As soon as the melt is continuously emerging from each hole, the stream is once again directed downwards. The die plate is cleaned and the pelletizer housing is fixed to the pelletizing head by means of the hydraulic lock.
3. Afterwards, the melt is directed to the pelletizing head with the die plate installed, and the emerging melt strands are pelletized under water. The pellets are then moved to the water treatment and drying system by the process water. The separator then removes any potential lumps.
4. In the pre-dewatering unit, the pellets are separated from the process water and conveyed to the centrifugal dryer. The centrifugal forces in the dryer and the special arrangement of the blades propel the pellets upwards and simultaneously separate the residual water via screens.
5. The pellets exit the system at top and move on to the next step.

6. The process water is collected in the water tank, filtered and recirculated to the process. A cooling circuit with plate heat exchanger is integrated to control the process water temperature.

- all thermoplastic materials can be processed
- push-button start – automatic, fast, and safe
- no “freezing” of the die holes due to the thermal insulation
- CECONID® die plate – highly wear resistant for a long useful life
- constant pellet quality
- smallest possible pellets, even micro pellets
- compact unit, minimal space requirements, simple handling
- minimal energy consumption – highest energy savings
- optional components for your individual requirements
- low labor and maintenance costs
- bypass piping not required, less water loss
- continuous process water filtration, optional with automatic compact band filter
- easily accessible pellet dryer, free of dead spots for simple and safe cleaning

Underwater Pelletizer	Water Treatment and Drying System	Throughput
EUP 10	EWT 110	1 up to 15 kg/hr
EUP 50	EWT 190	2 up to 120 kg/hr
EUP 150	EWT 250	100 up to 350 kg/hr
EUP 400	EWT 350-4	300 up to 600 kg/hr
EUP 600	EWT 350-6	500 up to 1,000 kg/hr
EUP 1500	EWT 400-15	800 up to 2,000 kg/hr
EUP 3000	EWT 400-30	1,800 up to 3,200 kg/hr
EUP 6000	EWT 500 with S+L DHL 725	3,000 up to 8,000 kg/hr

Generally, ECON's underwater pelletizers are offered in combination with the water treatment and drying system (EWT).

VIBRATION DRYING SYSTEM, EVS

Especially for materials with high filler content (e.g. with glass fibers or with mineral fillers), the vibration drying system is an excellent alternative to the standard centrifugal dryer. The gentle drying of the pellets ensures little wear and a low amount of fines and a residual humidity as low as 0.05 % can be reached.

The vibration drying system consists of two or three sequentially arranged vibrating screens. The first stage serves for dewatering of the pellets. In a dehydrator, the pellets are separated from the process water before they enter the screen. The process water is cleaned by an automatic band filter and recirculated to the process. In the second stage, the pellets undergo further drying. Electrical damping registers are installed under the vibrating screen to generate a warm stream of air through the screens.



An additional stage can be installed to treat highly hygroscopic materials with even more stringent requirements for residual humidity.

The ECON vibration drying system is suitable for throughputs up to 3,000 kg/hr.

PELLET DRYER, S+L

ECON's pellet dryers, S+L, can be combined with the ECON water treatment and drying system, but they are also suitable for stand-alone operation. These dryers are often used in the recycling industry to dry bulk or mill material or flakes. These centrifugal dryers are characterized by their compact design and sturdy construction. Depending on the temperature, size and structure of the material to be dried, residual humidities between 0.01 and 0.5 % can be attained.

The pellet dryers are available with different input systems and/or several optional components (such as sound insulation), depending on your requirements. In addition, special gas or explosion proof and wear-protected designs are available.

- compact design and sturdy construction
- high throughput
- gearless drive for maintenance-free operation



ECON Pellet Dryer	Throughput
S+L 360 D	approx. 500 kg/h
S+L 470 D	approx. 1.200 kg/h
S+L 530 D	approx. 2.500 kg/h
S+L DHL 725	approx. 10.000 kg/h

AIR PELLETIZER, ELG



The ECON air pelletizer was especially developed for processing wood and natural fiber compounds (such as WPC). Because water is used to cool and convey the pellets, processing wood-plastic compounds in an underwater pelletizing system requires a substantial amount of drying. Common drying methods are often unable to attain satisfactory levels of residual humidity.

The air pelletizer was designed to use air to cool and convey the pellets and thus eliminate any need to dry the pellets. At the same time, the system benefits from the thermal insulation, resulting in a uniform cut and easy conveying of the pellets from the "cool" cutting surface, without generating chains or agglomerates.

Among natural fiber compounds, the ECON air pelletizer is also well suited for processing PVC, which has a low inner specific heat, therefore requiring only minimal cooling.

The air pelletizer can also be combined with the ECON underwater pelletizing system. With only a few modifications, one system can be used for both underwater and air pelletizing.

Depending on the material properties, the ECON air pelletizer is available for throughputs up to 3,000 kg/hr.

LARGE SCOPE FOR HIGHEST DEMANDS

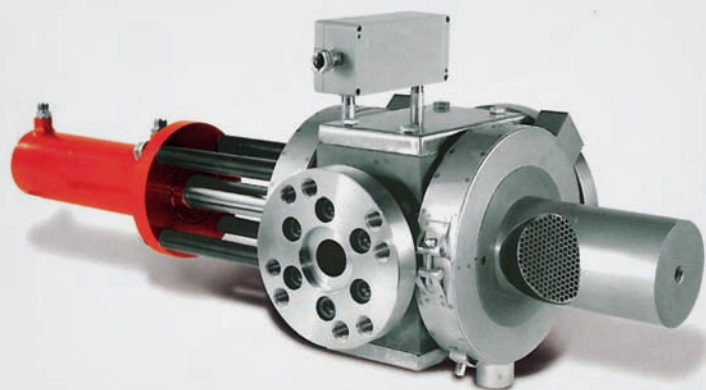
ECON offers a wide range of piston screen changers to match your material, filter fineness and extruder output. ECON offers patented solutions with large effective screen areas to meet your individual requirements, from discontinuous screen changers to continuous screen changers with backflush system.



ECON screen changers can also be provided with our **patented automatic venting system "W"**:

- no trapped air in the melt
- prevention of interruptions of production (film tear)
- contained air is pushed out through venting channels
- venting channels merge in one central bore
- individual adjustment for any specific application
- integrated splash guard to prevent splashing to the operator side

DISCONTINUOUS SCREEN CHANGER, ESD/ETS



With discontinuous screen changers, the screens are changed when the machine is stopped. The piston carrying the screen is moved out and the screen pack is switched.

For melts with very low viscosity (e.g. PET or PA), the ESD has been further developed to the "ECON thermo sealer" (ETS) screen changer. This model offers air cooling at the end of the pistons and is therefore leak-free, even with low viscosity materials.

The discontinuous screen changers are appropriate for throughputs from only a few kg/hr up to 2,500 kg/hr.

- approx. 65 % effective screen area for higher throughput
- low-optimized design of the melt channels
- extremely low pressure build up protects material and screens
- no dead spots for faster material changes

CONTINUOUS SCREEN CHANGER, ESK



The continuous double-piston screen changer allows screens to be switched out during operation. Normally, the melt is spread over both pistons, each containing one screen pack. After a defined maximum pressure is met, one piston is moved out hydraulically and the screen pack can be changed. Meanwhile, the complete melt is directed over the second piston. After exchanging the screen pack, the piston is moved back and the production process continues. Afterwards the procedure is repeated with the other piston.

The continuous screen changers are available for throughputs up to 6,000 kg/hr.

- all thermoplastic materials can be processed
- optimal design of the melt flow-way – short melt residence time
- low pressure build up – to prevent thermal variations of the melt
- no dead spots for fast changes of material or color
- operational reliability and long durability

CONTINUOUS SCREEN CHANGER WITH BACKFLUSH SYSTEM, ESK B



is met. The piston in the backflush unit redirects the melt flow, so only one piston with screens is currently being used in the production process. The other screen pack is flushed backwards, so any contaminants with only minimal melt are removed from the screens through the backflush unit. Afterwards the process is repeated with the other screen pack. The continuous screen changers with backflush system are available for throughputs up to 3,750 kg/hr.

- all thermoplastic materials can be processed
- optimal design of the melt flow-way – short melt residence time
- low pressure build up – to prevent thermal variations of the melt
- no dead spots for fast changes of material or color
- approx. 75 % effective screen area
- operational reliability and long durability

The continuous double-piston screen changers with backflush system provide major advantages with their fully automatic cleaning of the screens as soon as a defined maximum pressure

PYROLYSIS FURNACE, EPO



The ECON pyrolysis furnace was developed for environmentally friendly and gentle cleaning of extrusion and filter parts. Thermoplastics and mixed plastics are removed under vacuum without any cleansing agent at a variable working temperature. Sensitive parts are protected due to the precision setting of the temperature. Your advantage: fast, cost-effective and residue-free cleaning for an extended lifetime.

- gentle removal of thermoplastic materials and mixed plastics
- extended lifetime of tools and filter parts
- environmental safety, TÜV-certificate
- easy handling and highest reliability
- low-maintenance, oil lubricated vacuum pump
- no process water necessary
- no emissions because of activated carbon filter



Pyrolysis Furnace	Charging Chamber Ø	Charging Height	Load Capacity
EPO 300	Ø 280 x 580 mm	700 mm	300 kg
EPO 600	Ø 360 x 680 mm	900 mm	600 kg
EPO 1200	Ø 440 x 780 mm	1.100 mm	1.200 kg
EPO 1500	Ø 620 x 1.600 mm	1.100 mm	1.500 kg
EPO 1800	Ø 900 x 1.600 mm	1.150 mm	1.800 kg

STATE-OF-THE-ART TECHNOLOGY



Testing Environment

In our on-site technical center, we continuously develop and test our products. We also offer our customers the opportunity to conduct trials of their individual requirements on our equipment.

The following equipment is currently available in the ECON technical center:

- gravimetric metering unit
- twin screw extruder, ZSE 50
- underwater pelletizing system, EUP 150, incl. water treatment and drying system with automatic compact band filter
- continuous screen changer with backflush system and automatic venting system, ESK 140 BW
- melt pump
- pyrolysis furnace, EPO 300
- vibration drying system, EVS 600

Can't make it to our technical center? We'll bring the testing environment to you. Rent our machinery to conduct trials at your production site.

Service

For us "Pelletizing is in our DNA" is not just a meaningless phrase: pelletizing technology is the heart and soul of our business. A team of specialists with major successes in turning their theoretical knowledge of mechanical and process engineering into reality is on hand to work with you. Your success and your satisfaction are our passion and our qualified and enthusiastic technicians are here to help you make it happen.



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