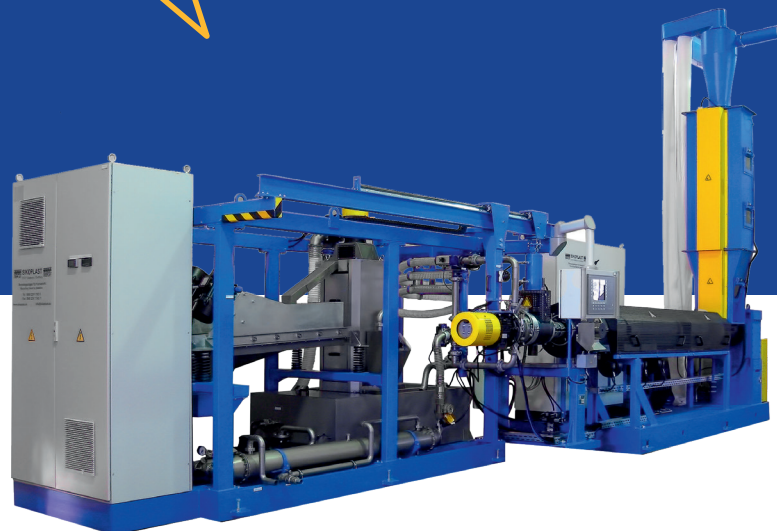
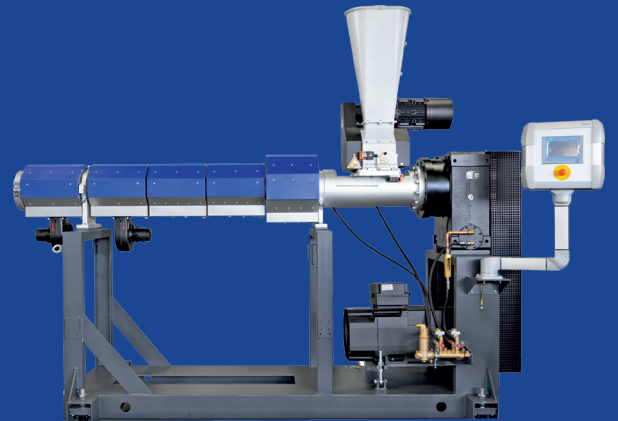


*Recycling systems for  
the plastic industry*



## Stylianos W. Nikolaou

Managing Director

*“We can proudly announce that SIKOPLAST Recycling Technology GmbH is one of the first pioneers in the development of sustainable and environmentally friendly plastics recycling equipment.*

*Nevertheless, today we must not rest on the successes of days gone by and must see environmentally conscious opportunities, act accordingly and bring them to the market.*

*This is what I am committed to at SIKOPLAST.”*

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# PLASTIC RECYCLING - COMPLETE SYSTEMS FROM A SINGLE SOURCE

## THE RIGHT EXPERTISE SINCE 1986



SIKOPLAST headquarters

### ABOUT US

When the oil crisis temporarily caused the raw material price of plastics to rise sharply at the beginning of the 1970s, a new market for recycling systems also emerged. Heinrich Koch, the founder of SIKOPLAST saw this as the future for his company and from then on developed the plant engineering and systems for the recycling of plastics. This development was consistently continued by SIKOPLAST, even when other engineering companies discontinued to follow this trend.

One of the heart pieces of this success are the conical single-screw extruders. This screw design, which has often been copied, forms the heart of the SIKOPLAST recycling systems even today in a modified design.

In 1986 the foundation stone of today's SIKOPLAST Recycling Technology was laid. The delivery program of the company SIKOPLAST has been continuously expanded since then.

In addition to conventional recycling systems for processing all kinds of thermoplastics, production waste, washing systems and parts for processing of post-consumer waste, as well as silos, conveyor belts, screen changer units, cutting mills, diverse types of granulating systems are part of today's delivery program. Today in the year 2021 SIKOPLAST Recycling Technology started its new orientation with the move to the new sales and service office in Troisdorf.

### COMPANY DATA

Foundation:	1986
Headquarters:	Troisdorf, Germany
Production:	Budapest, Hungary
Employees:	Around 60 employees
Representatives:	Worldwide, in more than 33 countries
Delivered plants:	In more than 70 countries
Demonstration and test plant:	Demonstration systems available

### WHY SIKOPLAST

- > Founded in 1986, we have more than half a century of experience in the recycling industry
- > Thanks to our wide range of products we are a recycling all-rounder. We produce both individual components and complete recycling plants
- > Quality and reliability are key elements of our products. For this reason, we only obtain all our purchased parts from German manufacturers (Siemens, Koellmann etc.)
- > With our worldwide representatives and a test plant in existence, we are able to offer our clients the best possible service, starting with the initial offer inquiry and going through to after-sales-service after installation
- > We are represented worldwide at selected trade fairs and are able to offer you an informative website to keep you up-to-date and informed about current innovation and Products

### OUR PRODUCT RANGE INCLUDES

- > Off-line re-pelletising systems for thermoplastic plastics (production of pellets)
- > In-line recycling plants for film and PP non-woven (direct return of sorted out production waste without the need for pelletising as an intermediate stage) but also for PA/PET fibres for return to a raw material reactor
- > Pelletising systems (water-ring, underwater and air cooled)
- > Granulators
- > Screen changers
- > Washing systems for soiled plastics
- > Preparation of PET
- > Conveyor belts
- > Steel rigs
- > Pellet transport boxes, pellet and material silos















### SOME OF OUR CLIENTS

# OFF-LINE REPELLETISING PLANTS FOR THERMOPLASTIC PLASTICS



## BENEFITS

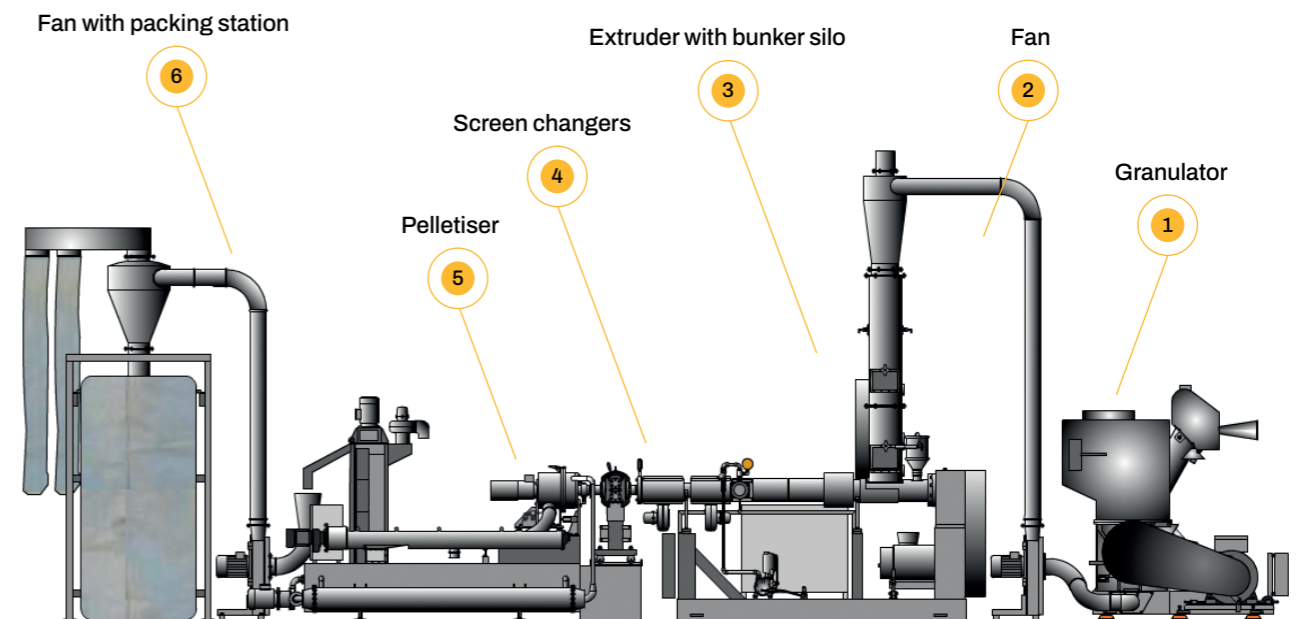
-  The recycling is carried out in a single process and results in first-class pellets that can be processed further in a range of different processes
-  Our supply range includes standard systems with material throughput performances from 30 kg/hour to more than 1,300 kg/hour
-  Feeding can be carried out using various methods: Manually by the plant operator, pneumatically via a feed pipe, via a conveyor belt, or fully-automated with a draw-in roller
-  The conical special screw enables processing of both heavy and light materials that do not flow freely. If necessary, the screw geometry can be matched to the raw materials
-  The screw design guarantees a gentle and homogenous melting of the plastic, without the need for precompaction or material damaging pre-treatment
-  The combination of hot and cold zones benefits the melting process and enables the setting of rheologically optimised melting temperature profiles
-  The robust, open construction of the Sikoplast plants not only ensures simple operation, but it also eases access and the maintenance of the system as well
-  Modularly constructed Sikoplast systems enable a flexible position and composition of the components desired by the client
-  At the request of the client our systems can be fitted with additional dosing stations to enable the addition of additives or master batches
-  When the materials are critical (damp, printed) the extruder is fitted with a degassing zone and a vacuum pump to extract the volatile components from the melted materials
-  The regeneration extruder is fitted as standard with a bunker silo mounted to the infeed area. This acts as a buffer and ensures constant material throughput
-  Thanks to the integration of melting filters, the material purity levels are increased and/or can be adapted as required to meet the current needs

## HOW IT WORKS

- > Preliminary shredding, usually with a granulator
- > The already shredded input material is transported by fan into the extruder silo
- > A stirrer integrated in the silo ensures even feeding of the extruder regardless of the material type. The extruder is then fed with the shredded material. In the extruder, the heart of the plant, the material is then gently melted under hermetically sealed conditions and thus without oxidation
- > It is then transported to the next downstream screen changer and then on to the pelletising head where the melted material is processed to form pellets and then dried in a centrifuge
- > The pellets are transported by a fan into a big bag station, a silo or a container

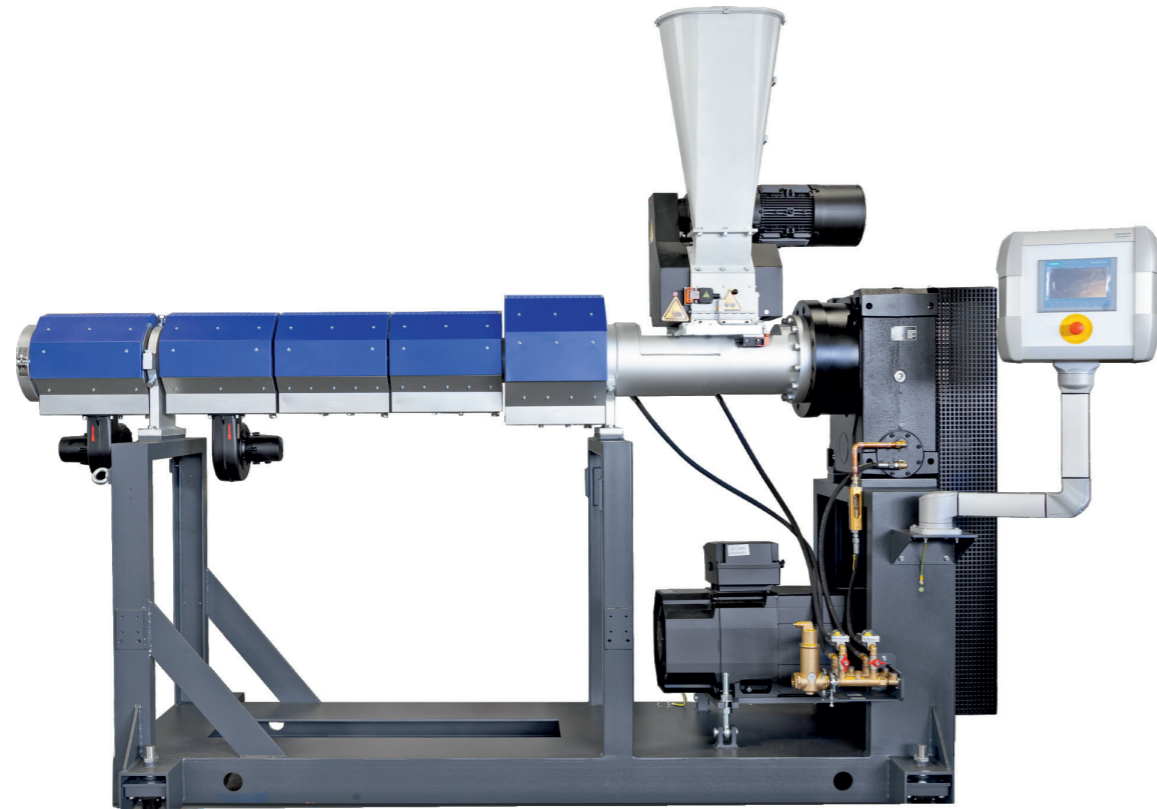
## AREAS OF APPLICATION

- > For thermoplastic plastics
- > Recycling of edge trim, drive rollers and waste produced by the plastic processing industry
- > Designed for various input materials, e.g. film and non-wovens, injection-moulded parts, profiles, tubes, drive lumps, milled goods, hollow objects, fibres, yarns, monofilaments and much more
- > Also suitable for printed and coated materials
- > Clean production waste and lightly soiled or damp materials can be processed just as easily
















# IN-LINE RECYCLING PLANTS FOR THERMOPLASTIC PLASTICS

## SIKOREX



### BENEFITS

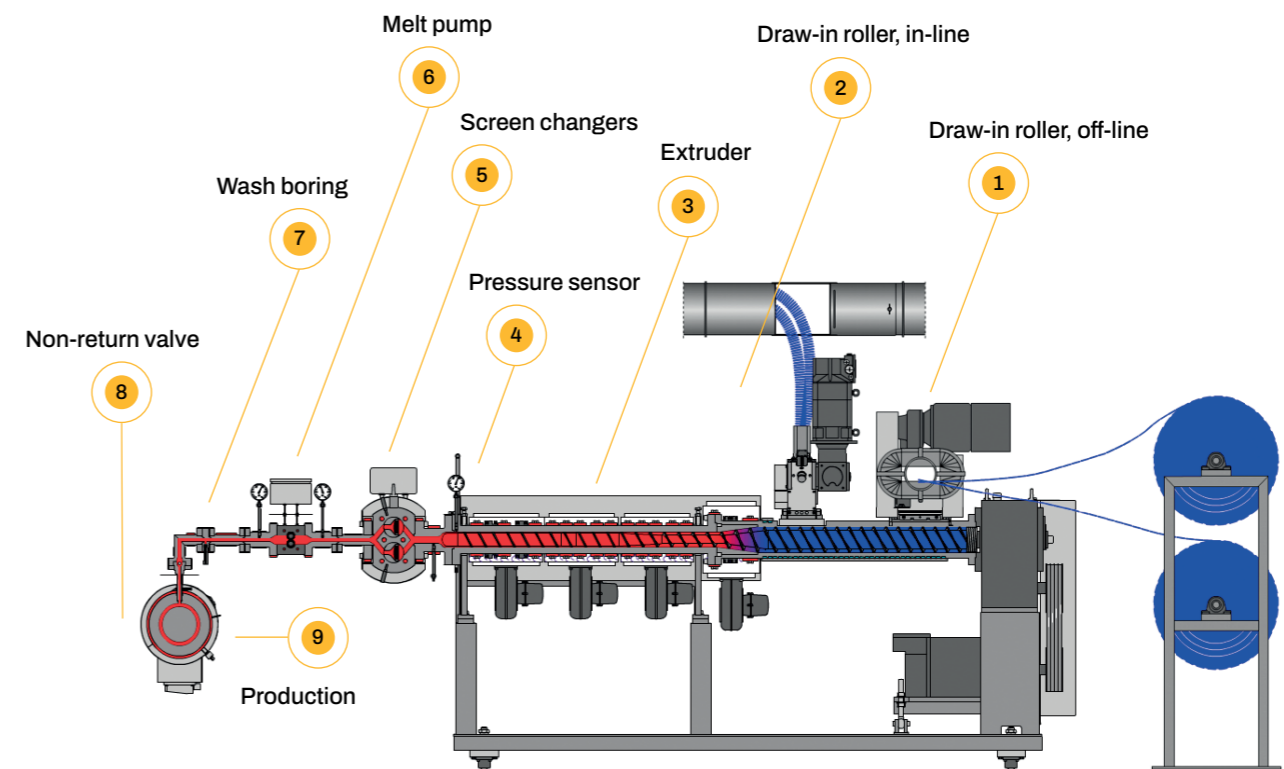
-  Our supply range includes standard systems with material throughput performances from 30 kg/hour to around 250 kg/hour
-  The special screw geometry enables the gentle melting of materials and at the same time short periods of time in the system
-  No preliminary shredding is required. This reduces the loads on the materials and no milling dust is generated
-  Direct feeding of the melted plastic into the production extruder. The intermediate pelletising stage is eliminated with no need for a replacement stage
-  Thanks to the small L/D ratio of the screw and the washing boring for washing the system, it is possible to quickly change the material and colour
-  Low spatial requirements thanks to the compact method of construction
-  The speed of the draw-in roller is regulated to eliminate fluctuations in the infeed material and to ensure an even return quota
-  In addition, the plant can be expanded to include a melt pump to ensure precisely defined return quotas
-  Parallel infeed of edge trims and roller goods is enabled by a second infeed, whereby both infeeders are regulated separately
-  If necessary, the plant can be fitted with a screen changer
-  The energy consumption is, when compared to OFF-LINE systems, half as expensive since both the preliminary shredding and the pelletising stages are eliminated
-  The fully automated return feed system does not require additional operating personnel
-  Short amortisation time as a result of the low investment costs, reduction of storage costs thanks to the direct return and the recycling process in production

### HOW IT WORKS

- > The material is fed directly from the winder (edge trims) and/or from the unrolling stand (rollers) by one or two infeeders
- > Then it is drawn into the draw-in area of the extruder, compressed and melted
- > The incorporated pressure sensor monitors the melting pressure
- > The screen changer acts as the filter system for the melted material
- > At the melt pump it is possible to set a regulated return quota
- > A wash boring enables easy start up of the plant
- > In the last stage, the melted plastic is taken via a melt pipe into the production plant. An integrated non-return valve prevents melted material returning from the production plant into the SIKOREX extruder

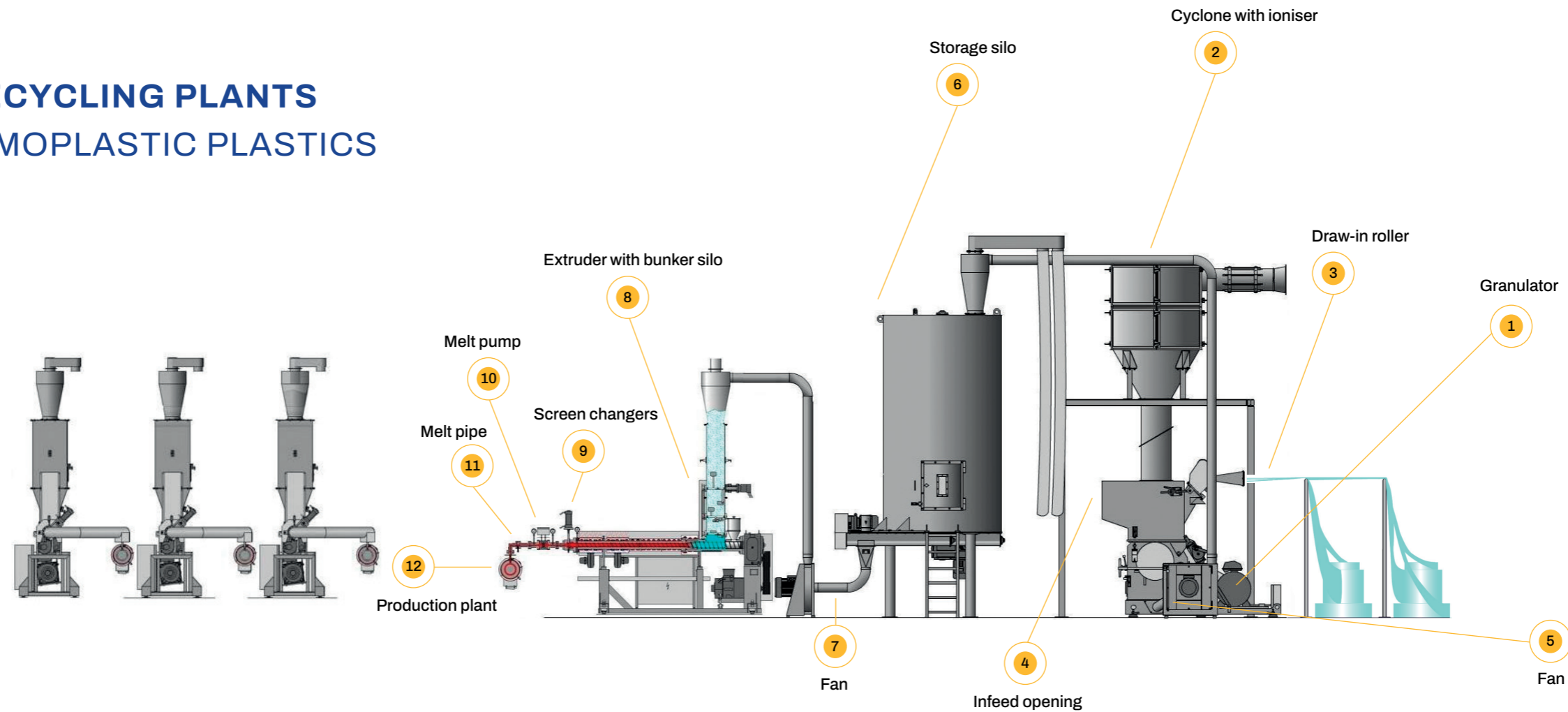
### AREAS OF APPLICATION

- > Specially developed for the non-wovens and PE/PP film industries
- > Non-wovens(SMS) with high MFI values and 100% „melt blown“ proportion can be processed with the highest process stability
- > Direct return of product residues in the form of melted material into the product plant or a raw material reactor (e.g. for PA/PET fibres)
- > For the return of roller goods or the direct return of edge trims with infeed speeds of up to 375 m/min
- > Existing plants can easily be retrofitted



# IN-LINE RECYCLING PLANTS FOR THERMOPLASTIC PLASTICS

## HYBRID



### HOW IT WORKS











- > The production residues are fed with the help of a fan and a pipe line from the winder or slitter unit of the granulator. The integrated ioniser unit eliminates static charges. The cyclone mounted on the granulator removes the air
- > At the same time, roller goods and loose waste can be fed in via the draw-in roller and the infeed opening of the mill
- > The shredded material is mixed and stored temporarily in the downstream storage silo
- > The output screw in the base of the silo transports the material outside where it is vacuumed pneumatically and distributed by means of fan and pipe line to the various extruder lines
- > Depending on the production plant, after the storage silo the hybrid system is divided into 2 or 3 extruder lines which have the same construction and which are supplied in turn from the storage silo. The mounted bunker silo on the extruder ensures even feeding of the extruder. The material is plasticised in the extruder

- > The integrated screen changer acts as filter system for the melted material
- > Then the melted plastic is taken via a melt pipe and a melt pump into the production extruder. In this way, the melt pump ensures a constant return feed amount of the material

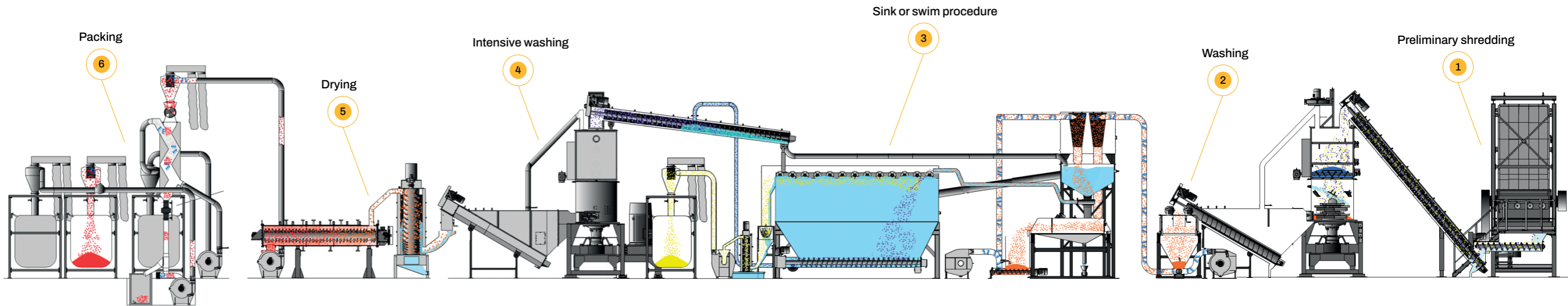
### AREAS OF APPLICATION

- > Specially developed for the non-wovens and PE/PP film industries
- > Non-wovens (SMS) with high MFI values and 100% „melt blown“ proportion can be processed with the highest process stability
- > Direct return feed of production residue in the form of melted material to the production plant
- > For the return of roller goods, edge trims and loose waste with infeed speeds of up to 1,500 m/min
- > Existing plants can easily be retrofitted

### BENEFITS

-  Our supply range includes standard systems with material throughput performances from 30 kg/hour to around 250 kg/hour (per extruder)
-  Variable material feed: Manually by the plant operator, pneumatically via a feed pipe and fully-automated with a draw-in roller
-  Roller goods with a width of up to 4.2 m (depending on area weight) can be drawn into the system via the draw-in roller of the granulator
-  Direct feeding of the edge trims with speeds of up to 1,500 m/min. The winding of edge trims in a rewinder is eliminated
-  Direct feeding of the melted plastic into the production extruder. The intermediate pelletising stage is eliminated with no need for a replacement stage
-  The hybrid system is fully integrated into the production process. Once set, the return quota is maintained constantly. In the event of throughput changes to the production plant, the hybrid system is automatically continued
-  An integrated melt pump ensures a precisely defined return quota
-  An integrated screen changer serves to eliminate contamination in the melted material
-  The energy consumption is, when compared to OFF-LINE systems, half as expensive
-  The entire process is gentle on materials and energy. There is no precompaction of thermal pre-treatment. This means that the material is not pre-stressed

# WASHING PLANTS FOR THERMOPLASTIC PLASTICS



## HOW IT WORKS







- > The PET bottles are usually pre-sorted and pressed into bales. These are transported via conveyor belt into the bale opener and separated there into individual bottles
- > If there is PVC content in the infed material then the subsequent use of a heat tunnel is recommended. The influence of heat will discolour the PVC bottles and these can be removed manually on the following sorting conveyor belt
- > In the next stage, the PET bottles are ground into PET flakes in a wet granulator
- > The already shredded input material is then subjected to an intensive cleaning process in the subsequent friction washer. In this process, paper labels and adhesives are removed. In the pneumatic separating stage, vibrating units and fans separate out the loosened contaminations
- > In the floatation tank, the infed material is separated using a density based procedure. PET flakes sink to the bottom of the tank, the PE/PP lids remaining floating on the surface of the water
- > If a particularly high level of purity is to be achieved for the PET flakes, the line is enhanced at this point by



- a hot washer. The addition of washing media (NaOH) is possible at this stage
- > The clean flakes are fed into the drying system, dried to a residual moisture level of less than 1 % and pre-crystallised at the same time
- > In place of the manual sorting described under point 2, an automatic sorting unit may be integrated to sort according to material type and/or colour
- > Then the clean PET flakes are filled into big bags or transported into a silo for further processing

## AREAS OF APPLICATION

- > For washing plastic material waste
- > For bottles, film, technical plastics and other materials
- > Harvesting of clean flakes, agglomerate
- > The washed material is suitable for use in food packaging and thus fulfils the highest quality standards
- > For existing washing plants, we make upgrades available or provide individual components/segments in order to achieve increased quality

## BENEFITS

-  Our supply range includes standard systems with material throughput performances of up to 2,000 kg/hour
-  The washing plants achieve an above average level of cleanliness even with heavily soiled input material, even without the addition of chemical washing aids
-  The modular construction makes it possible for us to offer a washing plant tailored to your specific application needs
-  With our washing systems, we are able to create high quality flakes that are suitable for use in food packaging (B2B procedure)
-  Thanks to the use of high-quality and energy-efficient motors and drives, the energy consumption of the entire plant can be reduced, and in some instances can even be reduced to under 0.4 kW/kg
-  The washing plants can be expanded with an on-site water recycling system. This means that waste water is operated in a closed system thus putting less pressure on resources and the environment

-  A complex washing plant can be individually positioned and can even be installed in small production halls
-  The selection of individual components means that we can tailor the system to your needs, to achieve the level of quality of washed flakes you need

## WHY SIKOPLAST

Our current generation of washing plants for **heavily soiled plastic waste** is the result of constant further development. We have been making and building washing plants for **heavily soiled plastic items** in the post consumer sector since 1977. This experience has led to the development of **the current generation of modularly constructed washing plants**. For you, this means a tailor-made solution designed to meet **the needs of your tasks and the level** of cleanliness you require.

# PELLETISING SYSTEMS

## HOW IT WORKS

- > The homogenous melted plastic is fed through a circular nozzle
- > The melted plastic that exits the circular nozzle is cut off with a rotating blade head
- > Then the pellets are cooled using either air or water and transported off
- > In the subsequent cooling area or the centrifugal dryer, the pellets are cooled or dried to a temperature at which the form is stable
- > In order to achieve pellets that are of the same size, the material is passed over a screen vibration unit
- > In the last stage, the pellets are filled into big bags, octabins, containers or material sacks

## AREAS OF APPLICATION

- > Pelletising of all current thermoplastic plastics
- > Different pelletising systems cover just about any application type
- > Both individual components used to complete existing systems are available as well as in conjunction with complete recycling extruders



### CHARACTERISTICS OF AIR COOLED HOT WASTE PELLETISING SYSTEMS TYPE HG

- Available for material throughput performances of up to 250 kg/hour
- Specially developed for the pelletising of LD-PE, LLD-PE, MD-PE and HD-PE
- The melt strings are cut to form pellets. No direct use of water
- The pellets are transported by means of air flow and are transported into a cooling spiral where they are cooled by air
- Simple, environmentally friendly and cost-effective system



### CHARACTERISTICS OF WATER-RING PELLETISING SYSTEMS OF TYPE HAW

- Available for material throughput performances of up to 1,300 kg/hour
- For the pelletising of PE, PP, (E/X) PS, ABS and similar plastics
- The melt strings are cut into pellets using a rotating blade head, are taken up by water, drawn off and cooled in the process
- A centrifugal dryer removes the residual moisture from the pellets
- Automatic blade adjustment ensures even blade pressure with a minimum of blade wear
- Simple, compact, tried and tested system



### CHARACTERISTICS OF UNDERWATER PELLETISING SYSTEM TYPE UWG

- Available for material throughput performances of up to 1,300 kg/hour
- Alongside PE, PP, ABS, (E/X) PS, the materials PA, PET, TPU etc. can be converted to pellets in a process-safe manner
- Operator-friendly, universal system optimised to the latest state of the art
- The melt strings are cut into pellets using a rotating blade head, transported by means of water flow and cooled at the same time
- A centrifugal dryer immediately downstream from the blade head removes the residual moisture from the pellets
- Automatic blade adjustment ensures even blade pressure with a minimum of blade wear
- Integrated diverter valves enable simple start up of the system without contaminating the blades or freezing the melted plastic in the circular nozzle
- High viscose plastics can easily be processed






## GRANULATORS



### HOW IT WORKS




- > Feeding can be carried out using various methods: manually, pneumatically via a feed pipe, via a conveyor belt, or fully-automated with a draw-in roller
- > Milling of the input material and a dual diagonal cutting procedure
- > The size of the milling material is determined by the holes in the screen
- > The shredded input material is either vacuumed with a fan or transported with an output screw into the subsequent aggregate

### BENEFITS

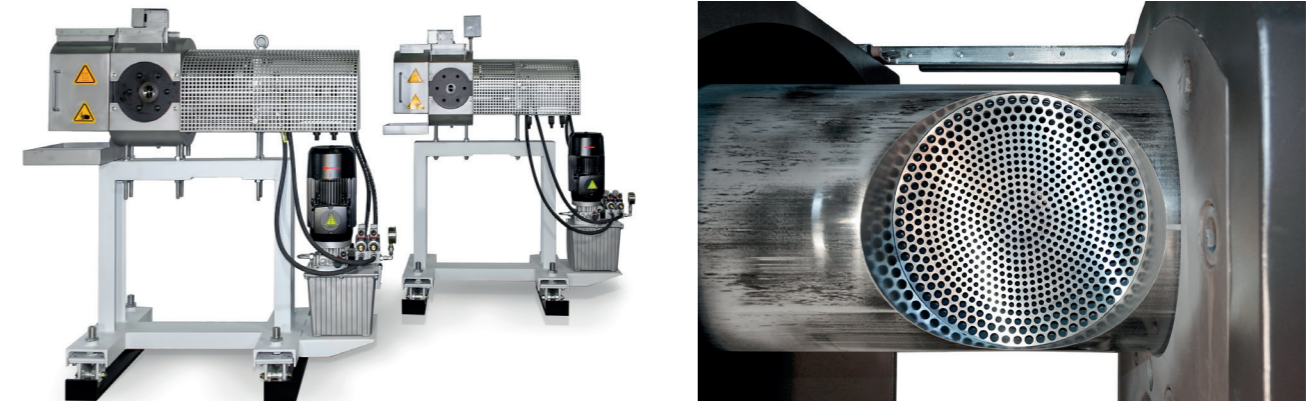
-  Available for material throughput performances of up to 2,000 kg/hour
-  The milling material size can be controlled via the screen selection
-  Can be expanded with automatic draw-in roller, conveyor belt and/or cyclone for the feeding of roller goods, loose input material and edge trims

### AREAS OF APPLICATION

- > To shred plastic items and production waste
- > Suitable for various film and non-wovens (drive rollers, edge trims), injection-moulded parts, profiles, tubes, drive lumps, milled goods, hollow objects, fibres, yarns and much more
- > Also available as wet granulator (for soiled material)
- > Both individual components used to complete existing systems are available as well as in conjunction with complete recycling extruders

-  Special arrangement of the blades prevents blocking of the granulator
-  Robust construction made from welded steel
-  No soiling and/or thermal load of the bearings since these are located in the exterior mill area




## SCREEN CHANGERS



### HOW IT WORKS



- > The melted plastic is passed through the screen changer and filtered by the inserted, replaceable screens
- > The pressure of the mass of the melted plastic is constantly monitored. When the maximum permitted pressure is exceeded, the screen changer piston extends automatically so that the contaminated screen can be replaced with a new one
- > The changing of the screen takes place during production, it is not necessary to stop the system

### BENEFITS

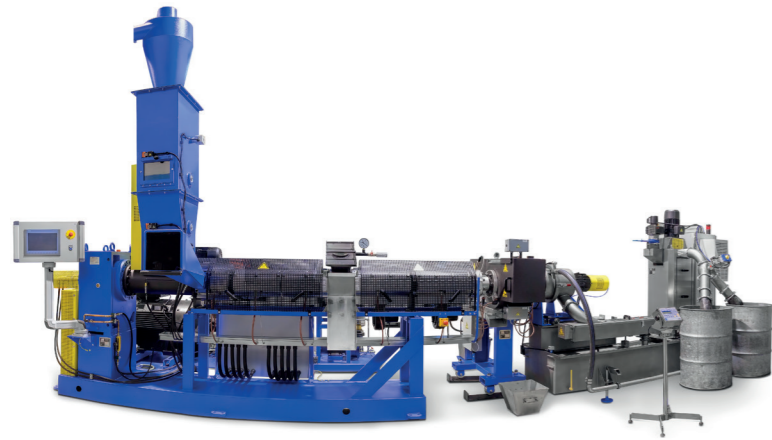
-  Available for material throughput performances of up to 1,300 kg/hour, screen diameters of 76 mm to 200 mm
-  According to requirement and application, both 1 piston and 2 piston screen changers may be used
-  Continuous operation, no interruption in production, also during screen changing

### AREAS OF APPLICATION

- > For filtering melted thermoplastic
- > Depending on the level of contamination and the required operation, manual screen changers (discontinuous operation) of up to 2 piston screen changers (4 screens) are part of the range available
- > If required SIKOPLAST screen changers can be installed in existing plants

-  The screen piston is extended and retracted hydraulically
-  Low maintenance required, simple operation, constant pressure monitoring

## APPLICATION EXAMPLES



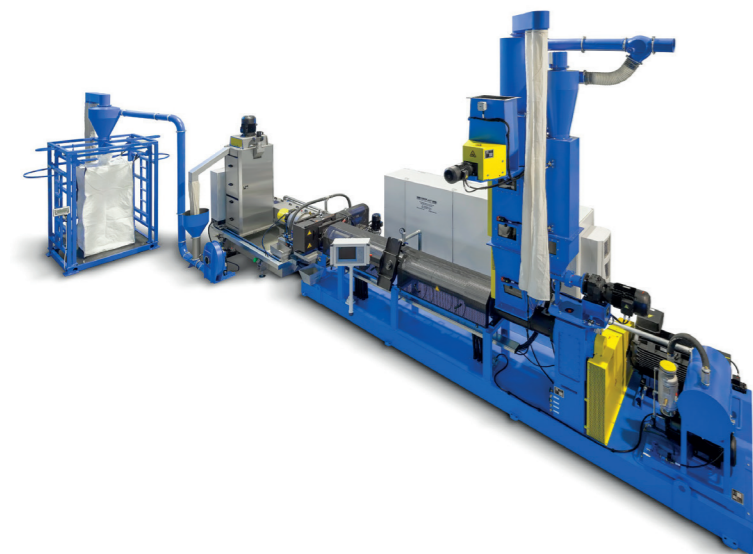
### REGENERATION PLANT FOR PE MILLED GOODS AND UNCUT PIECES

- > Regeneration extruder with bunker silo
- > Special screw with hopper for manual feeding of uncut pieces into the extruder
- > Waterring pelletising system



### REGENERATION PLANT FOR PE/PP SHEET

- > Regeneration extruder with bunker silo
- > Screen changer
- > Underwater pelletising system



### REGENERATION PLANT FOR PE/PP CARPETS, BAGS AND FILAMENTS

- > Dosing unit for rigid plastics
- > Dosing unit for powder
- > Regeneration extruder with bunker silo and degassing zone
- > Screen changer
- > Waterring pelletising system
- > Big-Bag Station

 **SIKOPLAST**  
RECYCLING TECHNOLOGY

