SIKOPLAST
RECYCLING TECHNOLOGY

Recycling Rethought
Efficient. Sustainable. Economical.

Washing Systems for Rigid Plastics

Efficient Cleaning Through Continuous Development

SIKOPLAST Recycling Technology
Reliable Solutions Since 1956

www.sikoplast-recycling.com

Stylianos W. Nikolaou

Owner & 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.“

CONTENTS

Washing Systems for Rigid Plastics

Our current generation of washing systems for heavily contaminated plastic waste is the result of continuous development. Since 1977, we have been designing and manufacturing washing systems for heavily soiled post-consumer plastic materials.

This extensive experience has led to the development of our present modular washing system concept. For our customers, this means a tailor-made solution precisely aligned with the specific application requirements and the desired level of material cleanliness.

How it works

- Pre-sorted rigid plastics (IBCs, bottles, containers, drums) are fed via conveyor belt to the bale opener or shredder.
- The shredded material is further reduced to flakes in the subsequent wet granulator.
- Intensive cleaning takes place in the friction washer, where paper labels and adhesives are removed and contaminants are separated by vibration and air flow.
- In the flotation tank, density-based separation is applied. For example, PET flakes sink while PE/PP caps float on the surface.
- To achieve a high level of purity, a hot washer can be integrated, with optional NaOH dosing. The flakes are subsequently dried and pre-crystallized to a residual moisture content of less than 1%.
- As an alternative to manual sorting, an automated sorting unit can be integrated, with optional material and color separation.
- The cleaned flakes are dried and either filled into big bags or conveyed to silos for further processing.

Fields of Application

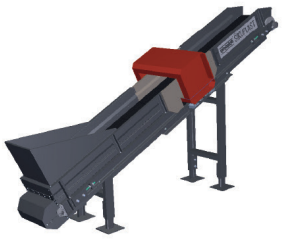
Our washing systems are suitable for the processing of plastic waste such as IBCs, canisters, rigid plastics, and engineering plastics. They deliver clean flakes of very high quality.

Existing washing systems can be upgraded or expanded with individual components to meet specific process requirements.

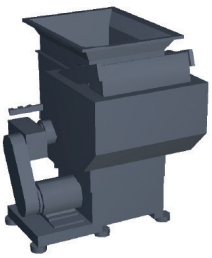
Benefits

- Our product range includes standard systems with material throughputs of up to 1,500 kg/h.
- Even when processing heavily contaminated material, the washing systems achieve a high level of purity - even without the use of chemical additives.
- The modular design allows for customized system configurations tailor-made to specific application requirements.
- Our systems produce high-quality flakes.
- Energy-efficient motors and drives help reduce overall energy consumption.
- The systems can be supplemented with water treatment units, enabling closed-loop water circuits and resource-efficient operation.
- Even in smaller production halls, complex washing systems can be flexibly configured and installed.
- Through targeted selection of components, system configurations are precisely aligned with the intended application and the desired flake quality level.

Process Flow Diagram - Washing System

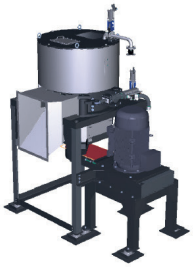


Feed conveyor



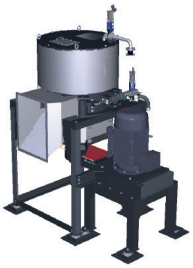
Shredder

01 STEP SIZE REDUCTION



Turbo Friction Washer No. 2 (Cold or Hot Washing)

Discharge Screw

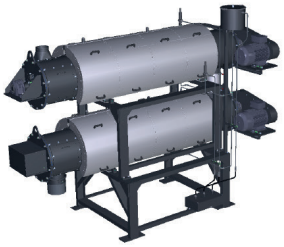


Turbo Friction Washer No. 1 (Cold or Hot Washing)

WASHING & DENSITY SEPARATION **02** STEP

Discharge Screw

Centrifugal Dryer



Two-Stage Tube Dryer with Thermal Oil Heating

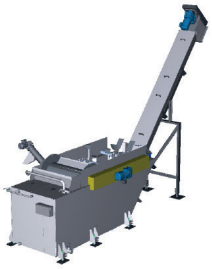
03 STEP DRYING

Big Bag Emptying Station

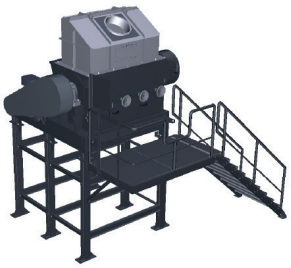
Big Bag Filling Station

Storage Silos

STORAGE & MATERIAL HANDLING **05** STEP

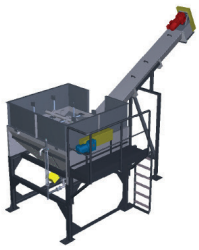


Separation Tank with Discharge Screw

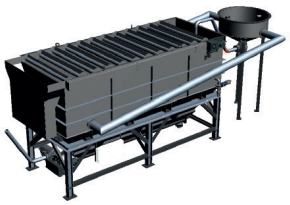


Wet Granulator

Discharge Screw



Separation Tank with Discharge Screw

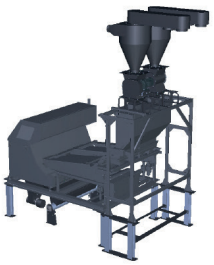


Flotation Tank

Neutralization Silo

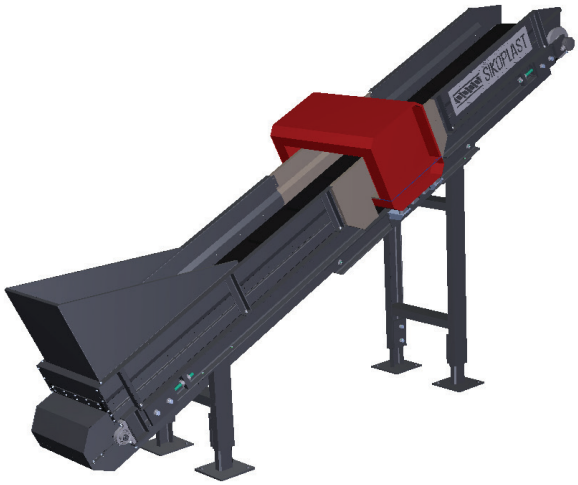
04 STEP MATERIAL TREATMENT & SEPARATION

Counter-Current Air Classifier



Material & Color Sorting

Size Reduction & Pre-Sorting



Feed conveyor

The Feed conveyor belt ensures reliable feeding and continuous material supply to the downstream shredder.

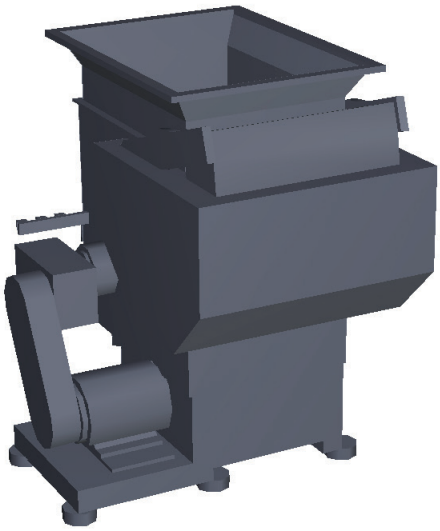
Thanks to its robust design and high load capacity, it is ideally suited for continuous operation in recycling plants and features low maintenance requirements.

Metal Detector

The metal detector provides reliable protection for downstream equipment against ferrous and non-ferrous contaminants, playing a key role in ensuring plant safety and product purity.

With adjustable sensitivity and a compact design, it can be seamlessly integrated on the feed conveyor and protects critical machine components from both magnetic and non-magnetic metals.

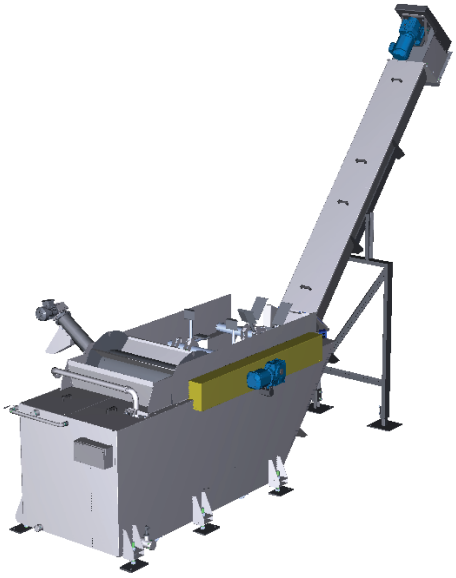
The conversion of the conveyor into a metal-free detection zone is included as standard. In addition, we also offer magnetic separation systems, such as overband magnets and drum magnets, for the removal of magnetic metals.



Shredder

The shredder is used for the pre-shredding of large-volume products and is equipped with a generously sized feed hopper. Material is supplied via conveyor belt, while a hydraulically controlled pusher automatically feeds the material into the rotor's cutting zone.

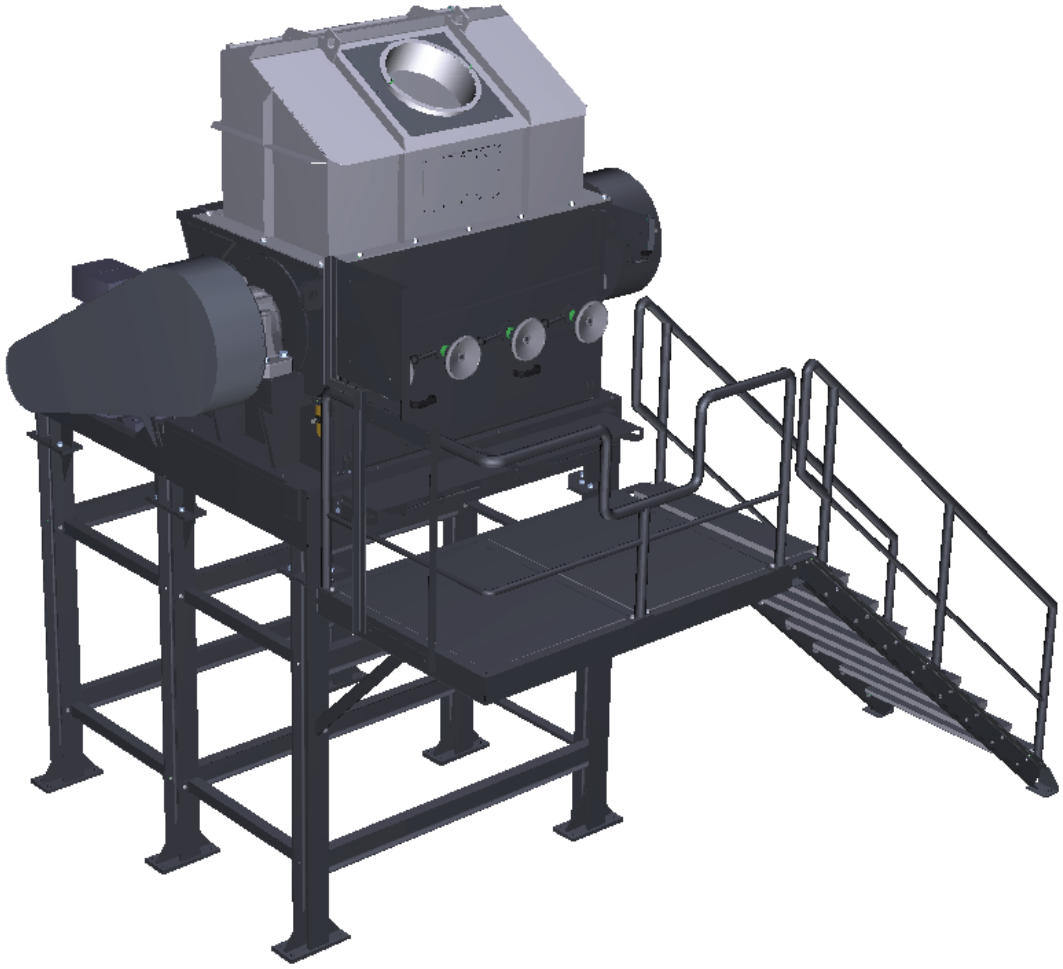
The single-shaft shredder prepares the material so that it can be taken up by the downstream conveying screw and fed into the wet granulator.



Separation Tank

The separation tank with discharge screw performs as pre-flotation, material conveying, and the removal of contaminants such as metal, sand, stones, and similar impurities from pre-shredded plastic material.

The material enters the flotation tank from above, is loosened by rotating agitator shafts, and guided toward the discharge screw, which transfers the floating fraction to the downstream processing unit.



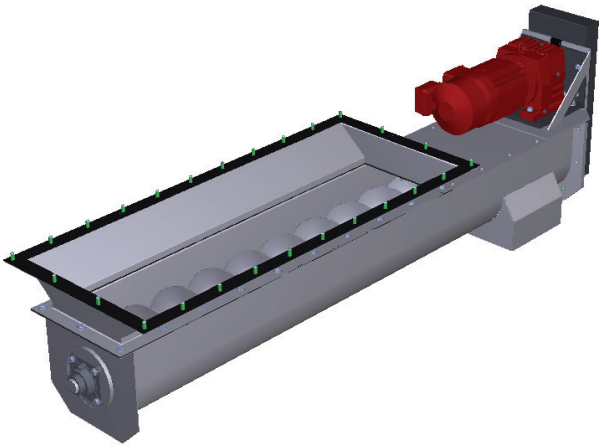
Wet Granulator

The wet granulator is designed for wet grinding of pre-shredded material using a double-angle cutting principle. The material enters the cutting chamber from above, where size reduction takes place between the rotating rotor and stator knives.

The water added during the cutting process, in combination with the high rotor speed, creates a washing effect comparable to that of a washing machine. Labels, adhesive residues, and surface contaminants are already loosened during the size reduction process through the resulting friction.

A screen located beneath the rotor determines the final particle size. The processed material is then discharged via a discharge screw(s) mounted below the granulator and transferred to the downstream conveying screw.

By using interchangeable screens, the particle size can be flexibly adjusted, allowing targeted control of bulk density.



Discharge Screw for Wet Granulator

The discharge screw ensures reliable conveying of the pre-processed material from the wet granu-la-tor to the downstream unit.

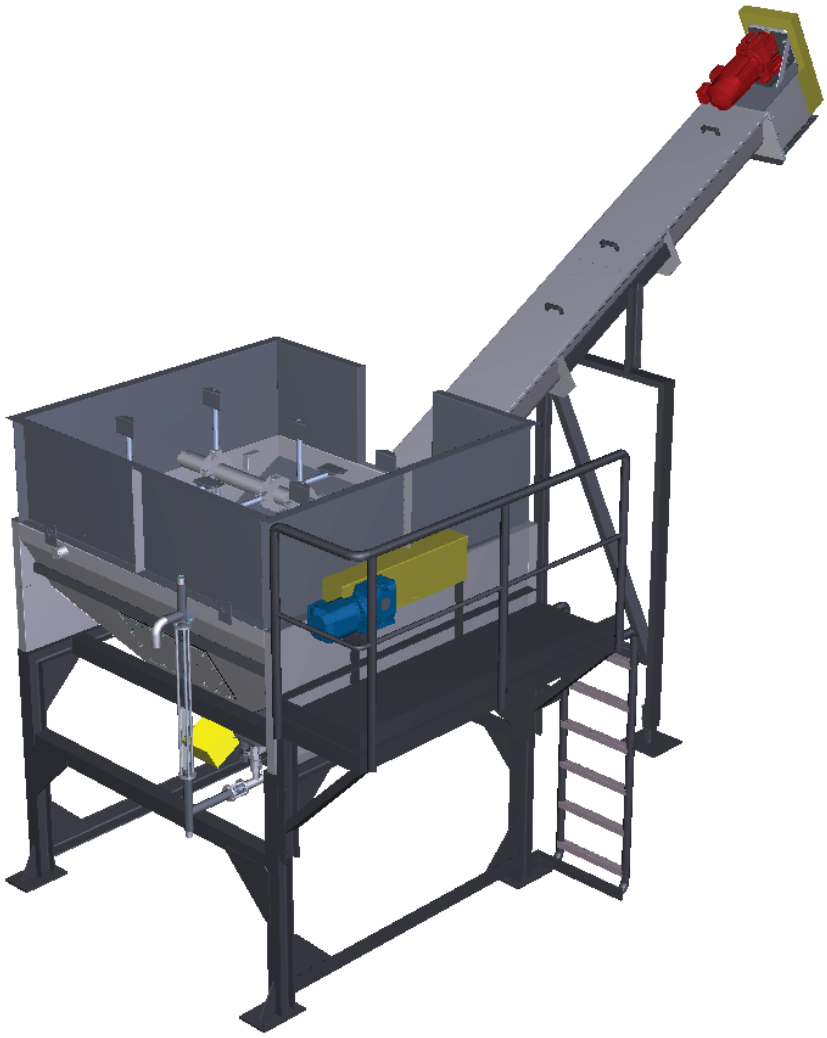
All product-contacting components are designed with corrosion protection and are specifically engi-neered for operation in wet processes.

Discharge Feeding Screw

The screw conveyor with integrated buffer hopper receivis material from the wet granulator and en-sures uniform feeding.

An integrated screen basket separates washing residues from the material, while the process water is discharged for further treatment.

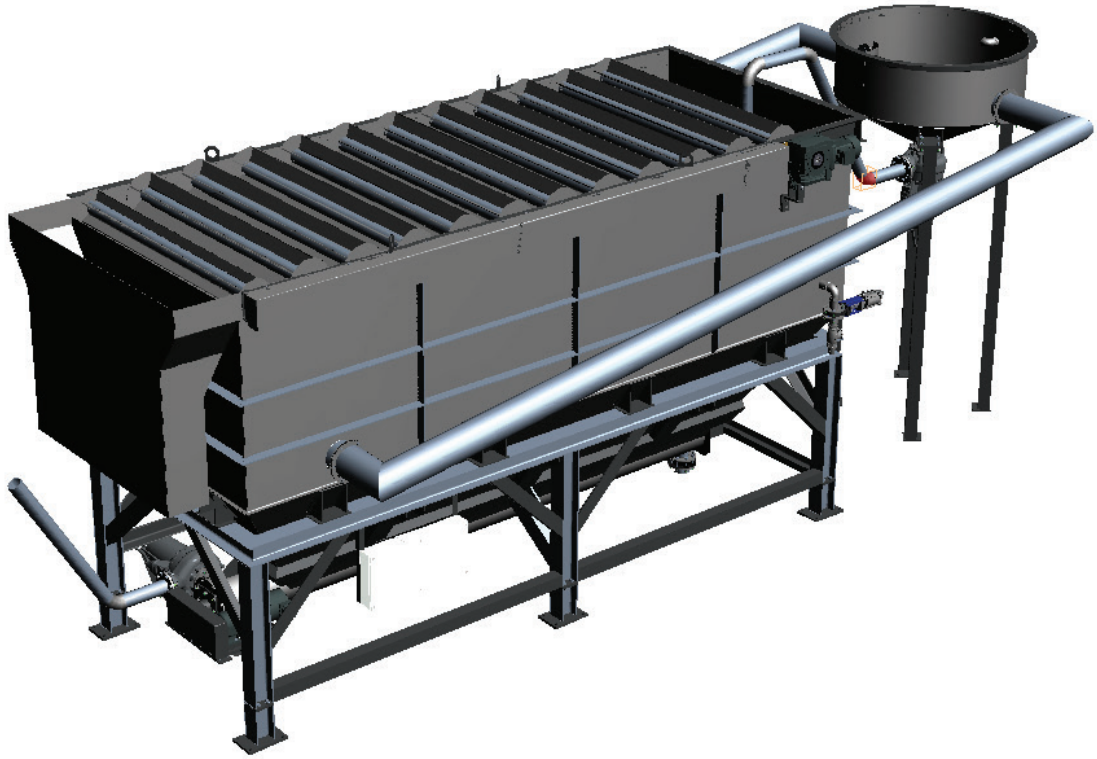
Washing & Density Separation



Agitated Washing Tank with Discharge Screw

The agitated washing tank serves to soak, mix, and buffer pre-processed material, preparing it for subsequent mechanical and/or thermal cleaning, such as hot washing. Material discharged from the transfer screw enters the tank from above and is kept in continuous motion by two integrated agitator shafts. This ensures homogenization and uniform wetting of the material.

The integrated discharge screw provides controlled and continuous discharge of the material and conveys it, for example, to the downstream friction washer. As an alternative, the agitated washing tank can be used instead of a flotation tank when density separation is not required and the focus is on soaking and uniform material feeding.



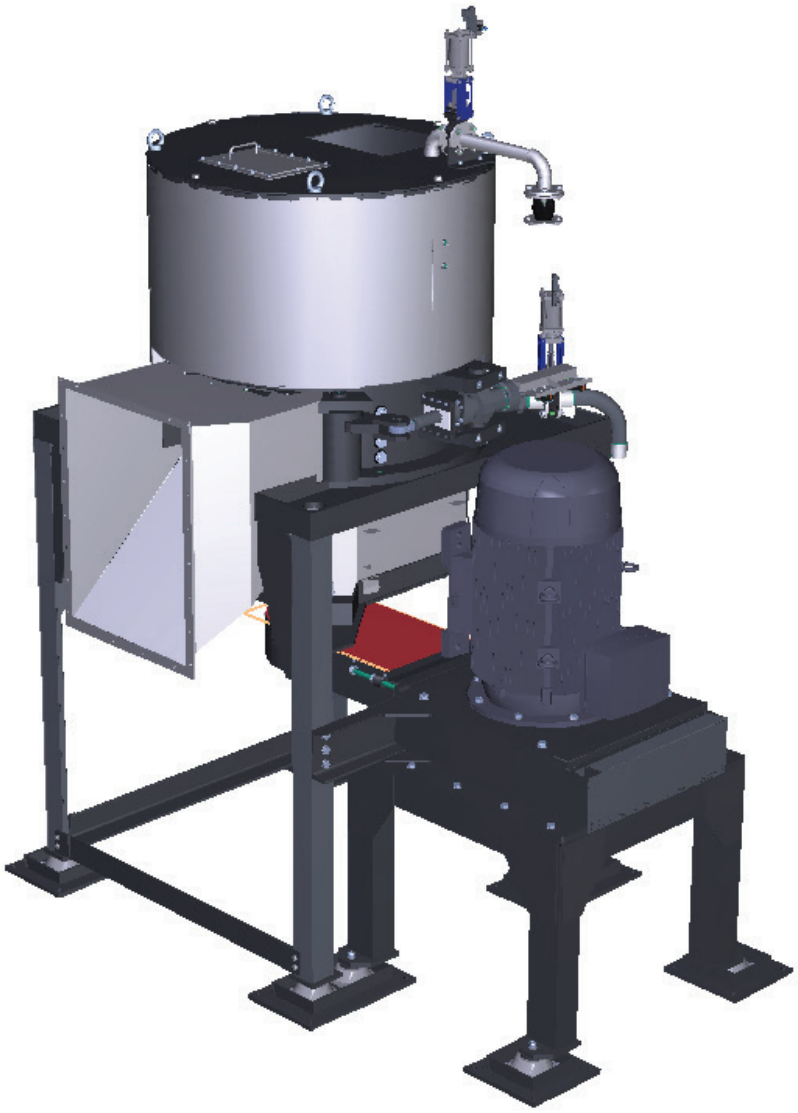
Flotation Tank

The flotation tank separates different plastic fractions based on density. The pre-cleaned flakes are intensively mixed with water in the pre-flotation tank and then conveyed to the downstream flotation tank via a special pump. Material is introduced deliberately below the water surface, reducing surface tension and ensuring high separation efficiency.

During the flotation process, heavy contaminants such as sand, stones, and metals, as well as polymers like PET and PVC, sink, while lighter materials such as PE/PP flakes remain on the water surface. The sinking fraction is discharged via a continuously adjustable screw conveyor.

Overflow channels allow process water and, if required, suspended material fractions to be recirculated to the pre-flotation tank.

The flotation tank represents a high-performance alternative to the agitated washing tank when targeted material separation is required within the process.



Turbo Friction Washer

The turbo friction washer ensures the intensive washing of pre-processed feed material. The high level of friction introduced during the washing process (particle-to-particle friction) reliably removes contaminants from the material surface. Impurities such as paper residues, adhesives, sand, and organic contaminants are detached from the flakes and flushed out with the wash water.

The washing process is carried out discontinuously in batch operation using two friction washers. Material is fed into the friction washer via a screw conveyor from the upstream washing stage. At the same time, water and, if required, cleaning agents are added. The process water can be heated either in the caustic soda tank or directly within the friction washer to temperatures between 70 and 90 °C. Thermal insulation of the housing minimizes heat losses.

The cleaning effect is generated primarily by material friction; therefore, the amount of water is dosed depending on the material. Excessive water addition reduces friction, while lower water volumes increase cleaning efficiency and allow controlled heating of the material.

Filling of the friction washer is controlled via power consumption monitoring. Filling level and washing time are adjustable. After completion of the washing cycle, the material is discharged via a hydraulically actuated discharge flap without additional residence time.

Discharge Screw for Friction Washer

The discharge screw manages the material flow by receiving it from the turbo friction washer and conveying it forward.

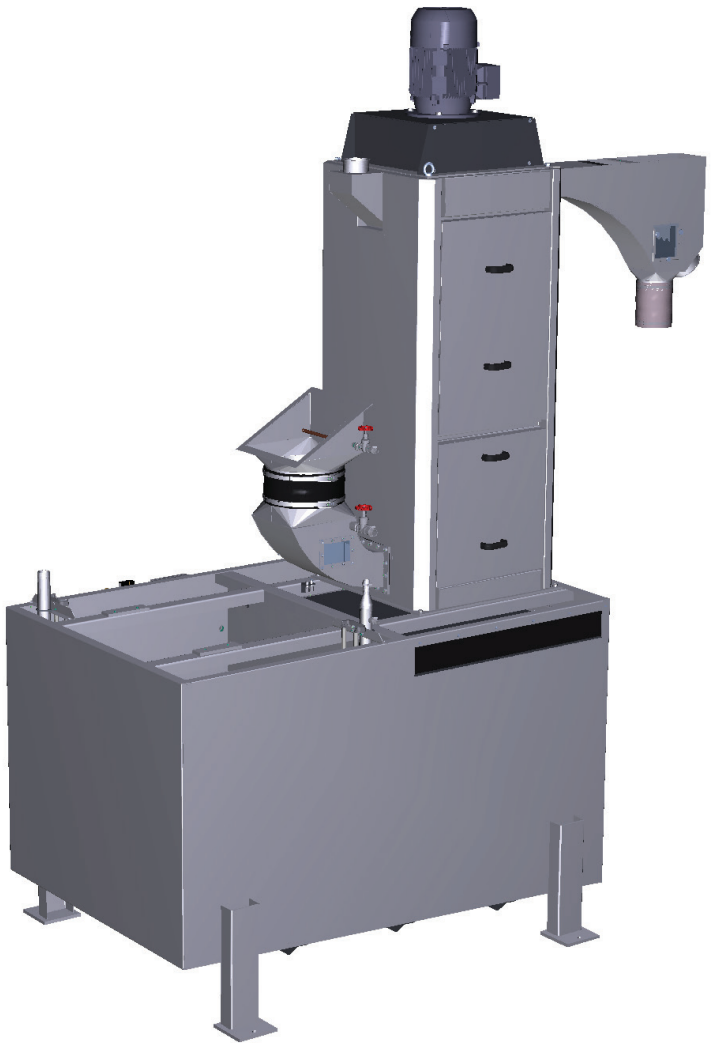
The material is fed discontinuously via a discharge chute and separated from the process water by an integrated screen bottom.

Caustic Soda Tank

The caustic soda tank serves as an extension of the friction washer for intensive cleaning of the feed material using sodium hydroxide (NaOH).
The insulated and heated tank design allows the washing solution to be maintained at temperatures between 65 and 80 °C.

The detergent concentration set in the caustic soda tank is precisely controlled via dosing pumps and supplied to the friction washer, ensuring consistent and reproducible cleaning performance.

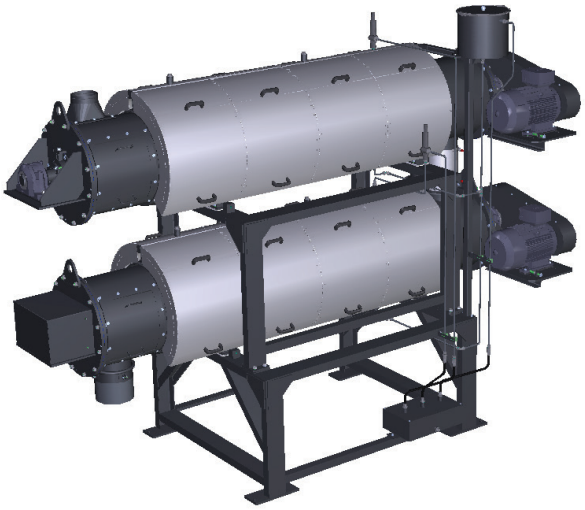
Drying



Centrifugal Dryer

The centrifugal dryer is specifically engineered for continuous dewatering and pre-drying of the washed material. The material is fed into the centrifuge from below via a discharge screw and a transfer hopper. At the same time, fresh water is added in the transfer hopper to reliably remove any residual caustic solution or detergents and to neutralize the material.

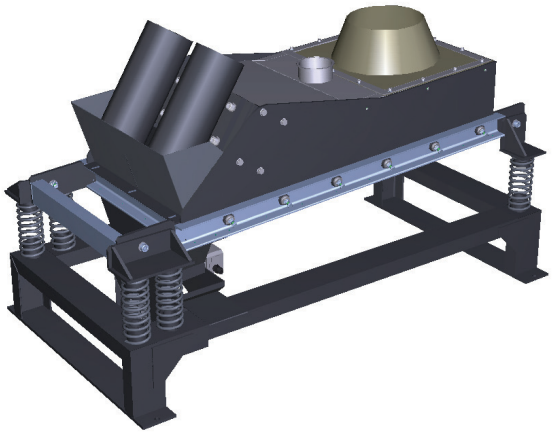
Within the centrifuge, continuous dewatering of the material takes place by means of centrifugal forces. The pre-dried material is then conveyed to the downstream drying system. The process ensures efficient water separation while maintaining high material throughput.



Drying & Crystallization Unit

The drying system is used for final drying of the washed material from the upstream centrifugal dryer. The feed material is gently heated and dried in a two-stage dryer before being conveyed to the downstream separation stage.

The system consists of two vertically stacked contact dryers in which the material is conveyed horizontally, evenly heated, and dried to a residual moisture content of less than 1%.



Separator

The separator combines cooling, separation, and conveying functions for material coming from the dryer or neutralization silo. Fine particles and over-size material are screened out and collected in a container below, while the qualified material is fed into the downstream process.

The material falls onto a vibratory screen mounted on springs and driven by two three-phase vibration motors. Via the screen or conveying plate, the material is guided to the discharge point and then pneumatically conveyed to downstream big bag stations, buffer silos, or sorting systems.

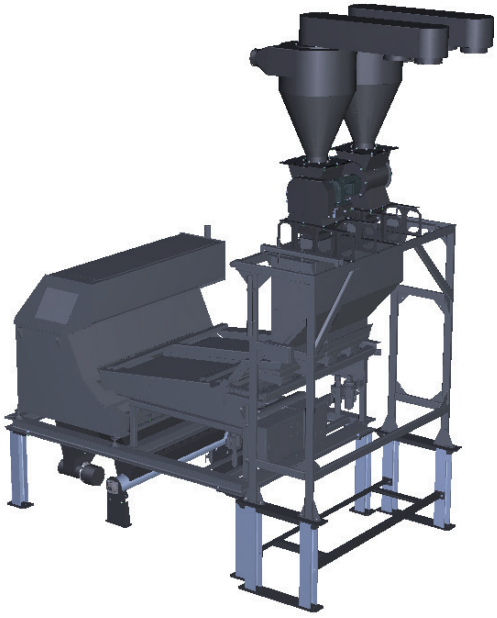
Material Treatment & Separation

Neutralization Silo

The neutralization silo neutralizes and homogenizes flakes from the washing system. It is specifically designed for flakes with low bulk density and ensures uniform material treatment and neutralization following the washing process.

The flakes are pneumatically conveyed into the silo and fed tangentially. A vertically arranged mixing screw keeps the material in continuous motion by conveying it from the lower cone section upward and distributing it across the entire cross-section of the silo. This permanent circulation ensures intensive and uniform mixing of the feed material and reliably prevents bridging.

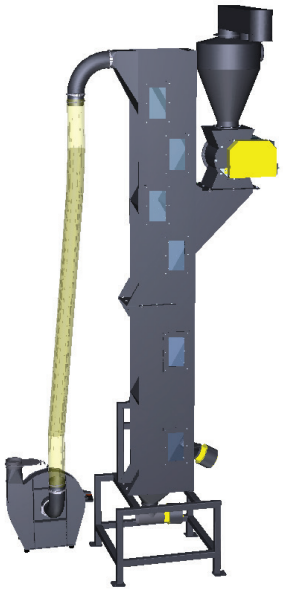
Discharge of the neutralized material is carried out via discharge screws integrated into the silo base, with continuously adjustable speeds. Multiple level sensors enable reliable monitoring of the material level and control of the feeding equipment. Safety features such as a manhole with limit switch ensure safe access during maintenance and cleaning.



Color Sorting System

The color sorting system enables the optional integration of a material and/or color sorter downstream of the washing line. Using modern NIR technology, different polymer types or color fractions can be reliably detected and separated. The system is fully integrated into the existing plant control system, allowing flexible adaptation to varying material requirements.

Sorting is carried out by a central sorter fed via pneumatic conveying units. An upstream buffer hopper ensures consistent material feed, while separated fractions are discharged in a controlled manner and collected.



Air Classification System

The air classification system functions as a final separation stage for residual contaminants such as dust, cellulose fibers, or film residues from the dried material. Separation is carried out in a counter-current process based on density and particle size.

Heavy plastic flakes are discharged as the main product, while lighter contaminants are carried away with the air flow and separated accordingly.

Storage & Material Handling

Silos

The silo is used for intermediate storage of free-flowing material and is designed for pneumatic feeding with tangential inlet. The conveying air is discharged via an integrated dust filter. Material discharge is carried out by means of a suction conveying system using a telescopic suction pipe for further processing on the customer side.

The silo is manufactured as a welded steel construction made of carbon steel, internally coated with a two-component coating and externally primed and painted. It is equipped with a support frame consisting of four tubular legs in accordance with DIN 2448, a manhole with sight glass and limit switch, and a rotary paddle level sensor for maximum level indication. A maintenance platform provides easy access for dust filter emptying.

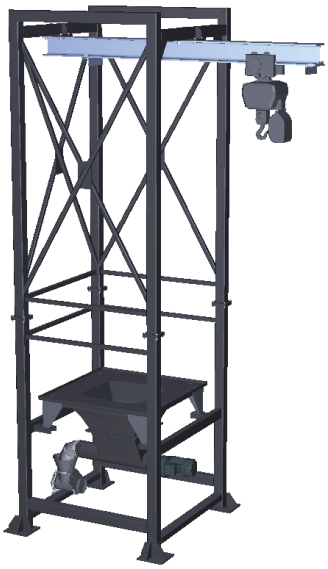
Versions:
GMS 5 (5 m^3) · GMS 10 (10 m^3) · GMS 15 (15 m^3) · GMS 20 (20 m^3) · GMS 25 (25 m^3)

Big Bag Filling Station

The universal big bag filling station is designed for reliable filling of flakes or granulate into big bags or octabins. The filling station is available as a complete system and includes a blower, piping, and a cyclone for pneumatic conveying of the material from the buffer silos.

As standard, the filling station can be configured with one to three filling positions. An integrated suspension system allows weighing and recording of the filling weight and automatically switches to the next filling position once a bag is fully loaded.

Optionally, the filling station can be equipped with a suction conveying system including conveying lines, mounted directly on the station, to transport the material to downstream customer-side processing equipment.



Big Bag Feeding Station

The big bag feeding station acts as an automatic supply unit to ensure a steady flow of material into the downstream equipment. The big bag is positioned and emptied using a support frame with a swivel arm and an integrated electric hoist. The material is discharged into a hopper with below integrated feed screw, and then conveyed by blower in a controlled manner into the subsequent process stages.

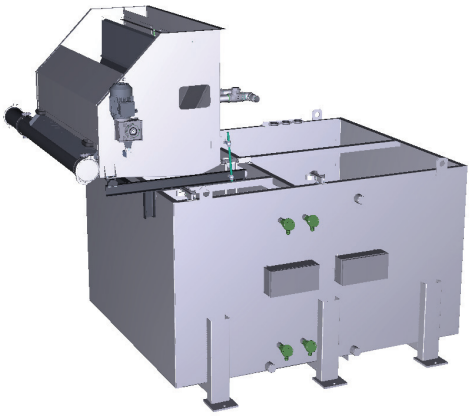
The system is designed for big bags with capacities of up to 1,500 kg and allows uniform, frequency-controlled material dosing. Custom sizes are available upon request.

Additional Equipment

Water Tank

The water collection basin is the final tank within the water system and collects the wastewater generated by the entire washing line. An integrated mixing unit keeps solids in suspension and prevents heavy sludge from settling at the bottom of the tank.

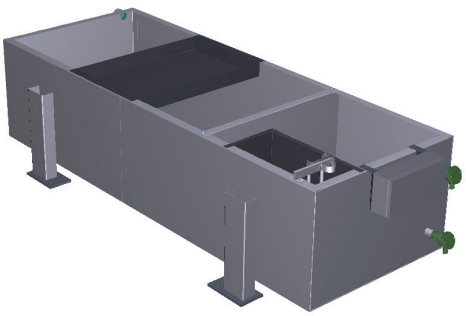
The contaminated water can be extracted and discharged in a controlled manner via a pump installed in the tank on the customer side.



Water Collection Basin

The water tank with slotted screen serves as an intermediate tank for collecting and filtering wastewater from the various water tanks. The filtered water is returned to the water system.

Contaminants retained by the slotted screen must be removed regularly by the customer.



Collection Tank with Slotted Screen

The water tanks collect wastewater from the individual machines and convey it to the water tank with slotted screen. Fresh water is supplied via the first tank, for example beneath the centrifuge, ensuring a defined and stable level throughout the entire water system.

Various Blowers

The pneumatic conveying units are used to transport the material between the individual process stages of the system. Depending on the application, either suction or pressure blowers with different performance ratings are employed. Material is collected from separators, sorting systems, or silos and conveyed via pipelines and diverter valves to downstream equipment.

The blowers reliably convey the material to bleaching silos, buffer silos, big bag emptying stations, or filling stations and enable flexible system configurations through targeted material distribution..

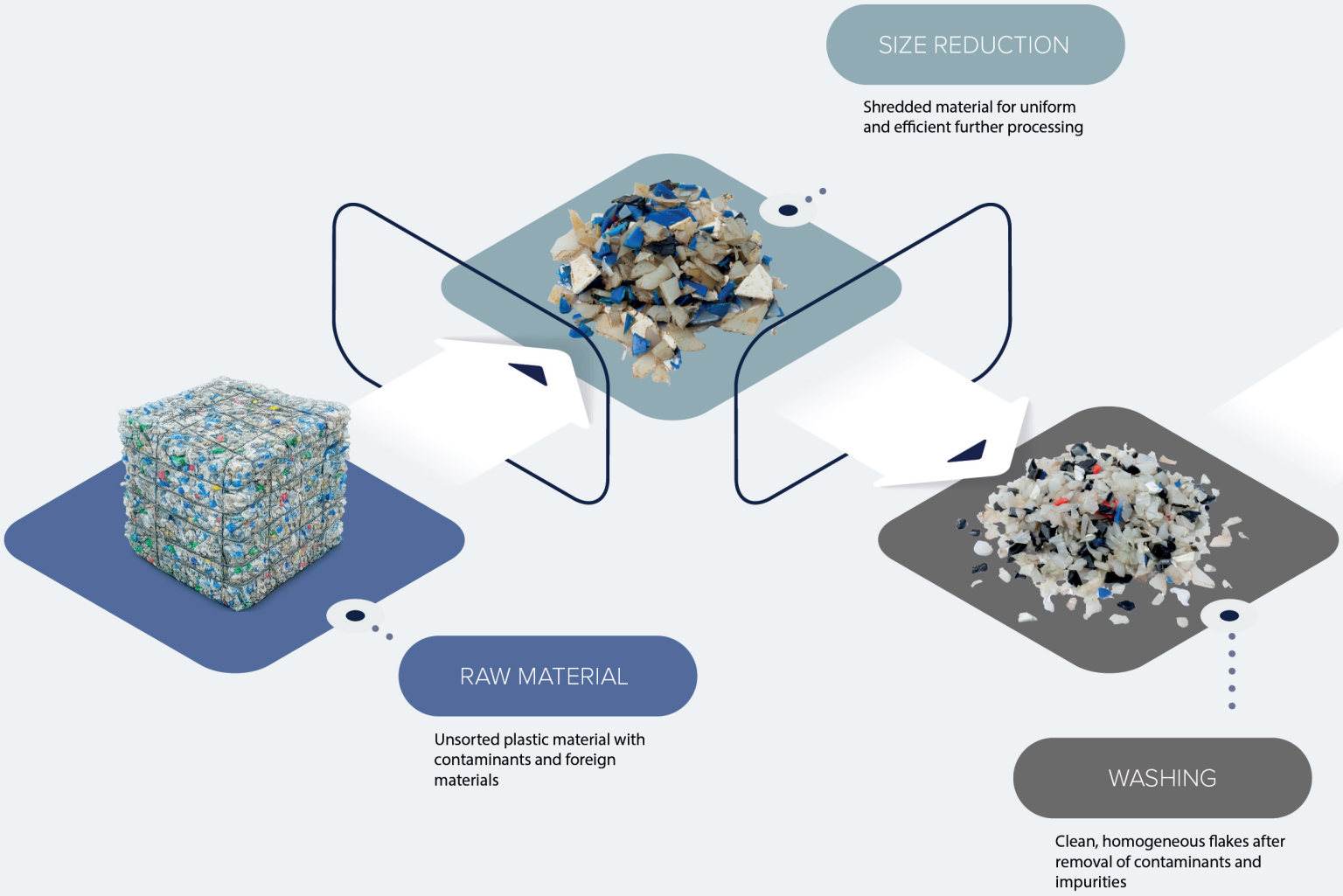
Control & Automation Cabinet

The control and automation cabinet serves as the central unit for controlling and monitoring the entire system. The control system is based on modern PLC technology and ensures safe, reliable, and energy-efficient operation of all system components.

Frequency-controlled drives, digital and analog input/output modules, and a clear visualization via an operator panel are used. The control cabinets are designed for industrial applications and equipped with high-quality components from well-known manufacturers. Electrical cabling up to a length of 10 m is included in the overall scope of supply.

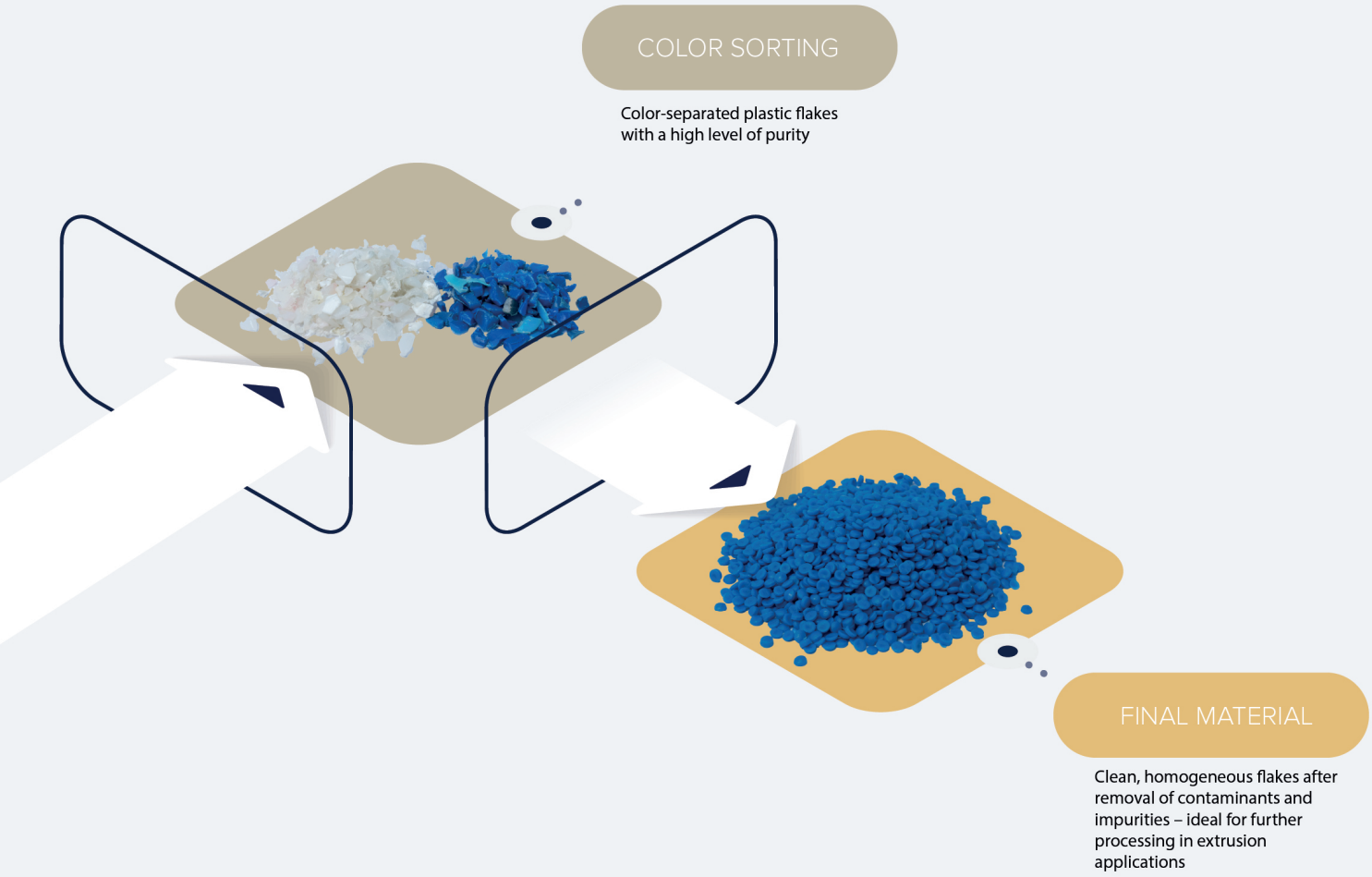
High-Quality Plastic Flakes
The Foundation for Your Product

We deliver clean, homogeneous flakes of the highest quality standard, ideally suited for further processing in the plastics processing industry. The uniform material structure ensures reliable processing into new, high-quality plastic products.



Our Process for Maximum Purity:

Starting from single-grade raw material, clean and homogeneous plastic flakes are produced through size reduction, intensive washing processes, and precise color sorting. Contaminants, foreign materials, and off-color fractions are reliably removed in the process.



- **Thorough Processing:** The raw material is thoroughly cleaned in multiple washing stages to remove contaminants, labels, and foreign materials.
- **Precise Sorting:** Downstream color sorting (optional) further separates and homogenizes the material, resulting in clearly defined material fractions with uniform color and structure.

The resulting flakes are characterized by high purity and consistent particle size. These properties enable reliable and efficient further processing in your production.

REFERENCE IMAGES

WASHING SYSTEM

The processed material is subsequently stored in silos or made available for further processing via big bag filling stations in a clean and efficient manner..

Size Reduction & Material Discharge

The raw material is coarsely pre-shredded in the shredder and continuously conveyed via a discharge screw to the wet granulator for fine size reduction with simultaneous washing, before entering the downstream washing and processing stages.

Service and Spare Parts Management for SIKOPLAST - Washing Systems

Service Services

- Spare and Wear Parts
- Inspections and Fault Diagnostics
- Repairs and Maintenance
- Remote Service and Remote Maintenance
- Complete Installations and System Modifications
- Maintenance and Service Services
- Commissioning and Training

Plant Operation Throughout the Entire Lifecycle

Reliable, trouble-free operation is essential for the economic efficiency of modern washing systems.

SIKOPLAST Recycling Technology GmbH supports its customers with experienced service personnel throughout the entire lifecycle of the system – from commissioning to ongoing maintenance.

Short response times and practical, solution-oriented support ensure high system availability and minimize downtime.

Reliable Spare Parts Supply & Short Response Times

Our comprehensive spare parts and wear parts inventory is continuously monitored and managed using system-supported processes. This ensures high availability of standard components and allows us to supply spare parts at short notice in many cases.

Spare parts supply is not limited to standard components of our own washing systems. Special or system-specific components can also be procured or provided individually at short notice.

Upon request, we stock critical spare and wear parts to ensure smooth and reliable operation of your system over the long term. Coordinated call-off models additionally provide predictable availability and economically attractive conditions.

Since 1956
Driven by Conviction

70 YEARS ANNIVERSARY

Why SIKOPLAST?

Since 1956, SIKOPLAST has been developing robust and durable technologies for plastic processing and recycling.
Since the 1970s, we have been designing washing systems for heavily contaminated post-consumer materials and continuously refining our processes.

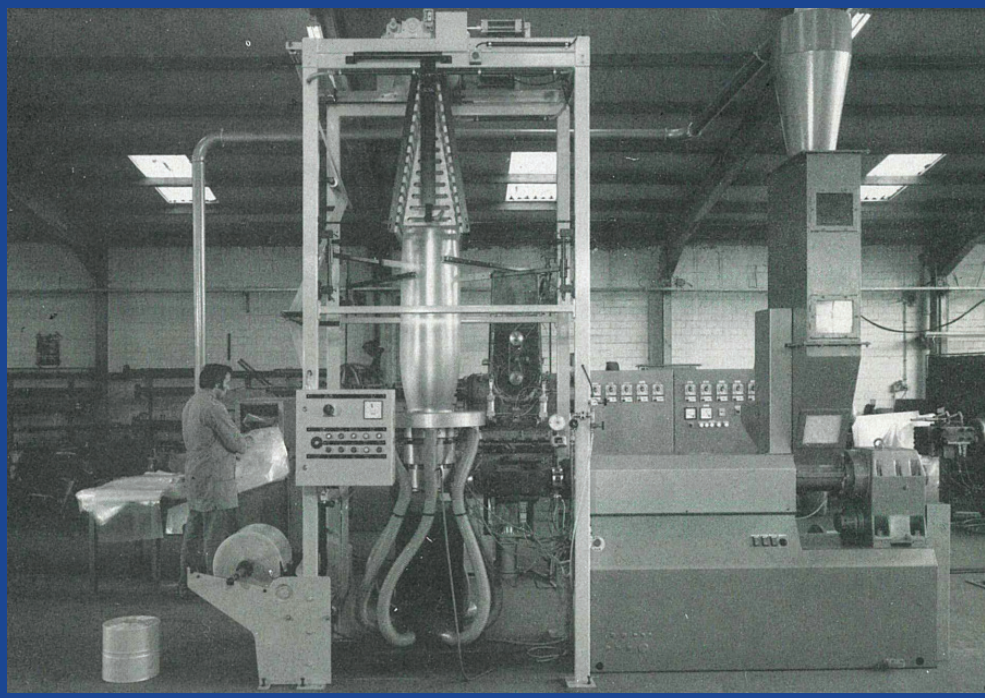
Our know-how is not based on acquisitions, but on in-house engineering, proprietary manufacturing, and decades of practical experience.
Modular plant concepts, energy-efficient systems, and material-friendly processing stand for technical substance and long-term investment security.

SIKOPLAST stands for quality, process stability, and sustainable partnerships.

„Tradition obliges.
Technology convinces.“

What began in the early years as robust machine construction has evolved into a sophisticated, modular washing system concept.

Efficiency, water reduction, process stability and durable industrial design form the foundation of modern SIKOPLAST systems.



An engineering philosophy shaped since 1956 and built to endure.

SIKOPLAST
RECYCLING TECHNOLOGY

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