



The PALLMANN Group of Companies

The Pallmann Group of companies is the leading manufacturer for size reduction machines and systems for the plastic and recycling industry.

Pallmann Maschinenfabrik develops and manufactures machines and complete systems according to customer requirements or as standard solutions for the preparation of almost any plastic as well as recycling products. In its headquarters in Zweibrücken, Pallmann operates one of the world's largest research and technology centers as well as a training- and service center. More than 130 different test machines are available for the preparation of a wide variety of materials. A downstream laboratory analysis of the test material as well as the preparation on a production scale is possible. In addition to the manufacturing facilities in North- and South America, the Pallmann group of companies operates a worldwide spare parts- and service network.



The PALLMANN Program

Engineering and Service:	Products:
Design and manufacturing	Agglomerators
Research and development	Pulverizing Systems
Production scale testing	Disc Mills
Laboratory analysis	Turbo Mills
Worldwide service	Pin Mills
Spare parts	Laboratory Mills
Controlling	Universal Mills
Process Control	Complete Grinding Systems
Installation & Start-up	Knife Mills
Overhaul & Repair	Profile Shredders
	Rubber Granulators
System solutions for:	Pipe Crusher
Pulverizing	Air-Swept Mills
Granulating	Impact Mills
Agglomerating	Industrial Granulators
Recycling	Cryogenic Grinding Systems

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PALLMANN

Plast-Agglomerator PFV



Plast-Agglomerator PFV

100% utilization of plastics

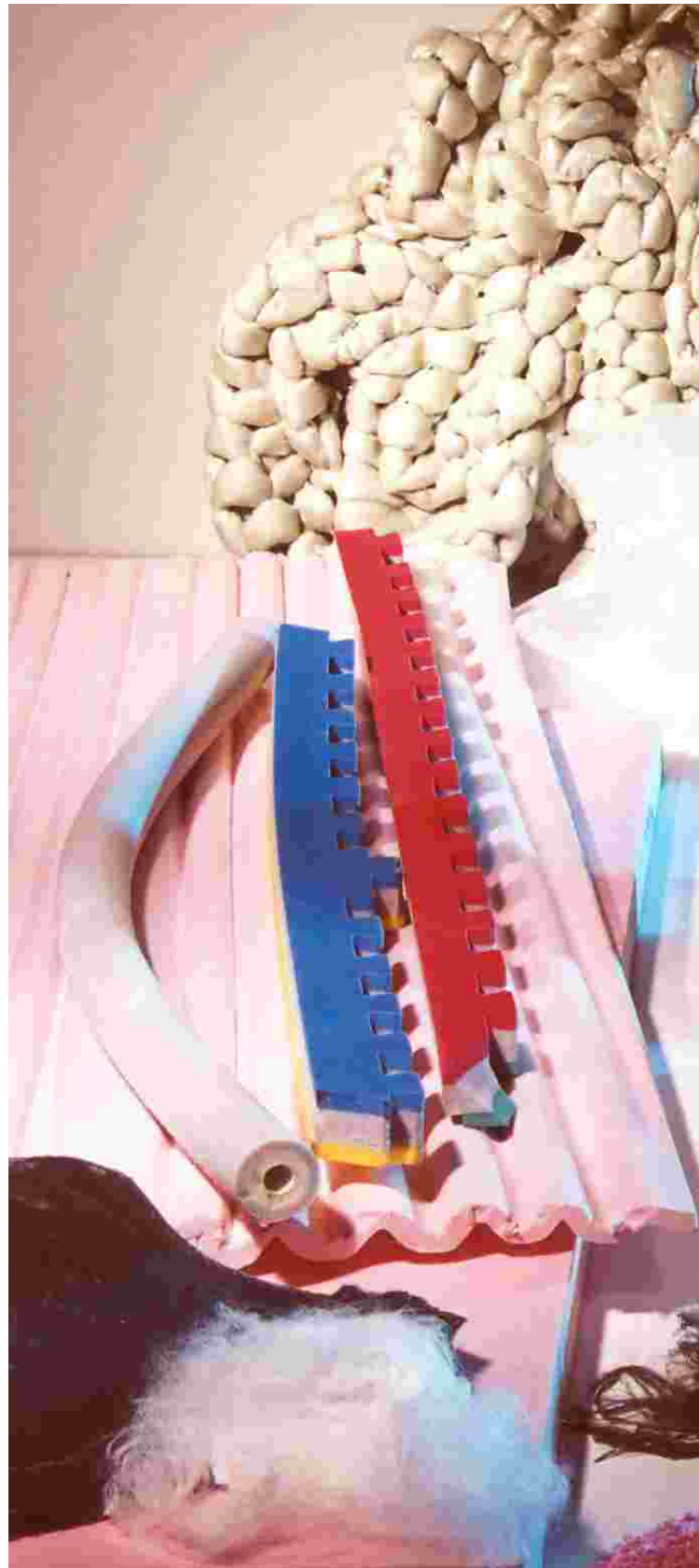
During the production and processing of thermoplastics, production waste occurs which can be agglomerated continuously with the PALLMANN Plast-Agglomerator into free-flowing granules and reused for production as a valuable raw material.

All thermoplastic materials such as polypropylene, polystyrene, polyamide, polyester, PVC, ABS, XPS and composite materials of any kind, dry or moist, can be continuously recycled with the same system.

The material is heated up with frictional heat only and is being agglomerated, within a fraction of a second, right below the melting point. Valuable granules are produced with a minimum of heat and thermo-degradable damage.

Film-, fiber, filament- and foam waste of bulky volume is converted into free-flowing granules with high bulk density by means of the economical PALLMANN-process.

100% utilization of plastics. This is the PALLMANN idea that will enable you to increase your profit margin.





The Plast-Agglomerator

The proven system for the continuous production of free flowing granules from thermoplastics of all kinds.

The standard Plast-Agglomerator system consists of the following processing steps:

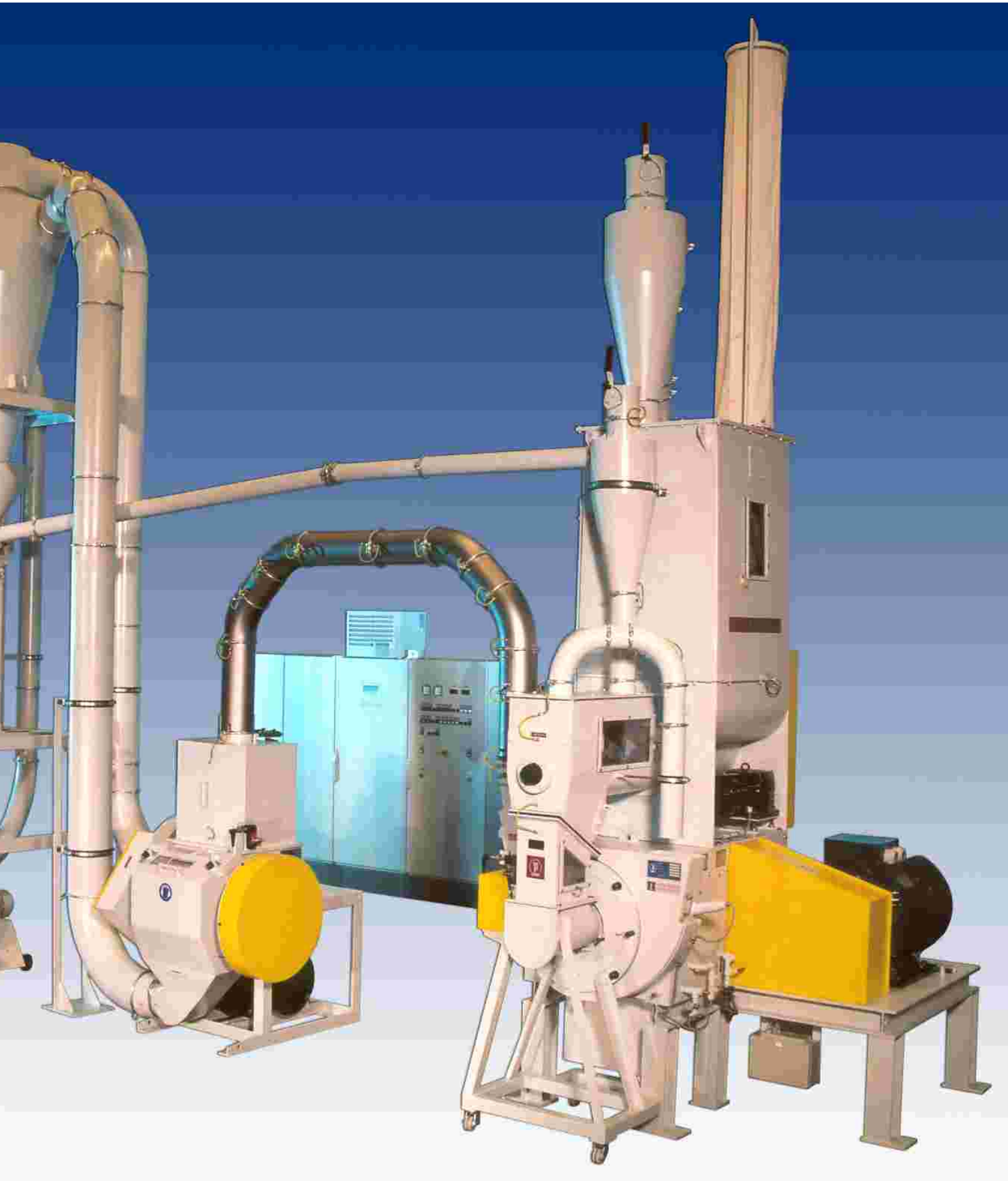
Granulating, pneumatic conveying, storing, feeding, agglomerating, hot-melt granulating, pneumatic vacuuming, pre-cooling, air classifying, transport and cooling. Depending on the material and specific application, these units are put together to an optimum system and the system concept is adapted to the requirements.

The Plast-Agglomerator, type PFV is available in different sizes with throughput rates from approximately 20 to over 4000 kg/h.

Characteristics

- Excellently free-flowing agglomerate with high bulk density
- Material-gentle agglomeration by means of frictional heat
- Continuous process
- Fully automatic start from a cold condition
- Low space requirement due to compact design
- Fully automatic continuous operation





Construction

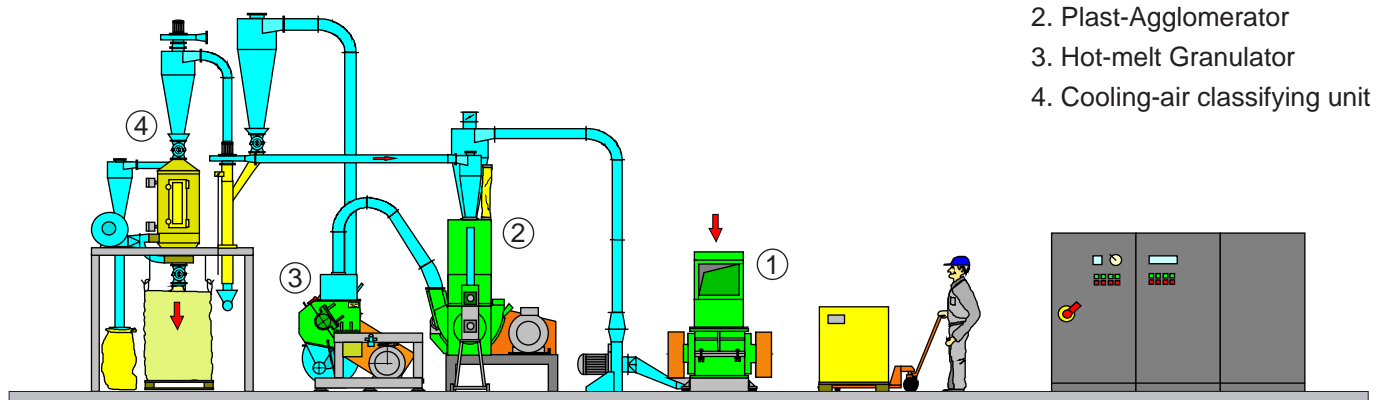
The agglomerator with its feed hopper is the main part of the PALLMANN Plast-Agglomerator System.

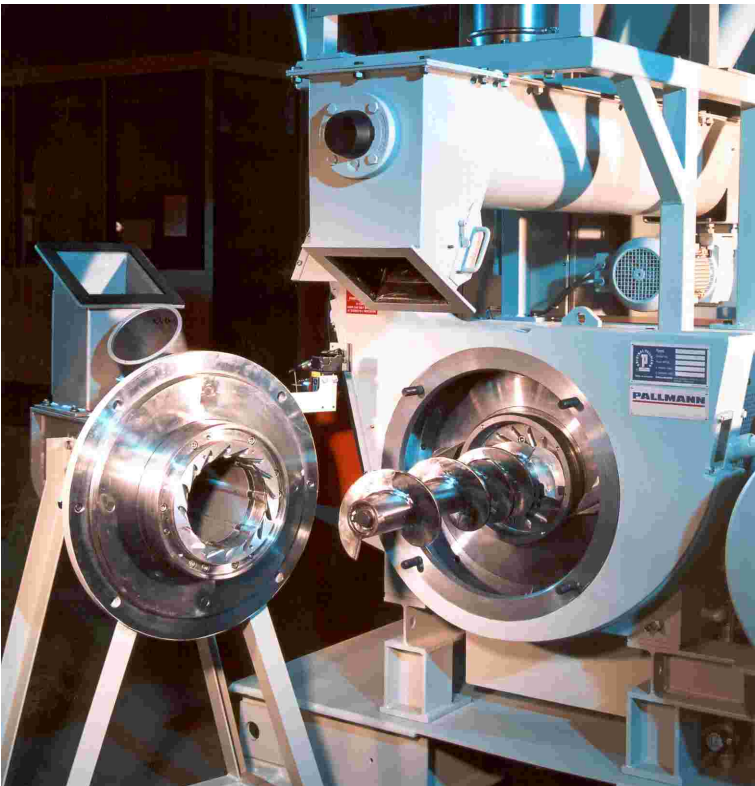
The machine housing is a sturdy steel welded design. For easy access to the agglomerating chamber, the front door with the feed screw slides open easily.

The machine housing and the motor are bolted on to a common frame. The machine is driven by V-belts. The shaft and the bearings are designed for around the clock operation. Fumes and odors from water, spinning oils, foaming agents, printing ink etc. can be vented at a central location.

The feed hopper in sturdy sheet metal construction is a self-contained unit and is equipped with horizontal agitators and a special feed screw. The cleaning door allows quick and easy access to the inside of the feed hopper. All doors and flaps have safety limit switches.

Options like low- and high level indicators, pressure sensors, speed control, construction in special materials, service platforms with ladder etc. are available.



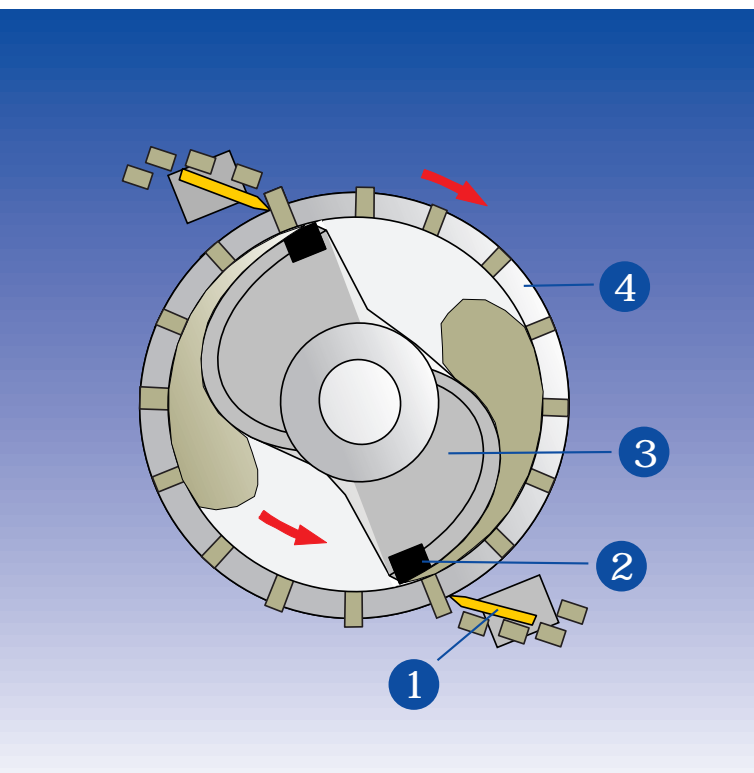


Principle of operation

From a feed hopper, an auger feeds the material to the agglomerating chamber. Agglomeration is done in a fraction of a second, right below the melting point of the material. The agglomerated material is pressed through the holes of a die.

The retention time in the agglomerating chamber is only a fraction of a second. Material exiting the die is cut by rotating knives and then conveyed by air to a cyclone separator into the hot-melt granulator. Here, the material is granulated to equal-sized granules. The hole size of the selected screen determines the size of the granules.

Depending on the material and the application, fines can be separated and returned to the agglomerator by means of a gravity sifter. Additional cooling of the granules can be obtained by using a granules cooler.



Schematic of the agglomerating process

1. Knives
2. Pressure piece
3. Agglomerating vane
4. Die

The control

The functions of the single system components are controlled from a centrally located control box. An overload control automatically regulates the material infeed to the agglomerator. The system is controlled by means of stored program control (SPC).

The hot-melt granulator

Agglomerated material is drawn into the hot-melt granulator.

The granules are equalized between the rotor and the stator knives. Material contacts with the double-walled water-cooled inlet section of the machine as well as the airflow cool the material.

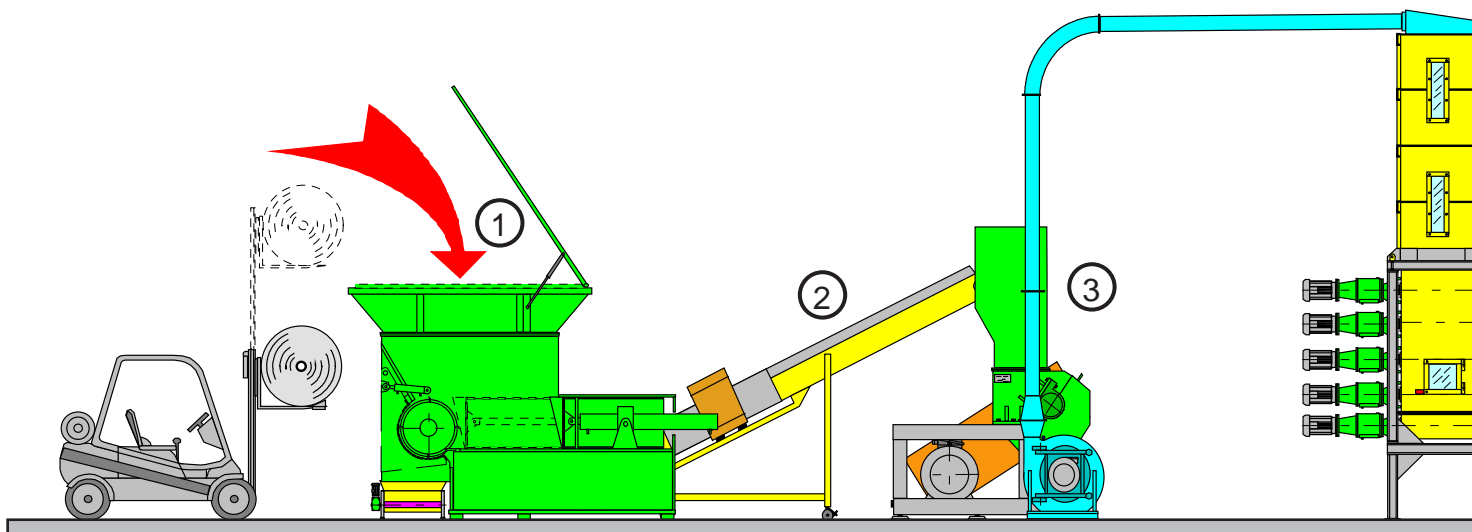
The hole size of the screen installed in the hot-melt granulator determines the size of the end product.



The sifter unit

For the separation of dust particles, a cascade sifter is used. The cascade sifter is a vertical air duct. Air flows through the cascade sifter from the bottom to the top, thereby separating the fines.

The dedusted granules occur at the lower end of the cascade sifter where they can be conveyed. Separated dust particles are re-introduced into the agglomerator.

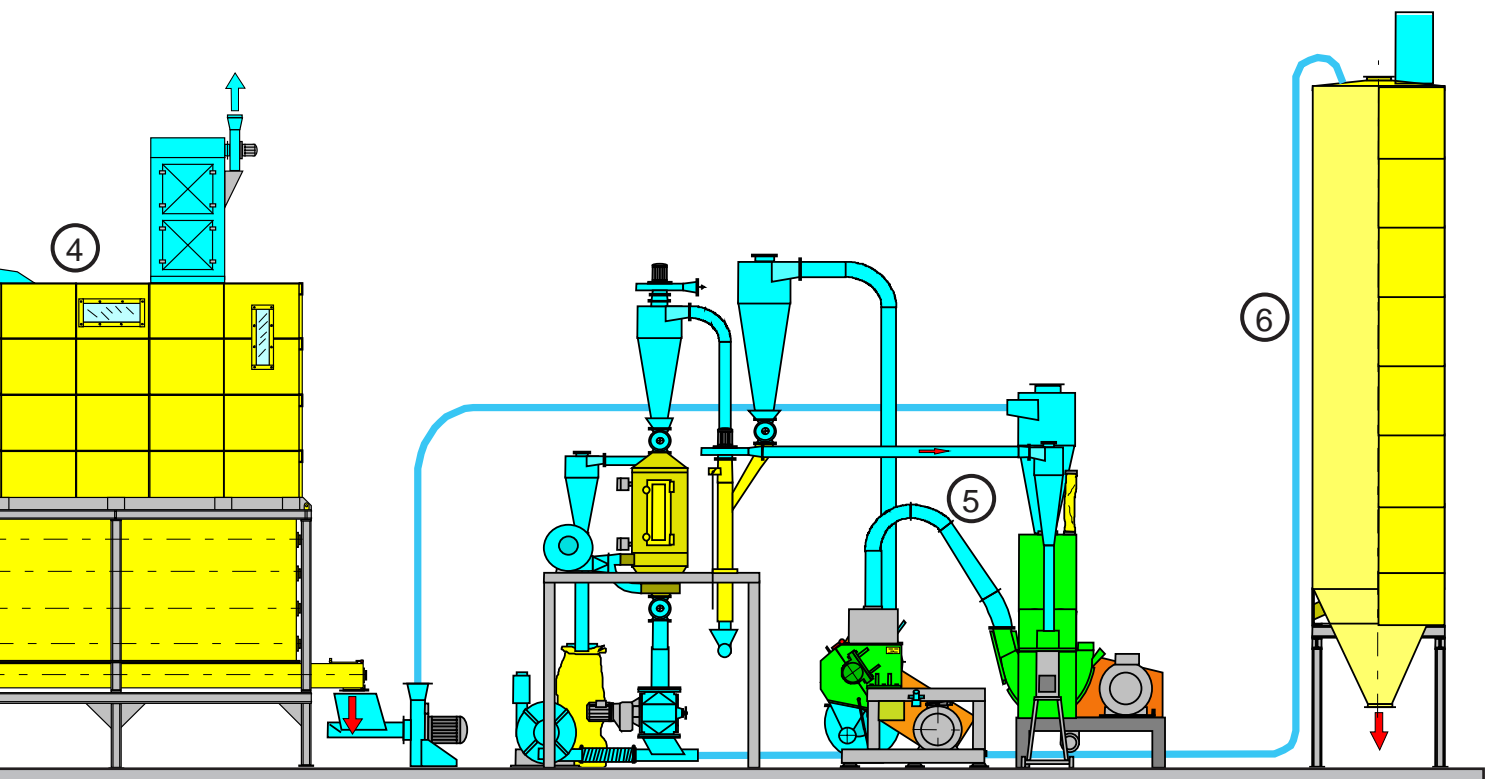




Granules cooler

Additional cooling is necessary for many plastics in order to bring the granules to ambient temperature. A granules cooler is used which operates on a counter flow cooling principle. The hot granules enter the cooling chamber at the upper end of the granules cooler. Counter airflow cools the granules. The granules remain free flowing and do not cake in downstream collecting bins.

1. One-shaft shredder with ramp feeder
2. Conveyor belt with metal detector
3. Special knife mill, type PS
4. Special silo with agitator and discharge screw
5. ORIGINAL PALLMANN Plast-Agglomerator, type PFV
6. Granules collecting bin



Gentle compounding

For the production of compounds from thermoplastics and rubber with fillers of any kind in different mixing ratios, PALLMANN has developed the Palltruder[®].

Plastic powders, film, fibers and foam as well as rubber granules or powder with inorganic or organic fillers in powder or fiber form such as limestone, talc, wood flour, cellulose powder, paper, leather, textiles, sugar cane bagasse, cotton sticks, rice hulls etc. can be processed into free flowing, homogenous granules with the Palltruder[®].

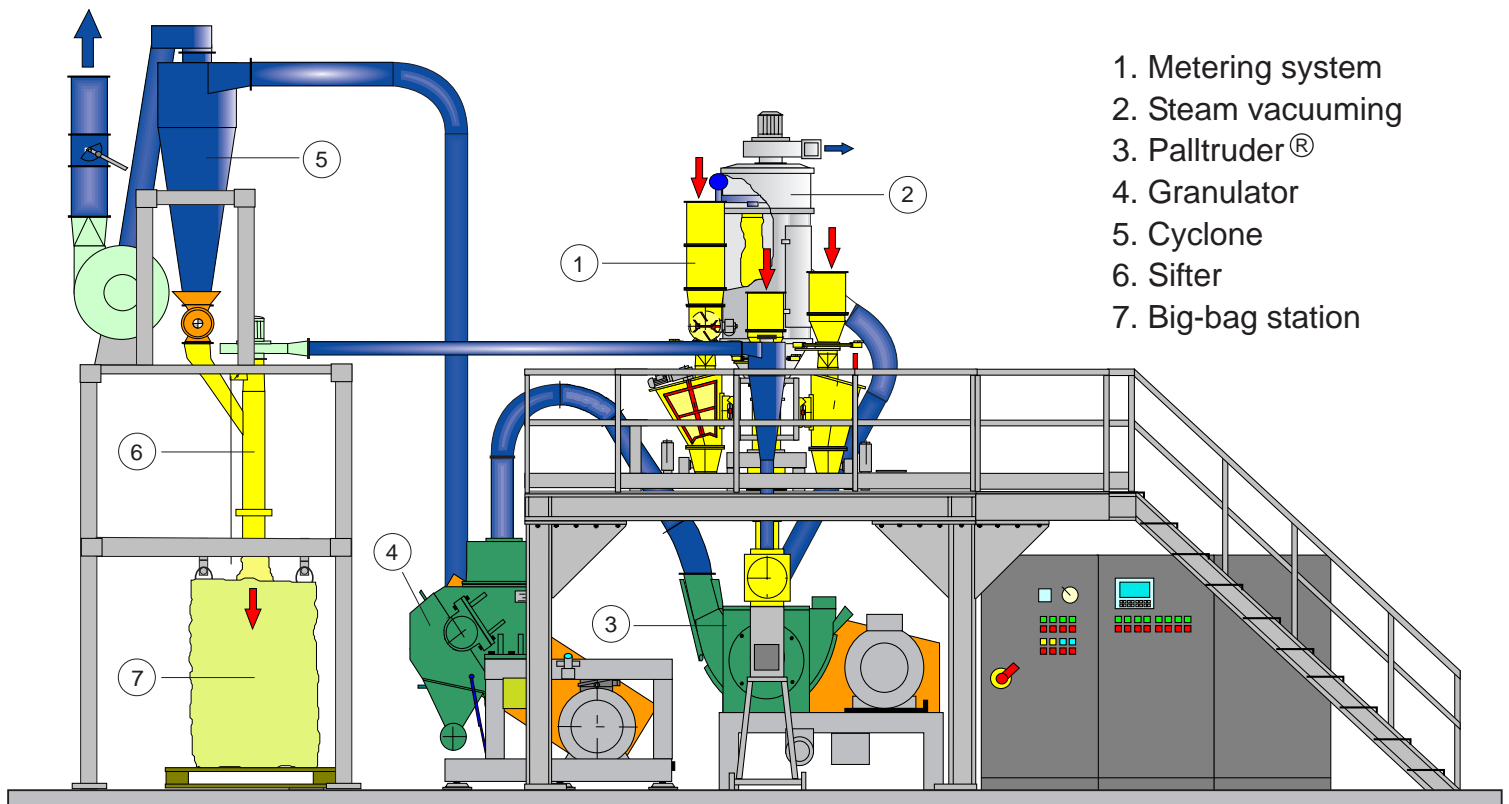
From collecting bins, material components are fed into the Palltruder[®] via a continuous turbo mixing screw.

If a precise mixing ration is desired, the materials are fed via gravimetric feed screws or belt-weighing scales.

Each mixing ratio can be freely chosen and exactly adjusted. By means of the stabilization of the mass throughput, the quality of the granules produced is kept constant.



The compounds manufactured in the Palltruder[®] can be processed into pressed parts of any kind, high quality injection moulded and extruded parts such as pipes, profiles and sheets, suited for downstream thermoforming.



Technical Data

Type	PFV	120	200	250	315	400	500	600
Drive, precutting mill	kW	7,5-15	7,5-22	18,5-45	30-75	75-110	110-160	110-160
Drive, agglomerator	kW	22-30	45-55	55-90	75-132	90-160	200-315	315-500
Cool water consumption	l/h	400-800	700-1100	700-1100	700-1100	700-1100	900-1300	900-1300
Drive, hot-melt granulator	kW	3-3,5	15-22	22-30	30-45	45-75	75-90	75-90
Total installed capacity *	kW	45-65	88-120	120-189	165-280	243-379	422-602	549-799
Width (B)	mm	4.000	6.000	7000	8.000	8.500	9.000	10.000
Depth (T)	mm	2.000	2.300	2.500	3.000	3.500	4.000	4.500
Height (H)	mm	4.800	5.100	5.500	6.000	6.500	7.000	8.000

* with sifter + cooler

Throughput rates **

Type	PFV	120	200	250	315	400	500	600
Throughput rate		kg/h	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h
Bulk density	g/l							
HDPE-Film up to 100 µm	350	40-100	120-180	360-450	450-600	600-840	1100-1600	1600-2000
HDPE-Film up to 100-150 µm	370	40-120	180-360	600-840	600-900	840-1400	1500-2600	2500-4000
LDPE-Film up to 100 µm	430	30-60	100-120	300-360	400-500	420-600	780-1200	1200-1900
LDPE-Film up to 100-150 µm	465	40-100	120-180	360-450	360-450	600-840	1100-1600	1600-2000
PE-foam	300	30-60	100-180	300-540	400-600	420-840	780-1200	1200-1900
PE-fiber	400	30-60	100-180	300-540	400-600	420-840	780-1200	1200-1900
PP-Film	350	30-60	100-180	300-540	400-700	420-840	780-1200	1200-1900
PP-fiber	330	30-60	80-150	180-300	250-450	300-600	540-840	840-1300
PS-Film	450	30-60	100-180	300-540	400-600	420-840	780-1200	1200-1900
XPS-foam	430	30-60	150-200	300-500	500-700	700-900	800-1200	1100-1500
PVC-rigid film	600	70-140	240-360	720-1200	800-1200	1100-1400	2000-3300	3200-5200
PVC-soft film	475	70-140	360-480	960-1500	900-1500	1400-2300	2600-4000	4000-6600
PVC-soft foam	470	70-140	240-420	720-1200	800-1200	1100-1650	2000-3300	3200-5200
ABS-film	410	40-120	180-360	600-840	600-900	840-1400	1500-2600	2500-4000
PA-film	450	30-60	100-120	400-500	300-600	300-600	780-1200	1200-1900
PA-fiber	430	30-60	80-150	250-450	300-550	300-550	540-840	840-1300
Polyester-film	475	40-100	100-180	300-540	420-840	420-840	780-1200	1200-1900
Polyester-fiber	480	40-100	100-180	300-540	400-600	420-840	780-1200	1200-1900
PET (A / G / GAG)	500	50-100	250-300	400-700	700-1000	1000-1300	1300-1600	1500-1800
EPS	500	30-60	150-200	300-400	500-700	700-900	800-1200	1100-1500
PMMA	480	30-60	150-180	250-400	500-700	700-900	800-1200	1100-1500
PC film	500	30-60	150-180	250-400	500-700	700-900	800-1200	1100-1500
Carpet waste	370	40-100	120-180	300-540	400-600	700-1000	1100-1600	1600-2600
Wood-plastic	350	40-100	120-180	300-540	400-600	600-840	1100-1600	1600-2600
Synthetic rubber	400	70-140	240-420	720-1200	800-1200	1100-1700	2000-3300	3100-5200

** Above throughput rates, which have been achieved during tests, serve as a guideline only. To establish exact performance data with your material in continuous operation, we like to perform trials in our modern research and development center.