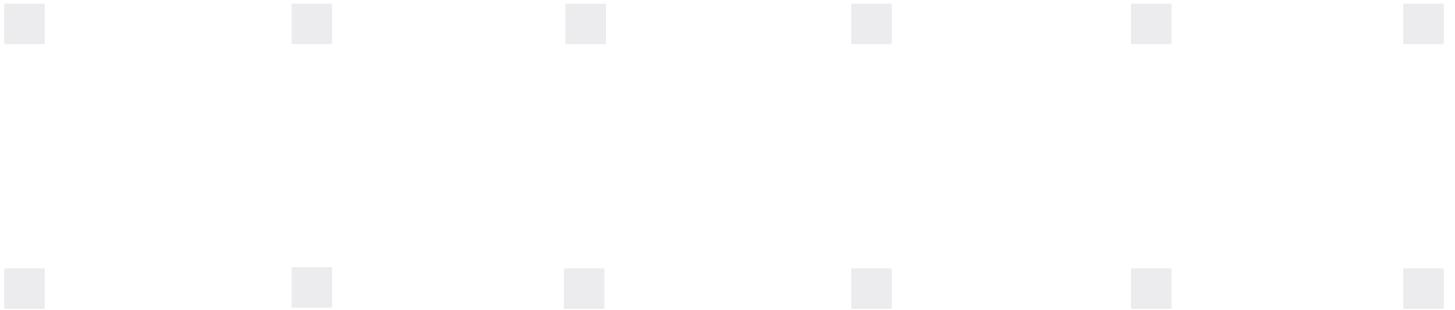


# PALLMANN

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## Agglomeration of Plastics



# Agglomeration of Plastics

## 100% utilization of plastics

During the production and processing of thermoplastics, production waste occurs. The PALLMANN Plast-Agglomerator processes this waste into free-flowing granules which are reused for production as valuable raw material.

Film- fiber- and foam waste is converted into free-flowing granules by means of the economical PALLMANN process. Thermoplastic materials as well as composite materials, dry or moist, can be continuously recycled with the same system.

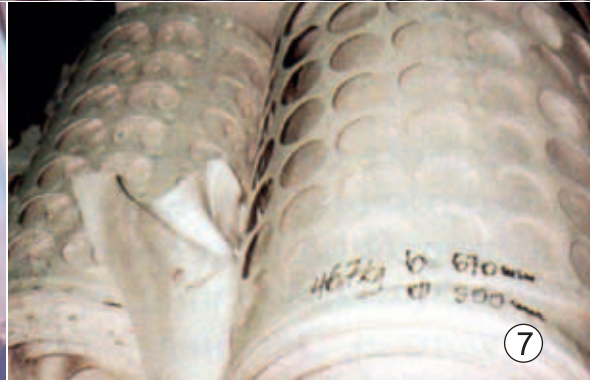
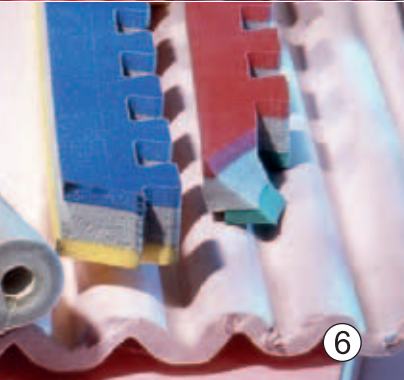
This is performed with a minimum of thermo-degradable damage. The plastic granules are plastified by means of frictional heat to right below the melting point and thereby economically agglomerated.

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

1. Fibers and tapes
2. XPS-sheets
3. Carpet
4. PET bottles
5. Adhesive film
6. Insulating material
7. Thermoforming sheets
8. Film waste
9. End product: Agglomerate with high bulk density







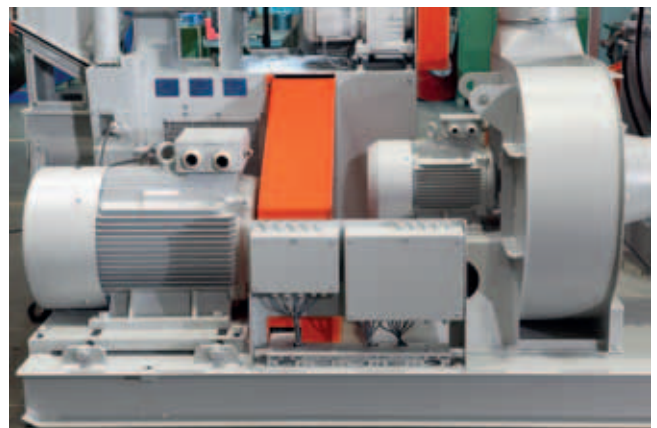


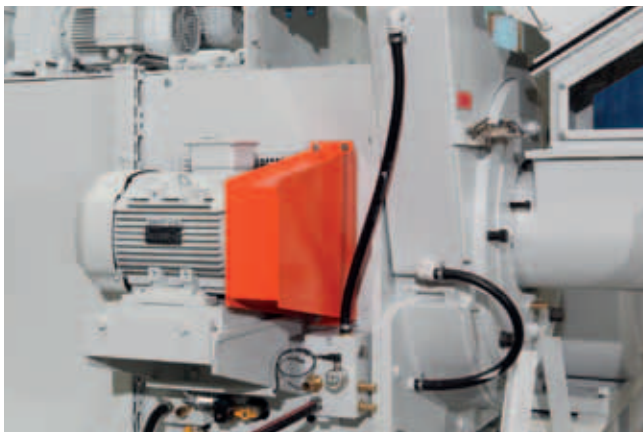
## The Plast-Agglomerator

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

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

- Excellently free-flowing agglomerate with high bulk density
- Material-gentle agglomeration by means of frictional heat
- Continuous, fully automatic process
- Fully automatic start from a cold condition  
Starting time less than 5 minutes
- Feed material with a residual moisture content of up to 10% can be processed
- Suitable for compounding of different feed materials
- Low cleaning requirements
- Low space requirement due to compact and modular design
- Fully automatic continuous operation







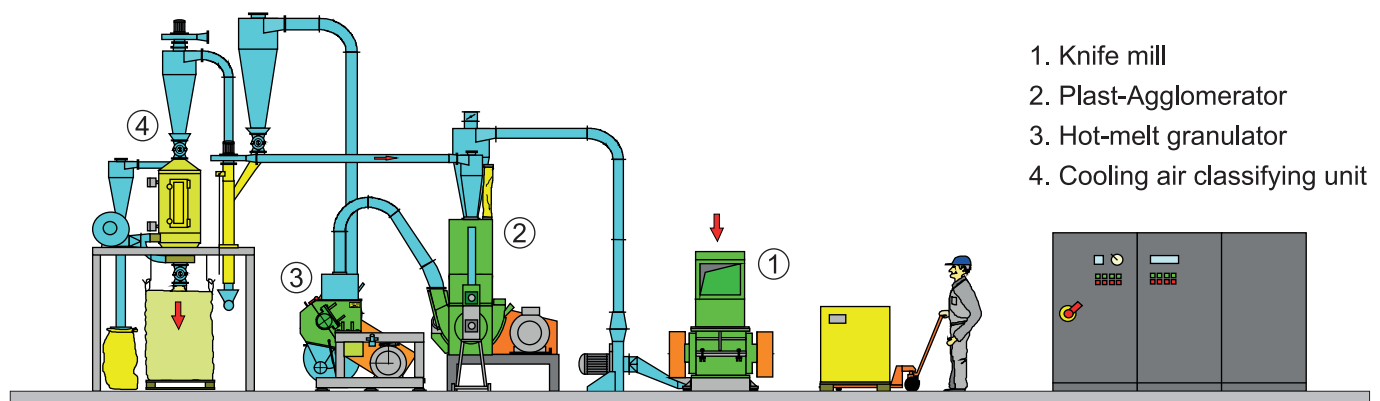
## Construction

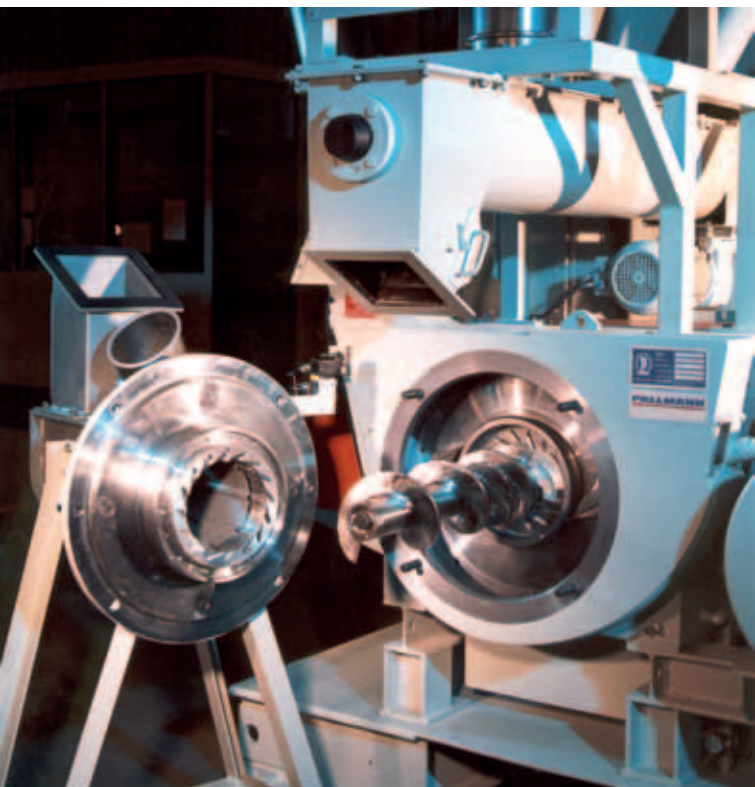
The agglomerator with its feed hopper is the main part of the Plast-Agglomerator System. The Agglomerator is in sturdy sheet metal construction. All building components are designed for rough 3-shift operation and are easily accessible for maintenance purposes. The front door with the feed screw slides open thereby allowing quick and easy access to the agglomerating elements. 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, with horizontal agitators and feed screw is a self-contained unit. The cleaning door allows quick and easy access to the inside of the feed hopper. The doors are secured with safety door lockings to avoid unintentional opening. Options like low- and high level indicators, pressure sensors, speed control, construction in special materials, base frame with integrated cabling and cool water connection, accessible service platforms with ladders etc. are available.

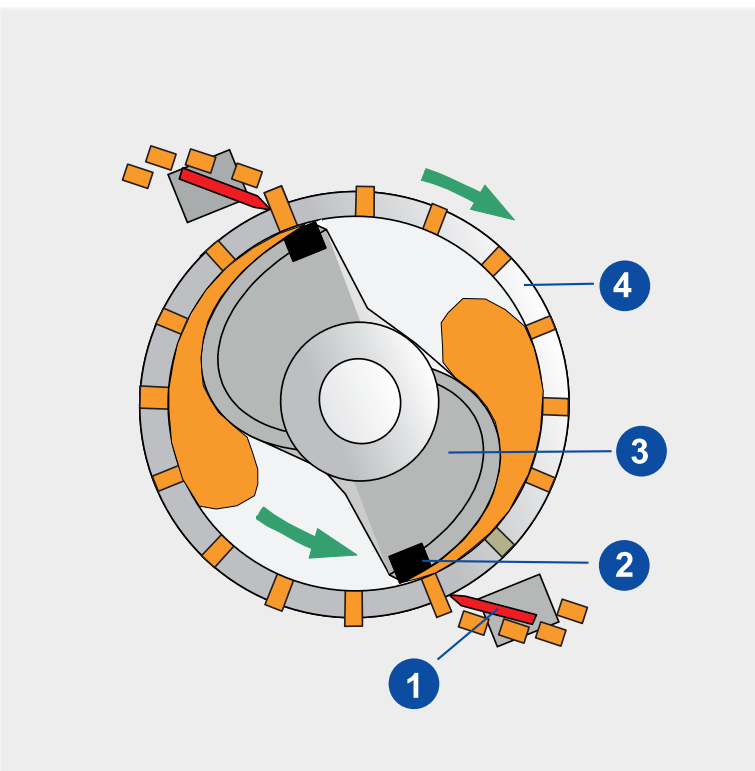


Agglomerator-Unit





Agglomerating chamber of the Plast-Agglomerator



Schematic of the agglomerating process

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

## Principle of operation

The feed material is fed into the agglomerating chamber by means of a dosing screw. Frictional heat and high pressure, produced between the agglomerating vane and the die, agglomerate the material and press it through the special hole size of the die. The processing temperature is right below the melting point of the corresponding plastic material. The retention time in the agglomerating chamber is only a fraction of a second. Material penetrating the die is cut by rotating knives and conveyed by the cooling air of a fan into the hot-melt granulator where the material is cut to equalsized granules. The hole size of the selected screen installed in the hot-melt granulator determines the size of the granules.

## The control

The functions of the single system components are controlled from a centrally located control cabinet. 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 and water-cooled inlet section of the machine as well as the airflow cool the material.

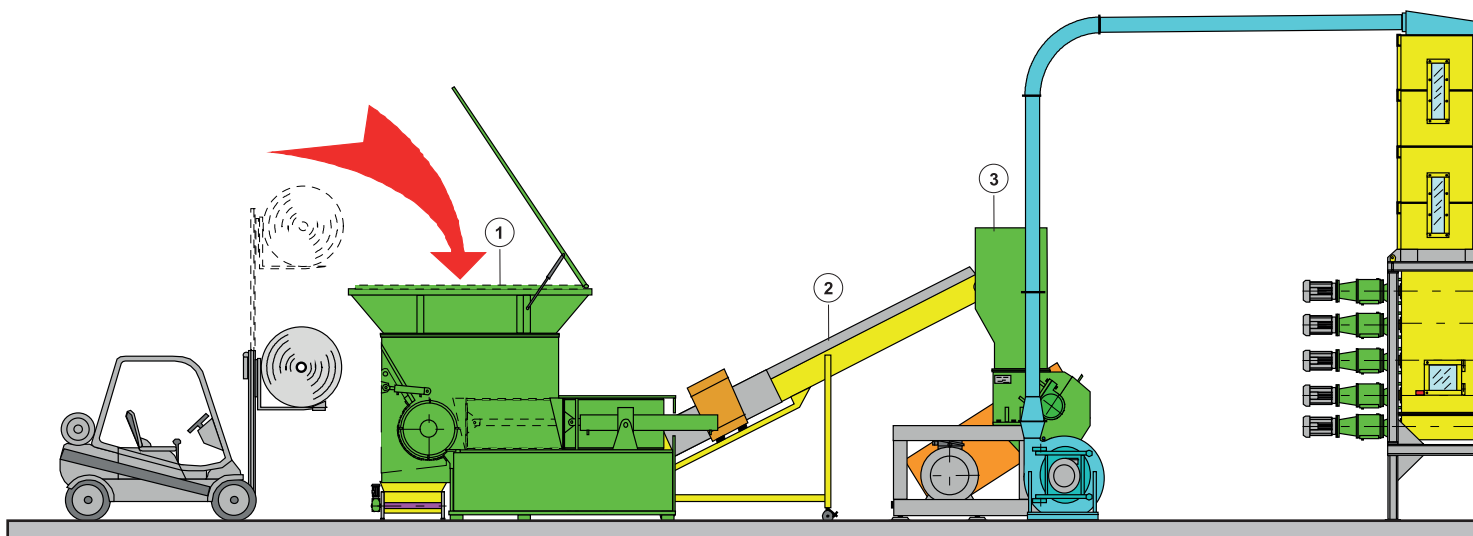
The hole size of the screen installed in the hot-melt granulator determines the size of the end product.



Hot-melt granulator

### System concept with Plast-Agglomerator

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







Granules cooler and sifter unit

## The sifter unit

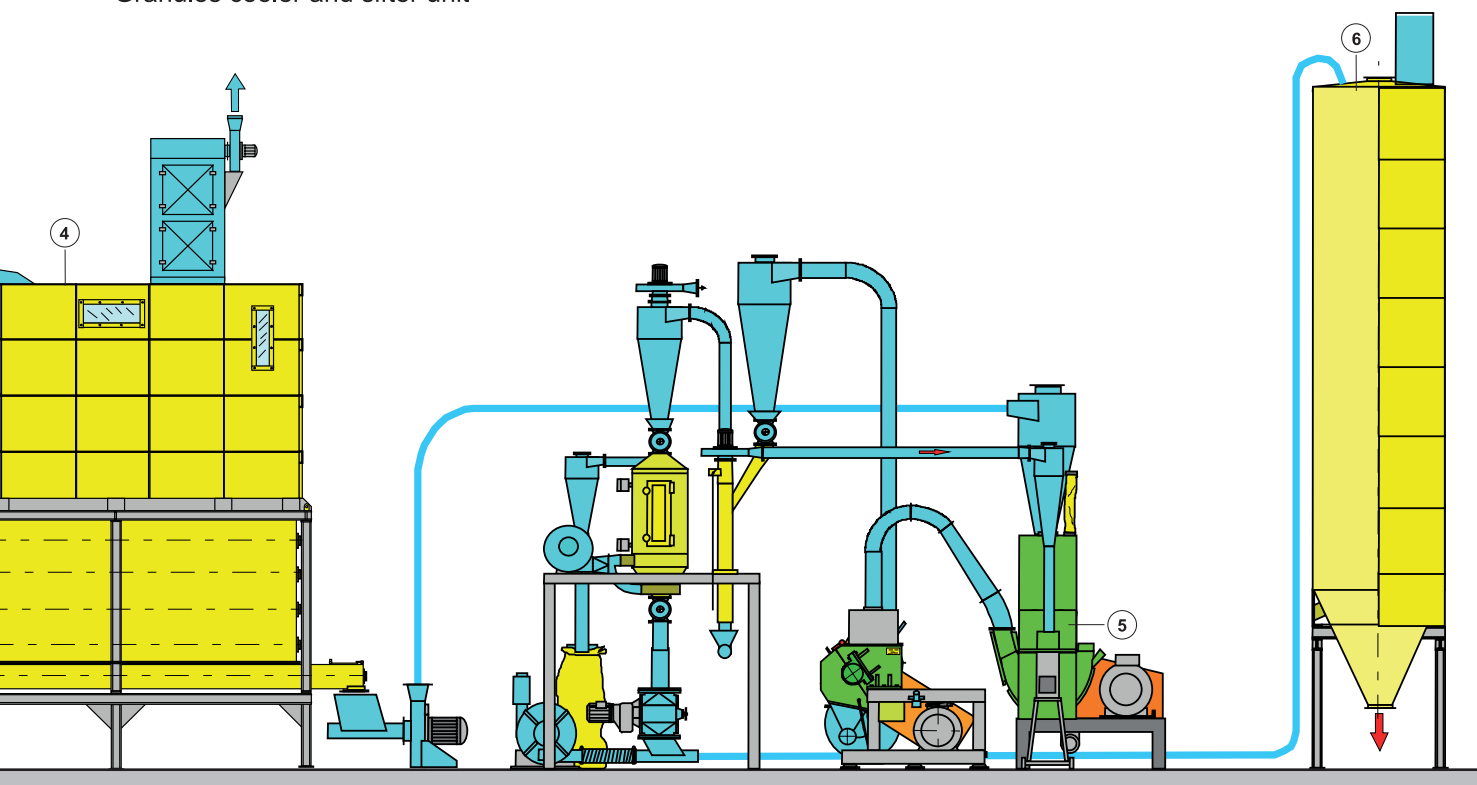
For the separation of dust particles, a cascade sifter is used. The cascade sifter is a vertical air duct. Air flows through the cascade sifter from the bottom to the top, thereby separating the fines.

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

## The granules cooler

Additional cooling is necessary for many plastics to guarantee that the granules remain flowable and do not cake together in the downstream collecting bins.

A granules cooler is used that operates on a counter flow cooling principle. The hot granules enter the cooling chamber at the upper end of the cooler. Counter airflow cools the granules.



## 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®.

With the Palltruder®, mixtures from inorganic or organic materials can be processed into free flowing granules. The feed materials can be powder, chips, film, fibers or foam. The materials from different collecting bins are fed into the Palltruder® via a continuous turbo mixing screw.

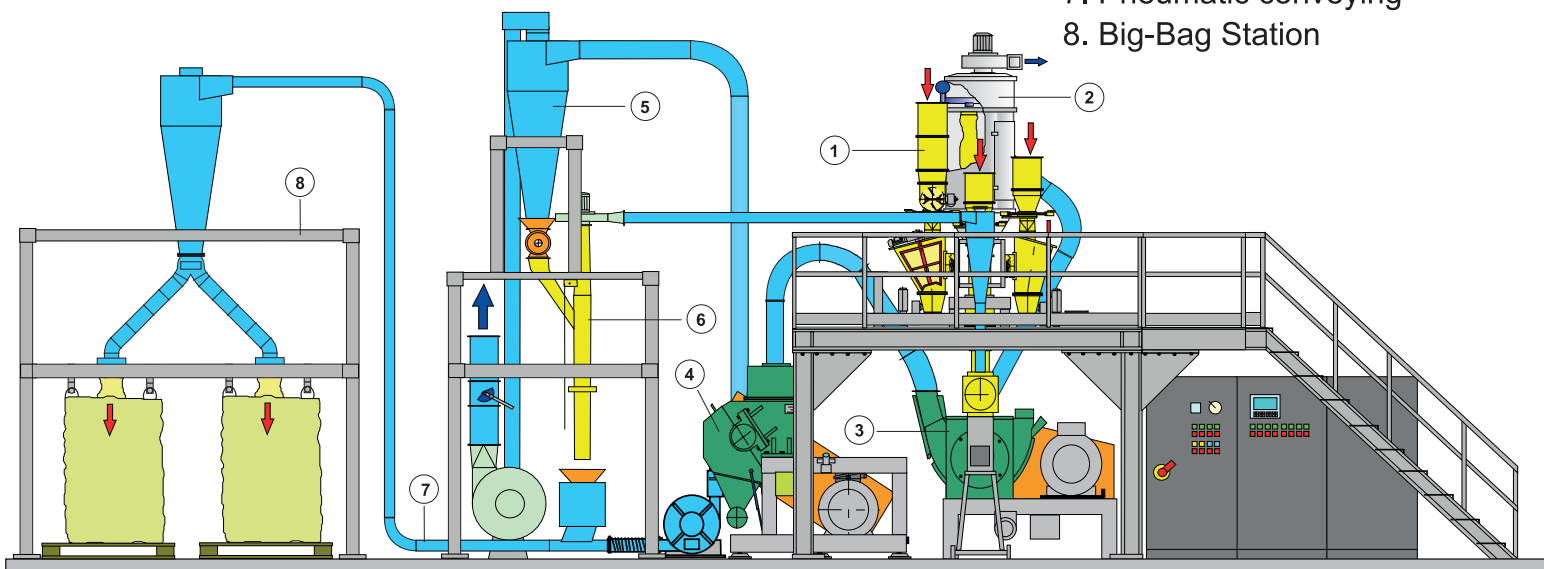
An exact mixing ratio of the feed material can be freely chosen and exactly adjusted. For the precise adherence to the chosen mixing ratio, the material is fed by means of gravimetric feed screws or belt-weighing scales.

Compounds produced with the Palltruder® are very well suited for the production of high quality injection moulded and extruded parts such as pipes, profiles and sheets, as well as for the production of pressed parts by means of double belt press technology.



Palltruder®

1. Metering system
2. Steam vacuuming
3. Palltruder®
4. Granulator
5. Cyclone
6. Sifter
7. Pneumatic conveying
8. Big-Bag Station





## Technical data

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

\* with sifter + cooler

## Throughput rates\*\*

Type	PFV	120	200	250	315	400	600
Throughput rate		kg/h	kg/h	kg/h	kg/h	kg/h	kg/h
Bulk density	g/l						
HDPE-Film up to 100-150 µm	350	40-120	120-360	360-840	450-900	600-1400	1600-4000
LDPE-Film up to 100-150 µm	430	30-100	100-180	300-450	500-600	600-900	1200-2000
PE-foam	300	30-60	100-180	300-540	400-600	420-840	1200-1900
PE-fiber	400	30-60	100-180	300-540	400-600	420-840	1200-1900
PP-film	350	30-60	100-180	300-540	400-700	420-840	1200-1900
PP-fiber	330	30-60	80-150	180-300	250-450	300-600	840-1300
PS-film	450	30-60	100-180	300-540	400-600	420-840	1200-1900
EPS	500	30-60	150-200	300-400	500-700	700-900	1100-1500
XPS-foam	430	30-60	150-200	300-500	500-700	700-900	1100-1500
PVC-rigid film	600	70-140	240-360	720-1200	800-1200	1100-1400	3200-5200
PVC-soft film	475	70-140	360-480	960-1500	900-1500	1400-2300	4000-6600
PVC-soft foam	470	70-140	240-420	720-1200	800-1200	1100-1650	3200-5200
ABS-film	410	40-120	180-360	600-840	600-900	840-1400	2500-4000
PA-film	450	30-60	100-120	400-500	300-600	300-600	1200-1900
PA-fiber	430	30-60	80-150	250-450	300-550	300-550	840-1300
Polyester-film	475	40-100	100-180	300-540	420-840	420-840	1200-1900
Polyester-fiber	480	40-100	100-180	300-540	400-600	420-840	1200-1900
PET-foam	370	30-60	150-210	300-450	500-700	700-900	1100-1500
PET ( A / G / GAG )	500	50-100	250-300	400-700	700-1000	1000-1300	1500-1800
PMMA	480	30-60	150-180	250-400	500-700	700-900	1100-1500
PC-film	500	30-60	150-180	250-400	500-700	700-900	1100-1500
PLA-foam	430	30-60	150-180	250-400	500-700	700-900	1100-1500
Carpet waste	370	40-100	120-180	300-540	400-600	600-1000	1200-2600
Wood-plastic	350	40-100	120-180	200-500	400-600	500-1200	800-2000
Synthetic rubber	400	70-140	240-420	720-1200	800-1200	1100-1700	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, trials can be performed in our research and technology center.



## 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 plastics 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 Europe, North- and South America, the Pallmann Group of companies operates a worldwide spare parts- and service network.



## The PALLMANN Program

### Engineering and Service:

Design and manufacturing  
Research and development  
Production scale testing  
Laboratory analysis  
Worldwide service  
Spare parts  
Controlling  
Process Control  
Installation & Start-up  
Overhaul & Repair

### Products:

Agglomerators  
Pulverizing Systems  
Disc Mills  
Turbo Mills  
Pin Mills  
Laboratory Mills  
Classifier Mills  
Universal Mills  
Complete Grinding Systems  
Knife Mills  
Profile Shredders  
Rubber Granulators  
Pipe Crusher  
Air-Swept Mills  
Impact Mills  
Industrial Granulators  
Cryogenic Grinding Systems

### System solutions for:

Pulverizing  
Granulating  
Agglomerating  
Recycling

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