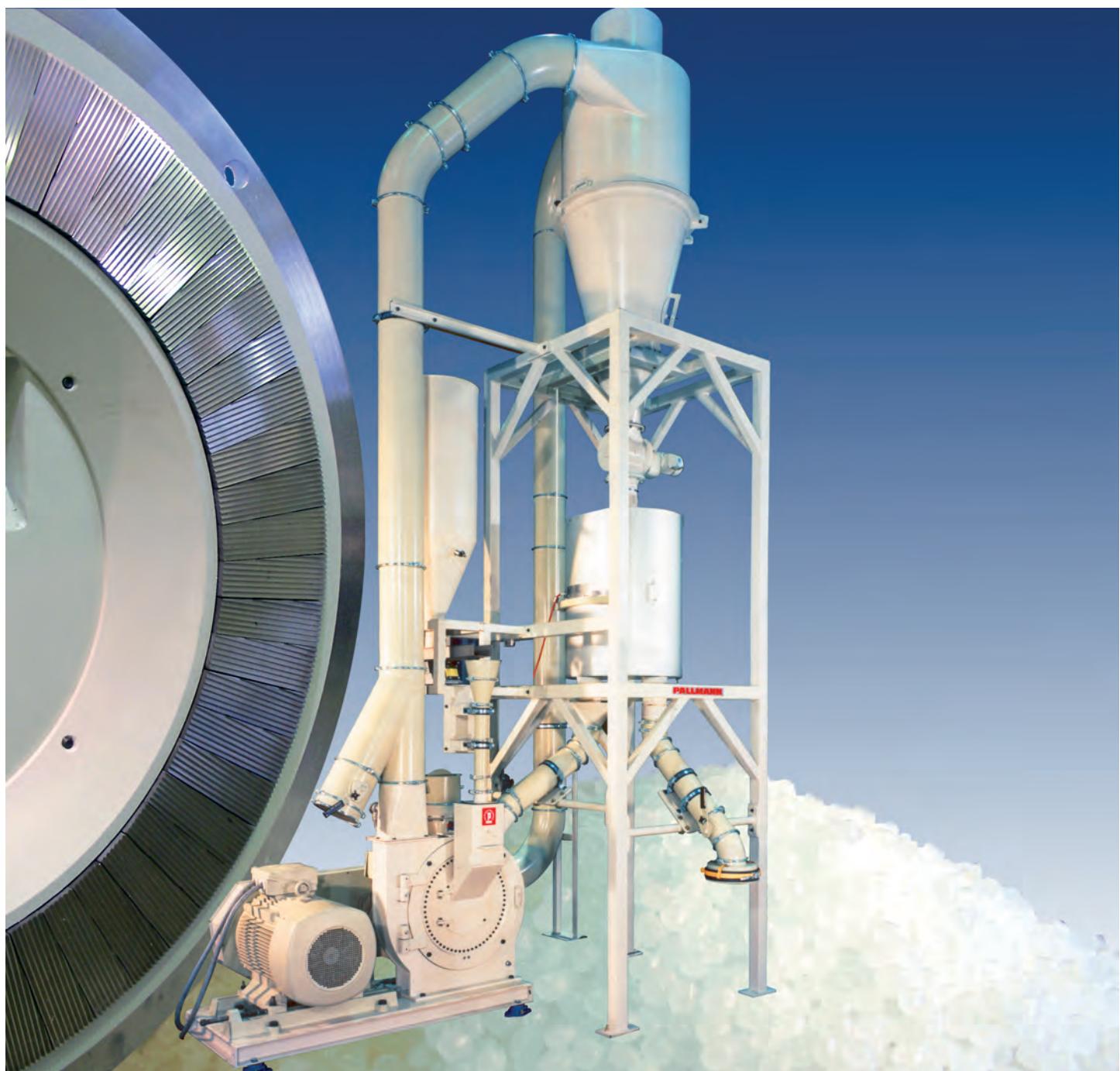


PALLMANN

Pulverizing of Plastics



Pulverizing of Plastics

Quality powders in any fineness

Leap ahead through innovation

PALLMANN has a worldwide reputation as the specialist for plastic pulverizing. On every continent Pallmann pulverizers are producing reliable high quality plastic powders for rotation moulding, whirl sintering, coating of coarse and fine textiles, electrostatic coatings, flame spraying processes, carpet backside coatings, extrusion and additional processes.

In 1955, the first "ORIGINAL PALLMANN" Turbo Mill was used for the pulverization of plastic which was a revolutionary invention. For the first time it was possible to pulverize plastics with a low softening temperature into free flowing powders with a narrow particle size distribution.

More than 1000 PALLMANN pulverizing systems worldwide clearly prove the leading market position and are a convincing proof for the high state of the art technology of these unique systems.

With numerous inventions and patents, PALLMANN participates, as an influential pioneer in today's size reduction technology. The one who takes the lead and sets new standards cannot avoid to constantly question existing technologies and methods of operation. Quality does not come by chance but by continuous research and development.



Therefore it is only logical that PALLMANN operates the world's largest research and development center for size reduction technology in Zweibrücken and works on the developments that define the markets of tomorrow.

Only top quality products can withstand in today's competition. This also holds true for pulverizing of plastics. PALLMANN, as the leading company in this field, offers the complete spectrum of machines and systems for the production of quality powders of any kind.

PALLMANN does not only manufacture machines but also supplies complete systems including application know how. New techniques and processes are first tested in-house. PALLMANN trains your operating personnel.

That insures quality and continuous production from day one.

Trend setting Technology

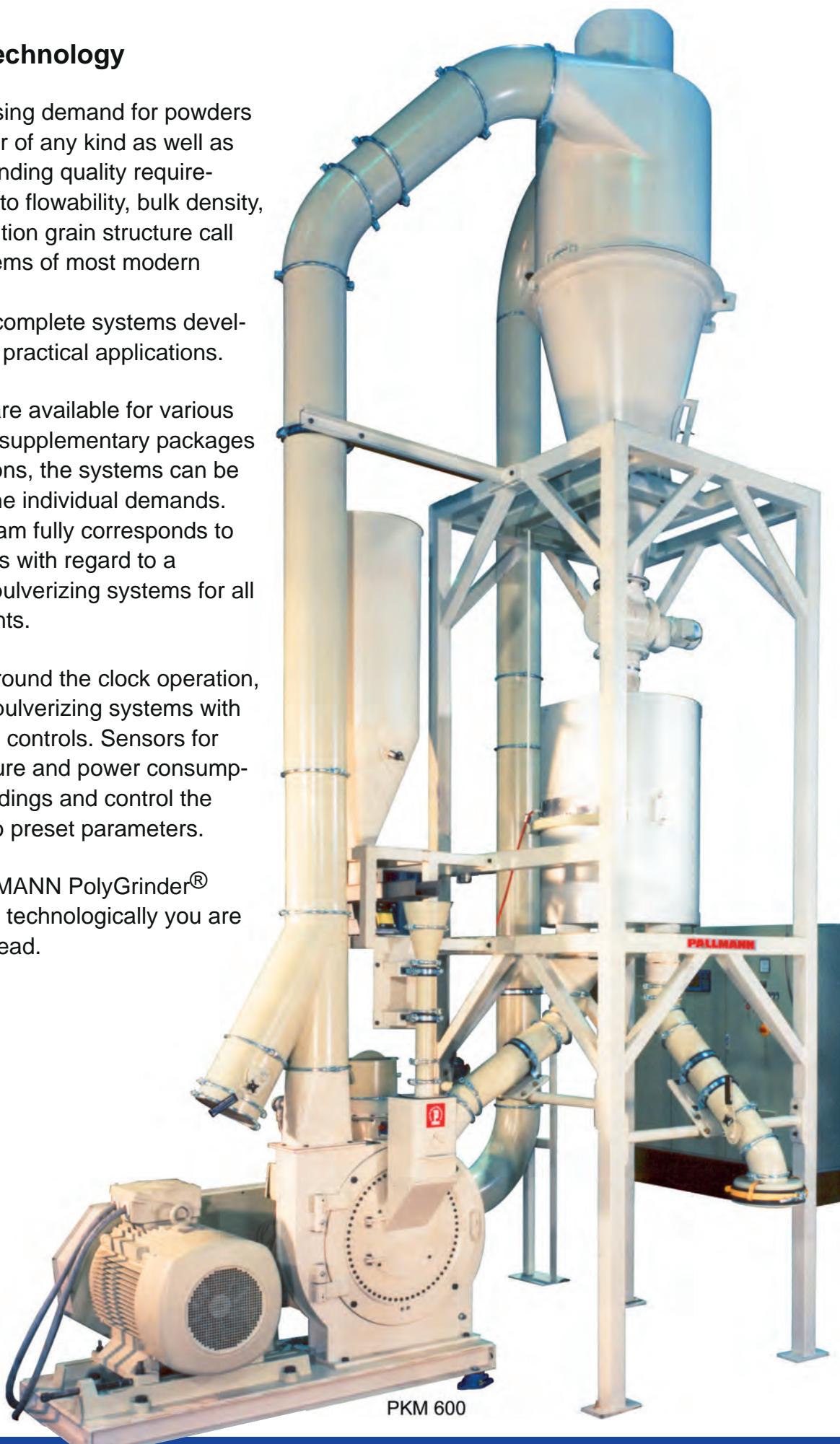
The steadily increasing demand for powders of plastic and rubber of any kind as well as the constantly expanding quality requirements with regards to flowability, bulk density, particle size distribution grain structure call for pulverizing systems of most modern technology.

PALLMANN offers complete systems developed and proven in practical applications.

Standard systems are available for various requirements. With supplementary packages and numerous options, the systems can be easily adjusted to the individual demands. The standard program fully corresponds to market requirements with regard to a complete range of pulverizing systems for all capacity requirements.

For fully automatic round the clock operation, PALLMANN offers pulverizing systems with specially developed controls. Sensors for temperature, pressure and power consumption register the readings and control the system according to preset parameters.

With the new PALLMANN PolyGrinder® pulverizing systems technologically you are always one step ahead.



Custom-made installations

PALLMANN solves problems, always keeping the client's interest in mind. Productivity and working reliability are achieved by selecting the right concept and by paying attention to the details.

The design and performance result from long term PALLMANN experience. The installations are perfectly designed and easy to operate, proven quality increases your profit.

The proven success of custommade PALLMANN installations is primarily due to technological competence, intensive development work and close cooperation with our clients.

These are the reasons, why the leading manufacturers and processors of plastics resins choose PALLMANN again and again.

System Set-up

PALLMANN pulverizing systems for plastic and rubber operate on a special processing principle. Granulated feed material is fed into the mill by means of suitable dosing systems. A suction system optimally designed for this application draws the ground material out of the mill.

Different screening systems are used to achieve the desired powder qualities. Coarse material from the screen is reintroduced into the mill via a closed-loop system. The finished product is weighed in bags, filled into containers or conveyed to downstream processes and silo systems, depending on the requirements. Standard systems for installation on the production floor are available. An individual installation in multi-story buildings is possible at any time depending on the local conditions.



Pulverization System PKM 450 with screening



Sophisticated Constructions, well-proven Solutions

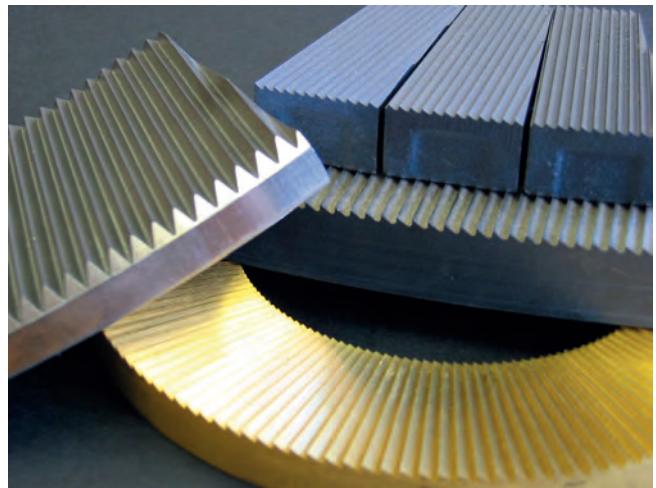
Different pulverizing systems are used for different materials such as HDPE, MDPE, LLDPE, LDPE, PP, PVC, ABS, PA, PES etc. The "ORIGINAL PALLMANN" PolyGrinder[®], type PKM covers the most broad material spectrum due to the large variety of different key segments available.

Constructive and process-technological characteristics are:

- Grinding path made of wear-resistant, technological optimized key segments
- Exact, central grinding gap adjustment
- Housing design for optimized air cooling
- Broad application field

For steady, unchanging tasks, PALLMANN uses disc mills, pin mills, turbo mills, knife mills or hammer mills specially optimized for the customer's requirement.

- Economical and cost effective
- Low specific power consumption
- Powder quality according to specification



Grinding System with PKM 800

Free-flowing Powders with high Bulk Density



Disc mill, Type PKM 800



Flowability time and bulk density



Screen analysis

Economical pulverization of thermoplastics at ambient temperature is left to the specialist. All powders are not equal. Different downstream processing techniques require special adjustment to powder qualities with specifically achieved particle form and sizes. For example, the powder quality for rotational moulder is defined in Germany under DIN 53492 and in America under ASTM 1895.

"ORIGINAL PALLMANN" PolyGrinder®-Systems guarantee adherence to quality parameters

Take advantage of our long-standing experience, competent advice and extensive service.

More than 1000 "ORIGINAL PALLMANN" plastic pulverizing systems all over the world are proof for our competence and reliability.

Constant development of the PALLMANN PolyGrinder®-Systems is the guarantor for the success of our customers and opens new market chances again and again.

Technical Data

Type	PKM	300	450	600	800
Grinding chamber Ø	mm	300	450	600	800
Drive, main motor	kW	37	55	75	110-162
Throughput rate	kg/h	150-200	250-350	450-650	750-1200

Ask for our special brochure

Quality Powders for Rotational Moulding



Grinding System with PolyGrinder® type PKM 800 and granule- and powder conveyor

Pulverizing Systems for Pipe- and Profile Manufacturers

Granulated production waste from PVC-pipe and profile manufacturing is pulverized, worldwide, with "ORIGINAL PALLMANN" pulverizing systems with Disc Mill, type PKM. These recycled powders are mixed with new PVC-material and are reentered into pipe- and profile extrusion.

The pulverizing systems are available with or without screening in order to meet the customers' demands for fineness.



Decisive advantages

- Fully-automatic temperature- and load-controlled system
- High throughput rate at low specific power consumption
- Easy access for maintenance and wear part exchange
- Compact construction with minimum space requirement
- Economical and cost effective



Standard Pulverizing System with PolyGrinder®, type PKM 450 with metal separator

Technical Data

Type	PKM	300	450	600	800
Grinding chamber Ø	mm	300	450	600	800
Drive, main motor	kW	30-37	45-55	55-75	90-160
Throughput rate	kg/h	80-250	100-450	300-800	600-1500

Pulverization for Masterbatch- and Compounding Industry



Pulverizing System with PM 300



Pulverizing System with PM 500

Technical Data

Type	PM	300	450	600	800
Grinding chamber Ø	mm	300	450	600	800
Drive, main motor	kW	30-37	45-55	55-75	90-160
Throughput rate	kg/h	90-225	165-460	325-940	525-1575

Compound manufacturers, worldwide, produce high quality powders and granules with "ORIGINAL PALLMANN Pulverizing Systems for applications in injection moulding, extrusion and roto-moulding. Even heat-sensitive materials such as PS, PC, PA etc. can be processed under ambient temperature.

The pulverizing system consists of only a few components with smooth surfaces. It can be easily dismounted and cleaned thoroughly.

Convincing Advantages

- Pulverizing without using liquid nitrogen
- Excellent flow rate and mixing possibility of the powder
- Easy access for cleaning and maintenance
- High throughput rate, favourable specific power consumption
- Compact construction, minimum space requirement

Manufacturing of Coating Powders

Finest powders with excellent flowability are used in the textile and metal industry for surface coatings. PALLMANN is the number 1 contact address for the pulverization of these thermoplastics, as they are normally very difficult to pulverize due to their high MFR. These plastics are mainly LDPE, EVA and PS. Many of these materials can be pulverized on PALLMANN special mills under ambient temperature with no need for any cooling agents. The economic efficiency is foremost. Compact and efficient systems solve this task.

Decisive Advantages

- Pulverization under ambient temperature without adding liquid nitrogen
- Free-flowing powders with narrow particle size distribution
- Powders with a high bulk density
- Fully-automatic continuous operation

Technical Data

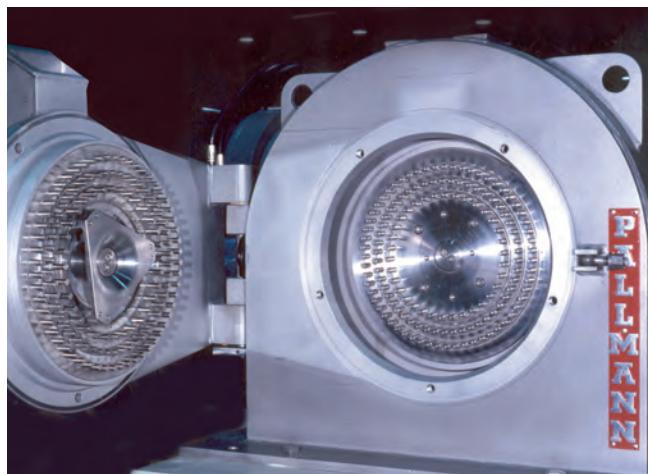
Type	PP	PP 4 S	PP 6 S	PP 8 S
Grinding chamber Ø	mm	400	600	800
Drive, main motor	kW	7,5 + 15	11 + 30	18,5 + 45
Throughput rate	kg/h	20-30	30-60	60-150



Pulverizing System, type PP 6S with tumble screen



Turbo Mill, type PP 6S



Pin mill, type PPST 400



Cryogenic pulverizing system with pin mill, type PPST 400



PPL 18

Cryogenic pulverizing systems with inert gas atmosphere are used for extreme heat-sensitive materials as well as for obtaining an exceptionally high fineness.

PALLMANN has developed the technology in their own custom processing facilities and offers standard cryogenic pulverizing systems in compact design for polyester, polyamide, EVA, elastomers, copolymers, synthetic rubber and other heat-sensitive materials. Decades of experience in this field form the foundation for design and construction of systems that are especially adapted to the application.

PALLMANN not only delivers the system and the processing technology but also the necessary application know-how. Quality and performance are guaranteed. Cryogenic pulverizing systems are reliable, efficient, safe and ultimately more economic.

Technical Data

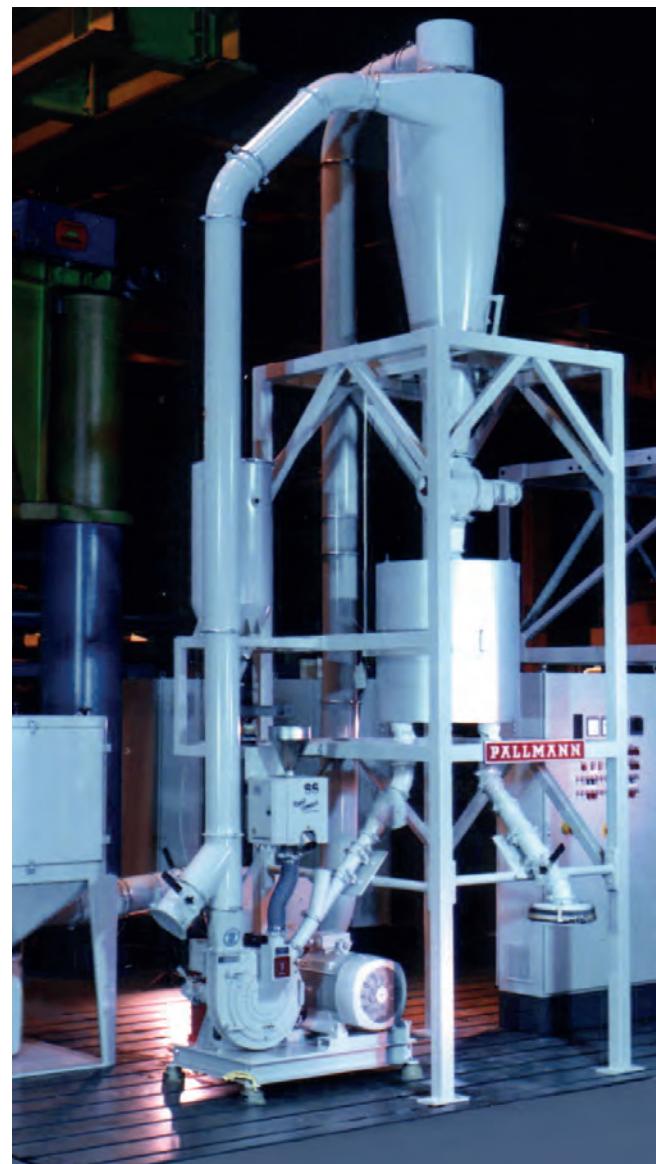
Type	PPST		250	400	630
Cutting chamber Ø	mm		250	400	630
Drive, main motor	kW		11 + 22	37 + 45	55 + 55
Throughput rate	mm	mesh			
Polyamide	0,3	50	60-100	140-240	300-550
Polyamide	0,1	150	20-50	45-115	100-250
Polyester	0,2	70	70-130	110-200	240-450
Polyester	0,1	150	40-90	60-150	130-340
Polyurethane	0,4	40	50-100	110-240	240-530
Polyurethane	0,2	70	40-85	90-190	200-420
EVA	0,3	50	30-60	80-140	180-300

Powder Manufacturing from Synthetic Rubber

For the production of compounds for cables, seals and other elastic parts manufacturing, rubber powders with different particle size distributions are used. The Disc Mills, type PKM and the Turbo Mills, type PP meet the requirements of this application – depending on material quality and end fineness.

Special Advantages

- Good flow rate and mixing possibility of the powder
- Narrow particle size distribution with low fines content
- Temperature – and load controlled
- Fully automatic continuous operation



PKM-300-System



Technical Data

Type	PKM	300	450	600	800
Cutting chamber Ø	mm	300	450	600	800
Drive, main motor	kW	30-37	45-55	55-75	90-160
Throughput rate	kg/h	30-150	120-300	250-500	400-800

Free-flowing Powders from Film Waste



The "ORIGINAL PALLMANN" Precision Knife Mill, type PS allows the processing of film in form of rolls, edgings as well as other loose material. The pulverized powder is used for floor coverings and for the production of pressed sheets.



Precision Knife Mill, type PS 5-10
with draw-in roller system



Specific Advantages

- Uniform end product with a high bulk density
- Good flowability
- Clean cut particles
- Material-gentle pulverization

Technical Data

Type	PS	5-10	5-12,5
Working width	mm	1000	1250
Rotor diameter	mm	500	500
Motor, main drive	kW	45-75	55-90
Motor (draw-in roller)	kW	1,1-3,0	1,1-3,0
Throughput rate	kg/h	100-400	150-550

Cost-saving Recycling of High Quality Materials

For the recycling of plastic waste, the most various preparation systems are used, depending on the material. After precutting, cutting, agglomerating or extrusion, on the average the materials must be pulverized in order to be able to mix them in as filler in a new application.

PALLMANN can choose from a variety of different types of mills in order to use the best suitable grinding principle. Typical machines for the preparation of fibrous materials such as carpet waste, post-consumer waste, waste pipe etc are successfully pulverized into defined powders with the "ORIGINAL PALLMANN", Turbofinerr®, type PLM. The result is valuable filler that, as a high quality powder, can be mixed into different fields of new material production.

When pulverizing rubber waste or for the preparation of cable waste – where plastic must be separated from metal – the "ORIGINAL PALLMANN" Turbo Mill, type PP has exceptionally proven itself. The principle of counter-rotating grinding elements is the base for optimum preparation of the material to be ground.

These are only two examples of the wealth of application possibilities for our pulverizing systems in the recycling industry. With these pulverizing systems, the costs of the end product are environmentally reduced.

Contact us when you are looking for the best solution for your requirements.



Turbofiner®, type PLM 800



Turbo Mill, type PP 6 S

Service in Size Reduction Technology

Top performance in size reduction – that is what made PALLMANN stands for.

The rapid development in this complex field of technology was only possible because we set the corner stone for professional development, decades ago, with our technology center.

Today, our customers profit from the world's largest technology center for size reduction technology, a know-how from 40.000 series of tests and trials.

With more than 130 PALLMANN size reduction machines, we offer the ideal prerequisite in our technology center, to prepare investment decisions on a safe basis.



Approximately 300 customers use our services yearly, with regards to

- **Test performances**
- **Custom grinding**
- **Laboratory analysis**

Contact us.

Custom Grinding, PALLMANN grinds for you

Industrial preparation of reusable plastic waste of most various types and origin, as well as the manufacturing of powders is the task of PALLMANN Mahlwerke since 1965.

The custom grinding plant in Gersheim professionally offers

- **Pulverization**
- **Cutting**
- **Agglomeration**
- **Cryogenic pulverization**
- **Mixing and homogenization**

of all types of plastic materials for customers all over the world.





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 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
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

PALLMANN Industries Inc.

820 Bloomfield Ave.
Clifton NJ 07012
USA
Phone +1 973 471 1450
Fax +1 973 471 7152
E-mail: info@pallmannindustries.com
<http://www.pallmann.eu>

PALLMANN do Brasil Ind. e Com Ltda.
Av. Presidente Juscelino, 11 56
09950-370 Diadema S.P.
Brasil
Phone +55 11 4075 3044
Fax +55 11 4075 4968
E-mail: pallmann@pallmann.com.br
<http://www.pallmann.com.br>

PALLMANN GmbH
Leninskij prospekt dom 158
Office Nr. 206
119571 Moskau
Russland
Phone 007 495 232 15 21
Fax 007 495 232 15 22
E-mail: info-ru@pallmann.de

PALLMANN Technology (Beijing) Co.,Ltd.
3F, Room 315-319, Union Development No.8
Building, No.728, Xin Hua Road
200052 Shanghai, China
Phone +86 21 6283 4454
Fax +86 21 6283 2277
E-mail: Jie.Tang@pallmann.eu
www.pallmannchina.com

PALLMANN Maschinenfabrik GmbH & Co.KG
Wolfslochstraße 51
66482 Zweibrücken
Germany
Phone +49 6332 802 0
Fax +49 6332 802 521
E-mail: plastics@pallmann.eu
<http://www.pallmann.eu>