

T-LINE™

Scrap tire recycling systems



SCRAP TIRE RECYCLING SYSTEMS

The amount of scrap tires is growing worldwide and therefore the necessity to recycle is increasing.

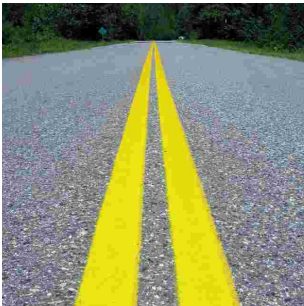
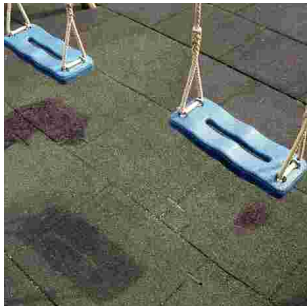
Scrap tire recycling, as it is commonly known, means not only the replacement of fossil fuels but also the separation of valuable materials such as rubber, steel and textiles and reintroduce them into the raw material cycle. For this application PALLMANN offers complete recycling systems from one source.

To start the recycling process, scrap tires have to be cut into chunks. High capacity shredders, type LION are used for this application.

Running in a circle with disc screens, these high capacity machines produce clean cut chunks, size 50 x 50 mm, a preferred and easy to dose bulk material for thermal reuse. The scrap tires are cut to chunk sizes, 150x150 mm as feed material for a granulation step for the production of rubber granules. Shredders, type TIGER loosen the rubber-steel-textile compound. The loosened components are separated by means of magnetic-, air- and screening technology. The textile fluff is very well suited as insulation material. The separated steel wires have a purity of > 97 percent and can be lucratively sold.

The rubber granules are, in a third step, granulated in the PANTHER to desired particle size and are further freed from steel and textile. Typical areas of application for rubber granules from scrap tires are the construction of sports arenas such as running tracks and tennis courts, flexible flooring for improved protection from falling on playgrounds, road construction as an additive to asphalt, for decreasing ruts and road noise, for the production of moulded parts for industries and households, the production of mats for heat-, noise- and vibration damping in vehicles and at workstations etc. The three-step PALLMANN process sets the standard for high capacity, low operating costs and an excellent return on investment.



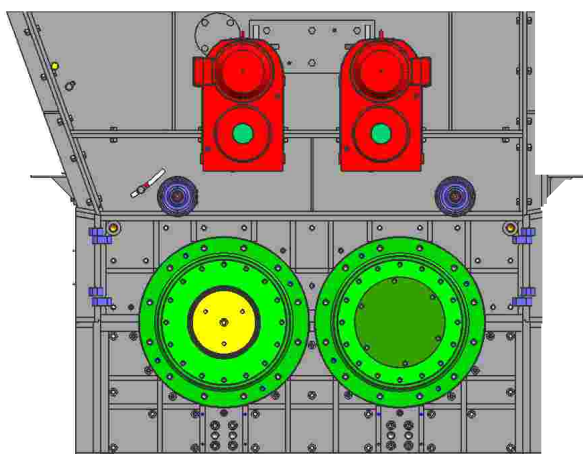
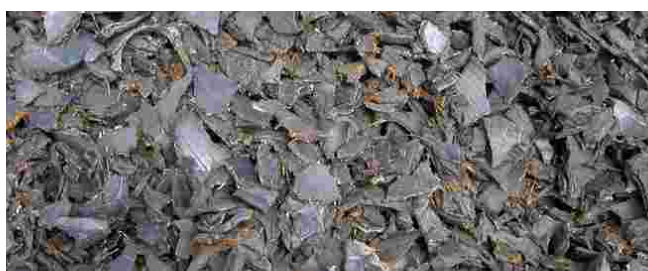


Shredding - Separation of Steel, Textile and Rubber

Double-shaft Shredder, PSDT - LION

The high-capacity shredder, type LION was specially developed for direct size reduction of truck tires into cleanly cut tire chips, size 50x50 mm. (TTC – Tire-to-chip). Cutting shafts for the production of larger tire chips are available (75, 100 and 150 mm). Each shaft has its own closed and load-controlled hydraulic drive. High torque at low speed cut even the strongest tires into pieces. All construction characteristics are designed for continuous operation in order to achieve highest throughput rates at lowest costs. Extremely precise tolerances between the cutting knives produce cleanly cut tire chips at low energy consumption. The cutting knives made of high quality CrNiMo-steel can be re-sharpened and reused which increases the service life and reduces the operating costs. The complete cutting chamber is lined with Hardox™ wear plates.

Large doors allow for easy access into the cutting chamber. We have put a lot of emphasis on time- and cost-saving maintenance that allows for increased availability. The LION achieves the highest throughput rates during trouble-free feeding of the scrap tires. For this application we supply specially developed tire feeders.

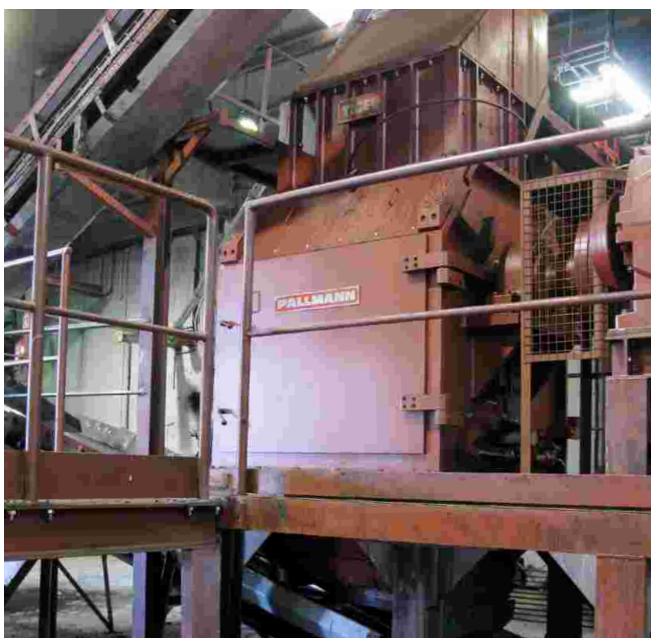


Type		PSDT 550x1250	PSDT 550x1550	PSDT 750x1250	PSDT 750x1800	PSDT 950x1800	PSDT 950x2700
Scale-up Factor	F=ca.	0,6	0,8	1,0	1,4	1,8	2,6
Infeed opening	mm	1250x1300	1250x1550	1650x1300	1650x1850	2150x1850	2150x2750
Motor	max. kW	110-160	132-200	160-250	200-315	315-400	355-500
Throughput rate	t/h	6,0 - 12,0	8,0 - 16,0	10,0 - 20,0	14,0 - 28,0	18,0 - 36,0	26,0 - 52,0

Single-shaft Shredder, PSRT - TIGER

The TIGER loosens the rubber-steel-textile compound. The produced geometry of the rubber particles is between 1 and 35 mm, depending on the type of screen and operating parameters. Steel and textiles are exposed and can be separated. We did not compromise anything during the construction of this special machine. The target was a simple and extremely robust machine. Steady and reliable size reduction, good preparation with extraordinary availability at lowest cost are the performance parameters with which the TIGER sets the newest standards of tire recycling in the industry. Material that cannot be size reduced can be determined before feeding by means of a photoelectric safety monitoring system and is automatically ejected through a coarse particle discharge. The patented concept of the tools allows for a high reliability at best preparation of rubber-steel-textile compound. The housing is divided and extremely massive.

The rotor is mounted in pedestal bearings outside the work area. The screens are hydraulically hinged. Exchangeable wear plates protect the entire work area as well as the whole surface of the rotor. Re-armoring in the machine is no longer necessary. Large access doors to the work area make for easy accessibility to all wear parts. Temperature control of the bearings is a standard as well as a hydraulic advance unit for the rotor. An optional vibration control drastically reduces the risk of damage. The components loosened by the TIGER can be easily separated by means of magnetic-, air- and screening technology.



Type		PSRT 600x1000	PSRT 600x1250	PSRT 1000x1250	PSRT 1000x1500	PSRT 1200x1750	PSRT 1400x2250
Scale-up Factor	F=ca.	0,4	0,6	1,0	1,25	1,75	2,5
Infeed opening	mm	450x1000	450x1250	750x1250	750x1500	900x1750	1050x2250
Motor	max. kW	132-160	160-250	315-355	400-500	600-700	800-1000
Throughput rate	t/h	1,6 - 2,8	2,4 - 4,2	4,0 - 7,0	5,0 - 8,7	7,0 - 12,2	10,0 - 17,5

Granulating and Pulverizing

Ultra-Granulator[®], PS-B - PANTHER

Rubber granules are granulated to desired particle size (< 2, 4, 6, 8 mm) in a third step by means of the PANTHER and are afterwards further freed from steel and textiles. The PANTHER produces cubical rubber particles, which are very well suited for the production of floor slabs and running tracks for playgrounds and sport arenas. Textile fibers and steel cord make up for approximately 30 percent of the weight of a tire. Granule purities of 99,99 percent, free from steel wire and 99,9 percent free from textile fluff can be achieved.

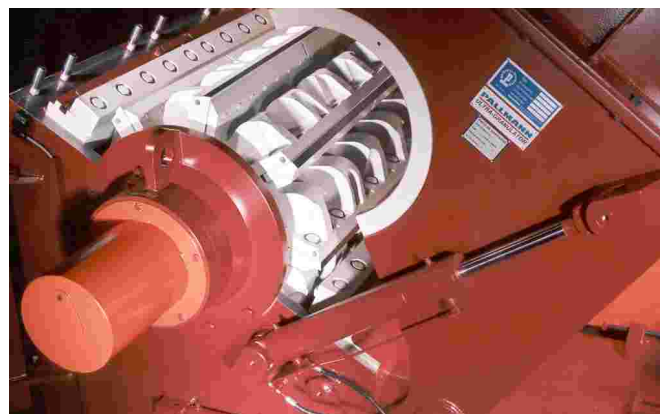
The PANTHER is an extremely heavily built knife mill with excellent cutting force. The knives in a shearing-type arrangement produce clean cut rubber granules at lowest energy consumption. The special cutting geometry ensures that the knife gap between the rotor and the stator knives remains constant for longer periods of time. Extreme stress of the components is thereby avoided.

During the design phase we have, in combination with practical experts from the industry, given special attention to constructive detail solutions. Therefore the housing is divided and can be easily opened hydraulically just like the material inlet. A large access door allows for excellent accessibility to the cutting chamber. The standard standstill control of the rotor during maintenance ensures for the necessary safety. Knives and screens can be easily exchanged in a timesaving manner.

Penetration of dirt into the rotors is already prevented outside of the cutting chamber due to the closed rotor bearings.

This also ensures that no grease can get into the grinding material. Thereby a maximum amount of

safety for the bearings and seals is ensured. Reliability and availability of this knife mill are unmatched.



Type		PS-B 630x800	PS-B 630x1000	PS-B 800x1250	PS-B 800x1600	PS-B 1000x2000	PS-B 1200x2500
Scale-up Factor	F=ca.	0,4	0,6	1,0	1,3	2,0	3,0
Infeed opening	mm	638x830	638x1030	810x1280	810x1630	1010x2030	1210x2550
Motor	max. kW	75-110	110-132	160-200	250-315	315-355	400-500
Throughput rate	t/h	0,4 - 0,8	0,6 - 1,2	1,0 - 2,0	1,3 - 2,6	2,0 - 4,0	3,0 - 6,0

TurboFiner[®], PLM - LYNX

The production of a high quality, secondary raw material as a natural rubber substitute from scrap tire rubber is best left to the specialists. In the pulverization step, a so-called LYNX is used, a special machine which under enormous pressure and shearing forces selectively breaks up the bonds in the scrap rubber material and partially re-establishes the original activity of the rubber. High quality rubber products can be directly produced from the rubber powder so achieved. This rubber powder is also excellently suited for use in road construction as an additive to asphalt.



CryoMill[™], PPST

During the cryogenic grinding process, the rubber granules are embrittled with liquid nitrogen and afterwards pulverized by means of impact crushing between counter-rotating pin discs. Finest rubber qualities can be so achieved. A proven technology from PALLMANN, used for the production of finest rubber powder with cubical particles. Most of the time the mill is used in combination with a screening machine. Screened coarse material can be re-introduced into the cooling screw for further size reduction. Machine and systems components are made of stainless steel and cold-resistant material.



Type		PLM 800	PLM 1000	PLM 1250	PLM 1600	PLM 1800	PPST 400	PPST 630
Scale-up Factor	F=ca.	0,4	0,6	1,0	1,6	2,0	1,0	2,2
Rotor diameter	mm	800	1000	1250	1600	1800	400	630
Motor	max. kW	110	160	250	400	500	30+45	75x75
Throughput rate	t/h	0,2	0,3	0,5	0,8	1,0		



Partners acting worldwide

The PALLMANN group of companies is the leading manufacturer of machines and systems for size reduction technology in the wood, plastic, processing and recycling industry. PALLMANN operates, at its headquarters in Zweibrücken, one of the world's largest research and technology centers as well as a training and service center. In addition to the manufacturing facilities in North- and South America, the PALLMANN group of companies maintains a worldwide spare parts and service network.



ECOTREC

ECOTREC is a Spanish company based in Barcelona and is specialized in the development of environmental technologies. The return on investment and the adherence to international regulations and environmental laws are always focused on. ECOTREC offers engineering and project management for the recycling of scrap and waste products, here especially for the preparation of scrap tires and brings production- and application know-how into the projects.

PALLMANN Industries Inc.
36 Atlantic Way
Clifton NJ 07012
USA
Phone +1 973 471 9135
Fax +1 973 471 7152
E-Mail: info@pallmannindustries.com
www.pallmannindustries.com

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
www.pallmann.com.br

PALLMANN Moskau Office
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@pallmann.ru

PALLMANN Maschinenfabrik GmbH & Co.KG
Wolfslochstraße 51
66482 Zweibrücken
Germany
Phone +49 6332 802 0
Fax +49 6332 802 401
E-Mail: recycling@pallmann.eu
www.pallmann.eu

PALLMANN Beijing Representative Office
Unit 13, 6th Floor of Tower A
Beijing Cofco Plaza
No.8, Jianguomennei Dajie, Dongcheng District
Beijing, China
Phone +86 10851 16826
Fax +86 10851 16825
E-Mail: info@pallmann.com.cn