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# Tyre recycling line

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**This offer is for complete line for tyres recycling .**

# 1. Specifications

Material:	wheel tires – private cars approx. – 40% truck tires up to 1800 mm approx – 60%
Quantity:	3 tons/hour of tyres
Output:	1 500 – 2 200 kg of granules in fractions 0-1, 1 – 2.5 and 2.5 – 3.0 mm 600 – 1 000 kg of steel 200-300 kg textile and dust

# 2. Offer

The technology divides into the 5 parts :

- A. Tyres preparation
- B. Preshredding line
- C. Granulating line
- D. Fine shredding
- E. Finer shredding
- F. Fine cleaning

## 2.1. Competitive advantage of the shredding line

**A.** The offered technology is based on the producer's extensive experience of waste processing. The shredding line construction reflects our experience of wheel tyre processing technological lines.

**B.** The offered equipment contains a complex system for process a whole tyre and obtaining highly negotiable granulated rubber at the end. When assessing the price of the equipment, it is essential to consider all its components.

**C.** All the shredders have a robust construction. High-speed equipment with dynamically balanced rotors is used for fine shredding. Machine components exposed to high abrasion are made of abrasion-proof steel HARDOX 500. The most loaded parts are hard-plated with Swedish tool-steel showing minimum abrasive wear after 1000-hour operation.

**D.** The shredding tools design allows for an easy production and replacement.

- The set of low-speed knives at the inlet can be re-sharpened after getting blunt and used for further shredding. The proper space for the low-speed knives is protected against abrasion by rotating plates at the side knives, which reduces the material abrasion at the stationary wall, preventing them from an early damaging.  
The high-speed knives for fine shredding allow use all four knife sides. The knives can be sharpened at least four times, which is positively reflected in the price and in the whole operation economics.

## 2.2. Description of material flow through the line, machines, prices

### A. Preparation line

*This part of the line is not necessary, but those machines helps to reduce production costs.*

The first step is to straight-cut tyres in 2 pieces. Material which is inside the tyre (stones, ...) can drop out. Half part of tyres is easy to manipulate.

Next step is debeader. It takes metal bead out of tyre. This operation is very important and has two meanings:

1. Wear of knives in preshredding and shredding line is less than 20% comparing with line without debeader
2. Clean metal is getting by this operation

For throughput 3t/hour we suggest 2 debeaders and 2 cutters.

If there are big tyres more that diam 1 200 mm up to 2 000 mm hydraulic shears are used to cut these tyres.

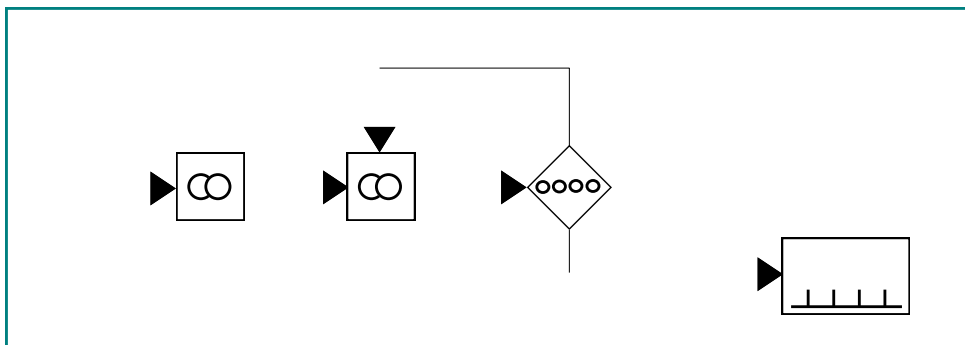
List of machines:

	Tyres preparation	pcs	kW total
1	Debeader	2	60
2	Cutter	2	10
3	Hydraulic shears	1	22

As a minimum for preparation tires we suggest 1 debeader.

## B. Preshredding line

The staff dose the tires by a conveyor into a two-shaft low-speed shredder ST IV-1300/70-150 KW. This shredder is designed especially for shredding tyres. The shredder has easy changable knives without dismounting the shredder. Knives are from special tool steel. The tires are pre-shredded into scraps. The scraps are around 70mm.



The rubber crumb then continues to a radial mesh that returns the pieces exceeding

70 mm back to the low-speed shredder. Undersize material is transported into the feeding reservoir that feeds shredding line by constant per-hour-quantity.

List of machines:

8	chain conveyor.800mm/6m-23°
9	Shredder SBH IV-1400/45-150 kW
10	Radial mesh 900/4000
11	Return belt w. 800mm/6m
12	Return belt w..500/6m-angular
13	Conveyor w.650mm/3m-500 mm - overhead
14	Conveyor w. 650mm/6m-23°

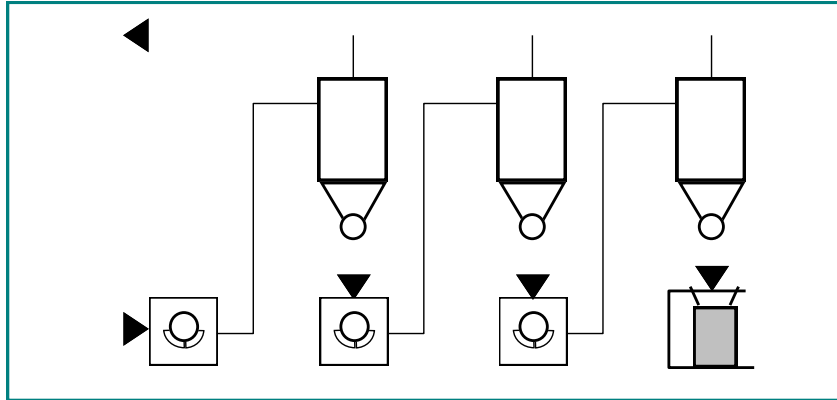
### **C. Granulating for obtain chips 20 - 30 mm**

The crumb from the reservoir is transported into granulation mill type GH in a precisely adjusted per-hour-quantity. The grinder power input is 200 kW. The GH mill is equipped with a 28 mm screen. First metal separation is behind the GH mill. Max. 1-5% of metal are in the rubber after the first separation. The rubber crumb produced after the mill is suitable as a substitute fuel, e.g. for cement works.

15	silo with feeder VP 1100x3000
16	Conveyor w. 650mm/6m-23°
17	GH 600/1200-6/6/20-200 kW
18	GH frame + chambre
19	Transport ventilator + V1 pipeline route, filter
20	Hermetic vibration feeder VP 1000x1500
21	Conveyor
22	Belt magnetic separator N.1
23	Conveyor w. 500mm-for rubber
24	Stainless conveyor w.500/4m for steel

### **D. Fine shredding for obtain granulate 0-4 mm**

After metal separation, the material goes on into the first mill G 600/1200/5/4/10. The mill's knives are made of a special material capable of shredding the mixtures containing residual metals. The screen in the mill output is a 10mm size. As well as at the GH grinder, the G mills shredding areas are hard-plated. Rubber crumbs are transported by a cyclone pneumatic transport. The 2nd mill G 600/1200/5/4/4 follows, with a 4mm screen. Double metal separation is in this part of the line. The crumbs are transported by a pneumatic transport consisting of blower, pipeline, cyclone and dust and textile removing. The outgoing crumbs are stored in BIG-BAGs.



List of machines:

25	Conveyor
26	silos for G1
27	Screw conveyor
28	Mill G1 600/1200 90 kW
29	Transport ventilator + V1 pipeline route, filter
30	Vibration feeder
31	Drum magnetic separation N.3
	Screw conveyor
32	Separator ROX
33	Double vibration sorter 800x2000 mm
34	silos for G3
35	Screw conveyor
37	Mill G3 600/1200 90 kW
38	Transport ventilator + V1 pipeline route, filter
39	Vibration feeder with bar screen
40	Drum magnetic separation N.4
41	Separator ROX
42	Vibration sorter JK Machinery
43	Screw conveyor
44	Silo 2 – 3 mm
45	Silo 0 – 2 mm
52	Textile treatment by air
	Galleries and constructions
	Feasibility study, project design
	Central electric control

### **E. Finer shredding for obtain granulate 0 - 3 mm**

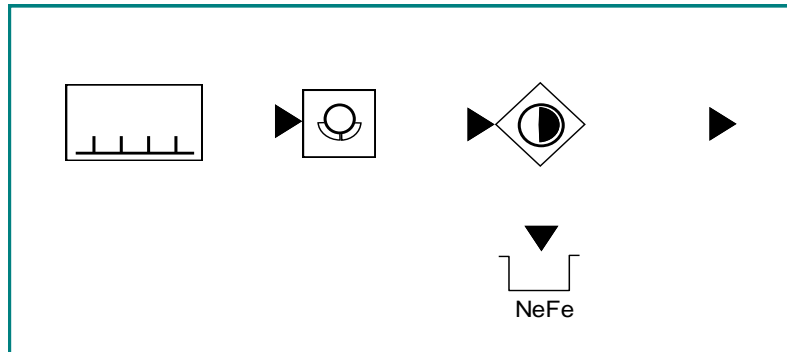
For obtain better and finer granulate the 3dr step of fine shredding is neccesary. The 3rd G 600/1200/7/4/3, has a 3mm screen. Pneumatic transport with crumbs suction under the mesh provides for a good function.

List of machines:

18	Reservoir for G3	1	2
26	Screw conveyor	1	1
29	Mill G3 600/1200 90 kW	1	90
30	Transport ventilator + V1pipeline route, filter	1	22
31	Vibration feeder	1	1
32	Drum magnetic separation N.5	1	1
	Screw conveyor		1
33	Textile separator ROX	1	3
34	Double vibration sorter 800x2000 mm	1	3

## F. Granulate final treatment

The final treatment technology consists of a mesh and fluid sorter system that size the rubber crumbs, removing residual magnetic metal and textile. The outcoming material is then transported to BIG-BAGs and taken for further processing. Continuous suction provides for dust-free technology.



List of machines:

46	Feeder for cleaners	4	4
47	Fine textile cleaners JK	5	15
48	Conveyor for clean rubber	6	6
49	screw conveyor	3	3



## 2.4. Assembly

The assembly can be carried out on a flat floor with no extra construction adjustments. The assembly takes about max. 30 working days.

## 2.5. Major machines - Technical parameters

### ST 1300:

Shredding area size	1600x950mm
Knife width	70 mm
Rotor revolution	20 rev/min...infinitely variable
Drive	2xplanetary gearing box
Power	155 kW
Number of rotor holders/knives	18/432
Power output on a shaft	75+75 kW
Throughput	5 - 15 t/hour
Lowering hydraulic aggregate power input	3 kW
Weight	15 t
Rating moment	100000 Nm
Dimensions w x l x h	3000x5000x3000

### GH600/1200-6/6/28:

Rotor diameter	600mm
Rotor length	1200mm
Rotor revolution	500 rev/min
Electric engine power input	200 kW
Electric engine revolution	1470 rpm
Number of rotor knives	6x4=24 pcs
Number of renewed knives	6x2=12 pcs
Power output on 30 mm mesh at 70x70 mm inlet, incl. dust	2-3t
Lowering hydraulic aggregate power input	0,37 W
Weight	10 t
Dimensions w x l x h	2500x4000x3000

### G600/1200-7/4/10:

Rotor diameter	600mm
Rotor length	1200mm
Rotor revolution	500 rpm
Electric engine power input	90 kW
Electric engine revolution	1470ot/min
Number of rotor knives	7x2=14 pcs

Number of renewed knives	4x2=8 pcs
Power output on 10 mm mesh at 28 mm inlet, incl. dust	2t
Lowering hydraulic aggregate power input	0,37 W
Weight	8 t
Dimensions w x l x h	2500x4000x3000

**G600/1200-7/4/4:**

Rotor diameter	600mm
Rotor length	1200mm
Rotor revolution	500 rev/min
Electric engine power input	90 kW
Electric engine revolution	1470 rpm
Number of rotor knives	7x2=14 pcs
Number of renewed knives	4x2=8 pcs
Power output on 4mm mesh at 6mm inlet, incl. dust	1,5t
Lowering hydraulic aggregate power input	0,37 W
Weight	8t
Dimensions w x l x h	2500x4000x3000

**G600/1200-7/4/3:**

Rotor diameter	600mm
Rotor length	1200mm
Rotor revolution	500 rev/min
Electric engine power input	90 kW
Electric engine revolution	1470 rpm
Number of rotor knives	7x2=14 pcs
Number of renewed knives	4x2=8 pcs
Power output on 3mm mesh at 4mm inlet, incl. dust	1 t
Lowering hydraulic aggregate power input	0.37 W
Weight	8 t
Dimensions w x l x h	<b>2500x4000x3000</b>

## 3. Application

### 1. Recycled tire rubber (rubber crumb)

#### **Sport surfaces**

Rubber crumb is used for sports ground ( football, basketball, ...), playgrounds, racecourses and athletic surfaces. Playgrounds and athletic surfaces are frequently covered with a layer of rubber granules in order to help prevent injuries. Many stadiums throughout the industrialized world have running tracks that consist of recycled material. Most commonly, a moisture-curing urethane is mixed with 4-10 mesh crumb rubber and applied in a similar way as other poured pavements

#### **Molded Products**

In the past few years, the increasing supply of crumb rubber and a newly developed moisture-curing urethane binder has led to a rapid increase in the number of products made by simple compression molding. Typically, this method is used to produce high-volume, low-tech products, such as livestock mats, railroad crossings, removable speed bumps and athletic mats.

#### **Thermoplastic-Elastomer Compounds**

Combining crumb rubber with a thermoplastic binder at high temperatures yields a material that can be processed more like a thermoplastic compound, but still has some of the elasticity of rubber. This is a very cost effective method of producing high volume products such as acoustic insulation in cars, pallets, railroad crossings, etc

#### **Rubber Modified Asphalt (RMA)**

Increased resistance to rutting, reflective and thermal cracking are the main benefits of RMA. Other advantages include better de-icing properties, reduced traffic noise and, most importantly, a significantly increased service life and thus a lower life cycle cost

### 2. Steel wires and beads

Steel wires and beads from recycled tires are used as common steel scrap.

### **3. Textile**

Separated textile from recycled tires is possible to use as alternative fuel in cement plants.

**If You need more information, send us Your request**

**We can prepare offer according to Your request. For this offer we need next information from You :**

- 1. Type of tires**
- 2. Throughput (t/hour)**
- 3. Dimension of output**

