



Granutech-Saturn Systems



Tire Granulation System



Systems designed to ensure the highest possible production rates while generating the industry's cleanest, finest, powdered material.

The Granutech System

Granutech-Saturn is one of the world's premier designers and manufacturers of high-quality equipment for turning scrap tires into valuable crumb rubber material. Turnkey systems from Granutech-Saturn ensure the highest possible production rates while generating the industry's cleanest, finest, powdered material.

Systems from Granutech-Saturn take material through a four-stage process including:

- **Primary shredding** — Saturn low-speed high-torque shredders provide ideal primary reduction of scrap tires
- **Secondary processing** — Granutech Grizzly grinders have established themselves as the optimum method for efficient, productive, secondary scrap tire processing. Grizzly technology liberates rubber from the steel contained within, resulting in a product that is consistently better than 98% steel-free. In a host of scrap tire processing applications, the Grizzly has proven successful in more than doubling throughputs.
- **Granulation** — Taking material through a Granutech G-3 Granulator provides the initial step in the actual crumb process and affords excellent initial fiber separation.
- **Final Processing/Refining** — The final step in the crumb rubber process includes routing material through a Granutech G-4 which generates material as fine as 100 mesh and allows for secondary fiber separation.

The following pages offer a closer look at the full scrap tire reduction process including the specific components and equipment needed to make up a turnkey Granutech-Saturn



Stage One

Granutech-Saturn Model 72-44BGHT Shredder

The initial stage in the crumb rubber process involves feeding as many as 2,500 whole tires/hour to a Saturn Model 72-44BGHT shredder to reduce them to strips of varying sizes. A classification system re-directs oversized material back for additional shredding until up to 8 tons/hour of material in a manageable 50-80mm size is created.

Shredder Specifications

• Shredder Inlet Opening	72" x 44"
• Shredder Outside Dimensions	152" x 73" x 43"
• Power Unit Dimensions	144" x 90" x 69"
• Shredder Weight	28,000 pounds
• Power Unit Weight	11,000 lbs. (dry)

Shredder Details

• Cutter Shaft	Torque: Fast – 48,915 ft./lb. Torque: Slow – 48,915 ft./lb.
• Cutter Speed	Fast Shaft – 24 RPM Slow Shaft – 21.4 RPM
• Cutter Force	Fast: 52,176 lbs. Slow: 52,176 lbs.
• Shaft Diameter	8" hexagon (across flats)
• Cutter Diameter	22.50" @ hooks

Power Unit — Open Loop, Skid Mounted

• Electrical Power	300 HP (3 x 100)
• Hydraulic Flow	238.5 GPM
• Rated Pressure	3000 PSI



Stage Two

Granutech Grizzly

Secondary processing using Granutech's Grizzly Grinder, involves taking up to 4 tons/hour of primary shred chips down to sizes in the 15mm or less range. During this step in the process, steel contained in the rubber is effectively separated out resulting in as much as 3 tons/hour of product that is 98% steel-free. Material at this stage can be marketed as high quality low-steel tire derived fuel (TDF) for a wide variety of combustion applications. Further steel separation allows production of steel free rubber.

Grizzly Specifications:

- *Horsepower* 300
- *Grizzly Inlet Opening* 80" x 23"
- *Grizzly Outside Dimensions* 233" x 127" x 176"
- *Grizzly Weight* 58,000 pounds

Grizzly Details:

- *Rotor Shaft Inertia (lb-ft²)* 15,000 Lbs.Ft.2
- *Rotor Shaft Speed* 321 RPM
- *Stationary Knives* 10
- *Rotor Knives* 50
- *Cuts Per Minute* 16,050
- *Shaft Diameter* 14"
- *Cutting Diameter* 34.50"
- *Rotor Length* 77.5"
- *Screen Area* 3476 sq. inches



Stage Three

Granutech G-3 Granulator

The minus 15 mm chips are then fed to a walking-floor chip bin for storage. To get as much as 3 tons/hour of 15mm material down to sizes of 6mm or less, a variable-feed screw feeds the chips to a Granutech G-3 Granulator. Material is removed from the G-3 via vacuum pneumatics which move it on for metal separation. Minus 6mm material that is virtually wire-free, is then conveyed into the fine grind mill feed storage bin or sent directly to the bagging area for packaging to go to end markets. Material at this stage can be marketed for a number of applications, including: soil amendment, playground material, road sub-base, sports fields, and some molded product applications. Prior to being sent for mill refining, material cleanliness is further enhanced by being run through a G-3 Gravity Bed Fiber Separator.

Granutech Model G-3 Granulator Specifications:

Drive Motor

<i>Horsepower</i>	200
<i>Motor RPM</i>	1800
<i>Voltage -</i>	3Ø440VAC
<i>Full Load Amperage</i>	230 Amps
<i>Recommended Service Entrance</i>	350 Amps

<i>Rotor RPM</i>	900
<i>Total Weight (in pounds)</i>	15,000
<i>Cutting Chamber</i>	24" x 28"
<i>Fly Knives</i>	2
<i>Bed Knives</i>	3
<i>Cutters — Quantity (Size)</i>	
<i>Rotor</i>	56 (1")
<i>Stationary</i>	84 (1")



Stage Four

Granutech G-4 Dual-Drive Refiner Mill

The final step in the crumb rubber process routes as much as 2.5 tons/hour of near steel-free, low-fiber 6mm granules to a Granutech G-4 refiner mill which generates volumes as high as 2.2 tons/hour of 20 to minus 100 mesh crumb rubber. At this point, fiber and other contaminants are removed using a proprietary triple-action gravity bed separator.

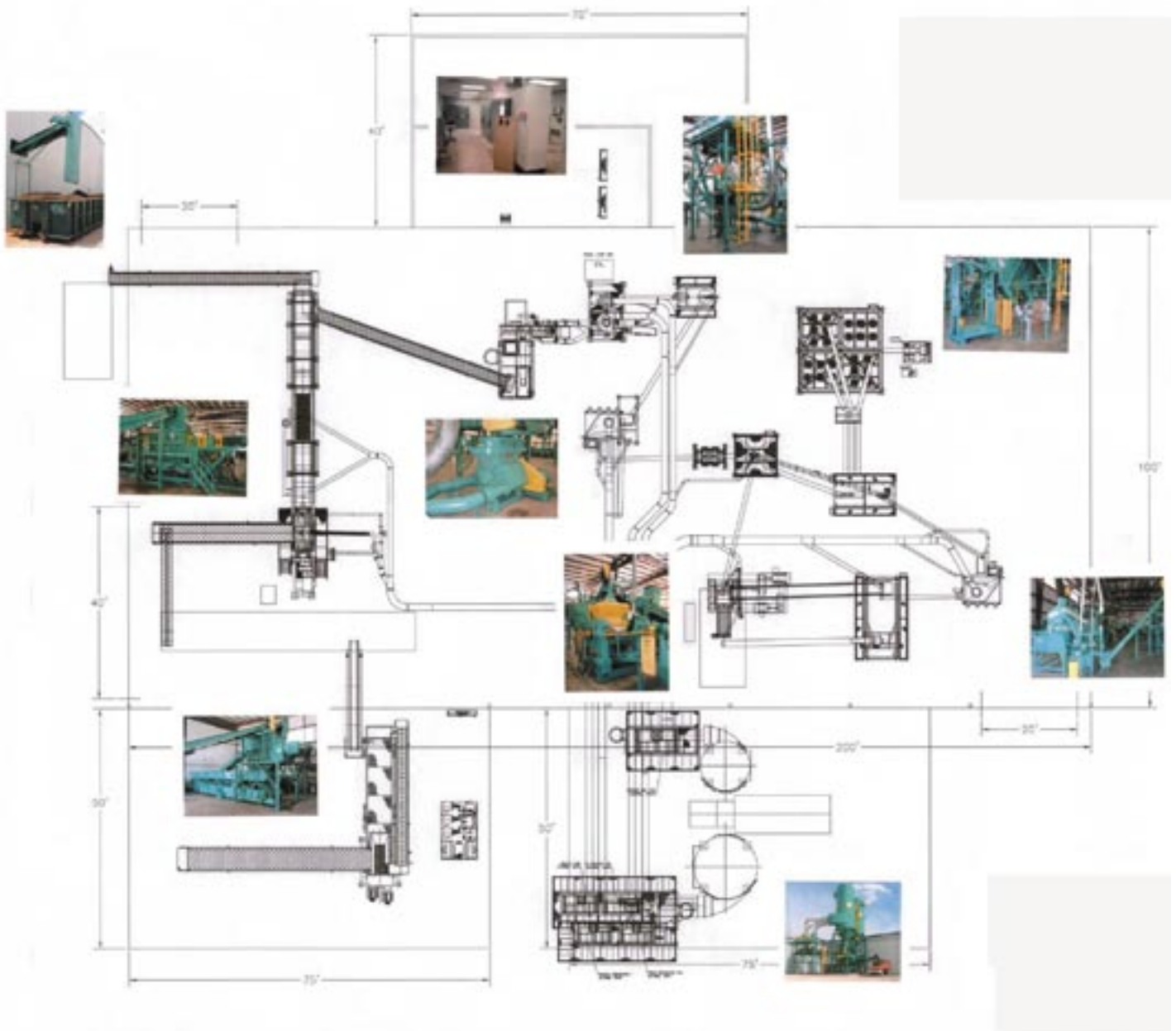
Specifications: Granutech G-4 Dual Drive 24"X24"X36" Refiner Mill

- **Controls** Variable roll speed and ratio controls with LED readout.
- **End Frames** Heavy duty cast mill frames. Machined and doweled to mill base.
- **Rolls (Rear)** 24" diam. x 36" face, hollow chambered, chilled iron, cored body design, 14" diam. journal necks.
- **Rolls (Front)** 24" diam. x 36" face, hollow chambered, chilled iron, cored body design, 14" diam. journal necks.
Roll Bodies corrugated to customer specifications.
- **Roll Speeds** Fast roll 6 to 90 RPM (37.67 to 565.48 FPM)
Slow roll – 3 to 45 RPM (18.85 to 282.74 FPM).
- **Roll Ratio** From 2:1 to 30:1
- **Roll Cooling** Roll ends equipped with rotary unions for water-cooling.
- **Bearings** Full circle bronze journal liners (SAE 64).
- **Lubrication** Automatic Lincoln pneumatic lube station with bearing temperature probes and PLC monitoring.
- **Batch Guides** Split and adjustable type.
- **Thrust Screw Arrangement** Adjusting screws attached to front bearing housings with pull back devices for opening front roll nip setting.
- **Guards** OSHA approved
- **Safety** Overhead cable safety with manual reset safety switch.
- **Machine Base** Steel fabricated base. Machine installation will be at floor level.
- **Drive Motor** 250 HP constant speed motor on high speed roll.
125 HP secondary drive motor on low speed roll. Customer specified voltage/frequency.
- **Gearbox** New parallel shaft, foot mounted gear unit, rated at 542 HP.
- **Ratio** 28.6 to1.



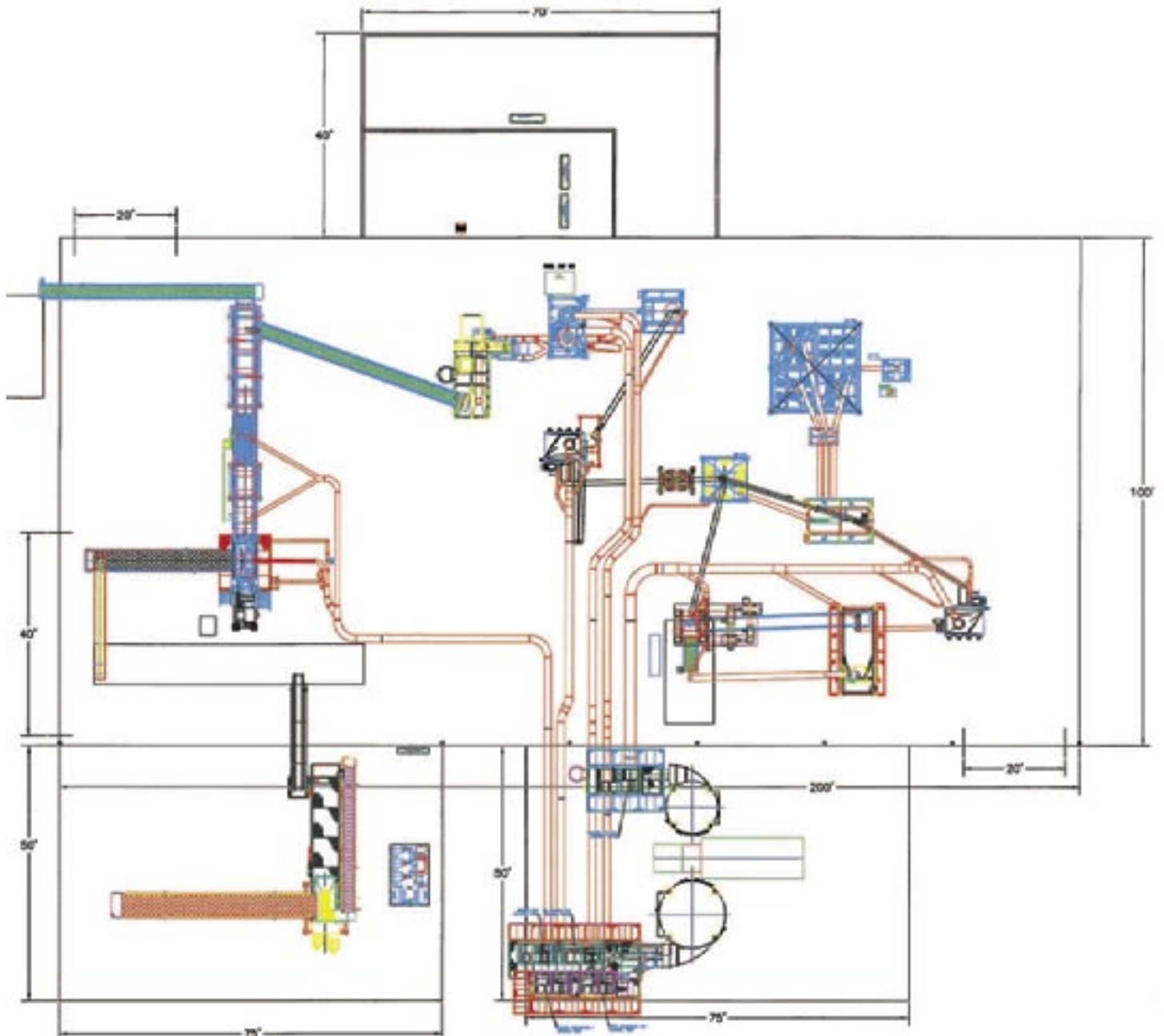
Crumb Rubber Processing Facility

Typical Plant Component Overview



Crumb Rubber Processing Facility

Typical Plant Schematic



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Granutech Saturn

شركة جرانيتوك ساترن الامريكية تأسست عام 1965 وعملت في مجال كيس وتقطيع السيارات التالفة حتى عام 1979 حيث أضافت إلى خطوط انتاجها معدات تدوير الاطارات وبهذا فهي من أولى الشركات المتخصصة في العالم بهذا المجال، تقوم الشركة حاليا بتصنيع وتوريد وتركيب خطوط تدوير الاطارات التالفة حول العالم وهي الشركة الوحيدة التي تصمم وتصنع معداتها ولا تحتاج لاستخدام معدات من شركات أخرى.

خطوط معدات جرانيتوك تحتوي على مكونات غير موجودة في خطوط الشركات الاخرى مثل حمام الماء لتنظيف الاطارات من التربة، معدات فصل التربة عن بودرة الاطارات، معدات تجنب الشرارة الكهربائية بخط فرز الكتان، معدات اطفاء الحريق ضمن خط الانتاج هذا وجميع معدات الخط تعمل من خلال وحدة تحكم إلكترونية مركزية وشاشات مراقبة كلها في غرفة تحكم منفصلة عن الخط وبذلك فإن موظف واحد هو الذي يدير خط التدوير بالكامل.

ويتكون خط تدوير الاطارات الذي تقدمه جرانيتوك من أربعة مراحل رئيسية الأولى هي تقطيع الاطارات والسلك والكتان معا بطاقة تصل إلى 17 طنا بالساعة "1900 إطار شاحنات مثلا" بواسطة كسارة تصل طاقتها إلى 550 حصان تعمل بالكهرباء أو موتور ديزل والمرحلة الثانية هي التقطيع الأصغر بواسطة كسارة قوية تصل قوتها إلى 400 حصان ثم كسارة أخرى سريعة تنتج حبيبات حجمها بحدود 6 ملم، والمرحلة النهائية هي تصفير الحبيبات إلى 0.425 ملم "40 ميش" أو أصغر.

وبين هذه المراحل يزال السلك والكتان عدة مرات حتى تصل درجة نقاء الحبيبات إلى 99,99% خالي من السلك و 99,95% خالي من الكتان وهذه هي المواصفات العالمية لأفضل أنواع البودرة المستخرجة من الاطارات التالفة.

وتتم جميع هذه المراحل تحت عملية تبريد متواصلة لضمان عدم رفع حرارة الحبيبات أثناء التشغيل وذلك لتجنب المطاط أي ضرر في مواصفاته بحالة ارتفاع درجة الحرارة

تبدأ أسعار خطوط الانتاج من 750 ألف دولار وذلك حسب الطاقة الانتاجية، حجم الاطارات الداخلة للخط وحجم الحبيبات المنوي انتاجها.

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