

**C.A.R.E. - MAY 2006**

**CARPET RECYCLING**

**FROM A TO Z**

**DAMON DEDO**

**GRANUTECH-SATURN SYSTEMS**



# ***THE PROCESS***

## A) FEEDING

- Bulk
- Conveyor
- Bale quality

## B) SHREDDING/GRINDING

### - THE ROTO-GRIND

Bigger is better, more torque!

- Principle of operation
- Variables with carpet types
- Wear parts (Cutters, Screens, Etc.)
- Power
- Dimensional data
- Maintenance

# ***THE PROCESS - continued***

## ***C) DISCHARGE SYSTEMS***

- Mechanical, conveyor, etc.
- Pneumatic

## ***D) PERIPHERALS***

- Metal detection
- Dust collection
- Fines separation, screening

## ***E) PRODUCT SIZING OPTIONS***

- \_\_\_ - Grizzly Shredder

## ***F. BUDGETS***

- Operating Costs  
wear parts  
utilities
- Capital costs  
Roto-Grind\_\_\_\_\_  
Material handling  
Peripherals

## ***G. EXPERIENCE***

# ***FEED SYSTEMS***

A) BULK LOADING

B) CONVEYOR LOADING

C) BENEFIT'S ONE VS. OTHER

D) FEED STOCK INTEGRITY!

# ***THE ROTO-GRIND***

- FOR CARPET RECYCLING “BIGGER IS BETTER”
- NO ROOM FOR SMALL, LOW POWER MACHINES
- AT A MINIMUM, YOU NEED 200HP, COULD BE MULTIPLE MACHINES OF 300+ HP
- TWIN DRIVE ROTOR PRODUCING UP TO 40,000 FT./LBS. OF TORQUE



- CLOSELY INTERACTS WITH POWERFUL, INTEGRATED FEED RAM



- SOPHISTICATED LOAD SENSING CONTROLS PRODUCE MAXIMUM PERFORMANCE BY KEEPING THE ROTOR FULLY LOADED

## ***ROTO-GRIND (continued)***

### ***VARIABLES THAT IMPACT PERFORMANCE***

- Types of cutters, 30mm, 40mm, 60mm
- Types of screens, if any (circular, zig-zag)
- Rotor speed, variable
- Ram force, rotor torque
- Type of carpet, form - loose or bale



**POWER** - HYDRAULIC DRIVE THAT PRODUCES THE HIGHEST AVAILABLE ROTOR TORQUE!

TWIN DRIVES, VARIABLE SPEED



## ***ROTO-GRIND (continued)***

***RAM - MUST GENERATE HIGH FORCE TO REACH MAXIMUM CAPACITY. UP TO 40HP RAM***



***GENERATE RAM FORCES UP TO 39,000 FT./LBS.***

## ***HIGH CUTTER MAINTENANCE APPLICATION***

- Expect cutter life of a few days with 24 hr./day operation.
- Most applications allow 4 useful points (or turns) of the cutter; with carpet, film or fiber, only 2.
- Cutter change can take up to three hours

### **CUTTER BLADE HOLDER TYPES- BOLT-IN, WELD-ON**

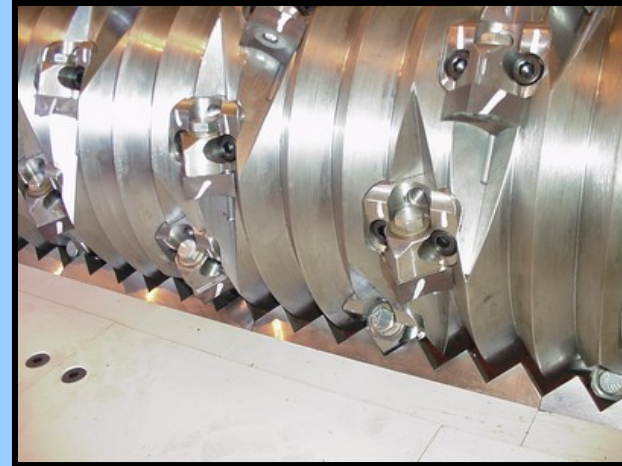
- Roto-Grind features a unique stationary cutter that permits multiple uses, can be re-ground and re-used. It also allows adjustment of cutter clearances for efficient material size reduction.



## *CUTTERS, BLADE HOLDERS, SCREENS*



**40mm cutter, weld-on and bolt-on rotary cutter blade holder, and stationary cutter**



**Standard Round Hole Screen**



**Zig-Zag Fiber Screen**

# ***PRODUCT DISCHARGE***

- *Mechanical, conveyor*

Can be more expensive. Simple, but can be a cause for housecleaning concerns.



- *Pneumatic*

Less floor space - more flexible layout design possibilities



# ***PERIPHERAL COMPONENTS***

## ***METAL DETECTION***

- \* Roto-Grinds do not tolerate heavy contamination
- \* Banding cutters, hammers, and wrenches are not combustible and do not shred well. There is no need to process them! Avoid at all costs
- \* If bulk loading, bale integrity must be known
- \* If conveyor feeding, metal detection should be installed



## ***PERIPHERAL COMPONENTS (continued)***

### **DUST COLLECTION**

- \* Carpet processing is extremely dirty and dust collection is recommended if not mandatory
- \* Enclosures required on feed hopper
- \* Dust collection also required at discharge area



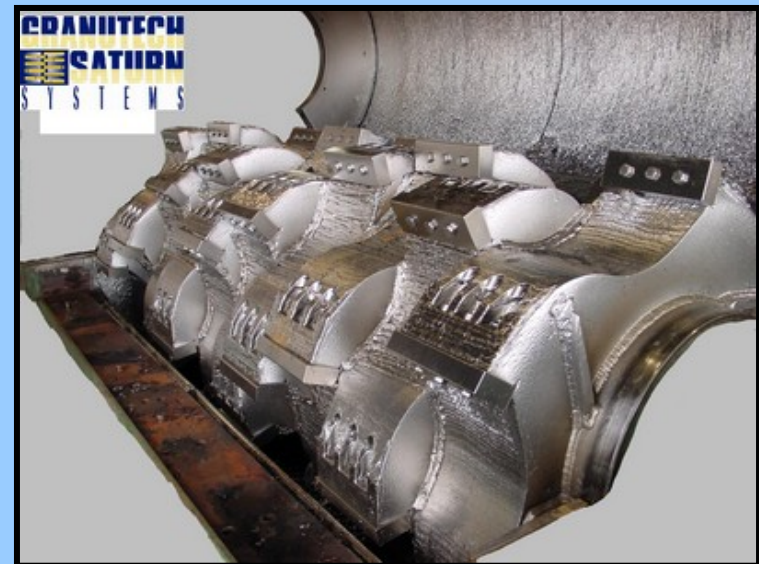
## ***PERIPHERAL COMPONENTS (continued)***

### **SCREENING**

\* Many applications want fines separated following grinding and this can be accomplished by processing the carpet fluff across a vibratory conveyor with a perforated pan.



**SECONDARY SIZE REDUCTION**  
**LIBERATION OF  $\text{CaCO}_3$  AND ADHESIVES (99.99%)**  
**MODEL 80 GRIZZLY SHREDDER**



**CAPACITY (WITH PRIMARY CARPET SHREDS AS FEEDSTOCK)**

- 3/8" SCREEN.....6000 LBS./HR.
- 1/2" SCREEN.....9000 LBS./HR.

## ***THE COST***

- Wear parts represent the greatest percentage of carpet recycling expense. Desired product size will strongly effect cutter costs. Budget \$3.50-\$7.50 per ton for cutter costs.
- The single rotor shredders are efficient, but use significant motor horsepower - many are 300HP. Utilities can represent a cost per ton of \$2.00-\$7.50 assuming .10¢ kWh.
- Capital Costs
  - \* Roto-Grind pricing for carpet processing will begin at \$200,000 and can approach \$400,000 for larger machines with special features.
  - \* Material handling and associated components can add as little as \$75,000 or as much as \$200,000 to the system cost.

## ***NOTABLE ROTO-GRIND CARPET APPLICATIONS***

A. NYCORE (Minnesota)

B. MAJOR SOUTHEASTERN CARPET RECYCLER

C. SHAW/SIEMENS (Dalton, GA)

D. NUMEROUS OTHER FIBER RECYCLING APPLICATIONS

***THANK YOU***

***DAMON DEDO***

***GRANUTECH-SATURN SYSTEMS***

***201 E. SHADY GROVE RD.***

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***[www.granutech.com](http://www.granutech.com)***

