

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



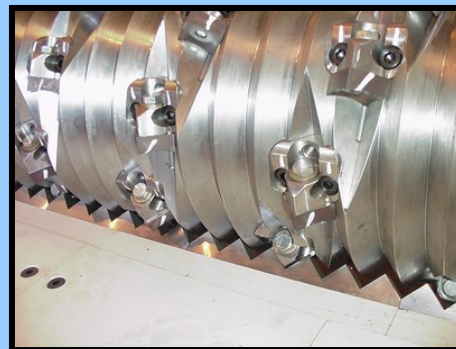
GENERATE RAM FORCES UP TO 39,000 FT./LBS.

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

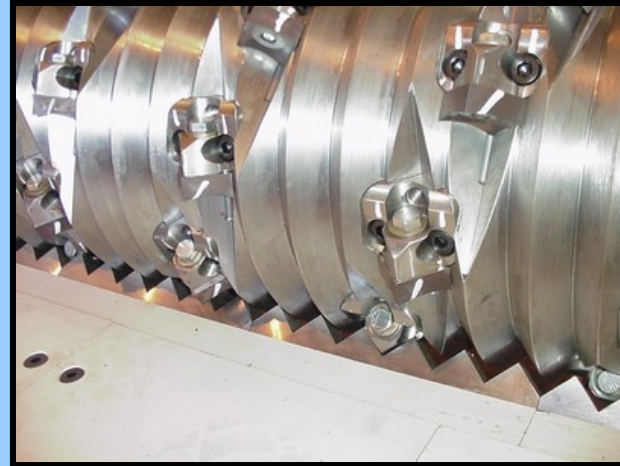
- Roto-Grind features a unique stationary cutter that permits multiple uses, can be re-ground and re-used. It also allows adjustment of cutter clearances for efficient material size reduction.



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 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.

GRAND PRAIRIE, TX 75050

www.granutech.com

