New Developments in Recycling Fiber and Carpet Waste

Presented by:
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Fiber & Carpet Scrap Forms

Fiber Bales

Carpet Rolls

Carpet Squares

Why Is Carpet So Difficult To Recycle?

Answer:

Carpet is a complex combination of different polymers and additives with different properties and methods of recovery.

Value of the recovered material is highest when they are separated.

This Presentation Covers

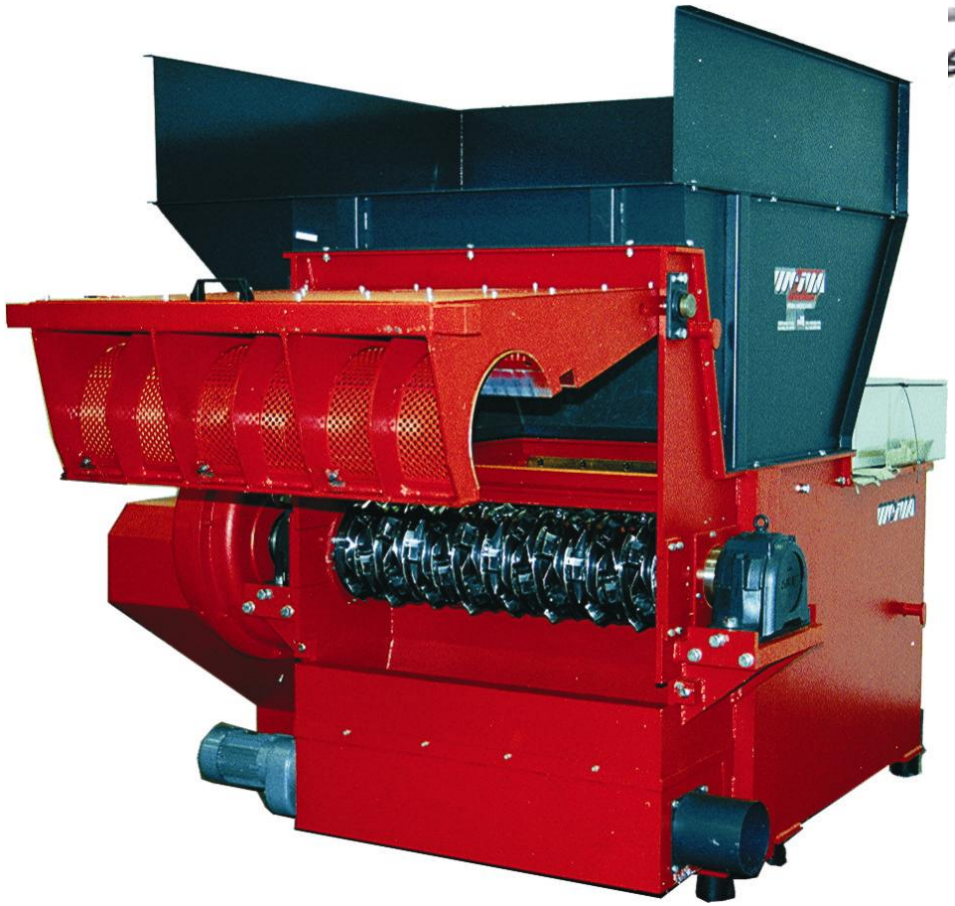
Carpet Recycling Techniques and Equipment, Focusing on…

Size Reduction Equipment

Separation Technology

Repelletizing Systems

Single Shaft Shredders

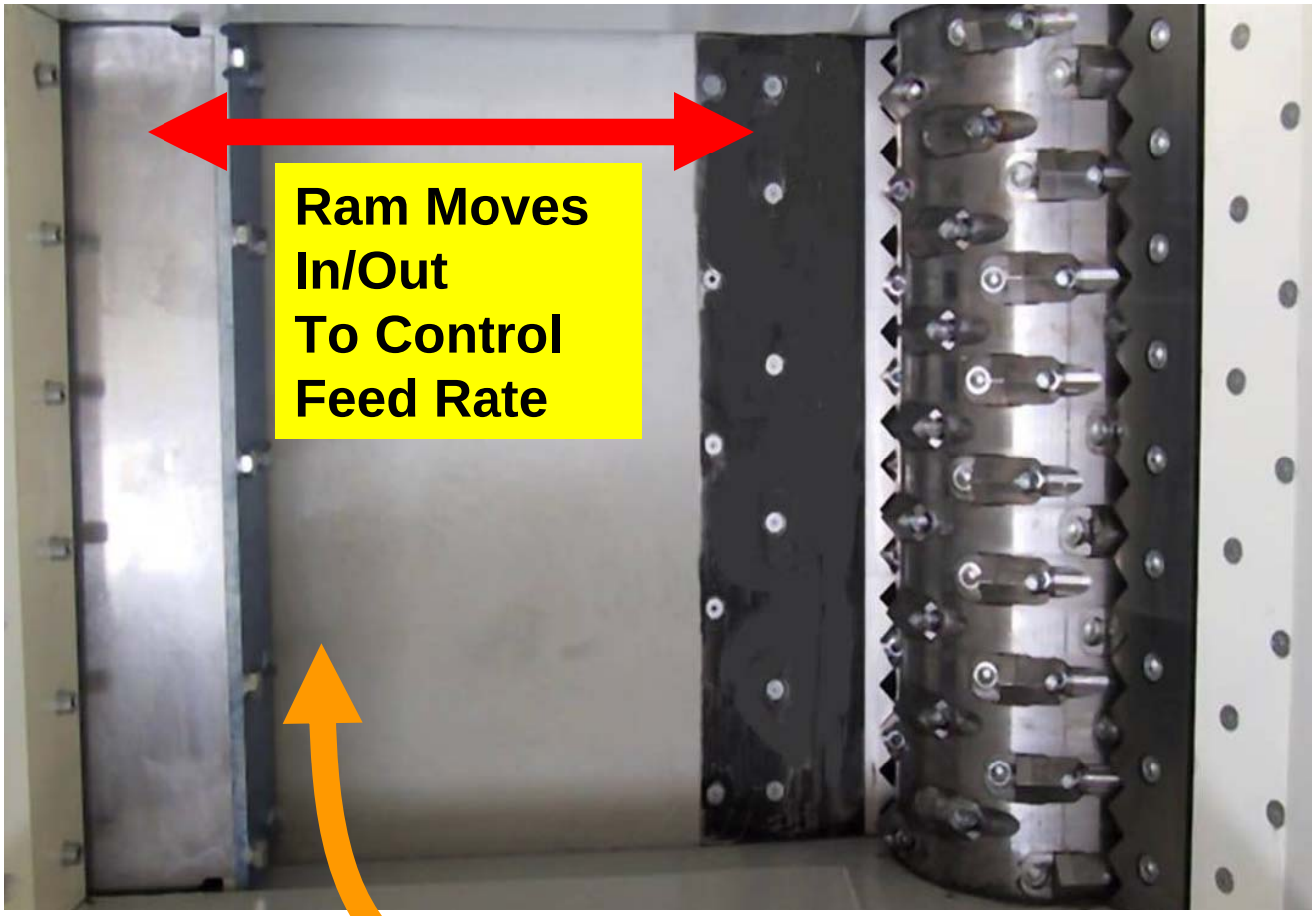


Single-shaft Shredders are good for breaking up carpet into 1-3” sized pieces .

Grinders are used to further reduce the particle size for finer separation if needed.

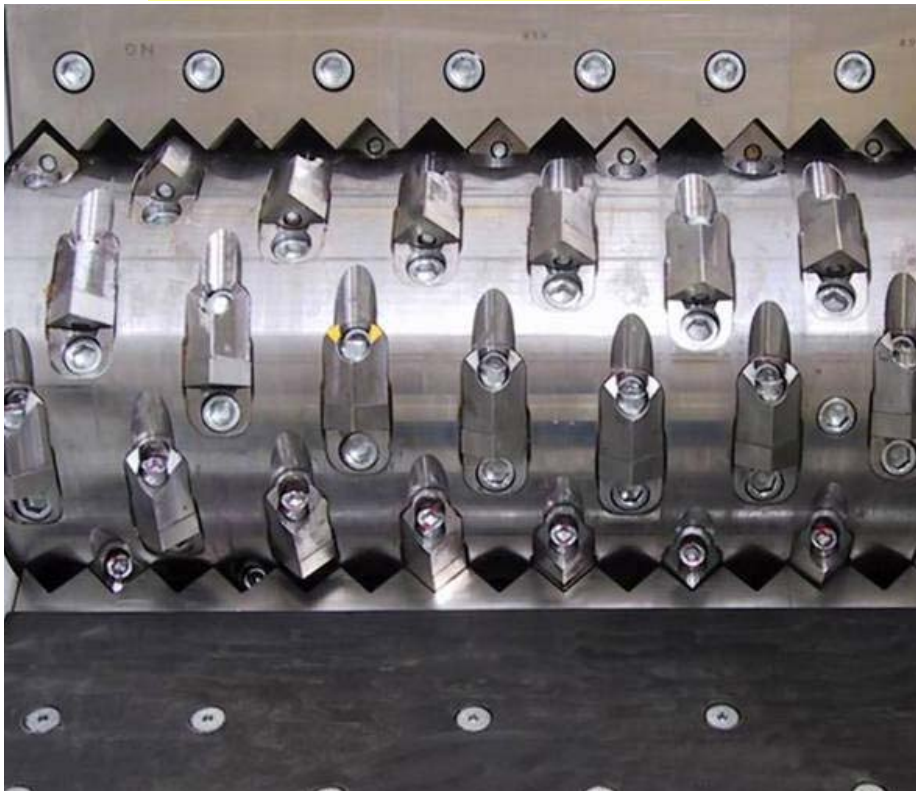
Designed for Operator to “Dump & Run”

Hydraulically powered ram feeder is controlled by shredder amp feedback to feed consistently without constant operator attention.



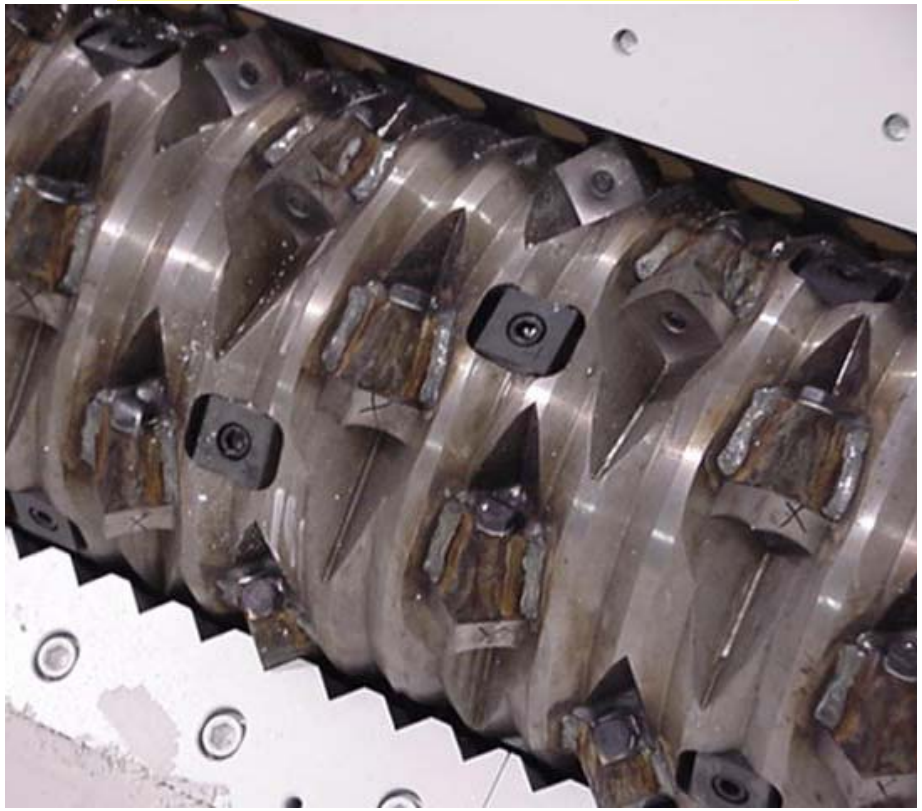
Single-Shaft Shredders:
Rotor Designs

Standard Rotor Design



Works great for materials like hard scrap and purgings.

Film and Fiber Rotor Design



Fiber and carpet are difficult to handle- special design prevents wrapping and increases throughput.

Carpet Square Recovery

Carpet squares are made up of the face fiber and the backing.

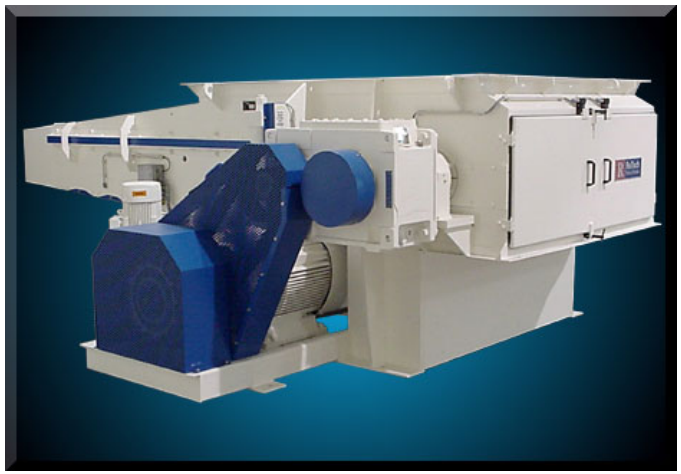
In order to recover the highest value, it is necessary to separate the face fiber from the backing before recycling.

Carpet Square Recovery

Step 1. Size Reduction

Carpet squares and trims are chopped into small pieces using a single shaft shredder, followed by a grinder:

Scrap material



Shredder

reduces to 1 to 3 inch pieces

Grinder

Final particle size 1/4 to 3/8 inch for separation

Elutriator…

Fiber

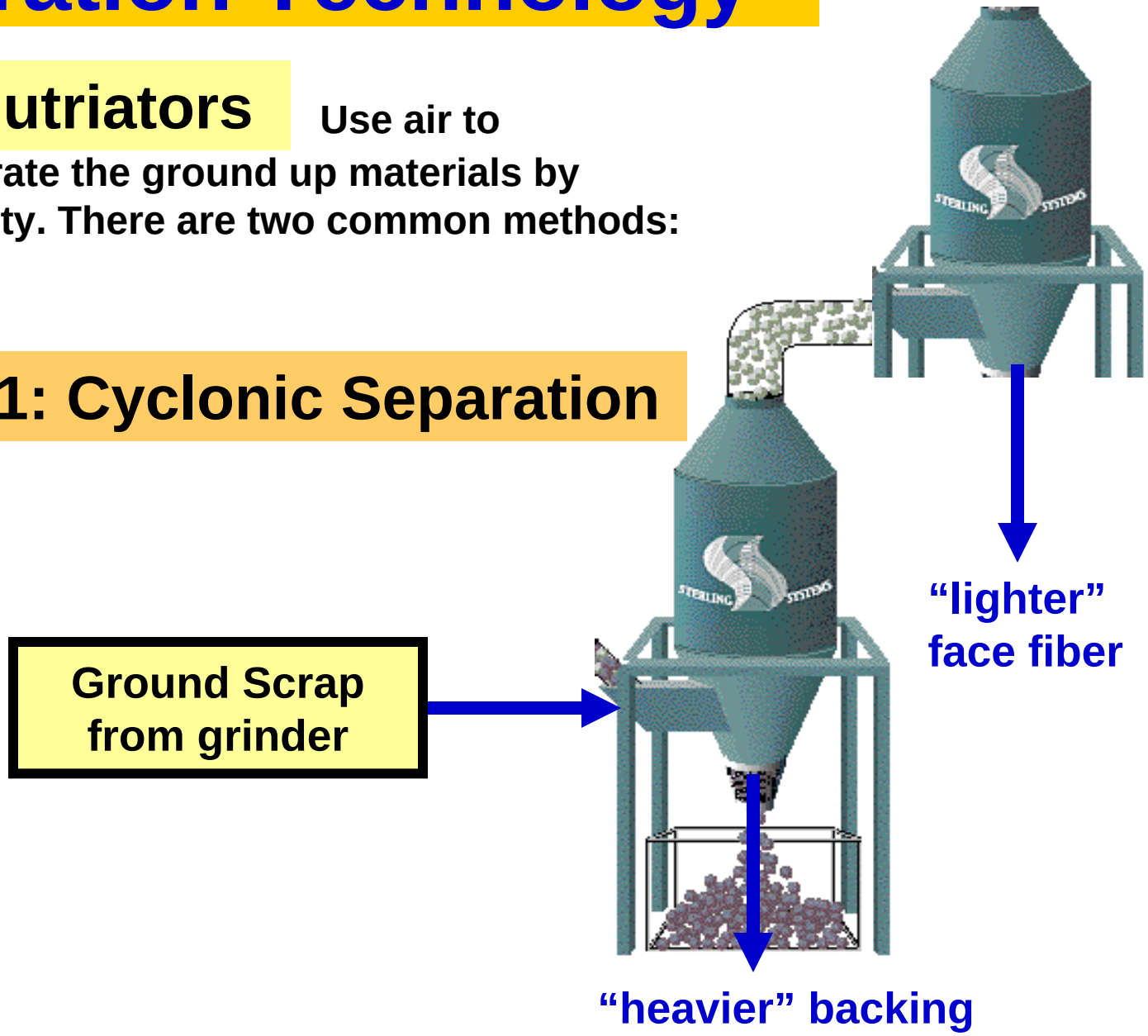
Backing

Separation Technology

Step 2. Elutriators

Use air to separate the ground up materials by density. There are two common methods:

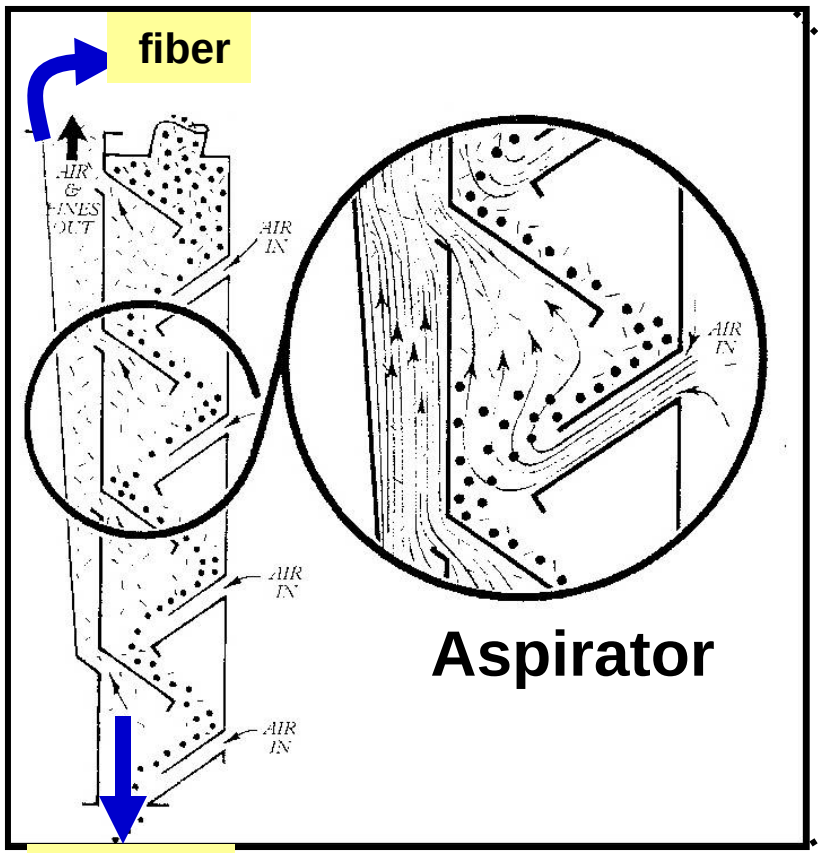
Method #1: Cyclonic Separation

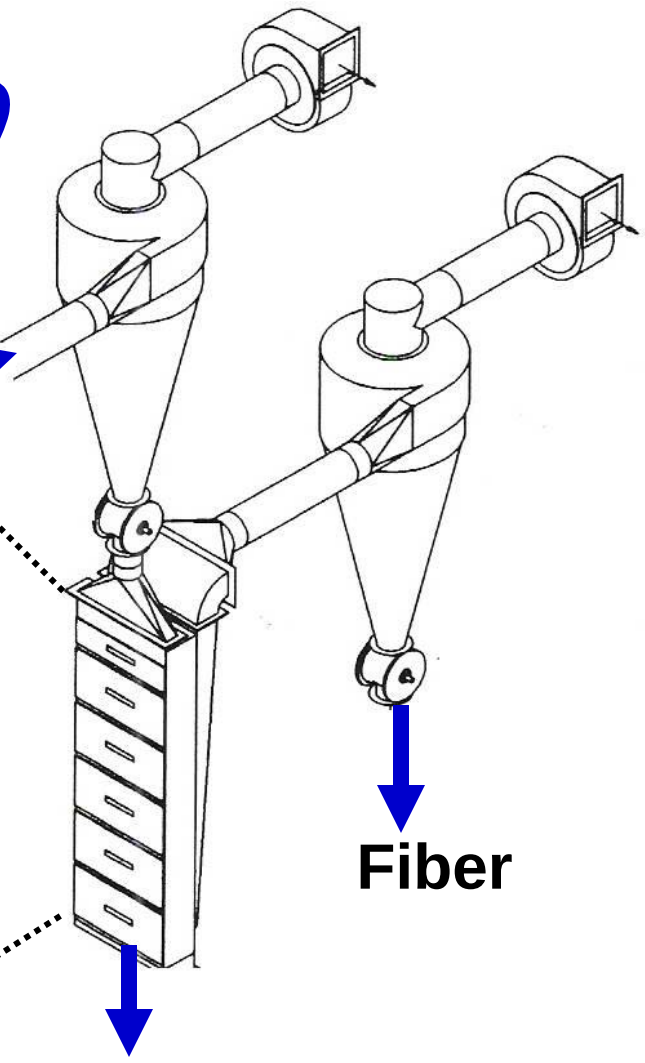


Separation Technology

Method #2: Multi-aspirator

Ground Scrap from grinder





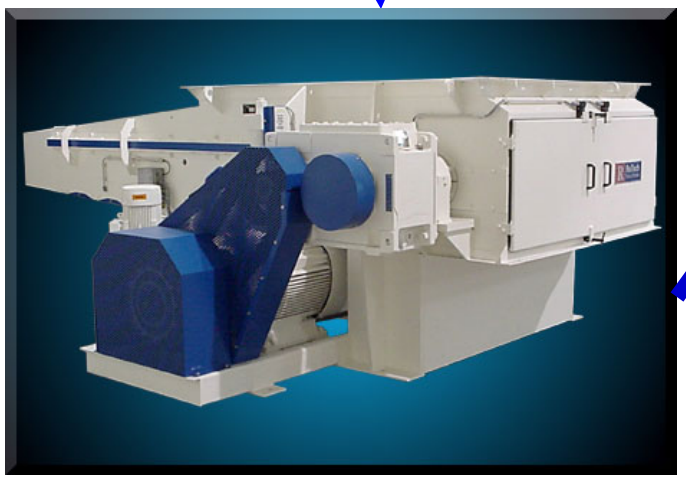
Broadloom Carpet Recovery

Broadloom Carpet Recovery

Step 1. Size Reduction

Carpet is chopped into small pieces using a single shaft shredder, followed by a grinder:

Scrap carpet



Shredder

reduces to 1 to 3 inch pieces

Vibratory conveyor with metal detection

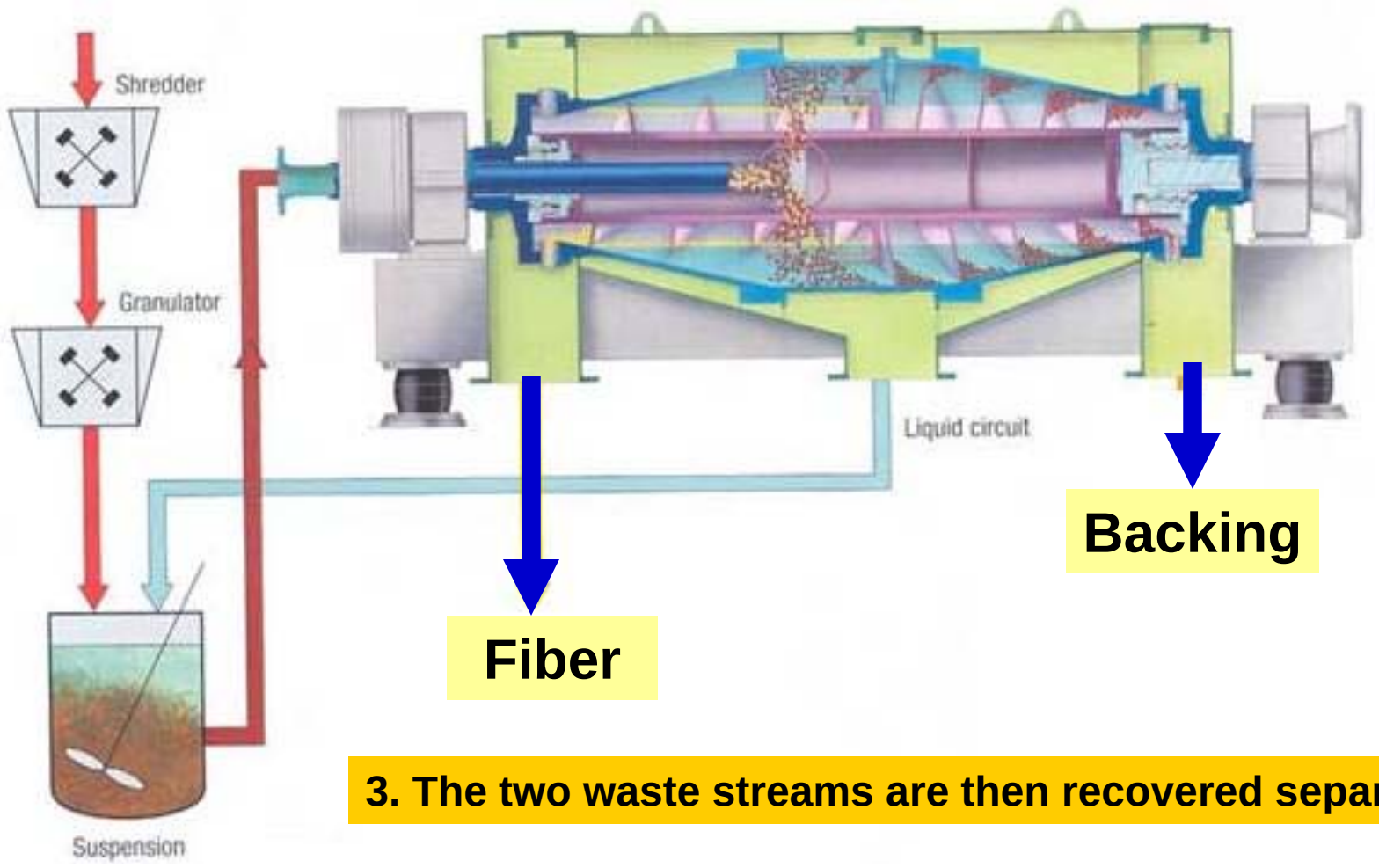
Removes Dirt, CaCO3, …

Grinder

Final particle size 3/16 to 1/4 inch ready for separation

Separation Technology

2. Centrifigal Separation system The small pieces are separated by density using liquid.



3. The two waste streams are then recovered separately…

We've Covered

Size Reduction Equipment &

Separation Technology

Now, We'll Discuss

Repelletizing Technology

Traditional Repelletizing Systems

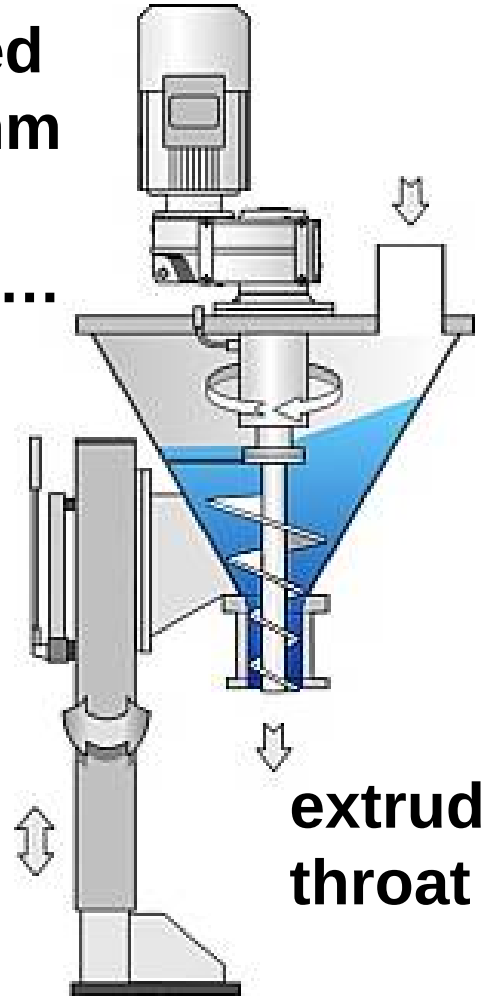
Ram-Stuffer

Densifier Drum

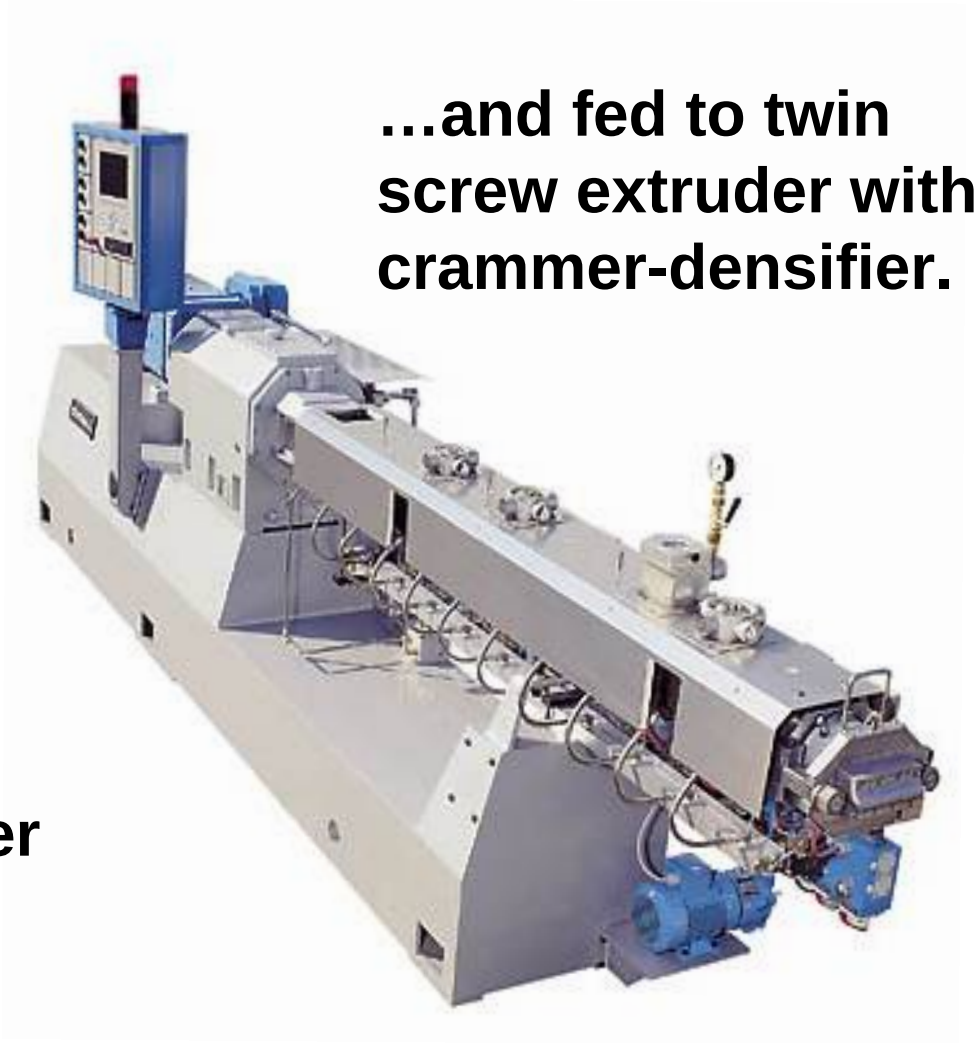
Traditional designs require pre-cutting.

Twin Screw Repelletizing

Fiber is chopped to 6-8mm using grinder…



extruder throat



…and fed to twin screw extruder with crammer-densifier.

New Technology For Repelletizing—Integrated Shredder-Extruder Combo

ONE-STEP Operation:

Requires No Prior Size-Reduction For Most Materials Including Fiber, Carpet, Nonwovens…

Feed Loose Scrap via Conveyor

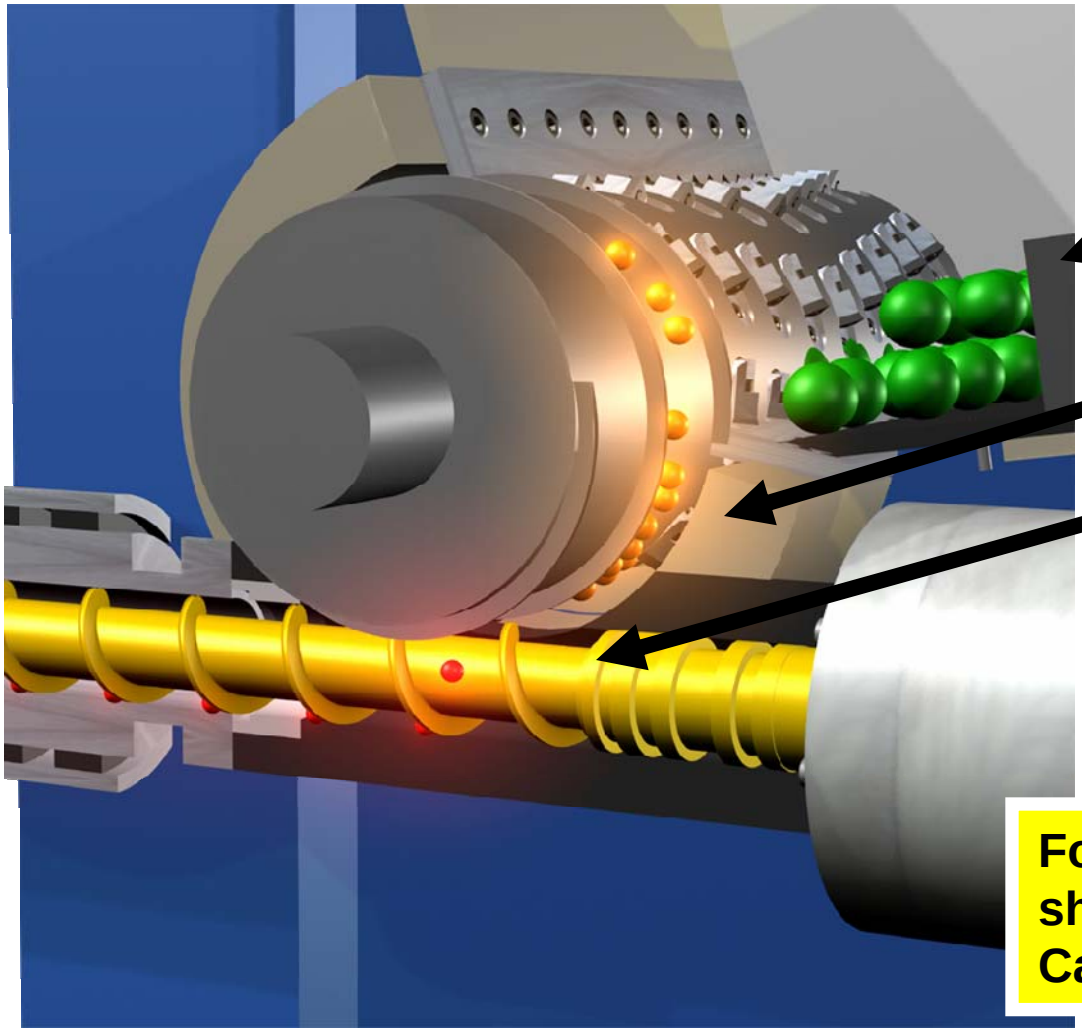
LOOSE SCRAP
bales, loose fiber, bobbins,burn-offs, cut pieces…

Repelletize without PRE-CUTTING !

Conveyor is controlled by Hopper level sensor.

Machine does not require continuous, labor-intensive feeding.

Material Transport Into Extruder



Shred…

Compact…

“Warm-Feed” the Extruder

IN ONE-STEP

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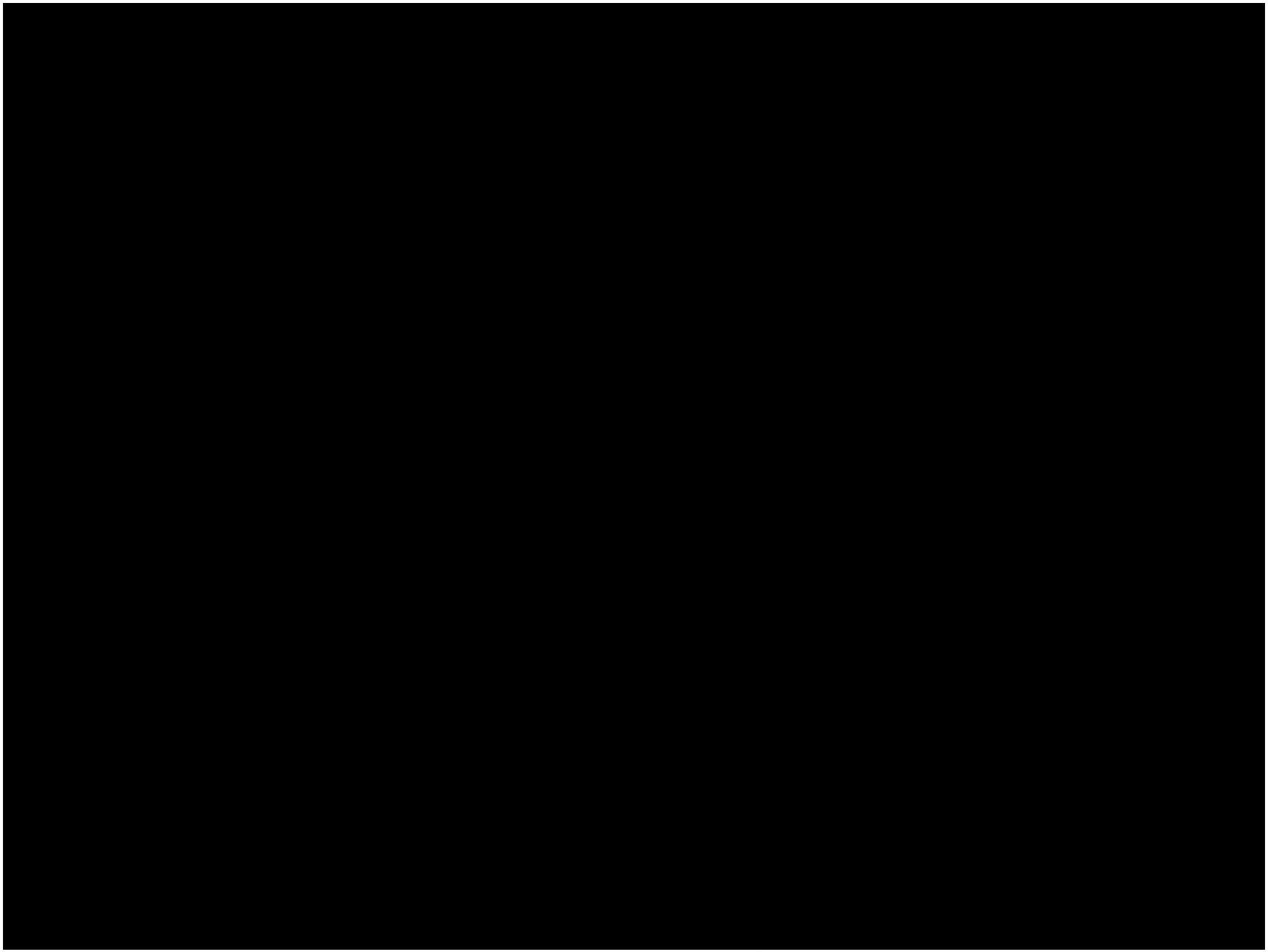
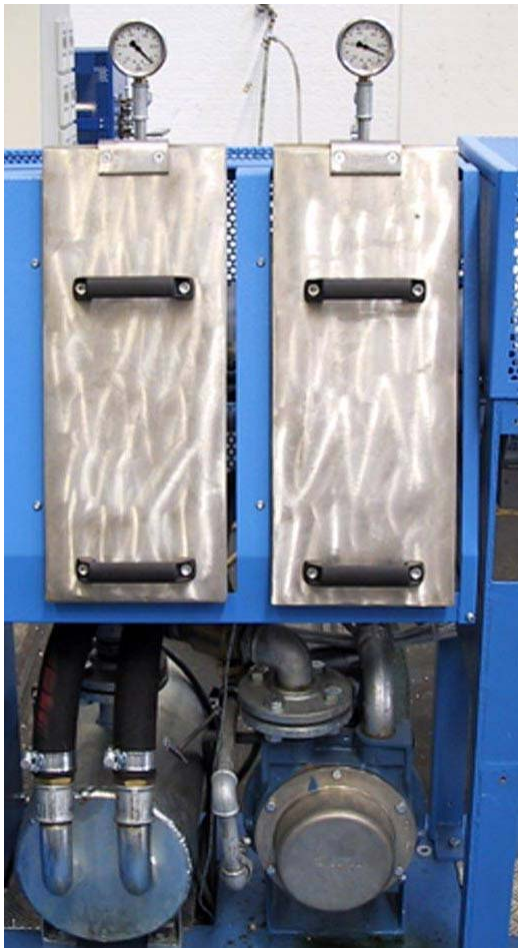


Dual Venting Removes Gases From Melt



closed under vacuum

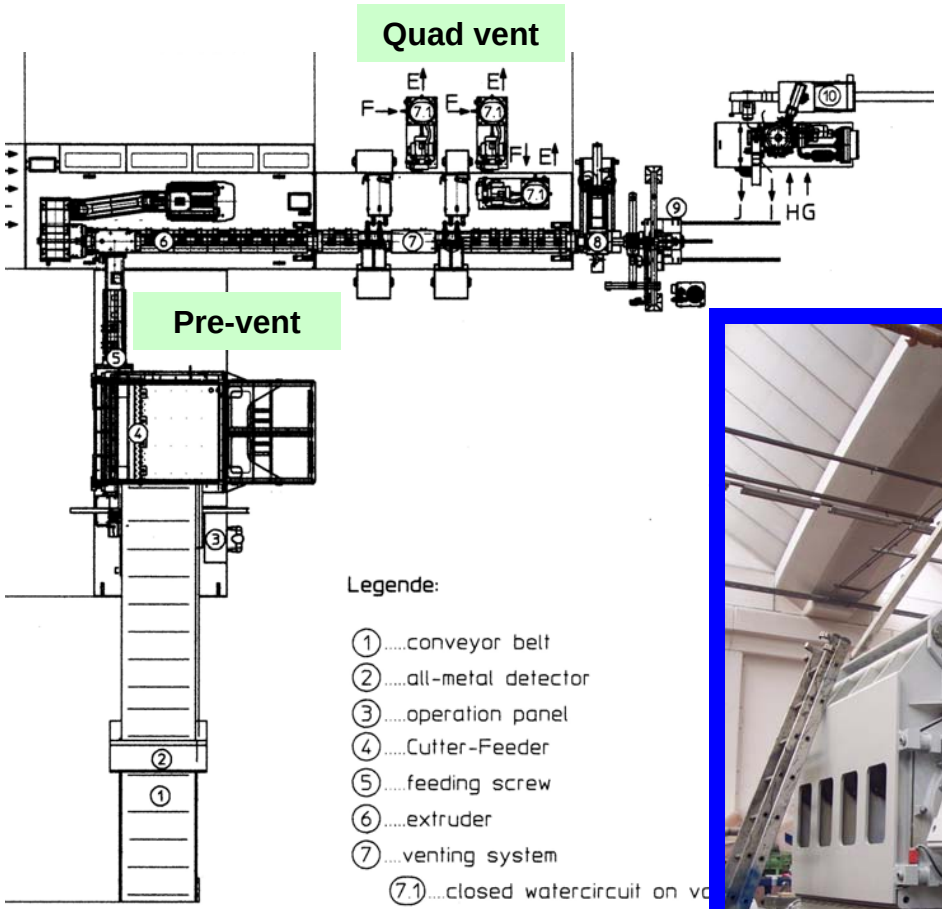
Removes:

Spinning oils
Excess Water
Process Lubricants
Other Volatiles

From the
End Pellets,
Improving Quality.

open for cleaning

One-Step Fiber Repelletizing @2500 pph



Can handle complete bales!

Contact Information

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“The Extrusion & Recycling Specialists”