Hosokawa Polymer Systems

Location: Berlin, CT - USA

Foundation: 1961

Member of Hosokawa Group: Since 1998

Over 10,000 Granulators sold

Combining the resources of:

- **Polymer System**
- **Polymer Machinery**
- **Amacoil**
- **Alpine**

Link to Hosokawa Polymer Systems Website

Hosokawa *Alpine*

Location: Augsburg - Germany

Foundation: 1898

Member of Hosokawa Group: Since 1987

Employees: approx. 600

Hosokawa Polymer Systems











Hosokawa Polymer Systems has over 50 years of history providing recycling system solutions for plastics, wire/cable and other similar markets. In 1998, we were acquired by Hosokawa (over 100 year old company) to coordinate recycling solutions between Alpine (Germany) and Polymer Systems.

Granulators : Dedusting

Granulators

- Slow Speed 2 - 7.5 Hp
- Press-Side 5 - 25 Hp
- Low Line 5 - 20 Hp
- Auger 5 - 15 Hp
- Hot Melt HMG 5- 50 Hp
- Rollfeed 10 -100 Hp
- Large Part 20 - 40 Hp
- Premium Shurfeed 20 - 40 Hp
- Shurfeed 50 -100 Hp
- Heavy Duty 50 -200 Hp
- Rotoplex 50 -600 Hp
- CL 75 -400 Hp
- DGE 10-75 Hp
- DGP 50-150 Hp
- DGH 50-400 Hp

Over 150 models/sizes to meet any need

Granulator Types (SPI)

- **Press Side**

Next to a press for immediate recycling of material (runners, parts) back into the process.

- **Under the Press**

Under a press (Auger, Thermoforming) for immediate and continual in-line recycling back into the process

- **Central**

Usually larger machines, systems for off line recycling and storage. (Greater then 16" rotor circle)

Granulator Chamber Geometry

- **Top feed**

Just as it sounds, the rotor is positioned in the center of the chamber and the feed drops in on top of the rotor.

- **Tangential**

This type of chamber has the rotor offset from the chamber top opening. The material enters into the tangential "bellows" and falls into the down stoke of the rotor circle. (The circle made by the rotor knife tip)

- **Semi - Tangential**

A moderation of the Tangential. Tilting of top feed chamber, offset hopper on top feed…

- ***Profile***

Given the name "profile" because if can take long parts "profiles". This is more a hopper change and the chamber is still one of the above.

- ***Feed Roll***

Using one of the above, adding a feed roll to automatically take film, sheet, fibers.. In a controlled manor into the cutting chamber.

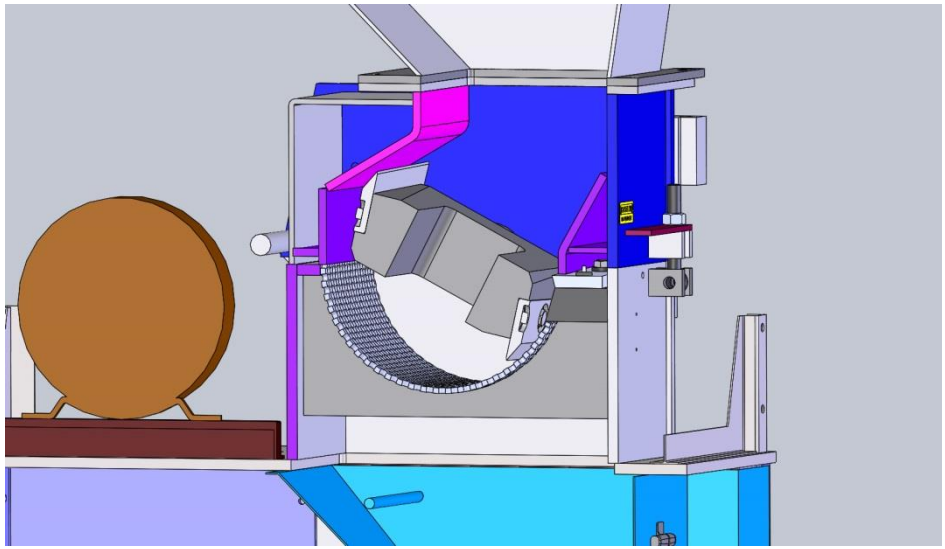
Granulator Chamber Geometry

- **Top feed**

Just as it sounds, the rotor is positioned in the center of the chamber and the feed drops in on top of the rotor.

Multipurpose
Best for parts, runner < ½ Diameter
Using gravity
Allows larger screen area
- **material evacuated faster – less fines**
- **runs cooler**
- **higher capacity**

Not ideal for larger, volumous parts
- **Can bounce**

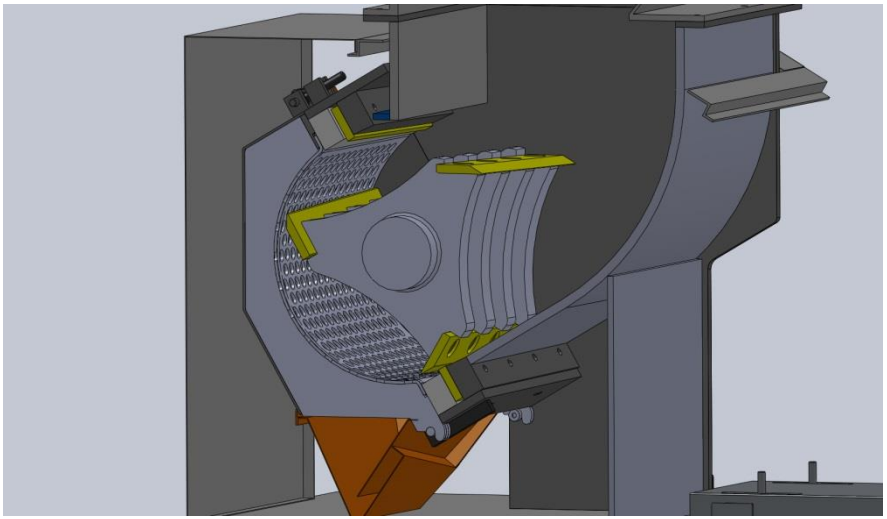


Granulator Chamber Geometry

- **Tangential**

This type of chamber has the rotor offset from the chamber top opening. The material enters into the tangential "bellows" and falls into the down stoke of the rotor circle. (The circle made by the rotor knife tip)

Ideal for volumous parts
Buckets, bottles, bumpers
Parts fall into the down stroke of the rotor knife
Uses centrifugal forces
Usually have less screen area



Fights gravity
Genate a little more dust
Terrable for purgings

Granulator Chamber Geometry

- **Semi - Tangential**

A moderation of the Tangential. Tilting of top feed chamber, offset hopper on top feed…

Partial benefits of top and tangential
Gas tanks, large cans, bumpers…
Still has large screen area
Can take heavier parts
.

Granulator Chamber Geometry

- ***Profile***

Given the name "profile" because if can take long parts "profiles". This is more a hopper change and the chamber is still one of the above, usually – top feed.

There are many types of profile configurations

They all should have the material enter on the down stroke of the knives

Hoppers and also allow for profile grinding on general purpose granulators

Granulator Chamber Geometry

- ***Feed Roll***

Using one of the above, adding a feed roll to automatically take film, sheet, fibers.. In a controlled manor into the cutting chamber.

Used for sheet, film in online or offline recycling
Feeding should be in front of rotor, not over rotor

Over the rotor can lead to tugging

Granulator Rotor Geometry

- ***Parallel Cut***

Using one of the above, adding a feed roll to automatically take film, sheet, fibers.. In a controlled manor in

- ***Angle, Double Angle Cut***

Using one of the above, adding a feed roll to automatically take film, sheet, fibers.. In a controlled manor into the cutting chamber.

- ***Chevron***

Using one of the above, adding a feed roll to automatically take film, sheet, fibers.. In a controlled manor into the cutting chamber.

- ***Cross Scissor Cut***

Using one of the above, adding a feed roll to automatically take film, sheet, fibers.. In a controlled manor into the cutting chamber.

- ***Stagger Cut***

Using one of the above, adding a feed roll to automatically take film, sheet, fibers.. In a controlled manor into the cutting chamber.

ber.

Granulator Rotor Geometry

- *Angle, Double Angle Cut*

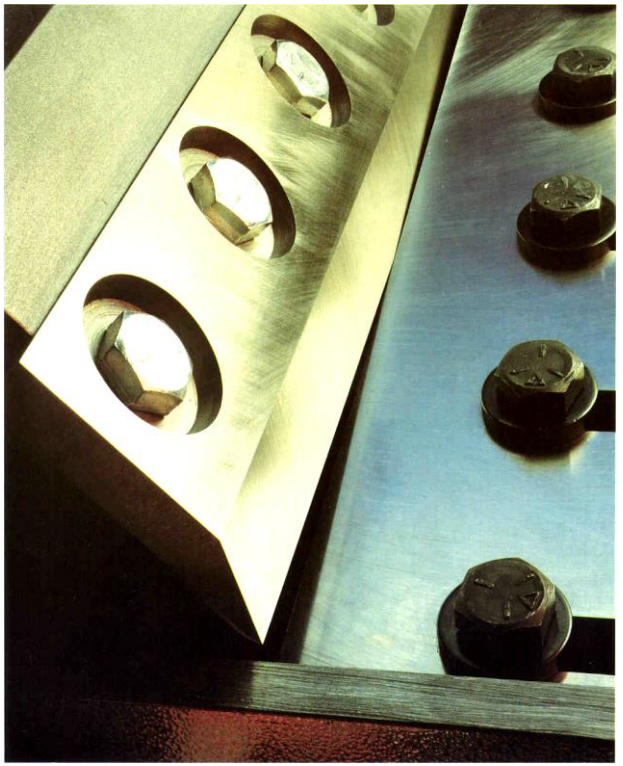
Boththe bed (stator) kinve(s) and rotor knives are angled between 1-1/2 – 2-1/2 degrees

This allows for tight knife gaps across the length of the knives

The focal point is one that now has immense shear force and is very smooth on the bearing loading

Can be high shear *As Seen to right) or semi radial

The cutting action is all to one direction



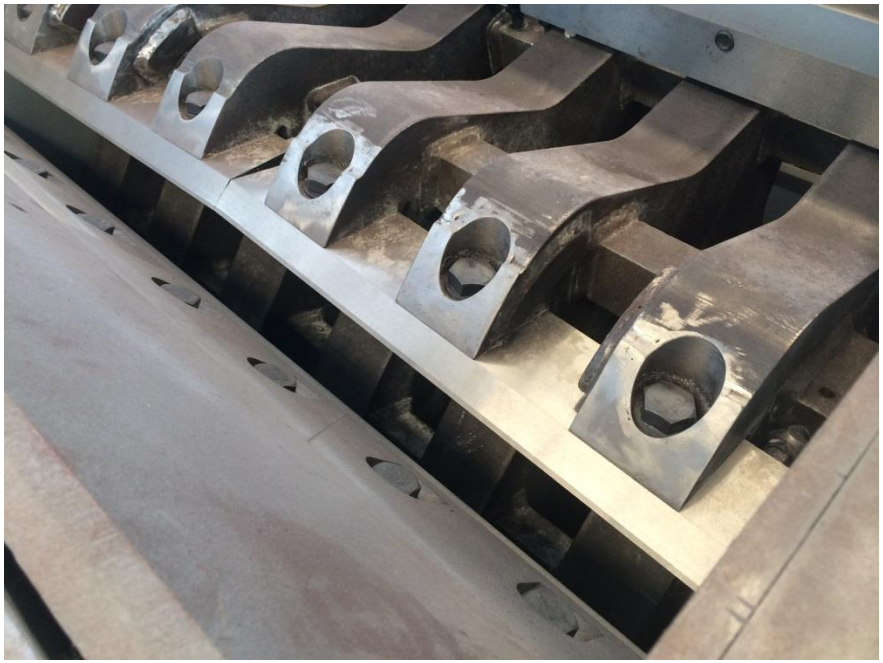
Granulator Rotor Geometry

- *Chevron*

Usually has the rotor geometry of two angle cuts
Tight knife gap is obtained
Allows for wide machines with tight gap – breaking up the knife length

Most are semi radial

Cutting moves material to a point



Granulator Rotor Geometry

- ***Cross Scissor Cut***

Uses sophisticated rotor geometry to obtain best knife solution.

Every other row of rotor knives is canted oppositely (So material is very evenly distributed)

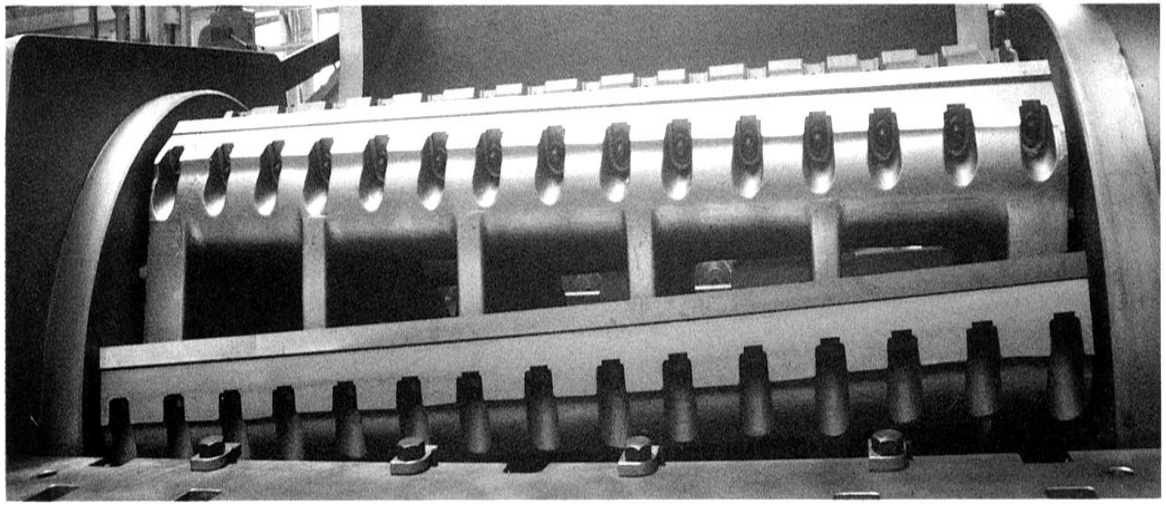
Cooler, higher capacity, maximize screen area

Multiple knives per row – tight gaps!

Patented

Expense

Really see advantages over 3' width



Granulator Rotor Geometry

- ***Stagger Cut***

Segmented rotor knives

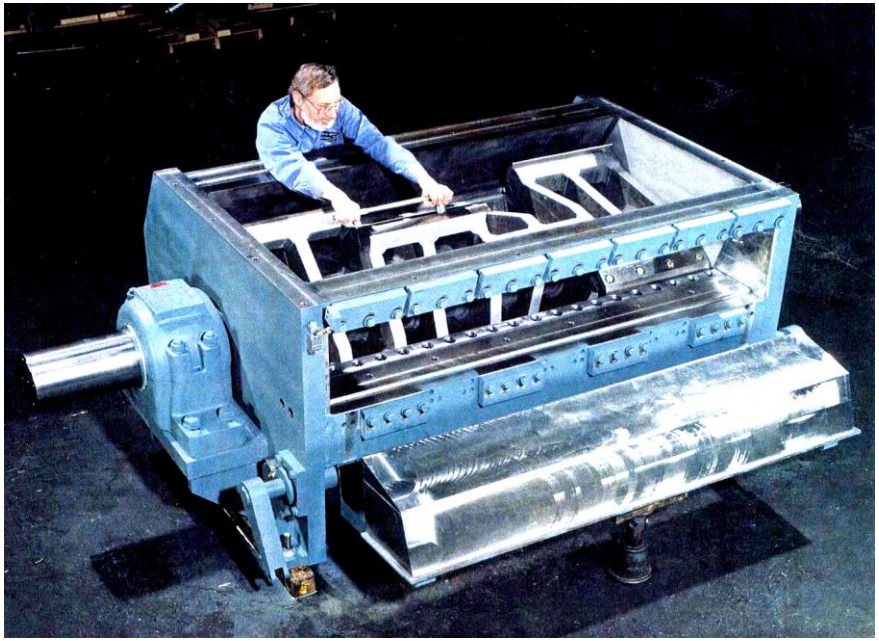
Angled or parallel

Nibbles material

Does not cut through all parts

Higher heat,

Used with solid rotors now



What to ask or know

- *Application:*

Parts/ Runner size: (length, width, height, thickness, Weight

Material type (Hard, flexible, fillers, glass, temperature, hydroscopic, corrosive…)

Capacity: PPH, cycle times :Capacity – depends on feed, thickness, impact mosdifiers… 25 pounds/hp rough generalization

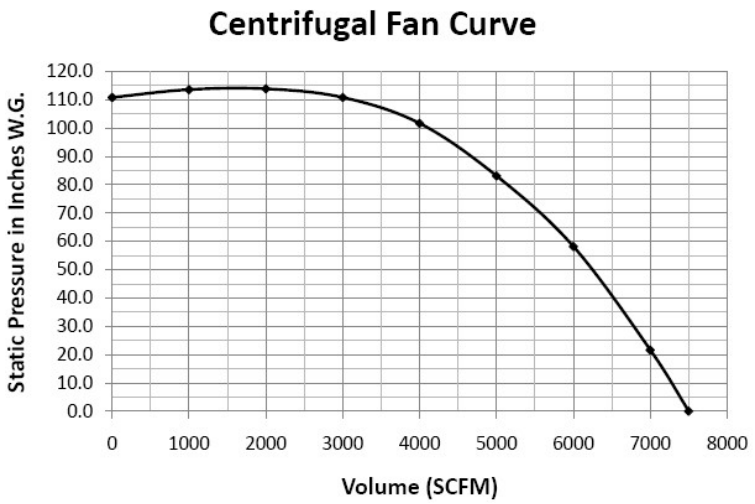
How to feed: Hand, conveyor, pneumatic feed,

Online or offline, floor space, height restrictions

Evacuation: vacuum, box collection Blower/cyclone (4500-6000: 5500 fpm)

- *Airconvey or no … cooling, pull material out, as small pc stay in chamber become fine – fine dust. Blower can be like a hammermill on friable material – wear…*
- *Bin capcity v. use ensue you can load more then you make!*

- *Evacuation? Filters…Blower curve*

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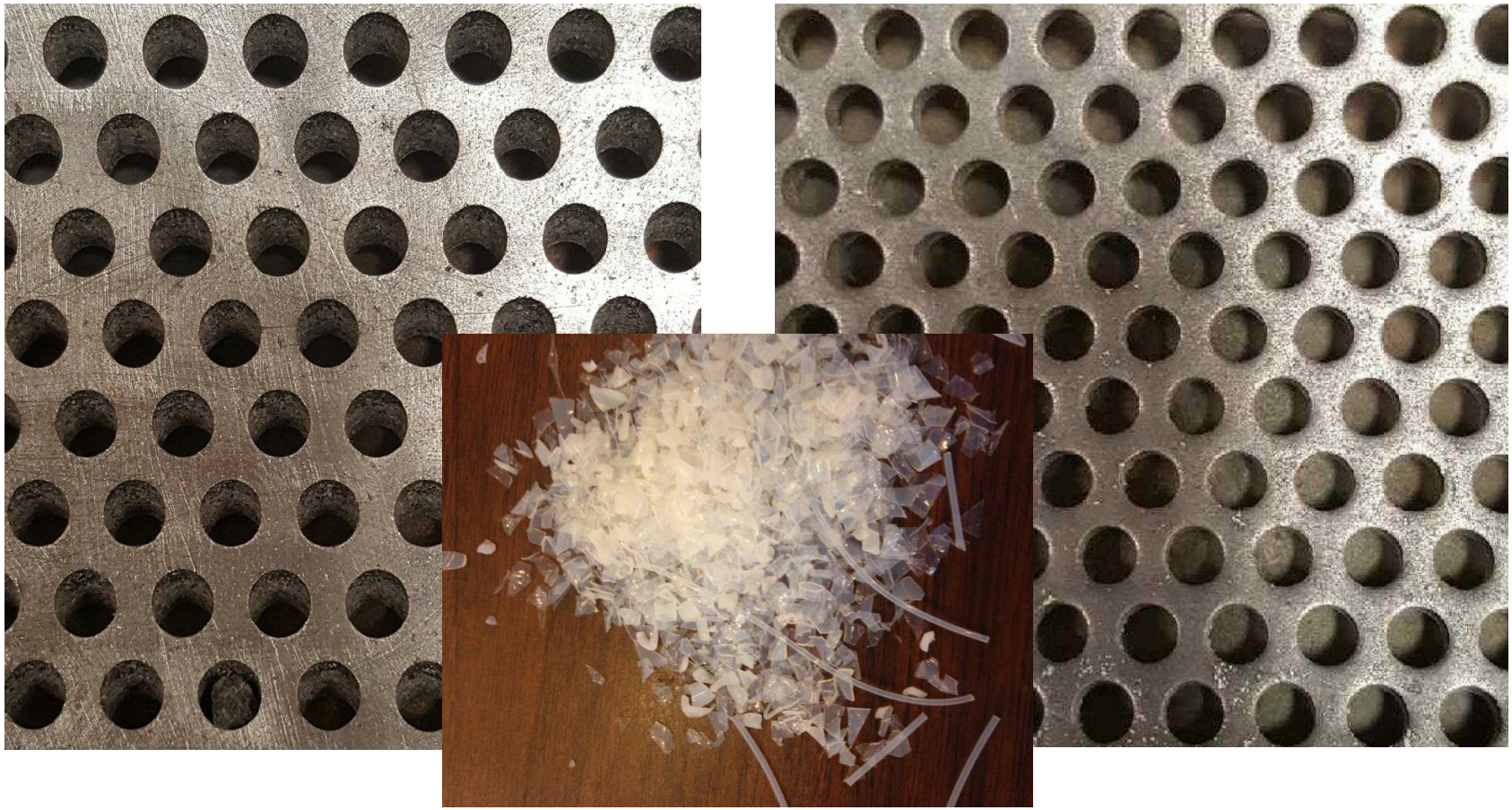
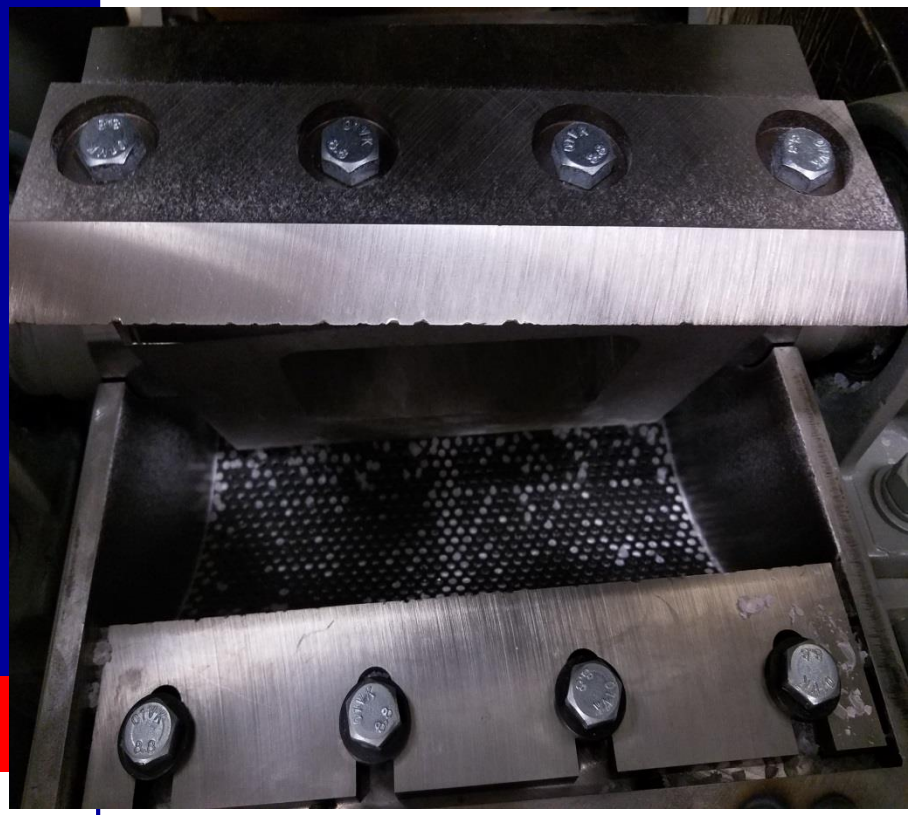
Longs?



- *Screens – thickness, hole size, geometry, drilled, punched, angles – longs…*
- *Longs in regrinsd… (Screen size, rotor speed, hole geometry)*

Dull, damaged and large gap



What does your regrind tell you?

- ***Double hits, impressions, tears, white /light stress stiations, bulk density fines, higher HP needed…Bag test:***

Dedusting and Separation

- Why Dedust
- HPS Technology
- Applications
- Minimizing dust generation

Why dedust - Plastic processing

Processing issues

Off spec parts, production

Downtown for cleaning machinery

Customer demanded

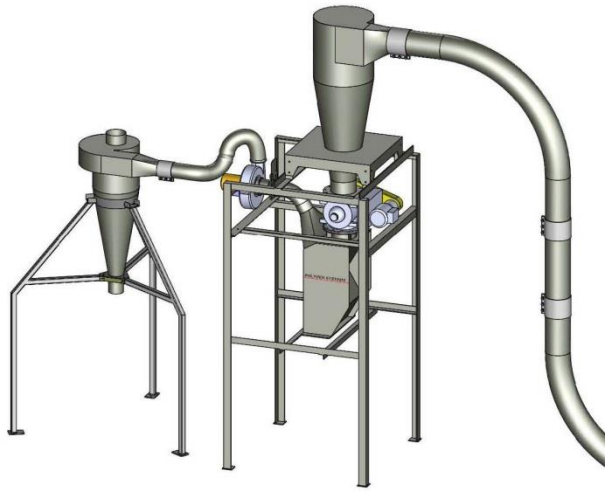
Health/Cleanliness issues

Hazards of airborne dust

General Housekeeping

KS Dedusting system

Air Stream Separators



Cascading

Function: Metered feed to dedusting system with independent deionized separation air to remove light fraction.

Advantages

Small foot print
High capacity
Self Cleaning/Easy clean
Static elimination
Ease of use
Quick cut point change
Separate dedusting/conveying air
Removes dust, fiber, anglehair…

Drawbacks

Height
Midrange price

Polymer Systems Solutions
KS KSS DE MZM

KISS

Even Air Distribution
Static Elimination
Fast Cutpoint Ajdustment
Low Maintenance
Quick Access / Clean
Compact

Dedusting/Separation System Models

- DE1 – DE5
- KSI – KSV
- KSSI – KSSV
- MZM – Various
- Custom – Various

Capacities

100-10,000 pph

Dedusting System Models

- **Model KS/KSS**

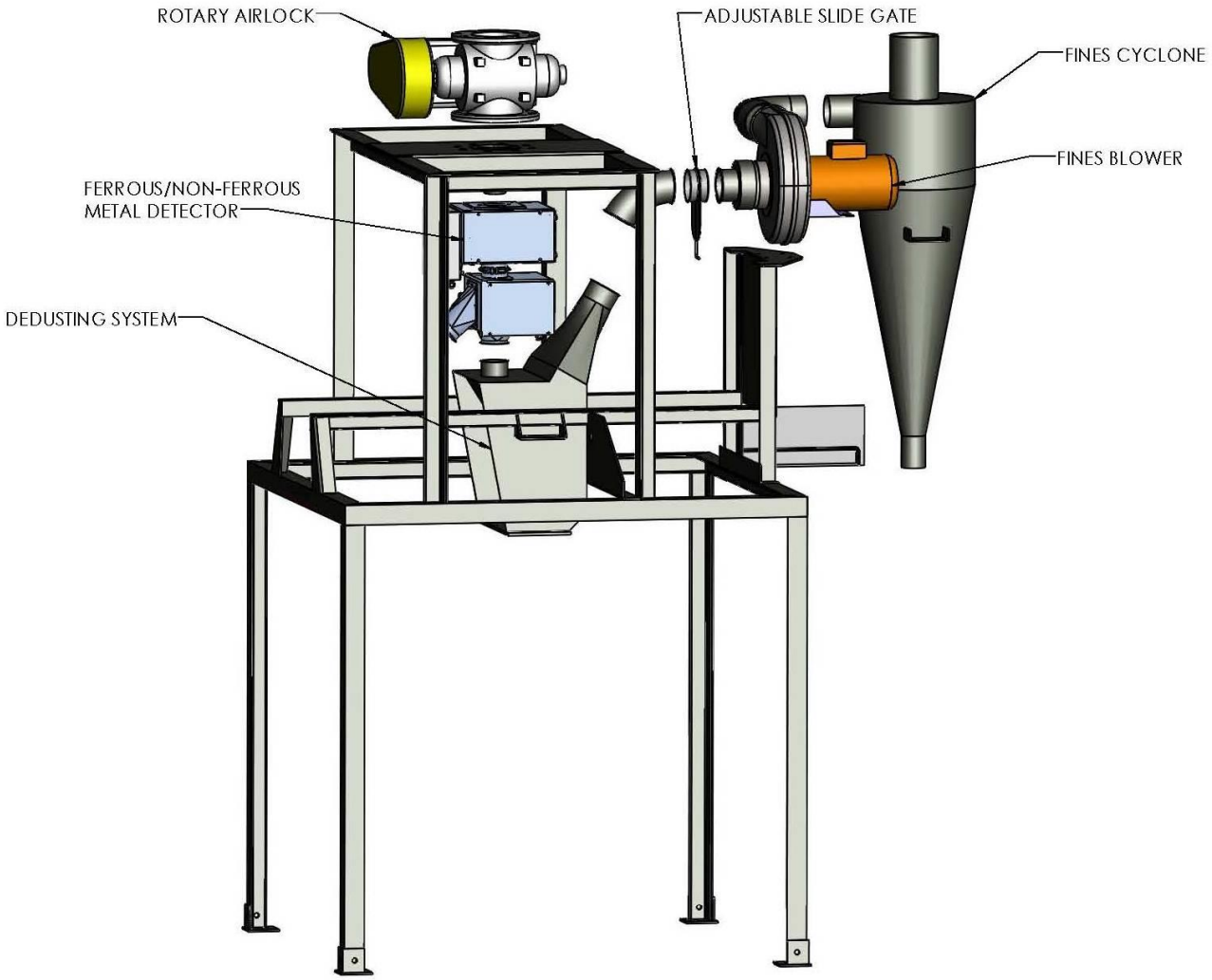
Variable – Easy to adjust

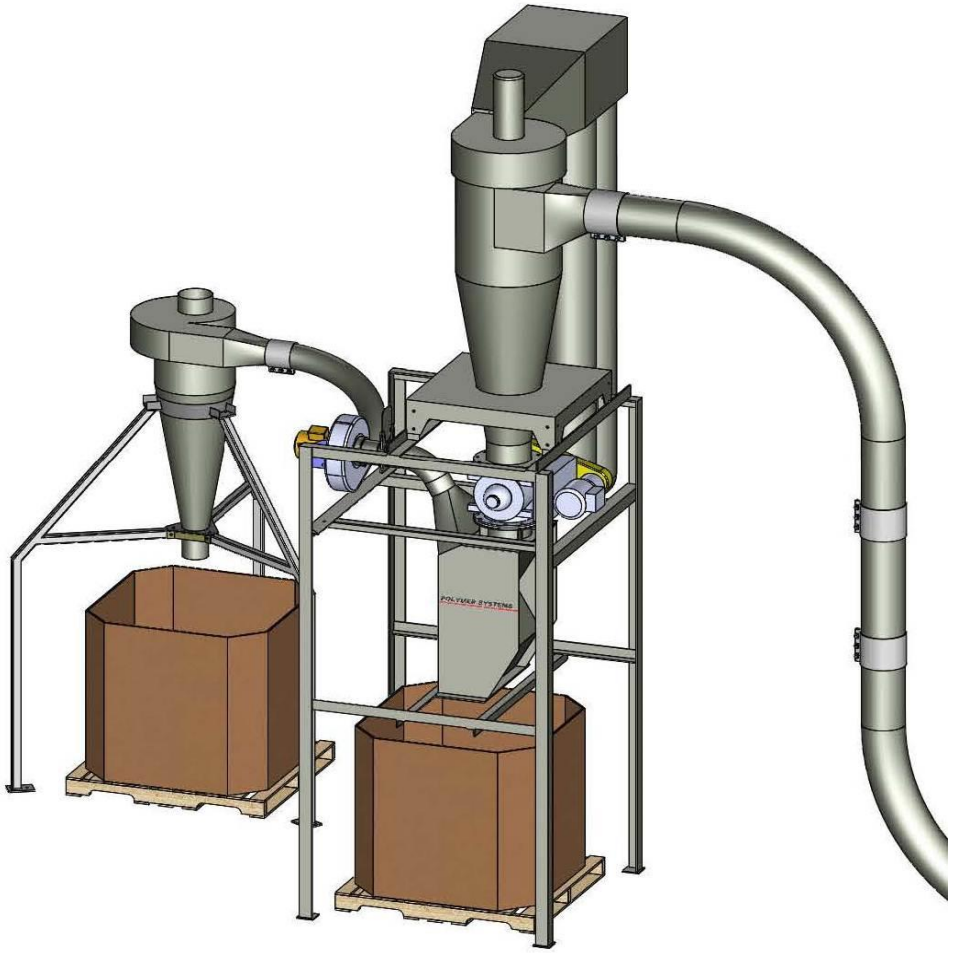
Independent airflow

Good for many varied applications

Different Technologies

KS/KSS





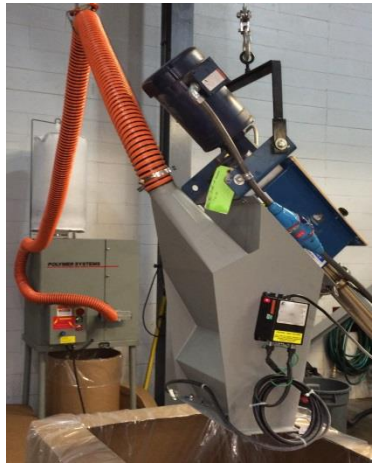
Dedusting System Models

- **Custom Dedusting**

Variable – Easy to adjust

Independent airflow

Designed for specific needs



Dedusting vs. Separation

Dedusting

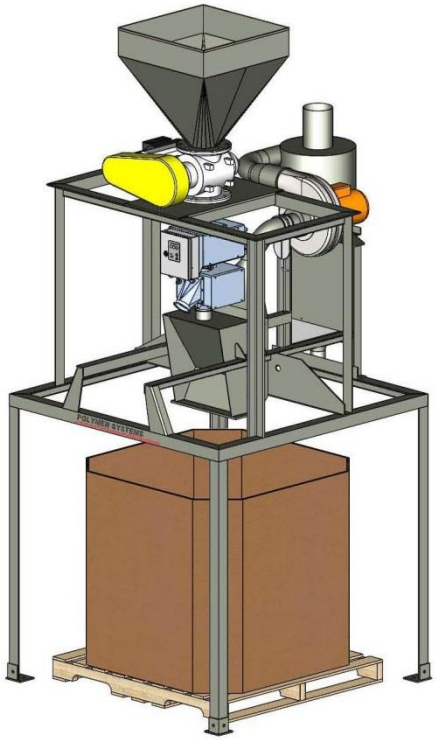
Removal of fine particulate and anglehair form a material stream

Separation

Splitting of two or more streams of dissimilar materials to recover more pure materials

Dedusting Applications

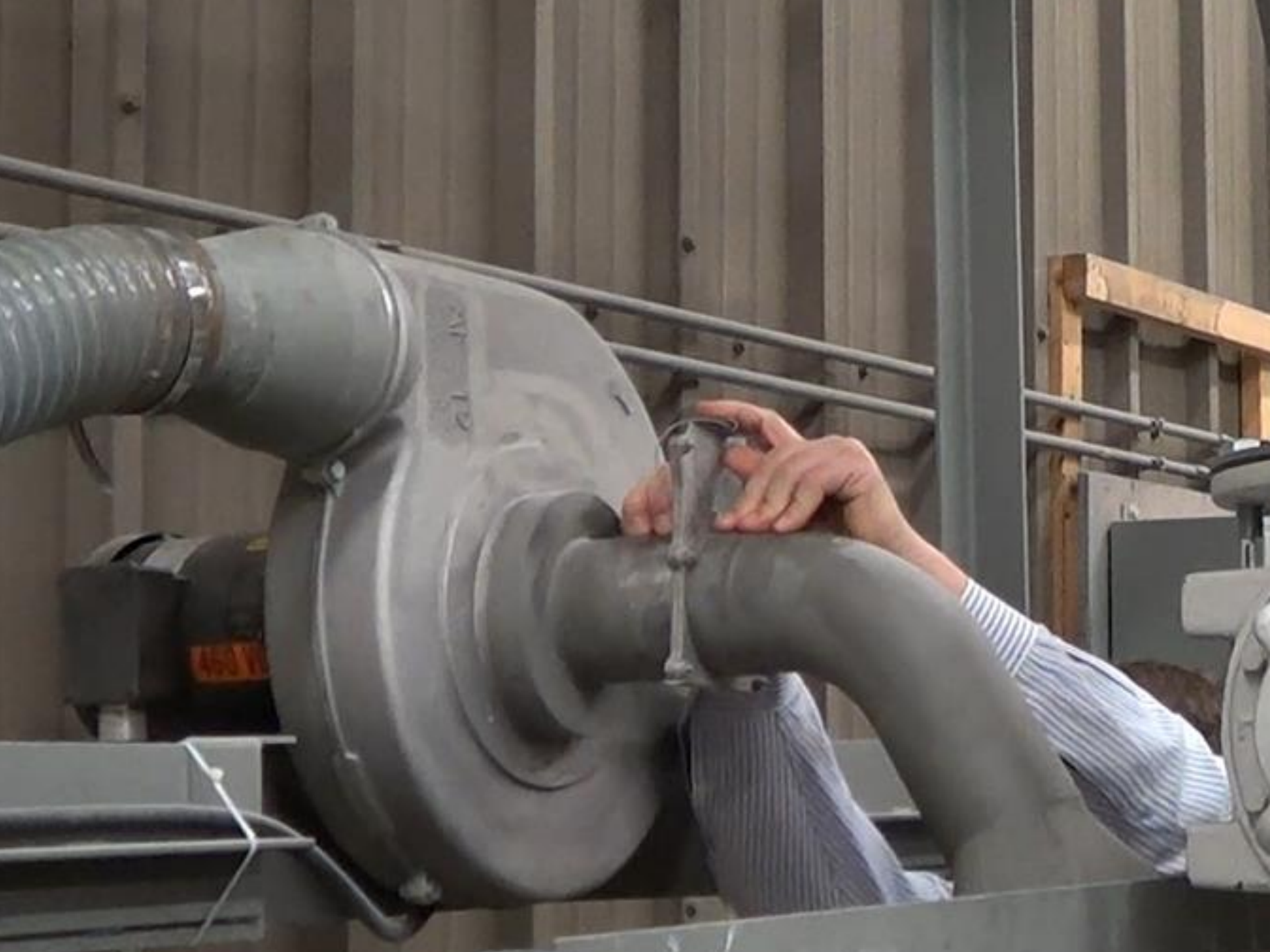
- Injection, Blow Molding, Extrusion and Pelletizing – masterbatch
- Transport, Material conveying
- Virgin pellets, regrind
- Filler such as talc, fiberglass
- Friable materials
- Polycarbonate, PET



Clean Regrind Fines


460 VOLTS
HOSOKAWA
POLYMER SYSTEMS

Separation: Paper and film from DVD Jewel Cases




Clean Regrind
Paper, Film, Dust

Do You Really Need a Dedusting System? Plastic recycling

- Granulator
- Temperature – cooling
- Smearing - anglehair
- Knife style
- Gap, Wear - impressions
- Screen area
- % open area, overall area
- Holes cleaned
- Evacuation
- Cooling, velocity, elbows
- Cyclones – vacuum
- paper under fine charged
- Deionizer only…
- Conveying
- Distance, velocity
- Travel by rail long way.

Do You Really Need a Dedusting System? Plastic recycling

Solution:

Proper filter area

Reverse fines collection bin

Do You Really Need a Dedusting System?
Plastic recycling

Solution:

Sharp Knives

Proper Gap

Want to Test?

Send inquiries to:

sales@hps.hosokawa.com

Please specify:

Material: HDPE,PVC,PP…
Regrind, pellets or parts
Capacity: #/Hr
Dedusting only or granulating and dedusting
Describe your current process
What do you want to accomplish?
Photos are welcome and help greatly

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