

AFR Pre-Processing Challenges & Solutions

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Overview of AFR processing



Types of Alternative Fuels



MSW



Paper Mill Waste



LEGACY



PLASTIC



INDUSTRIES SCRAP



HAZARDOUS



SLUDGE



TIRE WASTE



WASTE WOOD



MUSTARD HUSK



RICE HUSK



PELLET

Property	Range	Challenges
Bulk Density	50 – 1500 Kg/m ³	Wide Range, Lower BD → Lower Feeding rate Lower BD → Higher Transportation cost
Moisture	5 – 60%	Inconsistent/ Seasonal Variation, Higher Moisture → Lower CV
Ash Content	5 – 35%	Affect Calorific value Higher Ash → Higher Wear → High R&M Cost
Particle Size Distribution	0-2000 mm	Inconsistent / Unpredictable Bigger the particle → multiple step size reduction
Chlorine Content	0.5 – 1%	Higher the % → Accumulation / Clogging / Built-up in the Kiln → Affects Kiln emission & Performance
Impurities (e.g.; metal, stone etc.)	0-10%	Damages Equipment Higher Impurity → Higher Wear → High R&M Cost

02

Introduction to Alternative Fuel Preparation Technology

harden

1. Size Reduction

- ✓ Primary Hook Shredder
- ✓ Double Shaft Shredder
- ✓ Single Shaft Shredder



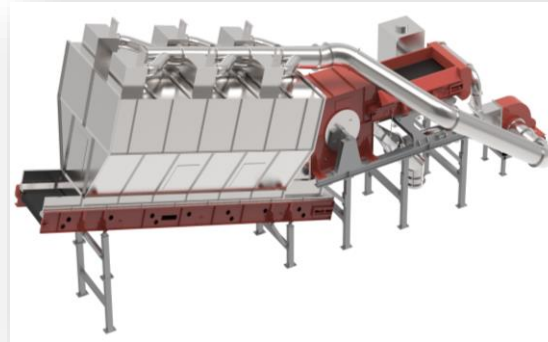
2. Screening

- ✓ Disc Screen,
- ✓ Trommel,
- ✓ Vibro Screens
- ✓ Flip-flow



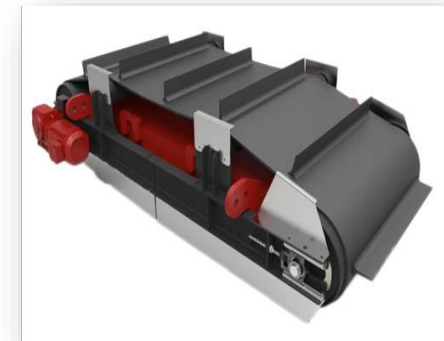
3. Density Separator

- ✓ Wind-shifter
- ✓ Ballistic Separator



4. Ferrous and Non-Ferrous Impurity Removal

- ✓ Magnetic Separator
- ✓ Eddy Current Separator



5. Moisture Removal/Drying

- ✓ Belt Dryer
- ✓ Fluidized Bed



6. Densification

- ✓ Balling
- ✓ Wrapping



Shreddeing solutions by Harden



- Single shaft



- Two shaft



- Four shaft



- Primary



High-capacity hydraulic primary shredders

TPH1620/TPH1826

- For initial primary shredding
- High material flexibility
- Useable with claw grab
- 30-80t/h
- Output size 250mm



Two shaft shredders

TD612/TD912/TD1216

- For initial primary shredding
- High material flexibility
- Useable with claw grab
- 30-80t/h
- Output size up to 250mm



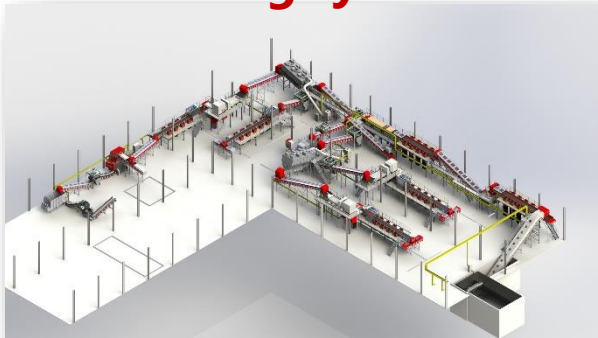
Fine shredders

SL1500/SL200

SG2200R/SG3000/SG3000R

- Materials with pure compositions
- Single step to desired output size
- Consistent output
- 3-20t/h
- Output size 30-100mm

MSW shredding & sorting system



Industrial wastes shredding & sorting system



Scrap tires shredding & sorting system



Biomass shredding system



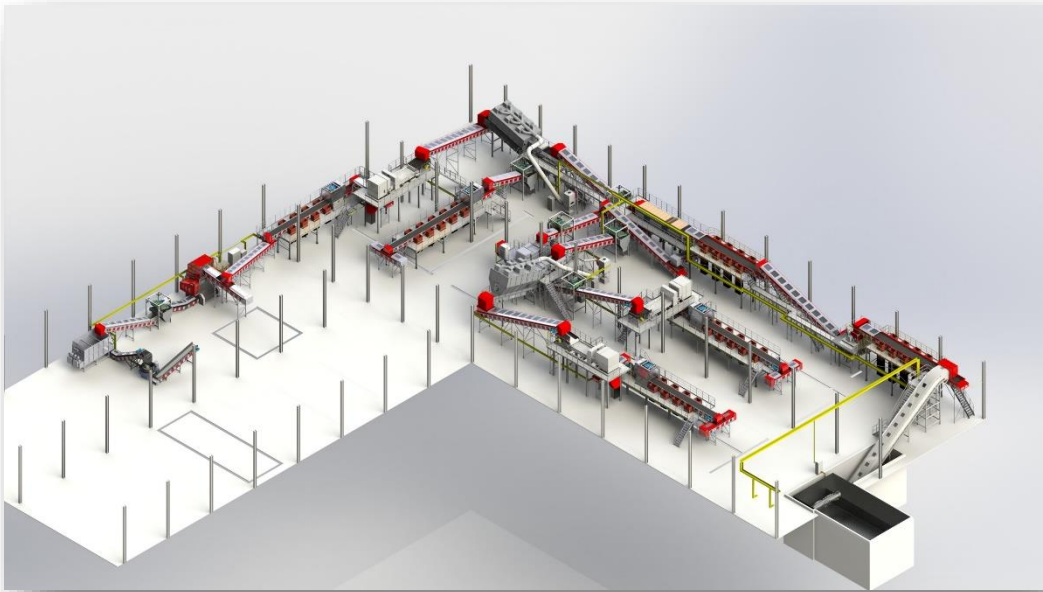
Hazardous waste shredding system



Paper mill waste shredding system

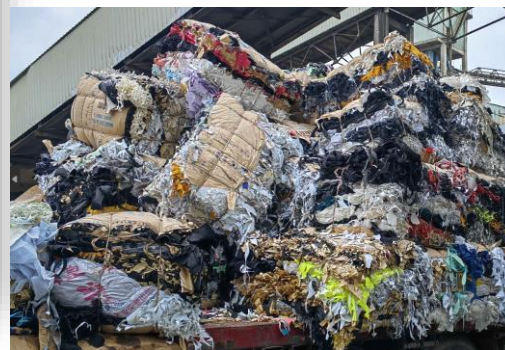


MSW/Legacy Waste Shredding & Sorting System

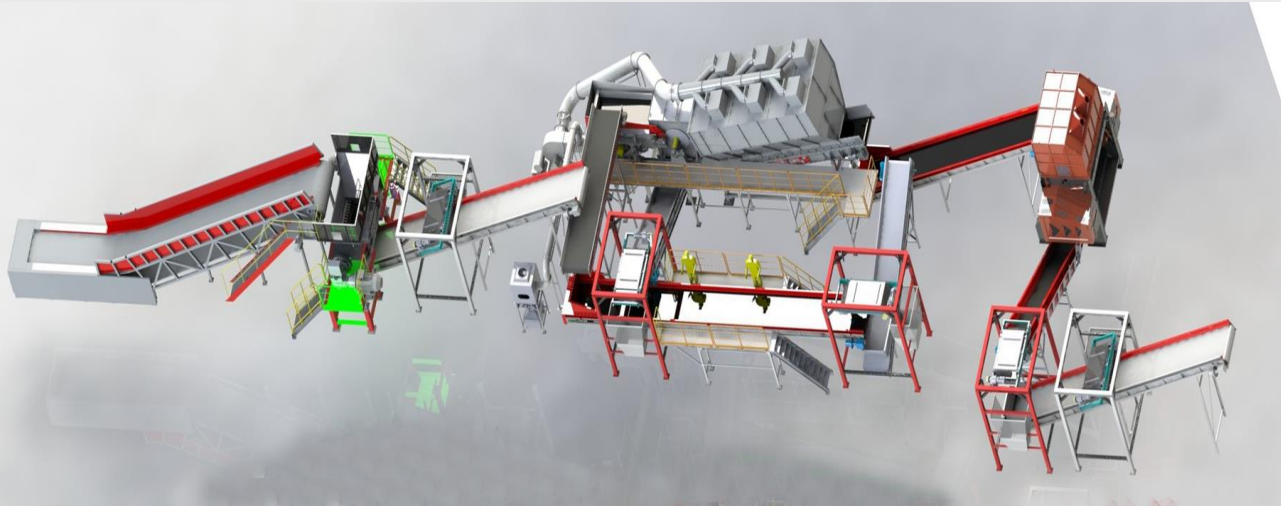


Industrial Wastes Shredding & Sorting System

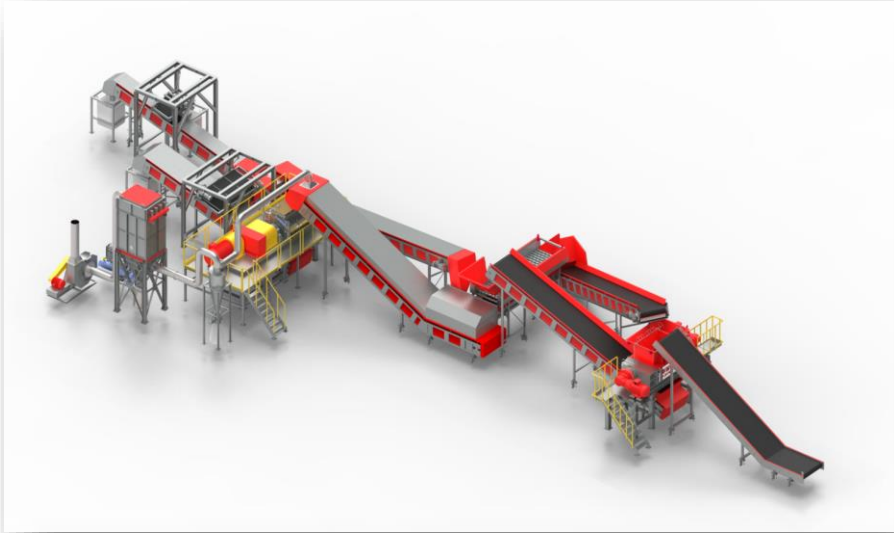
Raw materials



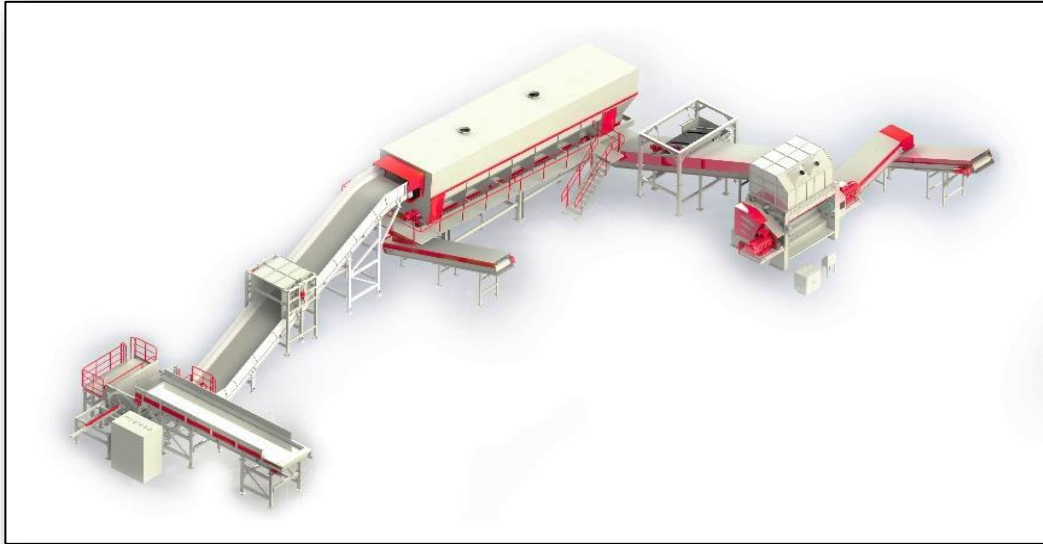
Products



Scrap Tires Shredding & Sorting System



Biomass shredding system



Hazardous Waste Shredding System



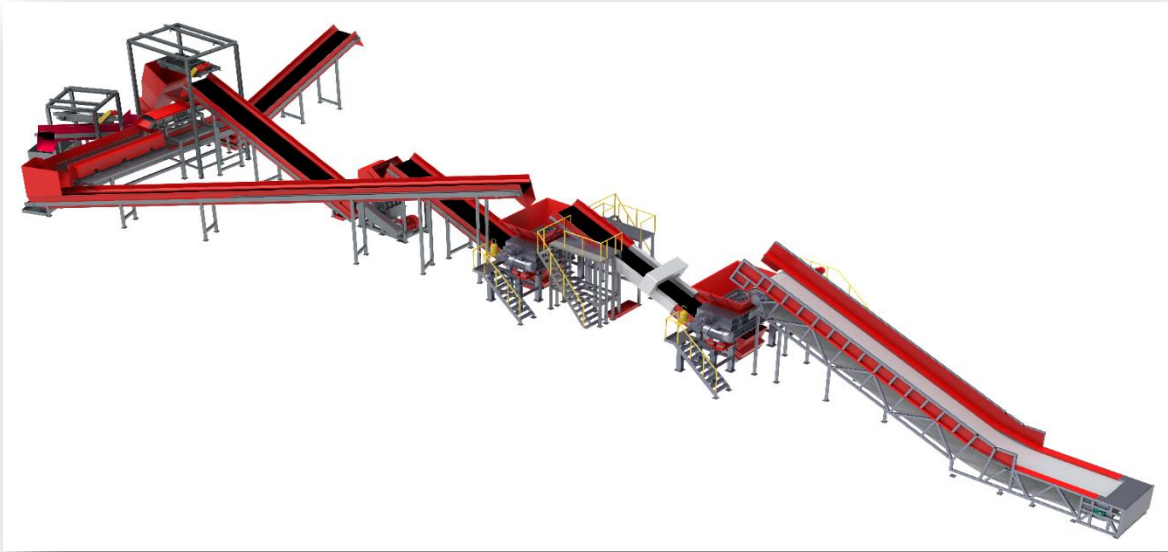
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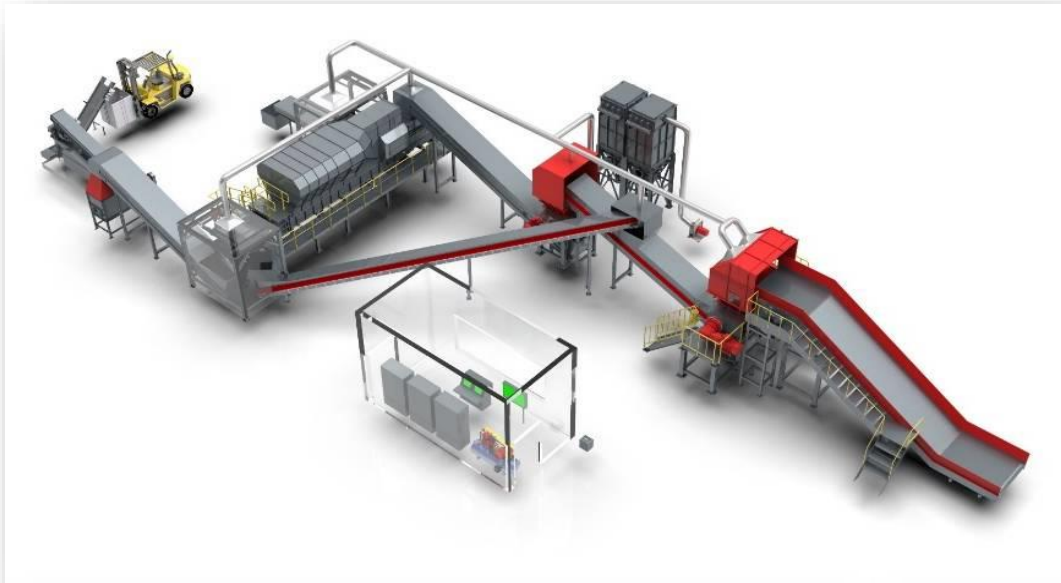
Product



Paper Mill Waste Shredding System



Bulky Furniture Shredding System



Raw materials



Product



03

About Harden



Harden Introduction

- Established: in 2010
- Location: Guangdong Province, China
- Brand: Harden (Leading Global brand)
- Employees: 270
- Auxiliary companies: 3
- Factory Area: 20,000 m²
- Products: Solid waste shredders & waste management system.
- Work scope: R&D, manufacturing, sales, and services.



04

Projects



More than 100 Cases of Alternative Fuel Projects



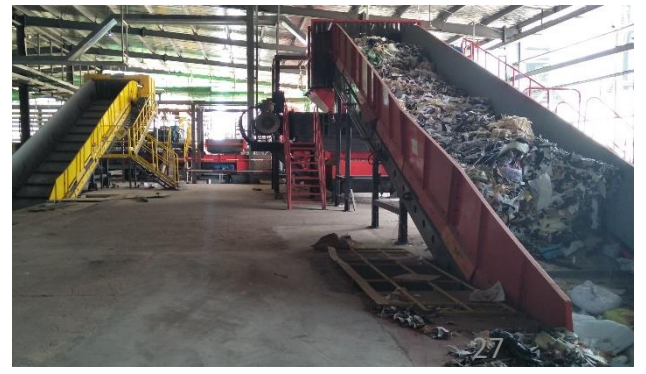
More than 300 Cases of Hazardous Waste Shredding System

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sales@arclerprojects.com

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