



KNOBLINGER Alternative Fuel Systems

Handling, Processing, Storage & Dosing
Solutions for Industrial Decarbonization



www.knoblinger.com



ALTERNATIVE FUELS

Turn residues into energy

From residue to reliable fuel supply

We turn the residues available at your site into a consistent, precisely metered fuel, with a complete plant concept tailored to your combustion system. Your partner - covering the entire process, from feedstock intake to furnace feeding.



Reduce energy costs

Use residues and production by-products as fuel and cut your spending on purchased energy



Gain energy independence

Rely on locally available feedstock and reduce your exposure to fossil fuel prices and supply risks



Lower your CO₂ footprint

Replace fossil fuels with biogenic and residue-derived fuels



One partner

Engineering, equipment and turn-key integration - from a single supplier



Reliable operation

Robust handling of demanding bulk materials keeps your fuel supply stable and continuous

TARGET INDUSTRIES & COMBUSTION SOLUTIONS



☒ ROTARY FURNACE

☒ SHAFT FURNACE

☒ BLAST FURNACE

☒ BURNER

☒ BOILER

FEEDSTOCK MATERIALS



WOOD	OTHER BIOMASS	PLASTIC	SLUDGE	WASTE
- Roundwood - Forest wood chips - Residual wood - Waste wood - Industrial pellets	- Olive stones / pomace - Nut shells / PKS - Grasses & straw - Cereal / rice husks	- Pellets - Plastic granulate - Production scrap	- Sewage sludge - Industrial sludge	- Special waste (CFK, GFK, ...) - Production residues - Sorting residues

OUR PROCESS



INTAKE

Receive and transport incoming feedstock



PREPARATION

Remove contaminants and pre-size the material



PROCESSING

Dry, grind or process to the target fuel quality



DOSING

Set the required fuel flow accurately



STORAGE

Buffer prepared fuel for a continuous supply

TARGET FUELS



WOOD DUST



WOOD CHIPS



BIOMASS DUST



PLASTIC-DERIVED FUEL



TORREFIED FUELS



DRIED SLUDGE



PROCESSED WASTE

- ✓ ROTARY FURNACE
- ✓ SHAFT FURNACE
- ✓ BLAST FURNACE
- ✓ BURNER
- ✓ BOILER

WOOD DUST

burner-ready • defined particle size • for industrial combustion

YOUR BENEFITS

- | **Replace fossil fuels** – use wood residues economically and gain energy independence through local raw material supply
- | **Use feedstocks flexibly** – adapt preparation to the incoming material, from dry shavings to moist wood chips or sawdust
- | **Achieve the required fineness** – match grinding to your furnace, whether burner, shaft kiln or rotary kiln
- | **Improve process stability** – consistent particle size ensures reliable dosing and a stable combustion
- | **Combine modules flexibly** – from intake to fuel injection, extendable step by step

SELECTED REFERENCES



Lime plant - Germany



Cement plant - Austria



Asphalt plant - Germany

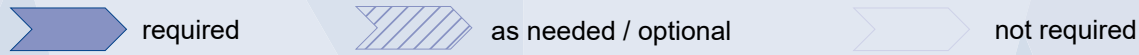
TARGET INDUSTRIES & COMBUSTION SOLUTIONS



- ☒ ROTARY FURNACE
- ☒ SHAFT FURNACE
- ☐ BLAST FURNACE
- ☒ BURNER
- ☒ BOILER

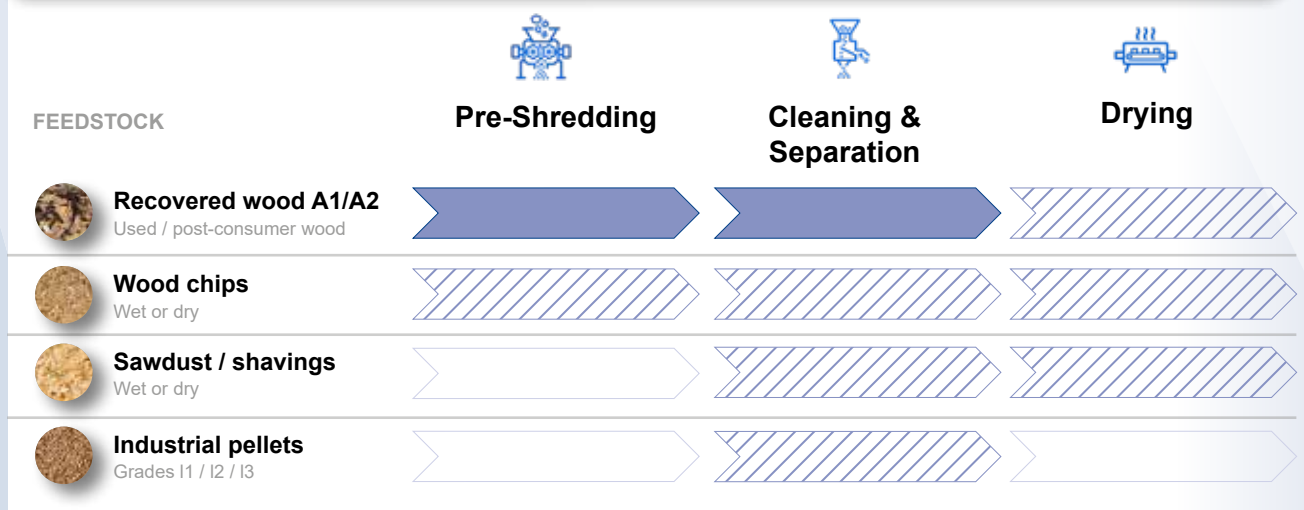
FROM FEEDSTOCK TO TARGET QUALITY

Overview of Core Processes



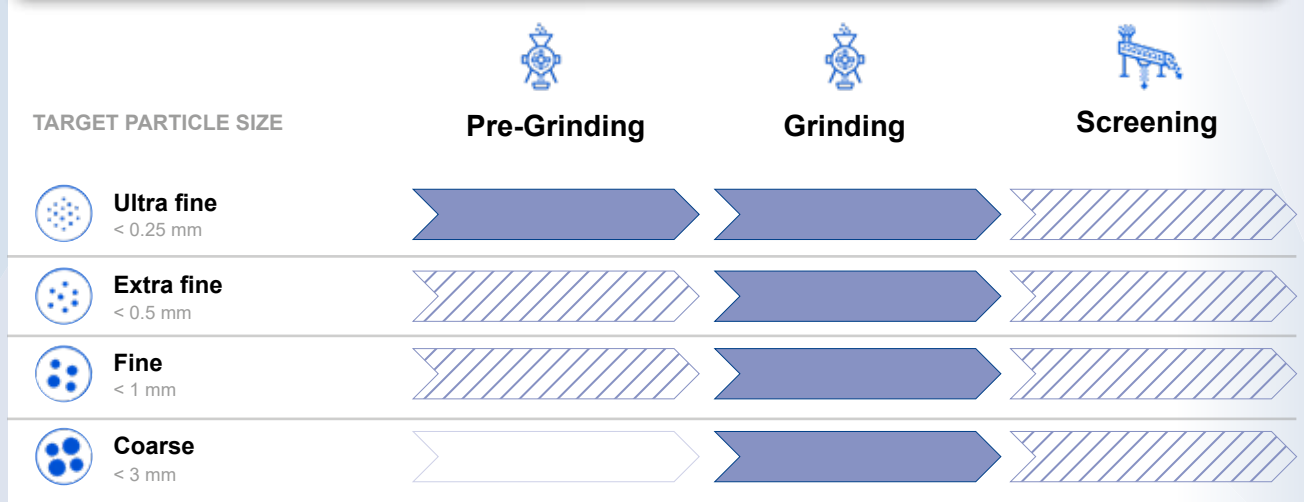
01

RAW MATERIAL PROCESSING



02

GRINDING



03

MATERIAL LOGISTICS

STORAGE

-  **Steel / Concrete Silo**
-  **Bunker**
-  **Dust Container**

DOSING & FEEDING

-  **Material Discharge**
-  **Dosing**
-  **Material Conveying**

WOOD CHIPS

defined particle size • dried as needed • for energy generation

YOUR BENEFITS

- | **Use regional wood resources** – turn roundwood, salvage timber or sawmill residues into locally sourced fuels
- | **Use feedstocks flexibly** – adapt preparation to the incoming material, from fresh wood to dry residues
- | **Control particle size and moisture** – produce chips for all common chip classifications
- | **Ensure reliable feeding** – discharge, dose and convey evenly, even with coarse or fibrous chips
- | **Combine modules flexibly** – from intake and chipping to fuel feeding, extendable step by step

SELECTED REFERENCES



Biomass heating plant - Austria



Wood chip production - Austria



Biomass heating plant - Austria

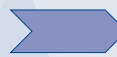
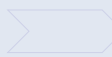
TARGET INDUSTRIES & COMBUSTION SOLUTIONS



- ☐ ROTARY FURNACE
- ☐ SHAFT FURNACE
- ☐ BLAST FURNACE
- ☐ BURNER
- ☒ BOILER

FROM FEEDSTOCK TO GRADED WOOD CHIPS

Overview of Core Processes

 required
  as needed / optional
  not required

01

RAW MATERIAL PROCESSING

FEEDSTOCK



Debarking



Contaminant Removal



Chipping



Roundwood
Individual logs



Wood offcuts
Solid sawmill offcuts



Forest wood chips
From forest residues



02

CONDITIONING

TARGET PARTICLE SIZE



Drying



Screening



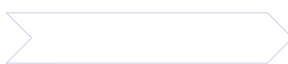
Premium heating chips
Fine • Dry



Standard heating chips
Medium • Semi-dry



Energy chips
Coarse • Wet



03

MATERIAL LOGISTICS

STORAGE



Steel / Concrete Silo



Bunker

DOSING & FEEDING



Material Discharge



Dosing



Material Conveying

BIOMASS DUST

defined particle size • derived from biomass residues • for industrial combustion

YOUR BENEFITS

- | **Use residual biomass** – turn olive stones, nut shells, straw or husks into fuel from regional sources
- | **Prepare diverse feedstocks** – adapt raw material processing to each material, from hard shells to light straw
- | **Achieve required fineness** – match grinding to the application, from burner to furnace
- | **Match fuel and furnace** – account for ash, chlorine and alkalis in plant and process design
- | **Combine modules flexibly** – from intake and drying to dosing and injection, extendable step by step

SELECTED REFERENCES



Biomass processing - Germany

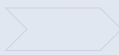
TARGET INDUSTRIES & COMBUSTION SOLUTIONS



- ☒ ROTARY FURNACE
- ☒ SHAFT FURNACE
- ☐ BLAST FURNACE
- ☒ BURNER
- ☒ BOILER

FROM FEEDSTOCK TO TARGET QUALITY

Overview of Core Processes

 required
  as needed / optional
  not required

01

RAW MATERIAL PROCESSING

FEEDSTOCK	Opening / Pre-Shredding	Drying	Contaminant Removal
 Olive stones / pomace Stones / moist pomace			
 Nut shells / PKS Hazelnut · peanut · palm kernel			
 Grasses & straw Open bales and shorten fibres			
 Cereal / rice husks Loose, lightweight bulk material			

02

GRINDING

TARGET PARTICLE SIZE	Pre-Grinding	Grinding	Screening
 Ultra fine < 0.25 mm			
 Extra fine < 0.5 mm			
 Fine < 1 mm			
 Coarse < 3 mm			

03

MATERIAL LOGISTICS

STORAGE

-  **Steel / Concrete Silo**
-  **Bunker**
-  **Dust Container**

DOSING & FEEDING

-  **Material Discharge**
-  **Dosing**
-  **Material Conveying**

PLASTIC-DERIVED FUEL

high calorific value • controlled preparation • for industrial combustion

YOUR BENEFITS

- | **Fossil fuels** – use energy-rich plastic fractions as fuel and cut CO₂-related costs
- | **Reduce disposal costs** – turn suitable production residues into fuel instead of paying for waste
- | **Use residual material streams** – process pellets, regranulate and scrap from regional sources
- | **Control fuel quality** – match particle size and dosing to the furnace for stable combustion
- | **Combine modules flexibly** – from intake to controlled fuel feeding, extendable step by step

SELECTED REFERENCES



Cement plant - Austria



Cement plant - Germany

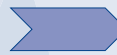
TARGET INDUSTRIES & COMBUSTION SOLUTIONS



- ☒ ROTARY FURNACE
- ☒ SHAFT FURNACE
- ☒ BLAST FURNACE
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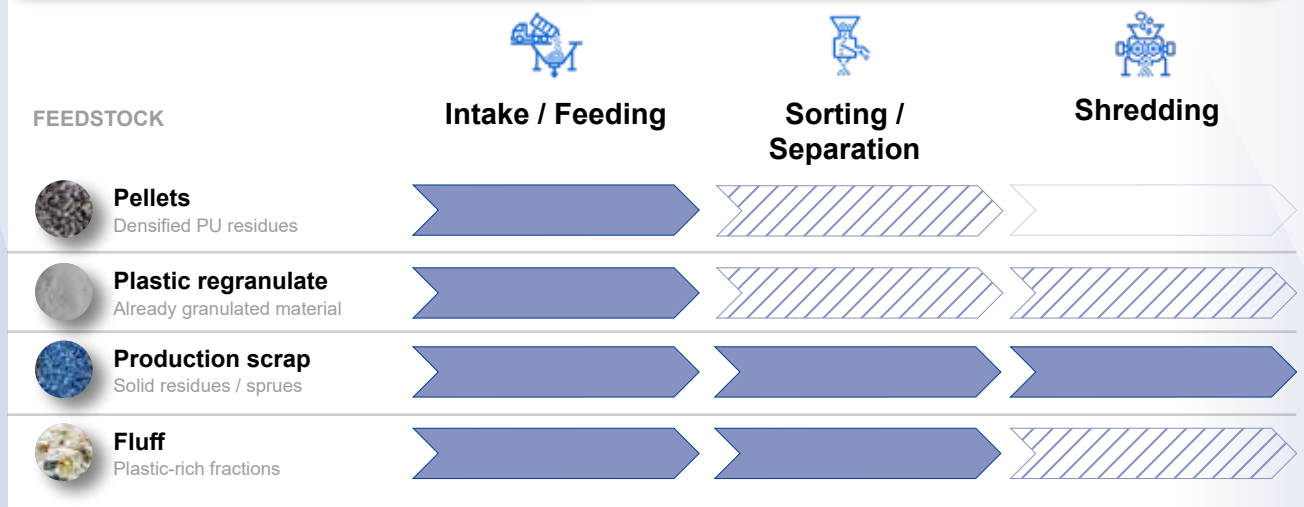
FROM PLASTICS TO INDUSTRIAL FUEL

Overview of Core Processes

 required
  as needed / optional
  not required

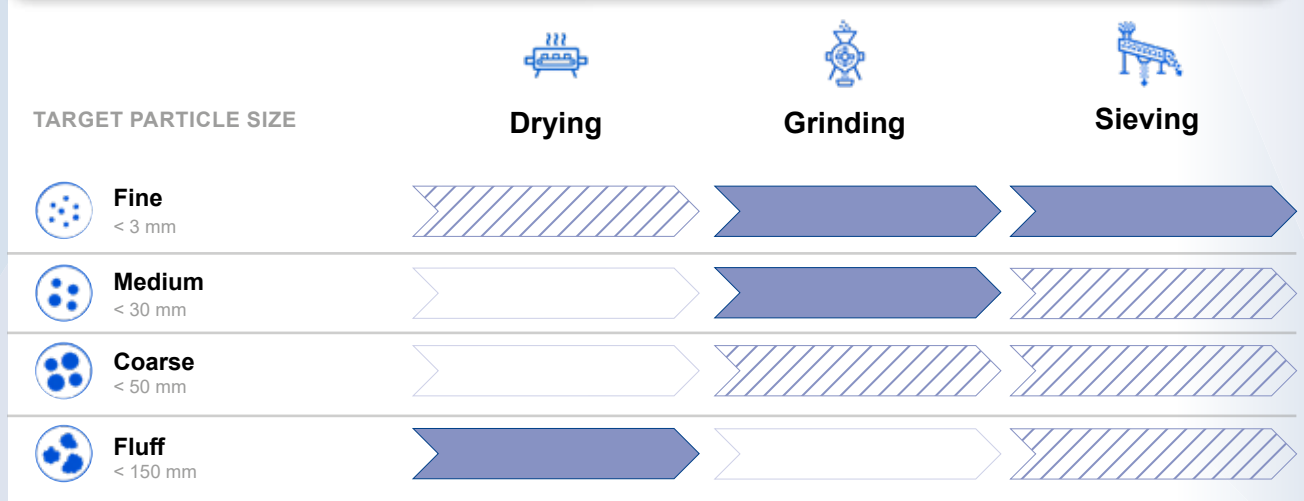
01

RAW MATERIAL PROCESSING



02

GRINDING



03

MATERIAL LOGISTICS

STORAGE

-  **Steel / Concrete Silo**
-  **Flat Storage**

DOSING & FEEDING

-  **Material Discharge**
-  **Dosing**
-  **Material Conveying**

TORREFIED FUELS

thermally upgraded • improved grindability • for industrial use



Wood chips



Wood dust



Residual wood



Shells / Stones

CORE PROCESSES

01 Raw Material Processing

- | Remove metals and other contaminants
- | Size the material to reactor requirements
- | Pre-dry to the required inlet moisture

02 Torrefying

- | Control temperature and time precisely
- | Process the biomass for better processing and energy density
- | Cool the product safely under controlled conditions

03 Material Logistics

- | Store the product in dedicated silos or bunkers
- | Discharge gently to minimise abrasion and fines
- | Conveying & precise dosing with low dust emissions

SELECTED REFERENCES



Torrifaction plant - Finland

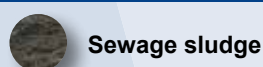
TARGET INDUSTRIES & COMBUSTION SOLUTIONS



- ✓ ROTARY FURNACE
- ✓ SHAFT FURNACE
- ✓ BLAST FURNACE
- ✓ BURNER
- ✓ BOILER

DRIED SLUDGE

dry as needed • waste to fuel • controlled dosing



CORE PROCESSES

01 Raw Material Processing

- | Receive dewatered sludge in an enclosed system
- | Adapt conveying to the sludge consistency
- | Feed the dryer with a steady material flow

02 Drying

- | Dry to the residual moisture your recovery route requires
- | Make use of available process heat
- | Capture and treat exhaust air as required

03 Material Logistics

- | Store or buffer the dried material
- | Match discharge and flow rate to downstream requirements
- | Precise dosing or transfer to loading

SELECTED REFERENCES



Processing plant - Russia



Sludge processing - UK

TARGET INDUSTRIES & COMBUSTION SOLUTIONS



- ☒ **ROTARY FURNACE**
- ☐ **SHAFT FURNACE**
- ☐ **BLAST FURNACE**
- ☐ **BURNER**
- ☒ **BOILER**

PROCESSED WASTE

coarse sorting for direct use • dry as needed • further processing into fluff



Special waste (CFK, GFK, ...)



Production residues



Sorting residues

CORE PROCESSES

01 Raw Material Processing

- | Receive waste streams and carry out coarse sorting
- | Separate recyclables and bulky contaminants
- | Shred to the target size to produce fluff fuel

02 Drying

- | Reduce moisture to increase the calorific value
- | Make use of available process heat
- | Capture and treat exhaust air as required

03 Material Logistics

- | Store or buffer the coarse fraction or fluff to match demand
- | Discharge and convey at a steady rate
- | Precise dosing or transfer to loading

SELECTED REFERENCES



Waste processing - Taiwan

TARGET INDUSTRIES & COMBUSTION SOLUTIONS



☒ ROTARY FURNACE

☐ SHAFT FURNACE

☐ BLAST FURNACE

☐ BURNER

☐ BOILER

KNOBLINGER AT A GLANCE

Driving efficiency and sustainability in bulk material processing

150 creative minds working on the energy transition

60+ years of experience in bulk material processing

30+ years as a trusted supplier of steel and heavy industries

OUR SOLUTIONS

TURNKEY PLANTS	COMPONENTS	INDUSTRIAL SERVICES
- Pellet production - Pellet handling - Alternative fuel processing - Bulk material logistics - Wood residue handling	- Screw conveyors - Chain & Belt conveyors - Bucket elevators - Moving floors ...and many more	- Maintenance & service - Optimisation & modernisation - Assistance with safety & fire protection - Spare parts supply

OUR INDUSTRIES



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Successful companies rely on KNOBLINGER

- | Complete wood pelletizing systems
- | Pellet storage technology
- | Alternative fuel processing
- | Grain and feedstuffs technology
- | Raw materials receiving technology
- | Loading and handling systems



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