



Biomass pelleting

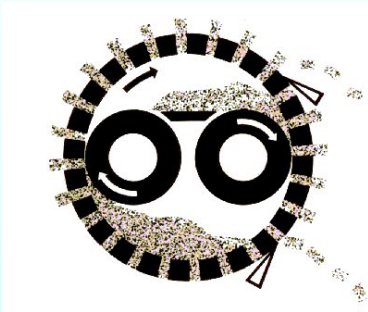
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Area manager - CPM Europe



- What is pelleting?
- Who is CPM?
- What is so special about CPM?
- Biomass applications
- Bagasse pelleting



What is pelleting?

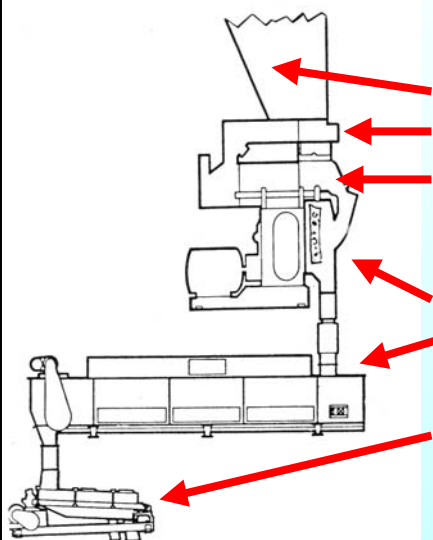


- A Pelletmill compresses mealy or powdery materials into firm, uniformly shaped granules.



What is pelleting?

Pelleting is a process:



- Bin: To buffer product.
- Feeder: To dose product.
- Conditioner: To prepare the product by mixing with liquid(s) and/or steam.
- Pellet Mill: To form pellets
- Cooler: To cool (and dry) the pellets.
- Sieve: To separate fines from pellets.




Why pelleting?

- Minimizes problems of reclaiming or disposing of dust, powders, residues or other hard to handle materials.
- Reduces cost for shipping, storage and handling.
- Densifies waste materials.
- Converts combustible energy resources into more efficiently consumed, cleaner burning pelleted fuel



California Pellet Mill & Roskamp / Champion

-  is the world leading designer and manufacturer of pelleting equipment, offering a complete line of pellet mills, conditioning systems, coolers, crumblers, coaters, feed cleaning systems and pellet dies.
- **ROSKAMP CHAMPION**
World Leader in Particle Size Reduction Designs and manufactures a broad range of particle size reduction machinery. The product line includes roller mills, hammer mills, shredders and crushers, and also flaking mills, oat hullers, steam chambers, rotary feeders.

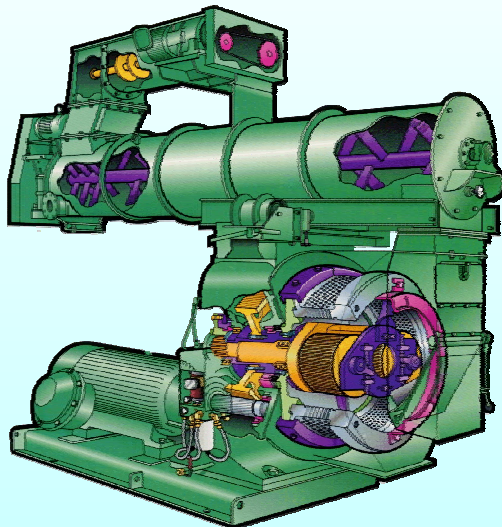


California Pellet Mills

Up to 50% of all pellet mills in the world are
made by CPM



What is so special about
the CPM pellet mill?





It is a gear box!

- high efficient power transmission
- compact safe design
- high production-line availability factor



Efficiency

- Do you realize that a gear has an over 11% higher efficiency than a two stage V-belt drive?
- Do you realize the savings?
- Do you realize what a high efficiency transmission means to the process and machine user-friendliness
- Do you realize the savings?



Efficiency

Example:

- Motor 225 kW
 - 20 Hours per day
 - 6 Days per week
 - 50 weeks per year
 - Energy rate Euro 0,08/kWH.
- } 6000 Hours/Year

SAVING: 6000 Hours/Year x 250 kW x Euro 0,08/kWH x 11% saving = **11.880 Euro/Year**



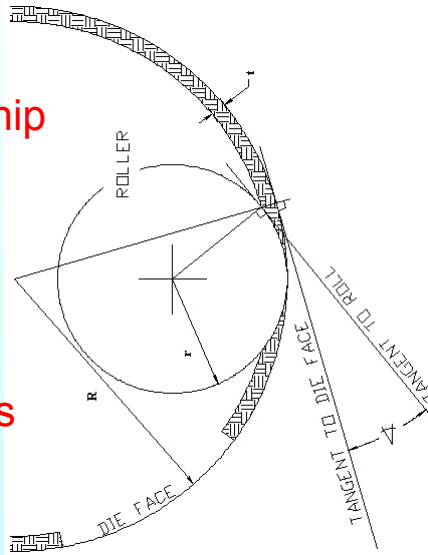
It is a “ring” die

- Less sensitive to moisture content
- High efficiency
- Users friendly



It has two rollers

- Better grip through small nip angle
- High efficiency
- Low wear costs



Compact safe design

- Space requirement
- Dust insensitive
- Static electricity
- fire/explosion danger
- safety



high production-line availability factor

- Less sensitive for
Overload/stall
- Low Maintenance



The CPM pelletmill features:

- Pellet mill and direct coupled drive
motor on common base plate.
- Reliable shear-pin protection.
- Continuous lubrication during operation.
- Easy die mounting.
- Two rolls
- User-friendly design.



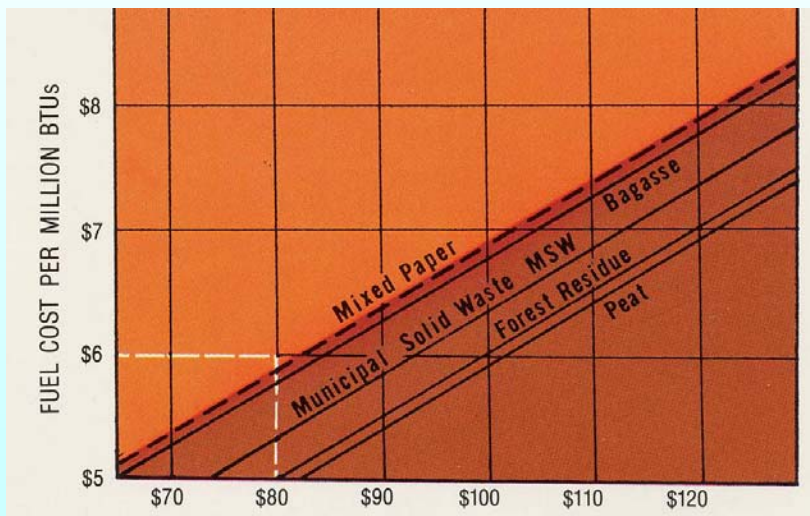
BIO MASS APPLICATIONS

- WOOD
- SEWAGE SLUDGE
- RDF
- COAL
- SUNFLOWER HULLS
- BAGASSE
- PEAT
- MEAT AND BONE MEAL
- OTHERS



BIOMASS APPLICATIONS

Fuel values, equivalent BTU basis





Why bagasse pelleting?

Pellets are:



Dust free:

reducing dust explosion potential

minimizing particle emission

Uniform:



more efficient control of combustion



Why bagasse pelleting?

Pellets are:



Free flowing:

facilitating material handling and rate of flow control

Increased bulk density:

more BTU's per volume unit

economies storage and transportation



Why bagasse pelleting?

1) Fuel for Burning

- \varnothing 6 / 8 mm: household stoves
- \varnothing 8 / 18 mm: Industrial
- Energy level: 4,8 – 5 kWh/kg
- Compared to Oil: 1 ltr oil = 2,4 kg bagasse pellets

2) Feed ingredient



TYPE OF RAW MATERIALS



- **Natural Bagasse**
(After extraction)
- **Hydrolyzed Bagasse**
(Steam treated)



PREPARATION PRIOR TO PELLETIZING

Drying:

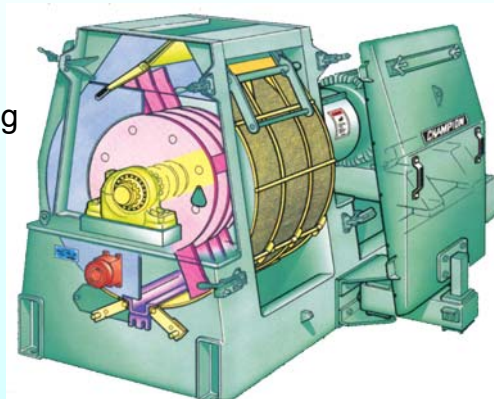
- Product will be dried down to 10-12% moisture
- Energy input around 1 MWh/t
- Dryer fired with waste bagasse



Particle size control

SIEVING:

- Use bigger sizes for burning



GRINDING:

- Usually \varnothing 8 mm hammermill screen
- Energy input typically 12 – 20kWh/t



PREPARATION PRIOR TO PELLETIZING

Addition of binding agent

- Molasses
- Other materials (spent grains, starch etc)
- Added before hammermill or before conditioning.



PREPARATION PRIOR TO PELLETIZING

Ripening time

- Soaking time for maximum absorbability
- Depending on site conditions with ripening kettle or separate bin



PREPARATION PRIOR TO PELLETIZING

Addition of water / steam

- Addition of surface moisture to lubricate and bind the particles.



PELLETIZING SYSTEMS

Type of pellet mills for bagasse

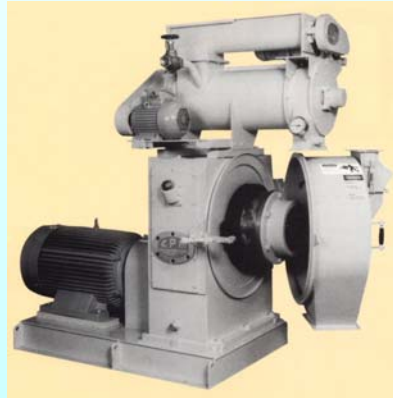
- Special range of pellet mills made suitable for biomass pelleting
- Dies have been designed to suit the tough pelleting conditions
- Rollers are developed to cope with the high loads
- Special forced feeder design suitable for low bulk density input materials



PELLETIZING SYSTEMS

Model Century pellet mills

- 2016-2 with 90 kW
- Capacity 1 – 1,5 t/h
- Die Area 750 cm²



PELLETIZING SYSTEMS

Model 7700 pellet mills

- 7722-4 with 160 kW
- Capacity 2 – 3 t/h
- Die Area 1700 cm²



PELLETIZING SYSTEMS

Model 7900 pellet mills

- 7930-4 with 250 kW
- Capacity 4 – 5 t/h
- Die Area 2250 cm²



DIES

- Integrated stiffening ring
- High resistant steel
- Total thickness adjusted
- Open area guidelines (around 39%)





Rolls







- Special bearings (spherical)
- Narrow track to reduce loads



- Reduced bearing loads = lower roll temperatures
- Reduced roll temperatures = longer bearing life
- Reduced roll temperatures = less degeneration of grease



Energy consumption

<i>Transport</i>	<i>Grinding</i>	<i>Pelleting</i>	<i>Cooling</i>	<i>Various</i>	<i>Total</i>
<i>5 Kw/t</i>	<i>15 kw/t</i>	<i>50 Kw/t</i>	<i>2,5 kw/t</i>	<i>2,5 kw/t</i>	<i>+/- 75 Kw/t</i>
					



Reasons for waste management and recycling

- Increased prices for landfill.
- Increased energy/fuel prices.
- Increased taxes on fossil fuels.
- Increased prices for products made of recycled materials.
- Increased prices for new basic ingredients.



CPM / Europe.b.v.
Amsterdam / the Netherlands



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Your partner for making Profit
Your partner for knowledge
Your partner for the future