



# Industry News

March 1997

## *Impacting the Particleboard Industry*

Since entering the particleboard industry in the 1980's, Bliss Industries has had a tremendous impact on the manufacturers' bottom line: decreased energy consumption, lower replacement parts cost and less downtime/labor costs. These improvements have allowed the manufacturer to gain on their overall profitability and be more competitive. An average size particleboard plant that processes their face and core material with refiners at a rate of 30,000 pounds per hour can expect to save approximately \$500,000 to \$700,000 annually. The majority of these savings

are in energy costs. These savings vary from plant to plant with changing variables such as incoming product size, moisture content, desired finished product, etc. No two particleboard plants have the exact same process. The following data is based on industry averages. All information was gathered from production and/or maintenance personnel from plants that are either using or have used in the past the different types of equipment in the comparison. In the following, we will try to show you some of the differences that can truly impact your bottom line.

## **Energy Consumption**

### **Hammermills**

The Bliss Eliminator Hammermill is being used on a number of different applications in the processing of Face, Core and Reclaim/Fuel material.

Face Material - Typically used on hogged incoming wood or screen classified overs. The hogged material is commonly 2" minus and the screened material generally ranges from +16 mesh to 1/2" minus. Moisture content in the 15% to 20% range.

#### **Soft Wood**

Hogged: 45 to 55 pounds per horsepower per hour

Screened: 100 to 110 pounds per horsepower per hour

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## Energy Consumption, con't.

### Hard Wood

Hogged: 25 to 30 pounds per horsepower per hour

Screened: 45 to 55 pounds per horsepower per hour

Core Material - Typically used on incoming raw material. Chips, planer shavings or hogged by-products are commonly used. These products are 2" minus with moisture content ranging from 15% to 20%.

### Soft Wood

Raw Material: 100 to 120 pounds per horsepower per hour

### Hard Wood

Raw Material: 40 to 50 pounds per horsepower per hour

Reclaim/Fuel Material - Typically used on by-products being generated throughout the process. This material can be recycled back into the board or can be burned for fuel. This material grinds much easier having already been through the process. It is composed of material that has already been reduced in size and has been through the drying process. Hard and soft wood grinds about the same in this application.

Reclaim/Fuel: 150 to 200 pounds per horsepower per hour.

### Refiners

Disc refiners are currently the most common type of size reduction equipment being used in processing face and core material. These machines see a fairly diverse range of incoming products. However, throughputs are affected very little. Incoming material is typically steam conditioned prior to entering the refiner.

Face: 15 to 25 pounds per horsepower per hour

Core: 20 to 30 pounds per horsepower per hour

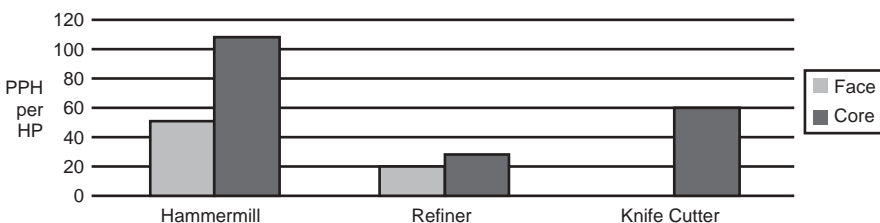
### Knife Cutters

Knife cutters are most popular for the processing of core material. The cutting action of one ring inside of another yields a finished product with some length to width ratio. The incoming products are typically raw materials e.g. chips, shavings, etc. Incoming material is typically 15% to 20% moisture.

Core: 55 to 65 pounds per horsepower per hour

### ENERGY CONSUMPTION

based on 2" minus incoming material @ 15 to 20% moisture



CUSTOMER



VENDOR

EMPLOYEE

### Mission Statement

TEAMBLISS, with the customer as team captain works continually toward improvement. We provide efficiency, productivity and ultimately profitability to the industries we serve.

# Replacement Parts Cost

## Hammermills

Major wear items on a hammermill are the hammers and screens. Minor wear items are the pins, spacers, squeeze collars and wear liners.

### Soft Wood

Hammers: Average life - 30 to 35 weeks  
Screens: Average life - 12 to 14 weeks

### Hard Wood

Hammers: Average life - 45 to 50 weeks  
Screens: Average life - 12 to 14 weeks

Pins, spacers and squeeze collars are typically replaced every second or third hammer change. Replaceable abrasion resistant wear liners are usually replaced annually.

Average annual parts costs:  
\$5,000 to \$7,000 per hammermill

## Refiners

Major wear items are replaceable disc plates. Minor wear items are liners, over rings, seals, etc.

Plates: Average life - 4 to 5 weeks

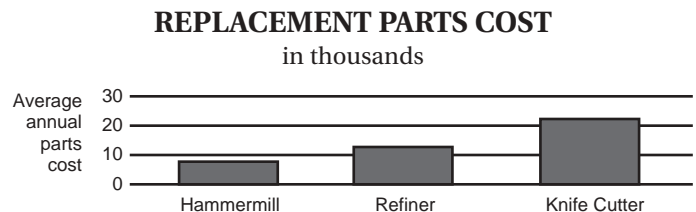
Liners, seals, bearings, over rings, etc. usually replace every 3 to 4 years with complete rebuild.

Average annual parts cost:  
\$13,000 to \$15,000 per refiner

## Knife Cutters

Major wear items are replaceable knives and knife rings. Minor wear items are back pressure plates and impeller wiper blades. Knives can be reconditioned for continued use by sharpening.

Average annual parts cost:  
\$20,000 to \$25,000 per knife cutter



# Downtime/Labor Cost

## Hammermills

A Bliss Eliminator is designed for 24 hour operation - 7 days per week. Preventative maintenance can be performed by one person. This includes changing screens and hammers as well as the other minor wear items. Bearings should be serviced every 1000 to 1500 hours of operation.

Average annual downtime: 8 hours per hammermill  
Total personnel required: 1 person  
Average annual man/hours lost: 8 hours

## Refiners

Refiner plates are typically replaced every 4 to 5 weeks. Replacing the refiner plates is typically a two person job. Average change time is 45 minutes.

Average annual downtime: 20 hours per refiner  
Total personnel required: 2 people  
Average annual man/hours lost: 40 hours

## Knife Cutters

Sharp knives are required for this machine to perform. Typically the knife rings are replaced once every 8 hours. This job requires 3 people for approximately 45 minutes per change. One person is required to

sharpen knives and to set up the replacement rings. Physically handling the sharp rings supported by a hoist is a serious safety concern.

### Knife Ring Replacement

Average annual downtime: 750 hours  
Total personnel required: 3 people  
Average annual man/hours lost: 2,250 hours

### Resharpener/Rebuilding

Average annual hours: 2,000 hours  
Total personnel required: 1 person  
Average annual man/hours lost: 2,000 hours

Average annual man/hours lost:  
4,250 hours per knife cutter



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# Economic Comparisons

|   | Hammermill    | Refiner         | Knife Cutter        |
|---|---------------|-----------------|---------------------|
| * Electrical Cost/lb. - Face  | \$0.00075/lb. | \$0.00188/lb.   |                     |
| * Electrical Cost/lb. - Core  | \$0.00034/lb. | \$0.00150/lb.   | \$0.00063/lb.       |
| Replacement Parts Cost/Yr.  | \$6,000/yr.   | \$12,000/yr.    | \$20,000/yr.        |
| Maintenance Downtime/Yr.  | 8 man hrs/yr. | 40 man hrs./yr. | 2,250 man hours/yr. |
| * Maintenance Labor Cost/Yr.  | \$80.00/yr.   | \$400.00/yr.    | \$22,500/yr.        |
| Additional Labor Cost/Yr.   |               |                 | \$20,000/yr.        |
| * Assumed Costs   |               |                 |                     |
| Power Factors: 0.749 KWH per HP   |               |                 |                     |
| \$0.05 per KWH  |               |                 |                     |
| Labor: \$10.00 per hour   |               |                 |                     |
| <i>Note: All economic information is based on actual industry averages per machine.</i> |               |                 |                     |

## Testing

Bliss Industries has been testing various processes for the particleboard industry since the 1980's. Over the past ten years, we have compiled a tremendous amount of data on these processes. However, with the different application of each individual manufacturer, we would like an opportunity to test your particular product. 200 lbs. of material is required for an accurate test. Please seal this product in multiple bags and ship in a drum to maintain moisture content. **Please consult the factory at: 800-569-7787 with any questions.**

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