SP Engineering Services

2129 SW 39th Terrace
Cape Coral, Florida 33914

October 20, 2020

CAN-AM Machinery Inc.
44 Old Princeton Road
Fitchburg, MA. 01420
USA

Attention: Daniel Nigrosh

Subject: Proposal # 31298A
(1) – Rebuilt 30” Series 4500 Double-D Refiner w/ Floating Rotor

Mr Nigrosh

We are pleased to propose the following rebuilt Beloit-Jones 30” DD Series 4500 Refiner with Variable Frequency Plate Adjustment and Upgrade to a Floating Splined Rotor.

Should you have any questions please feel free to call me at 1-518-265-6874.
Sincerely,

Pat Broderick
Manager – Sales and Service

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Equipment Specifications

Rebuilt 30" DD Series 4500 Refiner Coupled Motor Design

- Rebuilt 30 inch DD Series 4500 refiner with Floating Rotor and Variable Frequency Disk Plate Adjustment.

Rebuild Scope of Work

- Main Base will be cleaned, sand blasted, and inspected for cracks and critical dimensions. It will be machined to manufacturing specifications and all drilled and tapped holes will be repaired.

- Base Liner will be repaired or replaced based on damage and thickness.

- Stainless Steel cladding will be repaired or replaced.

- Adjusting Mechanism Assembly will be machined to specifications to match critical fits in the housing and include the following repairs.
  1. Cross bores will be repaired and machined to specifications.
  2. New adjusting gear set consisting of: worm gear, worm shaft and adjusting screw will be installed.
  3. Sliding guide pads and keyways will be repaired.
  4. Sliding head will be machined to specifications with new threaded inserts.
  5. Gear motor will be a new single speed motor.
  6. New gaskets, shims, packing, had wheel, updated grease blocks will be installed.

- Rotating Assembly shaft and bearing housing will be cleaned, inspected and repaired as needed to specifications. It will be assembled with new bearings, seals, gaskets, O-rings and hardware.

- Rotating Head will be Floating Rotor design.
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- Final Assembly will include reassembly of repaired and new parts along with new paint of customer's choice.

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Equipment Description

The bearings are designed for splash oil lubrication, with internal re-circulating oil. An oil cup located at the top of the bearing housing provides easy access for oil fills and serves as an air vent. A Direct-reading oil sight gauge is attached to the side of the bearing housing.

The design unitizes an adjusting mechanism housing that permits the thrust load to be transmitted directly to the door. The basic screw and worm gear along with the adjusting screw is immersed in oil at all times. The adjusting screw housing is sealed by the use of "O" rings and lip-type seals are used on the worm shaft. An oil fill pipe plug is located above the adjusting screw and a drainpipe plug is located beneath the worm.

The ductile iron-sliding head has a type ½" 316 stainless steel liner at the outside diameter, and a replaceable 1/8"cladding of type 316L stainless steel. This provides a plate-mounting surface and a non-corrosive surface for the lip seal and plates. Four pads, two with grease lubricated keyways; guide the sliding head in place, with the keys serving as anti-rotation stops.

The sliding head is jointed to the adjusting screw by means of a heavy shrink fit design.

The adjusting mechanism housing is hinged to the main refiner casting to facilitate disk inspection and replacement.

VDF Plate Positioning System

The plates are positioned within the refiner cavity by means of a motor/gear-box assembly. This design allows for proper plate Gap (0.003 – 0.005") during refiner loading. The initial and full open gap is set up by adjusting a 3/16" overall plate gap and setting the limit switch to provide repeatability. The Variable Frequency Drive Gear-Motor can be controlled by a signal from the mills DCS system.

Floating Rotor (Spline Rotor technology)

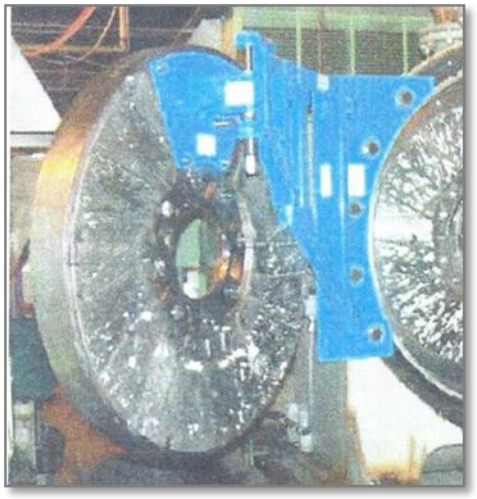
The floating shaft in the refiner has always been a maintenance concern. When the shaft does not float, plate-to-plate contact occurs causing poor refining and could eventually result in broken plates and damage to the refiner. It could also add thrust to the motor bearings and cause them to fail prematurely. With the new splined hub design, the shaft is fixed in the refiner and the "float" occurs by the rotor moving on the splined hub at the end of the drive shaft within the refiner cavity. This design eliminates the need for other parts of the refiner to work in conjunction to float or slide properly. Both the Splined Rotor and Splines Hub are reversible thus allowing two wear surfaces and long life.

Materials of construction are stainless steel for the body of the rotating head and for the drive shaft splined hub. Both will be heat treated and then with Nano-Fusion SLIP_TEK surface treatment to assist with smooth sliding and reduced wear.

Technical Service

Pricing in this proposal does not include supervision of installation or start-up assistance If these services are required. They are available upon request and by separate agreement as defined in the *Service Supervisors Rate Sheet.* Purchaser should schedule the Service Representative at least twenty one days prior to the occurrence of the service trip.
The Refiner Service Center is located in Woodland, WA and is on call 24 hours a day.

Optional Rotor Removal Arm – Quicker and Safer Plate Changes



- Eliminates the need for an over-head crane or chain fall.
- Lowers downtime for plate changes by up to 30%
- Safer handling of larger rotating disks

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SP ENGINEERING DATA SHEETS

Application Description (Primary, Secondary, Tickler, etc.)	Refiner
Refiner Size/Type Number required	30" DD 4500
Estimated Shipping weight	7,400 #s nominal
Capacity @ 4.5 Consistency, Gallons	1300 Max. 379 Min.
Hydraulic Capacity Per Unit @ 4.5 % Consistency, GPM	1800 GPM
Inlet Pressure, Range, PSIG	95 - 100 Max. 20 Min.
Outlet Pressure Range, PSIG	95 - 100 Max. 20 Min.
Refiner Metallurgy:	
Inlet/Outlet Connections	Stainless Steel
Casing Liner	Stainless Steel
Disc Rotor	Stainless Steel
Sliding Head	Stainless Steel
Shaft Sleeve	304 with Nickel - Boron
Packing Gland and Nut	Stainless Steel
Refiner Shaft	AISI 4340
Coupling, Type/Size/Manufacturer (by mill)	#4 Koppers
Coupling Guard Included	Not Included

SP ENGINEERING DATA SHEETS

Drive Motor Range, HP (actual motor by mill)	850 Max. 600 Min.
Recommended Motor HP/RPM	700 HP / 600 RPM
Starting Torque, %	50%
Pull-Out Torque, %	150%
Normal Wk^2	
Momentary Bearing Thrust/lb.	NA- Fixed Shaft Assembly
No Load HP @ Operating Speed	126 HP
Auxiliary Motors:	
1-speed motor: Plate Positioning, HP/RPM	2.0 hp/1800
Controls:	
Recommended Stock Pressures	20 psi low, 90/95 psi high 90 psi stops adjustment 95 psi backs out refiner
Recommended Gland Water Pressure	Alarm set 10 – 15 psi above inlet pressure
Seal Water Requirements	3.5 GPM @ 10 –15 psi above stock inlet.
Main Bearing Lubrication	AGMA 3 417 –510 SSU @ 100° F
Refiner Sound Pressure Level dBA	85 dBA @ normal operating conditions of flow and power
Paint	Included

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Rebuilt 30" Model 4500 Coupled Refiner w/ Floating Rotor Design

Rebuilt 30" Model 4500 Refiner with VDF Disk Plate Drive and Floating Rotor.

Price: ----------$76,500.00

Optional: Rotor Removal Swing Arm - add----------**$ 9,650.00**

Shipment Terms: ExWorks, Woodland, WA

Shipment: Rebuilt Refiner------- 5 weeks after receipt of order .

Payment Terms: Net 30 days

Quotation Valid: 60 days from quotation date.

Not included are any Duty, Brokerage fees, special handling, sales, excise, good and services taxes, and use and similar taxes.

Terms and Conditions:

Statutory and Regulatory Requirements: No known requirements