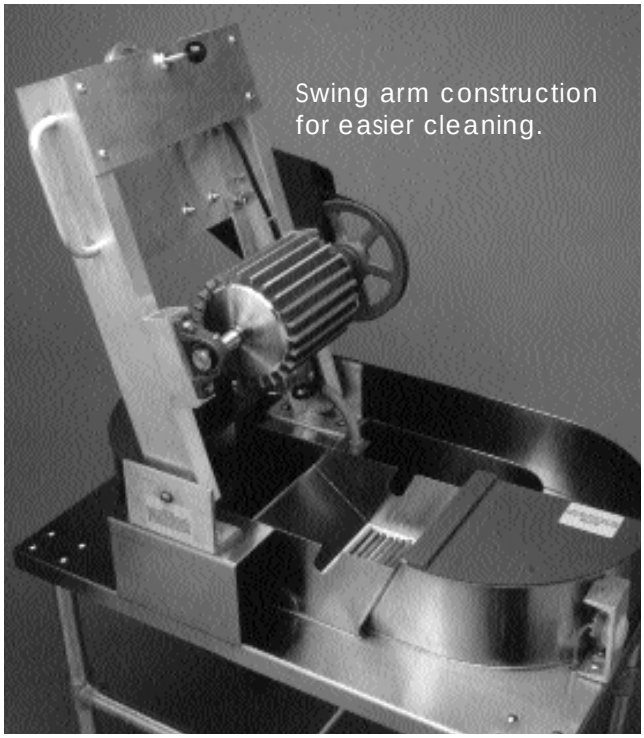
LEE SCOTT McDONALD



Stainless steel model, with arm raised and in beating position.

THE HYDRA HOLLANDER BEATER

Stainless Steel and Fiberglass Models

The Hydra Hollander Beater is designed to meet the needs of discerning papermakers everywhere. Hydra Hollander beaters are simple to use, sturdy, low maintenance machines, featuring a proven swing arm construction which effectively allows for a safer, faster beating. They are found in use in production mills, artist's studios and many teaching areas. Whether you are processing cotton linters for sheets or paper casting, beating flax or linen 12 hours for a transparent high shrinkage pulp, working with indigenous fibers or natural fiber cloth,the Hydra Hollander will give you the control to make pulp suited to the paper you wish to make. When coupled with our optional Amp meter you can be assured of the same beating from load to load.

The Hydra Hollander comes with either a stainless steel tub or a fiberglass tub. Both models feature an 8” x 8” 304 stainless steel beating roll with a matching grooved stainless steel bed plate. The beating mechanism features the roll and motor mounted on a swing arm. Roll height adjustment is by a handwheel located on the outer end of the arm. The design maintains proper beating position while allowing the roll to rise out of the way for large clumps. This allows faster lowering of the roll during the initial stages of beating. And you can clearly see the beating action through the Lexan roll lid.

New for 2000 is the redesigned one piece arm (it looks great!) and a newly designed builtup roll with replaceable laser cut blades.

toolsforpaper.com

PO Box 290264 Charlestown, MA 02129 phone: 888.627.2737 fax: 617.242.8825 email: McPaper@aol.com

As the beating mechanism is the same for both machines the choice between models is dependent on the tub, capacity and price. Both the Stainless Steel and Fiberglass reinforced polyester resin tubs come with an oversized 3" drain for easy dumping of the load of pulp. The Stainless Steel tub has a slightly larger capacity than the fiberglass tub, and is the most durable material for a tub. With both models the stand is made of aluminum tubing including locking casters for convenient movement. The beater is mounted high enough so a large container such as a garbage can can be placed underneath to collect the finished pulp. The Hydra Hollander Beater is exceptionally easy to clean because of it's swing arm design. The roll pivots on the arms completely exposing the bed plate. You can clean the stainless steel tub with a scrub pad often without damage to the finish. A fiberglass tub should be treated as you would a fiberglass boat and cannot be scrubbed so vigorously. Both models will stand up to heavy daily use and will last a very long time.

The Hydra Hollander Beater also features ***optimum safety:***

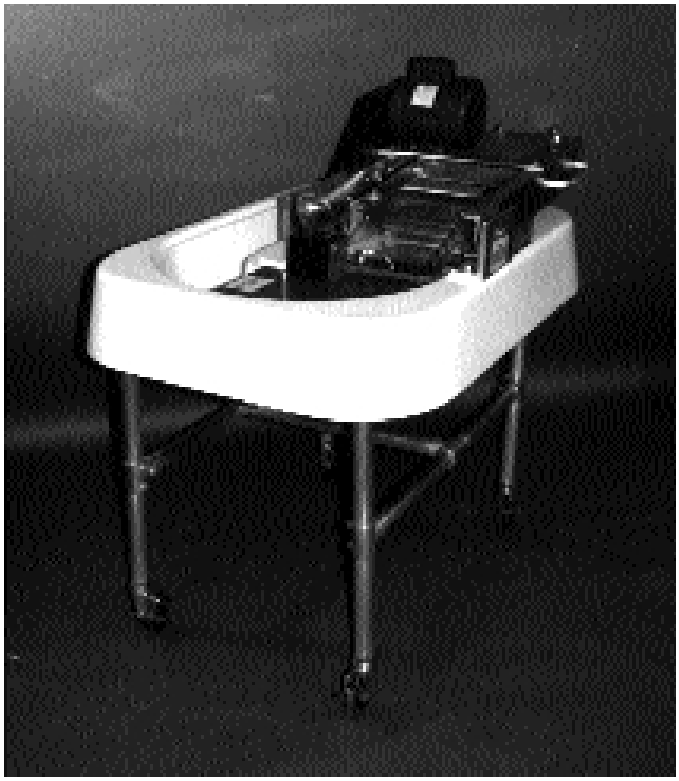
*guarded rotating parts to protect fingers and hands
*special air actuated switches to isolate the user from electrical current
*a lid lockout switch which allows operation only with the lid in position.

Both models are designed to be ***low maintenance****:*

*all exposed metal parts and fasteners are made of brass, aluminum and stainless steel for corrosion resistance
*the lid and roll work together so that no shaft seals are required - one less place where periodic maintenance will be needed.

Papermakers who need to make 10 lbs of pulp or less (5 loads of 2 lbs each) per day will find these machines to be hard working capable machines. For larger capacities, contact us to evaluate your needs.

Beater with Fiberglass Tub



toolsforpaper.com

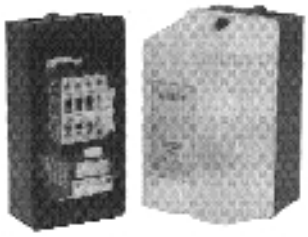
PO Box 290264 Charlestown, MA 02129 phone: 888.627.2737 fax: 617.242.8825 email: McPaper@aol.com

OPTIONS

AMP METER

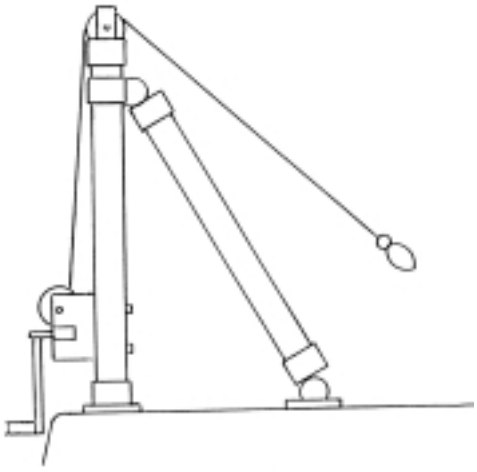
The optional amp meter provides an easy method of producing the same beating effects from load to load. The amp meter indicates how hard the machine is working on the fiber by measuring the power draw of the motor. By adjusting the beater to the same power setting and running it for the same length of time, your loads will be consistent batch to batch even if you make them months apart. It's an easy and effective method eliminating the need to count handwheel revolutions, or listening for beater volume changes. Shipping weight 20 lbs (9 kg).

MAGNETIC STARTER



Magnetic starters are used where safety and reliability are of the highest concern. A magnetic starter switch will not allow a machine to automatically restart if there is a power failure or the safety switch on the lid is opened. Some universities and businesses require this type of starter to meet safety codes such as OSHA codes. Universities should discuss requirements with their physical plant director. IEC Standard. Shipping weight 10 lbs (4.5 kg).

LIFTING WINCH



One of the features of the Hydra Hollanders is the ability to lift the arm and roll and expose the bed plate for cleaning. However the roll and arm weighs about 125 lbs which can be too heavy for some people to lift. We have designed a winch assembly to raise the arm to help those who would like to use a mechanical device to help lift. The option consists of a post with a pulley on top and a 40:1 gear ratio worm drive winch. The cable from the winch is attached to the U-bolt on the arm with a safety hook and the winch is used to raise the roll for cleaning. When beating, the cable is given enough slack so that it does not interfere with the beating process. To lower the roll after cleaning, the direction of the cranking is reversed and the arm is slowly lowered. If the winch is not ordered at the same time as the beater, some assembly will be required. (4 to 8 holes must be drilled into the tub, and some parts need to be bolted together.) Shipping weight 40 lbs (18 kg).

CLEAR LID

For your convenience we also offer a clear lid, which covers the full opening of the beater and considerably helps to lower the noise level. Shipping weight 8 lbs (4 kg).

1 HP MOTOR

A 1 hp TEFC (totally enclosed fan cooled) motor is available as an option. Most valuable if working constantly with raw fibers such as flax that are hard to break in the beginning.
Shipping weight 10 lbs (4.5 kg).

DIAL HEIGHT INDICATOR

For adjusting the roll height, you can judge by sound, amp maeter, ora dial height indicator. The rotating gauge makes roll adjusting precise and consistent. Shipping weight 3 lbs.

Beater Specifications

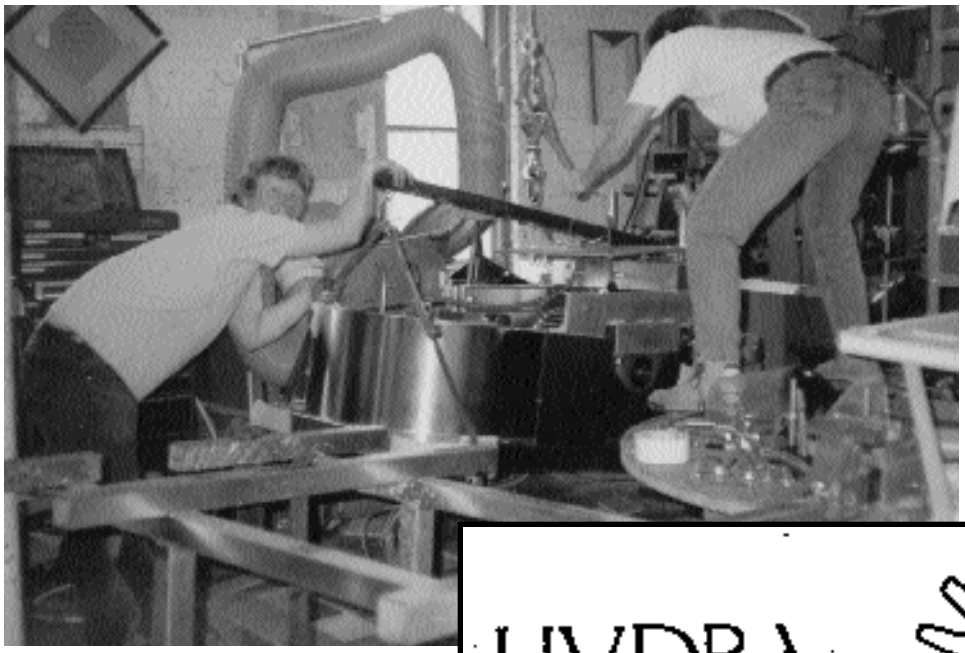
	Stainless Steel (Sh-Hydra-SS)	Fiberglass (Sh-Hydra)
Pulp Capacity	2.2 lbs (1 kg)	2 lbs (.9 kg)
Size		
Inches(L x W x H)	28.5" x 48" x 48"	32 x 49" x 48"
cm (L x W x H)	73 x 122 x 122 cm	82 x 125 x 122 cm.

Roll	8" x 8" (20 cm x 20 cm) 304 Stainless steel 24 -3 /16" (45 mm) replaceable blades mounted on 1"(2.54 cm) shaft Laser cut and assembled on
Motor	3/4 Hp TEFC (totally enclosed fan cooled) 110/ 220 volt 60 Hz *Optional 1 hp TEFC 110/ 220 volts 60 hz*
International Motors	3/4 hp TEFC 110/220 volts 50/60 hz *Optional 1 hp TEFC 110/220 volts 50/60 hz*
Motor Controls	Air actuated on /off switch mounted on end of arm coupled to motor rated switches in isolated electrical box.
Optional magnetic starter	Used where required by safety codes.
Lid Safety switches	Included:-machine will not operate without lid in place.
Adjusting mechanism	Single handwheel on end of arm with lock nut.
Stand	Aluminum tubing and fittings with casters.

OPTIONS	
Optional Amp Meter	Shows amount of power machine is using allowing the roll to be set at the same height for each batch.
Clear Plastic Lid	Covers returns area, makes beater quieter.
Lifting Winch	A labor saving device to raise roll into cleaning position.
SHIPPING WEIGHT	Polyester resin tub- approx. 280 lbs (128 kg) Stainless steel tub- approx. 300 (136 kg)

THE 7 lb. HYDRA HOLLANDER BEATER

Stainless Steel 3 kgs capacity



HYDRA. Hollander

Our 7 lb. beater is made for studios and production work which demand a larger capacity beater and the same quality as our small machines. Built with a larger swing arm.. This heavy machine uses 2 jack screws for roll adjustment. The roll raises 6" for cleaning. More clearance available with use of optional winch. It features a Stainless steel tub.

7 lb specifications
Capacity 7 lbs (3 kgs)
Roll 16" diameter x 12 face 2 3/8" shaft 36 1/4"' bars laser cut
Motor 3 to 5 hp as specified
Motor controls- Magnetic starter available
Options
Amp Meter
Timer and alarm
Bed plate 6" x 11" made of 1/4" bars
Price: Price availableupon request

PRICE LIST

HYDRA HOLLANDER BEATER

SH-HYDRA with polyester resin tub	$5,750.00
SH-HYDRA-SS with stainless steel tub	$6,500.00
SH-CRATING	$150.00

BEATER OPTIONS

SH-AMP Amp meter	$345.00
MAGNETIC STARTER OPTION	$575.00
SH- BEATERWINCH Winch option for cleaning	$506.00
SH-LID Clear lid	$230.00
SH-HYDRA-HEIGHT	$200.00
SH-1 HP 1 hp Motor	$75.00

Shipping is F.O.B. Charlestown MA. Shipped via truck, freight collect. Institutions will be billed for freight. You must arrange to unload from Truck. Contact us for shipping estimates. For shipping estimates elsewhere, including Mexico, Canadian orders, please call.
Please include a 50% deposit with your order; balance due before shipment. Institutions Net 30 with a Purchase Order. Prices and specifications are subject to change without notice.

HYDRA HOLLANDER BEATER FOR INTERNATIONAL PAPERMAKERS

For papermakers desiring a beater with a 50 cycle 220 volt motor we now offer both our standard polyester resin and stainless tub models with a 3/4 hp 50 cycle motor. All options are available for these machines. The Controls are available with our standard motor rated switches and also with a Magnetic starter. The choice will depend on local electrical and safety codes, personal preference, and budget. The electrical plug is not supplied with 50 cycle 220 volt beaters.

INTERNATIONAL BEATERS

For 50 hz/ 220 volt plug not included

SH-HYDRA-50 with polyester resin tub	$5,950.00
SH-HYDRA-50SS with stainless steel tub	$6700.00
SH-CRATING	$150.00

BEATER OPTIONS

SH-AMP Amp meter	$345.00
MAGNETIC STARTER OPTION	$575.00
SH- BEATERWINCH Winch option for cleaning	$506.00
SH-LID Clear lid	$230.00
SH-HYD-HEIGHT	$200.00

All international orders must be fully prepaid including shipping charges before beater is shipped. Please call for shipping price. Beaters can be sent by Air or Sea. The consignee is responsible for all customs and duty if applicable. Price and specifications are subject to change without notice.

Frequently Asked Questions

1. HOW DO YOU CALIBRATE A BEATER?

The simplest way to get reproducible results is to use an Amp meter. The Amp meter measures power draw and by lowering the roll until the the machine is drawing a certain amperage for a certain length of time, ensuring consistency from one batch to another. Another alternative is to lower the roll with the lid off until the roll touches and cannot be spun by hand. This becomes your zero point. From there you count the number of revolutions to bring it up to it's starting point. As you beat, you count handwheel revolutions and lower the roll to the next setting after a length of time. Experience will also give you a sense of how the beater should sound at various settings, The volume, how sharp of sound, whether it is continuous or bouncing as in the beginning etc are all sounds which you can identify. Over time you will be able to "hear" it and know that this is the proper setting.

2. WHAT CAN I PUT IN THE BEATER?

You can add any cellulose fiber to the beater. This includes raw fiber, cloth, & commercial pulps. Additives such as coloring or sizing can be added into the beater during the later stages, but note this makes it more difficult to clean the beater.

3. WHAT ARE THE DIFFERENT METHODS OF ADJUSTING A BEATER?

There are two styles of beaters: A moveable roll with a fixed bed plate and a moveable bed plate with a fixed roll. Our design features a moveable roll with a fixed bed plate. With a moveable bed plate weights are used on the end of a lever arm to apply pressure for the beating action. The more weight further out on the arm the heavier the beating action. Sometimes stops are used so the beating can only proceed so far. Moveable rolls are adjusted by a mechanism which lowers the roll down. This can be a gear mechanism or a simple adjusting screw on the end of an arm, such as our design.

4. HOW MUCH CONTROL DOES A USER HAVE IN PULP PREPARATION?

The user has great control over the beating process to prepare pulps for the type of paper being made. The factors which the papermaker has control of in the beater include:

* the intensity of the besting
*the length of time of beating and
* the consistency of the pulp (the ratio of pulp to water).

It is possible for the same fiber to make a soft bulky sheet such as a blotter paper or a crisp thin sheet such as a hard stationary paper. In practice some fibers work better than others for certain kinds of papers. Another factor which the papermaker can control, to some extent, is the width and sharpness of the bed plate and roll bars. Sharp bars tend to cut the fibers more, while dull bars tend to hydrate more (drive water into the cell spaces).

5. HOW DO I BEST CONTROL THESE FACTORS?

The best way to insure consistent results is to create recipes based upon one's own experiments in finding the proper pulp for each paper. You need to be consistent with each batch by using the same amount of water and the the same weight pulp. Beat the same amount for the same length of time. Learn to adjust the beating to steer the pulp in the direction you want it to go (this is just practice and experience). We also recommend the Amp meter as the most helpful tool for consistency from batch to batch.

6. WILL THE BEATER STAND UP TO HEAVY DAILY USE?

Yes the beaters with proper maintenance will be able to run all day long. Under heavy use conditions the most important thing to do to insure trouble free operation is to lubricate the bearings everyday. Proper bearing lubrication will ensure less frequent bearing replacement. The motor is rated for continuous duty and can run 24 hrs a day.

7. WHY WOULD I WANT A STAINLESS STEEL TUB VERSES A FIBERGLASS TUB?

The choice comes down to personal preference, ease in cleaning and price. Some people just prefer a stainless steel tub. Since both machines use exactly the same tackle, each model has the same beating characteristics. The stainless steel tub has a larger capacity by about a 1/2 lb. It will take a little longer to process a batch but less loads will be need to be done in a day.

* Cleaning is the major advantage of the stainless steel tub. If you dye pulp or put other additives in the beater you can vigorously scrub it until it is shiny again. The fiberglass tub must be treated with more care, just like a fiberglass shower stall or boat. There are cleaners and surface treatments available to maintain the surface, but it can lose it's pristine look over time.

WHAT A BEATER DOES

(PORTIONS OF OUR BEATER MANUAL)

Beating can have three main effects on fiber: fibrillation, hydration, and cutting. Fibrillation is the process of brushing the fibers and producing "hairs" which have partially broken off of the main fiber.

Hydration is the process of driving water into internal spaces of the fibers. This slows down the drainage as the water is now inside the fibers instead of just surrounding them.

Cutting fibers occurs when the fibers are exposed to the shear action of the rotating bars against the bed plate. Hand papermakers usually want to minimize this effect.

The shortening of fibers accomplished through beating enables the fibers to "felt" together to form a uniform sheet of paper. External and internal fibrillation increases the strength of a sheet by increasing the surface area. This creates more sites for hydrogen bonding to occur.

USES FOR BEATERS:

Processing the fiber of any cellulose-containing plant material, turning those fibers into pulp for papermaking (after proper preparation).

Rehydrating dried pulp; and through further beating, changing the characteristics of the pulp to suit whatever technique you choose for working with paper.

SAFETY PRECAUTIONS

The Hydra Beater contains rotating parts which can cause personal injury. Do not attempt to operate the machine without the lid in place. Do not insert hands or fingers under lid while the machine is operating. Disconnect power before cleaning or moving this machine. The Manufacturer disclaims any and all responsibility unless this unit is operated in compliance with all federal and local regulations. The guards and safety interlock switches must be in place and in good operating order. Removal of any parts or accessories from this machine is in violation of current federal and local safety and health laws. By acceptance of this merchandise, the purchaser and the user assume complete responsibility for the safe operation of this equipment. If the manual is missing, ask for another copy.

OSHA STANDARDS

Those in Institutions should talk to their physical plant or safety departments about requirements necessary for OSHA (the Occupational Safety and Health Act). If you require OSHA standard equipment, please contact us for information.

PLUG LOCKOUT DEVICES

To prevent unauthorized use of this machine, a plug lockout device may be used to render the plug unusable until unlocked. These can be purchased at major electrical supply houses or through us. You can place the lid in a locked cabinet to accomplish the same thing.

ELECTRICAL REQUIREMENTS

The Hydra Beaters are wired for 110 volts A.C. (60 Hz.), but can also be wired for 220 volts A.C.. To wire the beater for 220 volts, follow the instructions on the motor for wiring to 220 volt or "high" voltage, exchanging the plug supplied for the proper 220 volt plug (waterproof).

Because of the wet environment common in a paper studio, you should replace your current receptacle with a ground fault circuit interrupter (GFCI) receptacle for use with the beater and any other electrical equipment you use in the studio. A GFCI provides protection from electric shock hazards caused by ground faults, preventing you from being the path of least resistance for the electric current back to ground, should the grounding fail in the electrical device you are using. Ground Fault Circuit Interrupter receptacles can be purchased at electrical and building supply stores. If you are adding a separate circuit to supply the beater, follow local and state electric codes. Place any new receptacles high on walls, away from possible splashing. Avoid using extension cords because of the hazards of electric shocks.

USING THE BEATER

Up to 2 lbs. of pulp (about 2-3 sheets of cotton linters), or about 1 1/2 lbs. of cotton rag or other raw fiber can be processed in a load. In certain cases you can put in more, though certain fibers will not circulate unless there is less fiber and more water in the beater.To avoid clogging the beater, fabric should be cut into squares, 1 inch or smaller in size. Cut raw fiber such as flax to a length of 1 to 2 inches (or smaller).

LOADING AND OPERATING THE BEATER

Pre-Cleaning the Beater

When you start up for the day's beating, fill the Beater with a load of water and run it for 5 minutes. This will clean out any fiber that may have been lodged in the beater. Empty the beater and refill with clean water before adding fiber. Reach under the beater, place the drain plug into position from the bottom and tighten.

Make sure the roll is not in contact with the bed plate. If in doubt, unplug the beater and spin the roll with your hand. If the roll and bed plate are touching each other, raise the roll by the adjusting screw so that it is just touching the bed plate, then raise the roll 4 full turns of the adjusting handwheel to provide clearance. Place lid back into position, sliding it under the back lip until it hits the back stop. Before engaging latch, look to make sure that nothing is under the lid or in the tub where it does not belong. Lock the lid latch into place. This engages the lid interlock switch.

CAUTION:
Use caution when engaging the safety interlock switch. Without a Magnetic starter the beater will turn on if the main power switch has been switched on. Be prepared to turn off the main power switch or disengage the lid latch.

TURN ON MACHINE.
*Add water to the beater with a bucket or hose (this is always done with the machine running). Fill the beater with water until the water starts to circulate over the backfall. Stop when there is a steady flow of water and the water is about 1 1/2 inches below the level of the lower lip.
Add fiber or pulp. It is easier to tear most pulps when they have been wetted. Tear pulp to 2-3" pieces. Fabric should be cut into squares no more than 1" in size. Look in the opening for returning material. Once the material starts to circulate, larger pieces can be added. Add the pulp close to where it comes out of the backfall to give it time to soak up some water.
TIP:
If you cannot get the measured pulp into the beater before it stops circulating, you can add more water to make it circulate. In general, it is best if the water level is a little low as too much water in the beater will also cause the pulp to backup around the backfall.

MONITORING THE PROGRESS OF BEATING
The best way to monitor the progress of the beating is to scoop a finger full of the pulp from the feed opening, put the pulp into a clear jar, add water, and shake the jar. This can be done without stopping the beater. By looking at the pulp while you hold the jar to the light, you can monitor the progress of the beating. Among the characteristics you can observe are: the presence or absence of clumps which need further beating, fiber length, and whether knots are present (clearing the pulp will remove most of the knots). Based on your observations, you can decide to continue or end beating, and dump the load if the pulp is beaten to your satisfaction.

CLEARING
After beating, the roll is raised further above the bed plate so that the fibers are brushed. Clearing gets rid of many of the knots which form when the pulp is being beaten. Usually, a load should be cleared for 5 minutes if you are concerned about knots.

DUMPING
The load should be removed from the machine with the machine running, to ensure that all of the pulp is moved out of the roll area. Be sure the roll is entirely disengaged from the bed plate. Place a bucket under the drain. Reach under the front of the machine, loosen (unscrew) the drain plug, remove it, and let the pulp slide into the bucket. If you are ending your beating session or changing the material to be beaten, turn the machine off, take off the lid, and remove all the left-over pulp (you can wash the pulp out with a hose, or just push it out the drain). If you are going to beat a different pulp, you should rinse the beater out by running it with a load of water for a few minutes, then dump the water. If you are going to beat another load of the same material, it is not
necessary to get all of the pulp out. Replace the drain plug before filling the beater again.

MAINTENANCE

Because the wet environment and constant vibration during use is hard on some components of the beater, some preventative maintenance is necessary to keep your Hydra Beater in the best operating condition.

CLEAN THE BEATER AFTER EVERY USE.

* Lubricate the roll bearings once a week for light use, and daily with heavy use. Use a #2 consistency Lithium-base grease, formulated from a high quality mineral oil with rust and oxidation inhibitors. Use a grease gun with standard fittings to lubricate the bearings. The grease nipples on the bearings are accessible from underneath the arms, when the roll assembly is swung into the upright position. Use enough grease so that you can see a little grease coming out of the bearing housing. Clean up any excess so that it doesn't get into the beater and pulp.
* Check belt tension and alignment periodically. If belts are loose, the power transferred from the motor to the roll will be reduced. To tighten the belts, remove the belt guard. Next, loosen the motor mount bolts and slide the motor so that when you press down on the belt, there is only 1/2" of deflection. Tighten the bolts to hold the motor in position, and replace the belt guard.
* Check all the nuts and bolts for tightness periodically, tightening them when necessary.
*Check all electrical connections for tightness and leaks. Tighten or replace them as necessary.
* Arm pivot points are a special plastic bearing and are pre-lubed and will not need lubrication.
* The fiberglass tub can be kept in good condition with fiberglass cleaners and waxes available from places such as marine supply houses.

CLEANING

The fiberglass machine should be maintained as one would maintain a fiberglass boat. There are many cleaners and finishes which will help keep your beater looking its best. We recommend that you do not use any additives in the beater. This is a cosmetic recommendation, as colorants and additives can adhere to the sides of a tub and discolor it. This is not detrimental unless you care about the beater looking its best. Discoloration can be minimized by keeping the beater clean and using good fiberglass finishes so that materials will be less likely to stick. The stainless steel tub is less affected by colorants as it can be scrubbed more without damage to the finish.

rev. 10-00 mc

PO Box 290264 Charlestown, MA 02129 phone: 888.627.2737 fax: 617.242.8825 email: McPaper@aol.com

Make Paper, Make Art™
Lee S. Mc.Donald, Inc. PO Box 264 Charlestown, MA 02129
Phone 888.627.2737 Fax 617.242.8825 Email: McPaper@AOL.Com.