Vincent

In our ninth decade

CORPORATION

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OPERATING HINTS

SERIES VP PRESSES

SEE NOMENCLATURE DRAWING AT THE END OF THIS MANUAL

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OPERATING HINTS
SERIES VP PRESSES

RIGGING

Be sure to properly support the press when lifting it from the truck. Do not lift and drag just one end, as it is possible for the frame to deflect, which in turn can shift the screw positioning within the press. Interference between the screw and the screens can result. Use a spreader bar when lifting long presses.

INSTALLATION

Do not just bolt or weld the press down to a level foundation! Instead, first place the press where it is to be installed. Next, place shims between the press frame and the steelwork (or concrete pedestal or foundation) to fill any gap where the press is to be anchored. Only after shimming or grouting should the press be pulled down tight. Doing otherwise may rack the frame of the press, and this can cause misalignment.

The press must be mounted solidly to a concrete pedestal foundation or structural steel. If a press draws more than two thirds of its rated horsepower without the press being anchored to the floor, the frame of the press can twist.

For maintenance, the screw is removed from the cake discharge end of the press. Allow the space required.

It order to provide space for a cake take-away conveyor, the press can be installed tilted with an elevated discharge. Consult the factory, as the oil level in the gearbox may have to be adjusted.

Material can be fed into the press many ways. You may need to allow for bypass or overflow return material in the event that more is fed to the press than it can take.

Spill containment is a consideration which should be taken into account, because it may be possible for un-pressed material to purge from the cake discharge of a press.

We recommend that a manual disconnect, for killing power to the motor, be installed close to the press.

INVERTER VFD & PLC CONTROL

It is always recommended that an inverter VFD be used to start, protect, and operate the screw press. With a VFD it is possible to establish the optimal combination of screw speed and discharge cone air pressure. The VFD also can be used to reverse the press in case of a jam or to slow it down during upset conditions.

Nine presses out of ten will operate unattended, indefinitely, and just fine at line frequency of 50 or 60 Hertz. If two screw presses are mounted in parallel, they are usually fed with a screw conveyor which drops to fill the first press, with the rest going to the second press; this is followed with a drop-out for overflow.

However, we need to address the exceptions:

Use of level controls is becoming more and more common. These are used to regulate either the flow going into the press or to regulate the screw speed.

In some applications a press is sized for handling upset conditions of large flow, while the normal flow is quite small. In these cases a level control is used, and the PLC can be programmed to turn off the press when a low level is reached in the inlet hopper, and the press re-started when a higher level is signaled.

In some cases the press will tend to jam, overload, and trip out on high amps. In this situation it may be necessary to program the controls so that the cone automatically goes open on high amps, re-closing at a lower set point. This arrangement requires a solenoid operated 4-way air valve, replacing the manual valve which is provided with the press.

In other cases of jamming, a simpler arrangement is to install a Cone Timer. A timer is used to periodically open the cone. The closed period is determined by the amount of time required for press cake to accumulate in the press. The duration of the "cone open" period is long enough to dump most of the press cake that has formed. This type of operation may be used if the press periodically experiences jamming or overload due to fluctuations in the amount of material being fed into the press. Alternatively, it may be used with slippery or slimy press cake that cannot be dewatered to sufficient firmness to force the cone open. Cone Timer panels are available from Vincent at no charge.

Some applications require the use of a specially programmed variable frequency drive. In this case the VFD is not used to change the speed of the press, but, rather to set it for auto-reversing operation. By having the screw run backwards for three or four turns every few minutes, some difficult-to-dewater materials can be pressed much more effectively. This operation can help a great deal with material which tends to blind (cover over) the openings in the screen. Vincent has loaner VFD's if you want to give it a try. The technique works well on bar screens; care must be taken with perf screens so that the screw does not snag the screen during the reverse cycle.

Once through start-up, the cone is almost always permanently left in the closed position at whatever air pressure has been found to be effective. A plug of cake will be left around the cone whenever the press is turned off; this will clear on its own accord on restarting the press.

However, some materials may set up and become hard, or freeze, within the press when the press in turned off. This is especially true in the case of pressing wet coffee grounds or outdoor installations. For these applications it is advisable to open the cone for a period of one minute before turning off the press. This allows the press to partially empty itself, fluffing the material left in the press. Vincent can provide information for automating this procedure.

INSTRUMENTATION

The most useful instrument to have when testing a press is an ammeter. The load drawn by the drive motor of the press is indicative of how much work the press is doing. The higher the amps, the better the dewatering. Also, the higher the amps, the closer the press is to jamming, and the greater is the abrasive wear. Very low amps indicate little dewatering is being done; the screen is blinded; low compression is taking place; or the flow into the press has stopped.

A moisture balance is valuable for measuring the moisture content of the inbound material and of the press cake. If an oven is used to dry samples, be sure it is set at 160^{o} F or less if there are sugars in the sample. Samples should be left in the oven overnight. The tare weight of the pan should be much less than the weight of the sample which is being dried.

As mentioned previously, level controls can be useful in operating a press. With a signal providing the depth of material in the inlet hopper, the speed of the press can be varied to match the flow going into the press. With egg shells, a simpler level control is used to only signal when a high level is reached; its signal will increase the screw speed. In special cases the press can be turned off when a low level is reached and re-started when a higher level is reached.

In the case of pressing liquids that contain dissolved sugars or salts, a refractometer is valuable for assessing press performance. The Brix of the inbound flow, the press cake, and the press liquor will all be the same figure. The higher the Brix, the higher the solids will be in the press cake.

If dissolved (soluble) solids are present, the suspended (insoluble) solids (fiber) in the press liquor are generally measured by filtering and washing a sample and drying the filter paper in an oven. Dissolved solids will be washed from the sample during the washing process.

START-UP

Before putting power to the screw press, it is advisable to bump the motor or even rotate the screw by hand. This will prevent damage to the press in case tramp material has been left in the press. Also, the screw may have shifted so as to hit the screen. (Minor rubbing is normal; it will go away once there is material in the press.) To turn the screw by hand, remove the fan guard on the motor and turn the fan blades. Alternatively, on belt-drive presses, remove the belt guard and pull on the sheaves or belts; be careful.

The screw of the press turns in a counterclockwise direction, when viewed from the drive end of the press.

If problems are encountered, they are apt to be blinding, jamming, channeling, or purging. There is a section for each of these ahead in this manual.

FEEDING

Material can be fed into the press many ways. Commonly, screw conveyors, pumps, transition chutes, pre-thickener screens or cyclone separators are used. Consider making provision for return of overflow material, in the event that more is fed to the press than it can take.

Sometimes either a static (sidehill or parabolic) or a rotary drum screen (RDS) must be mounted over the inlet hopper to prethicken the flow ahead of the press; the tailings (solids) from the screen are funneled into the press. This arrangement is desirable when the feed to the press is dilute.

Also, material can be dropped from a shredder or cyclone separator into the press. A shredder is used to increase capacity and dewatering in the case of low bulk density materials like lettuce leaves, alfalfa, onion peel, and cornhusk, or to prevent blockage.

Most commonly, the best screw press performance is achieved if the material in the inlet hopper stays just over the top edge of the screw. Usually presses work the best with only atmospheric pressure in the inlet hopper. In order to minimize static head, press headboxes are kept short, and level controls are used to minimize the depth.

When a pump is used to feed a press, the system can be either open or closed. We recommend the open system where little or no pressure exists in the inlet hopper, thus preventing the press from being force-fed. In this arrangement either there is an open return line allowing flow back to the source feeding the press, or level is controlled in the inlet hopper. It is best to have a line that allows material to recirculate past the press inlet. This will prevent pressurizing the inlet of the press, which can cause both blinding of the screen and purging from the cake discharge.

A port on the side of the inlet hopper is frequently provided on larger Vincent presses. It is used to view the level of material over the screw. It has a bolted cover because it is rarely used.

If a fluid flow is piped through a sealed cover which is bolted to the inlet hopper, force-feeding is possible. A by-pass tee should be provided so that the pressure in the inlet hopper is minimized. In addition, a 2" vent line, open to the atmosphere, must be provided to prevent siphoning material in the inlet hopper out through the recirculation line.

Inlet hopper pressure over one to four psi can force fibrous material against the screen so as to blind off the screen, resulting in unsatisfactory performance.

At pressures above 10 to 15 psi in the inlet hopper, it is possible to blow the "plug" of press cake that forms at the discharge of the press. Unscreened liquid will purge from the cake discharge. Exercise caution if either hot or hazardous material is being pumped into a press.

At inlet hopper pressures of 40 psi and above, the shaft seals will be blown out of their housing. At pressures around 60 psi the screen will start to separate from its support plates, resulting in bypassing of feed material directly into the press liquor flow.

BUILDING A PLUG

In order for the press to work, a plug of cake must form between the cake discharge opening and the pressure cone. The press will almost always do this on its own accord as material is fed into the press.

In the case of sloppy materials like manure and DAF sludge, it may be advisable to start off by first packing the discharge of the press with any available fibrous material.

Alternatively, the press can be turned on and the feed pump allowed to run just long enough to fill the feed line and the press. Then shut off the pump, leaving the press running, and wait until no more liquid drains from the screen of the press. Repeat this process until a plug of cake starts to open the cone.

PRE-THICKENING

Almost always, the thicker a flow going into a press, the better it will work.

If the flow into a screw press is too dilute, the high volume of liquid going through the press screen can cause either of two problems. The flow may either flush most of the solids through the screen, or it may plaster solids against the screen, thus blinding (covering over) the screen.

To prevent these things from occurring, it may be necessary to pre-thicken the flow ahead of the screw press. This is commonly done with a static screen (sidehill) or a rotary drum screen (RDS). In the case of very dilute feed to the press, a Vincent Fiber Filter can be used.

AIR CYLINDER REGULATOR

To regulate the air pressure of the discharge air cylinder, presses are supplied with an air pressure regulator along with a Parker four-way reversing valve. These should be installed near the cone end of the press. (Until recently FRL (Filter, Regulator, Lubricator) sets were provided to regulate air pressure. Most air cylinder manufacturers now recommend against the use of lubricators.)

The Parker valve allows manual selection of the shut, open, or "neutral" position. This valve connects air supply from the regulator to one end of the air cylinders, while simultaneously opening the other ends to atmosphere. The vent line on the 4-way valve allows air to escape when pressure is switched from one end of the air cylinders to the other.

Continuous air flow from the Parker vent line indicates a leak inside an air cylinder, or possibly a faulty 4-way valve.

Once material is going through the press, set the 4-way valve so that the discharge cone goes shut in the "in" or closed position. Start with a low air pressure, working your way up until the desired performance is obtained.

The neutral position of the Parker valve is used only in testing. If left in the neutral position, the cone will not move unless it is pushed open by press cake. If, later, the flow of press cake is diminished, the cone will remain in the position to which it was pushed, and purging can occur.

FRL AIR REGULATOR WITH REVERSING 4-WAY VALVE

DISCHARGE CONE

The principal adjustment of the press is made with the discharge cone. The cone is the component at the cake discharge end of the press that acts as a door or stopper plug to restrict material from leaving the press. The more pressure exerted by the discharge cone, the drier the cake material will be leaving the press. Also, the motor amps can be expected to increase with added pressure, and throughput may decrease.

The discharge cone is moved in (actuated) by the air cylinders. Typical air cylinder pressures to actuate the discharge cone are in the range of 30 to 60 psi. Some materials will press only in a low range, say 10 to 20 psi. Other materials may press best with a pressure of 60 to 100 psi. Air consumption is minimal in all models, 1 to 2 cfm.

During initial, first-time, start up, presses are generally started up with the discharge cone in the withdrawn position. This will avoid an unnecessary jam.

Note that with many materials it is necessary to start the press with the discharge cone in the closed position at low air pressure. Thin or soupy materials, like pumped manure or clarifier underflow, can tend to purge right through the press if the press is operated with the discharge cone open (in the withdrawn ("out") position).

However, with materials that are dry to begin with, such as sawdust or plastic wash tank sludge, it becomes more important to start with the discharge cone in the open position. This is because these materials may tend to jam or overload the press. Similarly, high freeness materials, from which the water falls away freely, will have a tendency to jam in a press. Be sure to start the press with the cone open, and gradually close it with low air pressure, when running such materials for the first time.

Once you are through the initial start up, it will be unlikely that your press should have the cone opened before starting. Most operators never open or shut the cone once it is set.

As the pressure on the discharge cone is increased, not only will the cake become drier, but the flow through the press may also be reduced. With very slippery or slimy feed material it is sometimes possible to apply enough discharge cone pressure to stop the flow altogether.

High discharge cone pressures will result in increased quantities of suspended solids in the press liquor.

Care must be taken if a press is to be left running at a very low pressure like 10 psi. If some fiber enters between the cone bushings and the screw shaft, it will take more than that much air pressure to close a cone which has been pushed open by a heavy flow of cake. The result will be either high moisture content in the cake or, worse, purging.

With some feed materials, the press can be operated with the discharge cone in the withdrawn position. The screw alone may do enough compressing and dewatering to produce a cake at the discharge.

It is acceptable to open the discharge cone, in most cases, during normal operating conditions. This allows inspection, while in operation, of the discharge end of the screw and screen. This will give the operator a chance to observe operation with minimum dewatering and maximum throughput. It is also a good technique for purging bad material (i.e., either jammed or spoiled material) from the press. (Do not try this trick if you are pressing hot or chemically aggressive materials.)

Where very low air pressure is required for proper operation, it may be practical to put the 4-way valve in the neutral position, half way between open and closed. A press should not be left permanently in this condition: keep in mind that a slug of cake will push the cone open, and it will not re-close on its own afterwards.

There are a few applications where the air cylinders are removed and replaced with a jacking bolt. This is used if the cone pushes completely closed even with the lowest air pressure. It results in operating the press with a fixed discharge annulus. Air cylinders with linear actuators are available.

ROTATING CONE OPTION

Some VP screw presses are offered with an optional feature which makes the cone rotate and strip away the press cake. The rotation is driven by two large pins mounted on the back of the cone. These pins engage with a collar which is clamped onto the screw shaft. Press cake is stripped away by studs on the face of the cone. These studs are in an axial position parallel to the screw shaft.

The rotating cone can serve multiple functions. By stripping the cake away it can prevent either jamming or purging. Its use generally results in wetter press cake and lower motor amps. Most commonly it is used when all the press cake tends to channel out past one side of the cone. It is invaluable in situations where press cake props open the cone and allows un-pressed material to purge.

The cake will tend to co-rotate with the screw when the cone is rotating. A spin-stop feature is included to prevent this.

Positioning the drive collar limits the maximum opening of the cone. If a large amount of cake comes form the press, the cone can run into the drive collar and for it to slip along the screw shaft.

If the cake comes out too wet, shorten the length of the studs on the face of the cone.

Disconnect the rotating cone by removing the drive pins and/or drive collar.

INTERMITTENT OPERATION

In the case of intermittent operation, it is recommended that the control panel for the feed pump or conveyor which feeds the press should have a timer. This timer should be set to have the press run for three minutes after the feed pump (or conveyor) shuts off. This will partially clear the press so that it will not trip out on overload when it is re-started. (This applies in high torque applications in installations where the material in the press dries out or freezes.)

An extreme case occurs when pressing spent coffee grounds and some paper mill fibers. Each time the press is turned off, the cone must first be opened for a minute. If this precaution is not taken, nasty damage to the press screw or screen can occur when the press is re-started.

(See the previous section, INVERTER VFD & PLC CONTROL.)

Minimize the time that the screw press is run with no material being fed into it. The last material admitted to the press will dry to powder, and it can cause severe accelerated abrasive wear.

Initially the press will likely be run empty in order to check rotation. Even though some rubbing may be heard, negligible wear will occur so long that this period is kept to a minimum. Also since the screw is supported to some extent by the material inside the press, running dry may allow the screw to rub the screen.

DOUBLE PRESSING

Some processes benefit from what is called double pressing. This means that the cake coming from the press is run through a second press (or through the same press a second time). If little moisture is removed in the second (double) pressing, then it is known that the liquid removed in the first pressing is all of the free liquid that there is to be pressed out.

Sometimes water is added to the cake in between the first pressing and second pressing. This is done to enhance the recovery of dissolved sugars in the original press cake.

Molasses can be added to press cake between the first and second pressing. This is used to infuse dissolved sugar into the cake, increasing the solids content of the final press cake.

Capital-effective double pressing can be achieved by using an inexpensive Soft Squeeze Series KP screw press for the first pressing, following with a tighter-pressing Series VP/CP in the second position.

MOISTURE CONTENT

A screw press separates free water. This will leave organic water in the press cake. The organic water is either bound to, or part of, the animal or vegetable molecules. Mechanical pressure alone will not remove organic water; it takes heat or chemistry. Frictional heat from the press can remove organic water, but this obviously should be avoided. For chemistry, skip ahead to the Hydrated Lime, Gypsum and Alum section. For heat, see the Fluid Injection section.

To determine the moisture content of a material (feed to the press, press cake, or press liquor), a sample should be weighed and dried overnight at a temperature slightly less than 100^{o} C. (If sugars are present use less than 70º C to prevent caramelizing.) The sample should weigh six or more times the tare weight of the sample tray or cup.

The moisture content of press cake varies considerably. Tomato press cake will be 90% moisture. Orange peel will be 80%, unless it is reacted with hydrated lime, in which case it will go down to 74% moisture; add molasses and it will go to 65%. Dairy and hog manure will come out at 70% moisture, unless there is sand or sawdust in the sample, which will reduce the moisture content. Cellulose fiber from a paper mill (knots, screen rejects, primary clarifier underflow) will come out about 50%. However, if secondary (biological) sludge is added, then the moisture content of the cake will go up considerably. With high ash content in paper mill samples, moisture may go down to 40%. Moisture contents of only 25% can be achieved pressing things like sand, eggshells, glass, and plastic chips.

The heat from steam injection can change the chemistry of the material being pressed so that cake with lower moisture content is produced. This blanching or parboiling effect works with fish and orange peel, for example.

A quick approximation of what to expect from a screw press is to squeeze as much water out with your fist, and figure that the press will do a little bit better. A better way is to twist a ball of the material in a cotton cloth.

COMPRESSION

A screw press achieves compression using several methods: (1) The discharge cone of the press causes back-pressure on the material being dewatered. The higher the cone pressure, the greater the liquid removal. (2) The pitch of the flights of the screw tightens as the material is conveyed through the press. This forces liquid to go through the screen. (3) The diameter of the shaft of the screw may be progressively increased, forcing material outward, against the screen. This is a tapered shaft design.

SCREW WITH TAPERED SHAFT

Force-feeding (supercharging) the press and applying a vacuum to the outside of the screen are two additional methods which may achieve compression. These two are used infrequently because the performance results are uncertain.

PRESS SPEED (RPM)

In general, the slower the screw speed, the greater the dewatering. Longer residence time in the screened area results from lower screw speed, which allows time for more thorough dewatering. Unfortunately, it also goes with reduced throughput capacity.

Screw press speed (rpm) can be changed by using a Variable Frequency Drive (VFD). Alternatively, the drive motor can be switched to a different pole motor (900, 1200, or 3600 versus the standard 1800 rpm). Most modern motors are good for permanent 120 Hertz operation; they are always good for a test at this high speed.

Higher speed can result in premature gearbox failure. Switching to synthetic oil, replacing the normal mineral oil, is recommended. Consult the factory for assistance.

A small change in screw speed, like 15%, will generally not result in a measurable change in performance of the press.

Low screw speeds are used for cooker crumb, potato peel, many sludges, and low freeness materials in general.

It has become normal for a variable speed drive (frequency inverter VFD) to be used with Vincent presses.

CAPACITY MEASUREMENT

The best way to measure capacity of a press is to collect timed samples of press cake and of press liquor. This should be done during a period of sustained, stable operation, rather than by timing a batch through the press.

Press cake is generally captured in a tarpaulin, and press liquor in a 5-gallon pail or 55-gallon drum. When the drain is at floor level, a 3-mil plastic bag can be used to catch press liquor. If the press liquor goes to a pit or tank, the change in depth can be timed.

Sometimes it is possible to collect only one flow, either press cake or press liquor. In these cases it is possible to estimate the press throughput if the solids content of the inbound material and press cake are measured. It is assumed that there are zero suspended solids in the press liquor, although this is never really the case.

A-B-C-D PLATES

There are four vertical plates making up the frame of the press. These are called out in the Nomenclature schematic as the end of this manual.

Starting from the drive end of the press, the first one is the A Plate. This A Plate forms the wall of the inlet hopper closest to the gearbox. The shaft seal plate is bolted to the A Plate.

The next plate is the B Plate. It forms the downstream wall of the inlet hopper. The screen starts at the B Plate. There is a notch, called a Cord Cutter, in the B plate. Also, there may be a bar called Brian's Stripper welded to the B Plate, inside the inlet hopper; it is in a position to kiss the edge of the screw flight as it passes. These two features prevent long fiber pieces from balling up at the exit of the inlet hopper. See the section ahead on Cord Cutters.

The final plate, the C Plate, supports the discharge end of the screen. The discharge cone touches this plate when the cone is in the closed position.

There is a fourth plate, called the D Plate, on which air cylinders and thrust bearing are mounted.

SCREW LIFE

If a press loses its previous throughput capacity, or if cake moisture content increases, it can be a sign of a worn screw.

A screw can last anywhere from six months to twenty years. It depends on the material being pressed and how hard it is being pressed.

Premature screw failure can arise from several causes. The two main ones are:
(a) If a press is allowed to run when no material is being fed into it, the screw can wear out in one or two months. The same can happen if a very low flow is consistently fed into the press.

(b) If abrasive material is dewatered with high cone air pressure, rapid wear will occur. This condition is avoided if a few drops of water can always be squeezed from a fistful of press cake.

Two effective ways to extend screw life are:
(a) Various grades of hardsurfacing rod can be used to protect the flights of a screw. The best hardsurfacing will have Tungsten Carbide impregnated in it.
(b) Using a VFD or lower speed motor to reduce the screw rpm will extend screw life

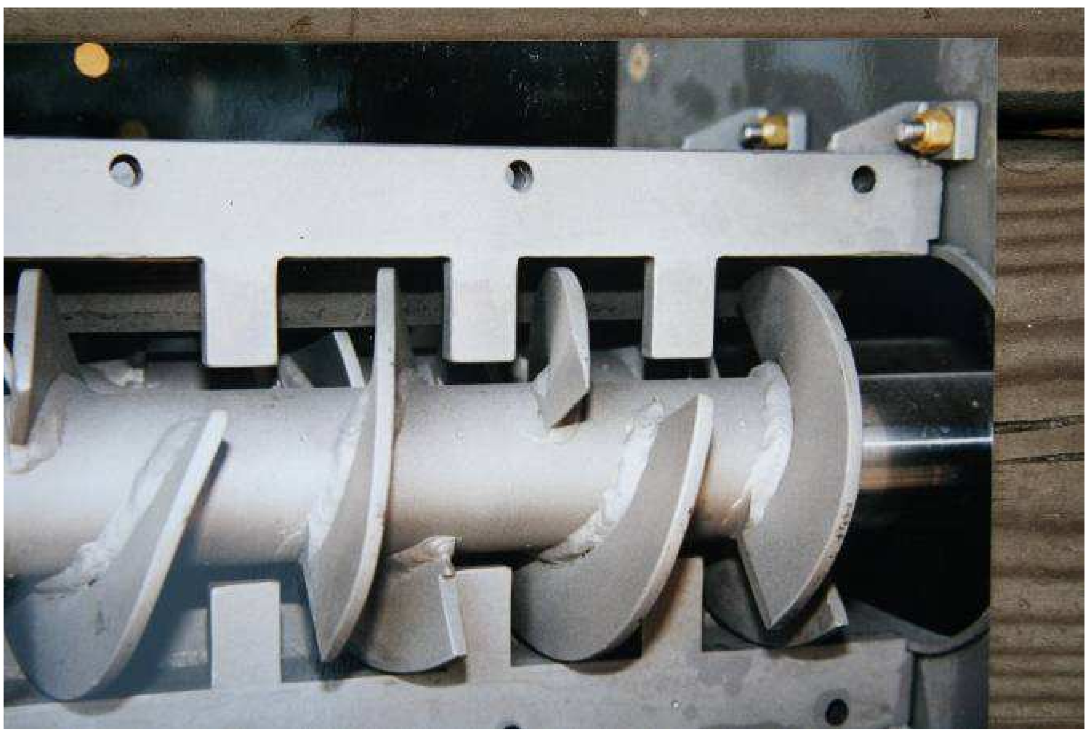
If a worn screw is suspected, the thing to do is to shut down the press, open the cone, and dig out the cake until the tips of the last two flights can be seen or felt. Check how badly the tips are worn. If the there is 1/2” between the tips and the screen, serious wear is evident. It is also an indication that the sharp edges of the flights throughout the press may have worn, becoming rounded. This can cause the flights to act like a putty knife, plastering solids against the screen, preventing water from coming through.

Worn screws are either restored locally or returned to Vincent for rebuilding. The maximum cost of a screw rebuild is around one third the cost of a new screw.

SCREW CONFIGURATION

Almost all Vincent screw presses use the Interrupted Screw Flight design. The interruptions leave room for stationary resistor teeth that are mounted outside of the screen. These teeth go through the screen and reach almost to the shaft of the screw. This design of screw press stands in contrast to a Continuous Screw design. The main advantage of the interrupted design is that solid material must accumulate in the interruptions until sufficient consistency is reached for the solids to be pushed toward the cake discharge. There is a reduced tendency for the material being pressed to co-rotate with the screw. Also, there is more agitation within the press and, consequently, quicker and more thorough dewatering.

The screw starts with a feeder section of continuous flight. This picks up material in the inlet hopper and pushes it into the screen section. The feeder section ends at the first resistor tooth. This feeder section of the screw is followed by compression stages where the flights have reduced pitch. The reduction in pitch of the flights results in compression of the material going through the press.



INTERUPTED FLIGHTS, RESISTOR BARS, and RESISTOR TEETH.

PIE CUTTING

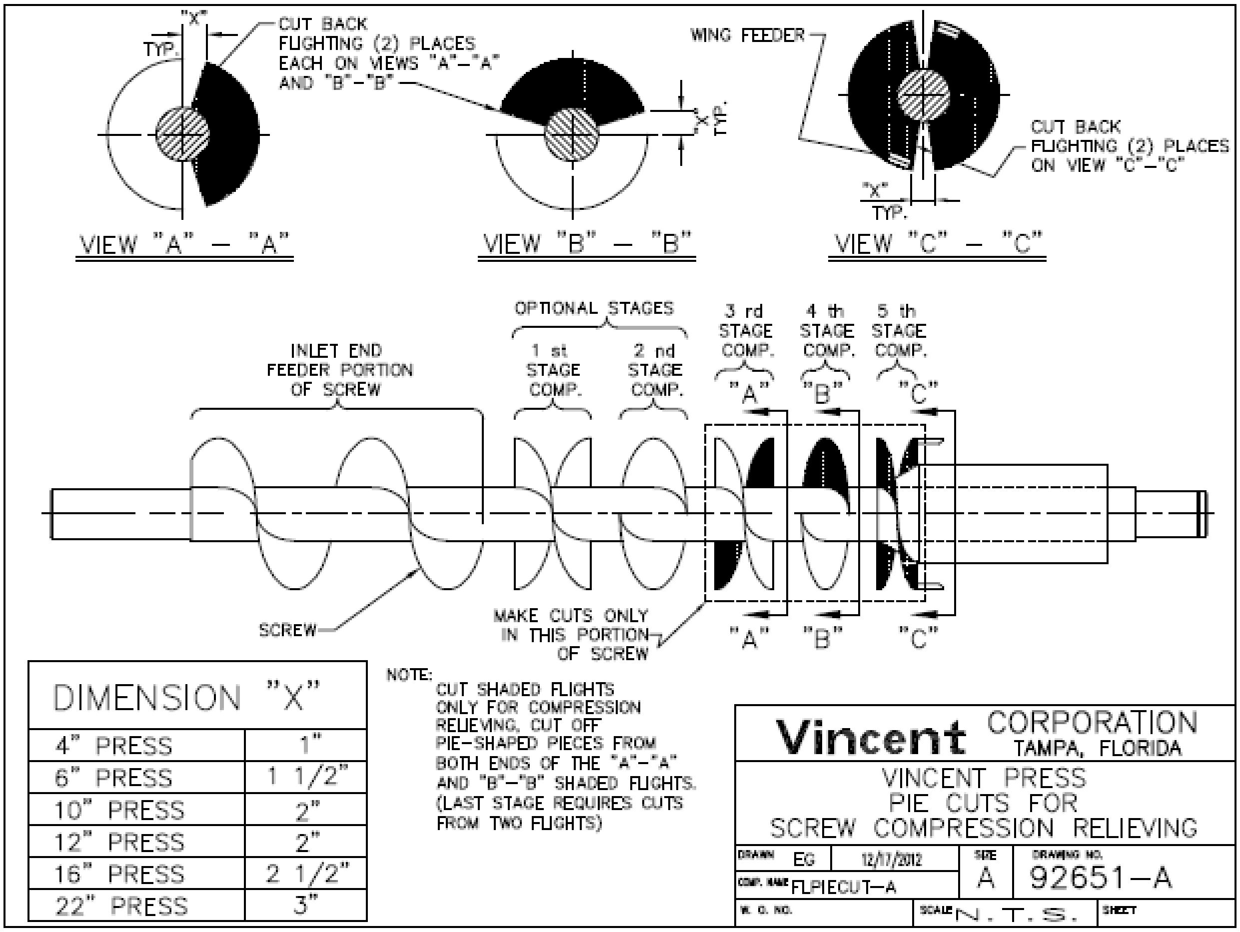
Sometimes the compression of a screw is reduced, in the field, in an operation called "pie cutting". This involves cutting pie-shaped segments from certain flights of the screw, leaving a butterfly (end view) configuration. The modification is done to avoid excessive compression and jamming. The "sterile cut" is more dramatic. Consult the factory for assistance before making this modification.

4" PIE CUT

PIE CUT

NOT PIE CUT

BUTTERFLY CUT



JAMMING

Should a press trip out on overload because it has become jammed, a series of steps can be taken to un-jam the press. Generally, the easiest thing to do is to reverse the rotation with a VFD or to reverse the leads on the electric motor drive. This will cause the screw to feed material backward into the inlet hopper.

Generally jamming is caused by over-pressing excessively dry material. Running the press backwards will break up this material. If the jamming was caused by tramp material, hopefully this can be found and retrieved from the inlet hopper following operation in the reverse direction.

Having a reversing starter greatly facilitates this operation. These cost little more than a standard starter; they come with a forward-reverse switch. (Having a VFD with a reverse button can be even handier.)

If a press has had extensive use in an abrasive application, the outer diameter of the flights will be worn away at the discharge of the press. Radial wear of 1" to 4" in large presses will lead to serious jamming and, possibly, a burst screen.

When a press is operated in the reverse direction it is possible that solid in the press will be forced against the A Plate. This can damage the shaft seal. For this reason, care should be taken when running the press backwards. Three or four turns of the screw are usually all that is required to un-jam a press.

Usually three or four revolutions of the screw are sufficient to clear a press. If running the press backwards several cycles does not clear the jam, a screen should be removed so that the cause of the jam can be determined. Look for a bent flight. Before going to the trouble of removing the screen, shut down the press and try clearing the end of the press with a bar or long screwdriver.

Sometimes when a press is jammed, a flight on the shaft of the screw will fold. This can happen if the press overloads on dry cake or if tramp metal is caught between a flight and a resistor tooth. The weld at the shaft may tear. When this happens flow through the press is greatly impeded.

FOLDED FLIGHTS

SCREEN BLINDING

A common problem is for the screens of the press to become blinded (covered over). When this occurs, the flow of press liquor coming through the screens diminishes. The level in the inlet hopper will fill up to where it overflows.

In some cases, the screens can be cleared by periodically reversing the direction of rotation of the screw. This can be programmed with many VFD's, so that the press runs forward for a given period and then reverses direction briefly for three or four turns when the screens start to blind. This is one of the easiest possible solutions to test. Sometimes it is the only one that is effective.

Many other methods are used to address blinding: (1) Adding notches to the screw, (2) Reducing or eliminating the pressure in the inlet hopper, (3) Adding press aid to the flow, (4) Changing to a different screen selection, (5) Reducing the screw-to-screen clearance, and/or (6) Employing a screen flush with caustic solution, acid, or high pressure spray.

If blinding occurs after an extended period of satisfactory operation, it is usually due to wear of the screw. Rounded edges of the flights will contribute to blinding.

CHANNELING

A condition somewhat similar to purging can occur with slimy materials, like concord grapes, pineapple pulp, or spent brewer's grain. These may tend to channel or squirt out from one side of the cone. Two ways to eliminate channeling are to lower the air pressure on the discharge cone and to slow down the speed of the press. Channeling can also be reduced by adding press aid to the material being dewatered, or by reducing the inbound flow to the press.

The rotating cone option is very useful in breaking up channeling. The cone is caused to rotate so that the relative motion between it and the stationary screens breaks the channeling. A pin on the face of the cone will strip away the press cake, breaking up the channeling. If the cake comes out too wet, shorten the length of the pin.

To break up channeling, pieces called wing feeders can be welded to the end tips of the last two flights of the screw. See the Wing Feeder section of this manual.

PURGING

An undesirable condition can occur when the material being admitted to the press purges, without liquid-solid separation, from the cake discharge. This can occur especially if pressure exists in the inlet hopper.

Mechanically, purging occurs when a dry lump of press cake holds open the discharge cone. Un-pressed material will flow around this partial plug.

Purging may occur when there is a much reduced, small flow of cake coming from the press. Usually this is a sign of blinded (covered over) screens. This can be caused by a worn screw. Liquid from the inlet hopper will wick into the press cake, making it soft enough to blow out. Sometimes this condition is avoided by mounting the press inclined at about 5^{o} above horizontal; the simplest way to do this is to place a block under the cone end of the press.

A drop in operating amps can be an indicator that a purging condition has begun. An ammeter circuit can be installed to alarm or trip the system when a reduction in motor amps occurs. This is rarely done.

Purging is prevented with the rotating cone option. To use it, it is necessary for the cone drive to be engaged so that the cone spins with the screw. Pins on the face of the cone will strip away the press cake, preventing it from holding the cone open. If the cake comes out too wet, shorten the length of the pins.

BRIDGING

Sometimes bridging will occur at the inlet hopper, preventing material from flowing into the press. If an independent surge hopper is mounted over the inlet of the press, it should have at least one, preferably two or three, vertical walls. This will minimize bridging.

Bonding Teflon sheets to the inlet hopper of the press is a remedy that has been used to reduce bridging of bulky materials which allow free-draining of water.

A vibrator, mounted on the side of a feed hopper, may also alleviate bridging.

One way to overcome this is to direct a stream of water into the inlet hopper to break the bridge. The nature of the screw press is that essentially all of this added liquid will be removed in the pressing operation. (It may be convenient to pump a jet of the press liquor into the inlet hopper to break the bridging.) This is rarely done.

RESISTOR TEETH

The interrupted screw design press has stationary teeth that protrude into the flow of material as it passes through the press. These fit into the gaps of the screw where there is no flighting. They stop just short of the shaft of the screw.

The resistor teeth are an integral part of the Resistor Bar. These resistor bars are positioned axially, parallel to the screw, with one bar above and one bar below the screw. The resistor bars are bolted between the B and C plates; they form a part of the structural frame of the screw press. The screen frames bolt onto the resistor bars.

Rarely the resistor teeth are shortened, usually by half, to increase the capacity of the press. Removing the teeth altogether will result in co-rotation and jamming.

Not infrequently the resistor teeth are drilled so that fluid can be injected into the press during operation. See the next section.

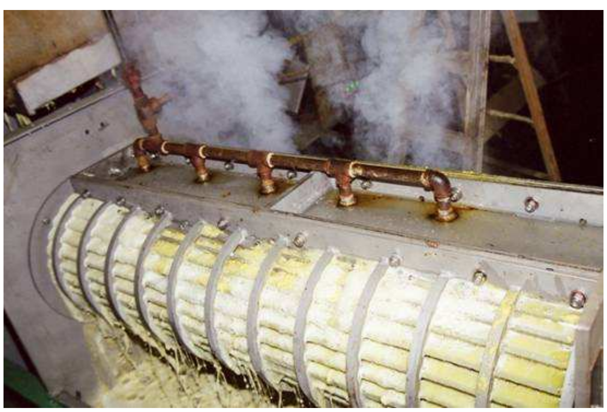
FLUID INJECTION

Resistor teeth can be drilled so to permit injection of steam, solvent or water while the press is in operation. Also, these modified resistor teeth can be used for CIP cleaning, without the need of removing the screen from the press.

Commonly alcohol injection is used to achieve in-line washing to remove sugars. Hot water injection is used to recover dissolved solids in juice production. Steam injection is used in dewatering raw organic materials.

The moisture reduction that results from steam injection is related to a chemical change that comes with blanching, or parboiling, a material. Steam injection works well on pineapple skin, citrus waste, and raw fish. Tests run with steam injection in a Vincent press at Anheuser-Busch showed little benefit. The material being pressed, spent grain, had already been "cooked" before steam was added.

Injection is achieved by drilling holes through the resistor teeth and piping these holes to a manifold outside of the screen. Photos and drawings are available from the factory. Vincent does not charge for providing a drilled resistor bar.



STEAM INJECTION
IN TWIN SCREW PRESS

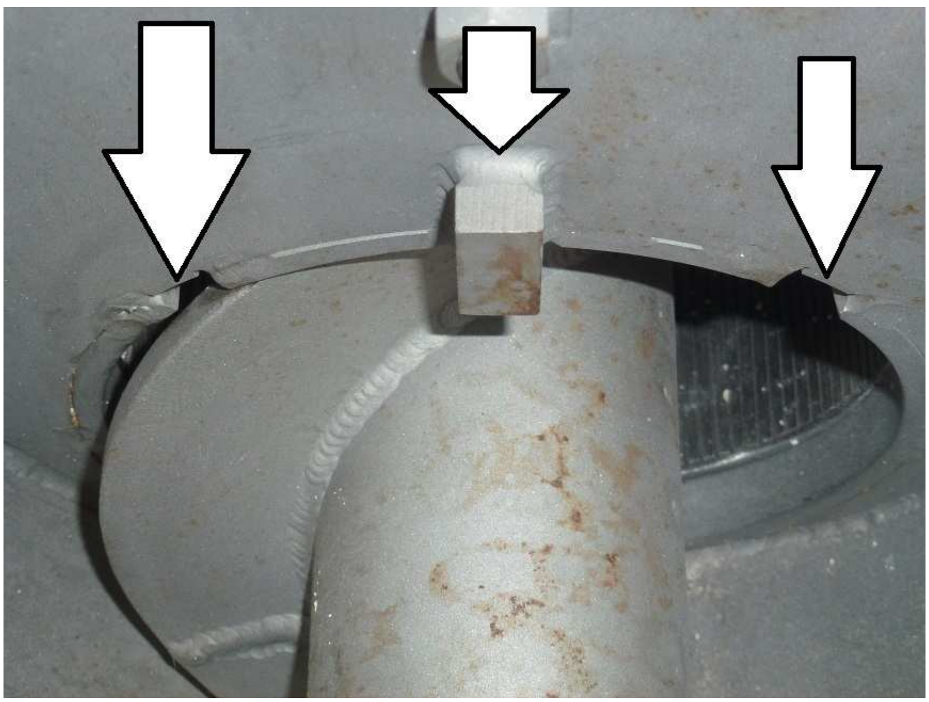
LAB PRESS
STEAM INJECTION

CORD CUTTER AND STRIPPER

Sometimes long stringy material will be pinched where the feeder portion of the screw goes through the hole in the B Plate. This material will co-rotate with the screw and build into a bundle which reduces the flow through the press.

A groove, like a keyway that is 3/8" deep, is cut half way through the hole in the B plate. We call this a Cord Cutter. Material trapped between the flight and the hole in the B plate will pop up slightly as it passes the Cord Cutter. The result is that the material is sheared loose.

Sometimes a part called Brian's Stripper is welded to the B Plate, inside the inlet hopper. It goes in a position so that the flight lightly kisses the stripper as it goes past. This strips the material away. Strippers are made of square bar stock.



STRIPPER AND CORD CUTTERS

POLYMER

Infrequently the addition of polymer may be required in order to achieve adequate screw press performance. Polymers are added to dilute waste streams, especially to those containing very small size suspended solids. The long chain molecules of the polymer will flocculate the solids, agglomerating them to the point where they can be pressed. Under the right conditions, drastic improvement can be observed in press throughput, press cake moisture, and press liquor clarity.

Nalco and GE are the leading polymer suppliers. Their sales engineers are anxious to recommend the product best suited for your application.

Low speed operation of the press is usually required in order to achieve good performance.

NOTCHES

Sometimes it is necessary, during press operation, to have the screw wipe the screens clear of blinding material. This is best achieved by having notches in the outer edge of the screw. Fibrous material accumulates in the notches and brushes away slimy material which may be blinding the screens. Shallow notches (1/8" wide by 1/8" deep, 1-1/2" apart) in the outer edge of the screw flights work well. Typically, notching is done from the B plate to the second resistor tooth. Most Vincent presses are supplied with notches.

GRINDING NOTCHES IN THE FLIGHTS

WIPERS

Before the advent of notches, wipers, made of UHMW strips or nylon brushes, were sometimes mounted to the outer perimeter of the screw flights. If at all possible we advise against the use of such wipers because (a) they tend to cause material to co-rotate and jam in the press, (b) they are difficult to replace, and (c) they wear rapidly, resulting in unacceptably frequent shutdowns for replacement. Wipers tend to improve dewatering performance for the first week or so. After that the wiper material wears and press performance reverts to being just a little better than if no wipers were used. Wipers are made either of 1/4" thick high durometer polyurethane or of nylon bristle brush. Wipers are preferably mounted on the downstream edge of the flight.

PRESS AID

Some materials press best if a press aid is mixed into the material to be pressed. Typical press aids are rice hulls, cottonseed hulls, cellulose fiber from a paper mill, and ground newspaper. Ground wood is the best, but most expensive, press aid.

Press aids are most commonly used in producing juice from deciduous fruit. The press aid gives the press something to get a bite on. Press aids also tend to hold back fines (short fibers) and prevent them from going through the screens with the press liquor. If apples are fed into a press, apple *sauce* will come through the screens. However, if a press aid is added to the apples, then apple *juice* will come through the screens.

Typically, the amount of press aid used is only 1% to 3% by weight of the flow going through the press. This will look like more than such a small percentage because press aids have a much lower bulk density than the wet materials that are pressed.

HYDRATED LIME, GYPSUM, AND ALUM

Lime (calcium hydroxide) must be added to citrus peel before it can be pressed. The lime breaks down the pectins or cell walls so that the press can remove moisture. Less than 1% by weight is used. A reaction time of several minutes must be allowed prior to pressing. Lime has been used successfully in the same manner with potato, onion, tomato, carrot, and pineapple waste. It works well on acidic materials such as strawberries and coffee bean pulp. Vincent offers lime dosing equipment.

Gypsum and alum salts are also effective chemical press aids. They are typically used in dewatering sugar beet pulp, and they have rarely been found effective on other materials.

VACUUM EFFECT

In some applications, increased screw press capacity can be obtained if the area outside of the screen is under a vacuum. This can be achieved by mounting the press at a high elevation, with the press liquor drain line dropping below the surface of a drain tank or pit.

That is, the drain line from the press should go below the surface of the pit or pond into which it drains. If this line is relatively small in diameter and has a steady downward slope, a vacuum will be induced around the screen of the screw press. The mass and velocity of press liquor flowing through the drain line create this vacuum. To draw air bubbles downwards with the press liquor, the velocity of the fluid must be greater than five feet per second.

The covers over the screen of the press will have to be sealed, usually with Silicone.

The amount of vacuum is a function of the elevation between the press and the drain pond. For good results, the press should be mounted on a stand that is 20' tall or higher.

PRESS LIQUOR

A screw press produces relatively "dirty" press liquor as compared to a Filter Press or Belt Press. Suspended solids will pass through the screen of the screw press along with the liquid being expressed from the inbound material.

If suspended solids need to be removed from the press liquor, the most common method is to pump the press liquor either over a static (sidehill) screen or through a rotary drum screen. Generally, the screen tailings (sludge solids) are fed back into the screw press along with the flow of inbound material. Most of these fines will be captured with the solids of the inbound material and end up in the press cake. Although some of these tailings will once again go through the press screen with the press liquor, equilibrium of recirculating solids is reached and satisfactory pressing operation is realized.

If the press liquor is to be concentrated in an evaporator, better screening than can be achieved with a static screen may be required. Another Vincent machine, the

Fiber Filter, provides premium performance. Decanters or centrifuges may be required.

SCREEN SELECTION

The screen of the press is made either of wedgewire (slotted screen) or perforated stainless sheet (round holes). Wedgewire screens are expensive one-piece weldments that must be replaced when excessive damage or wear has occurred.

Wedgewire screens in Vincent presses can be reversed in order to achieve double life. That is, wear starts at the cake discharge end of the press. When this occurs, the screen can be turned 180^o so that the fresh inlet section is then located in the discharge area.

Screens made of wedgewire come standard with 0.015" to 0.020" slot width; they are also available with slots that are 0.008" to 0.060" wide. With slot widths less than 0.012" there is a tendency for the screen to blind (be covered over) with the material being pressed. However they work well in alcohol and oil separation. Changing the slot width generally has little impact on the clarity of the press liquor or the dewatering capacity of the press.

The most common damage to a wedgewire screen is for part of the surface to be smeared over by rubbing the screw. This rarely is bad enough to affect press performance. Wedgewire screens generally work satisfactorily with 30% or even more of their surface smeared over.

Smeared screens can be remedied by running a box cutter blade through the slots.

TIG welding is used to close the gaps in the case where either a few wedgewire slots get spread apart by tramp material or a perforated screen gets torn.

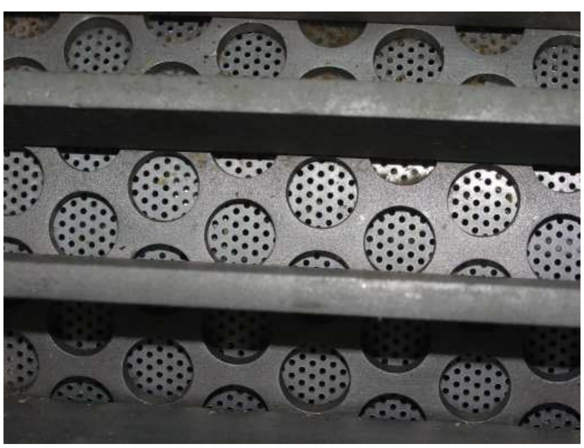
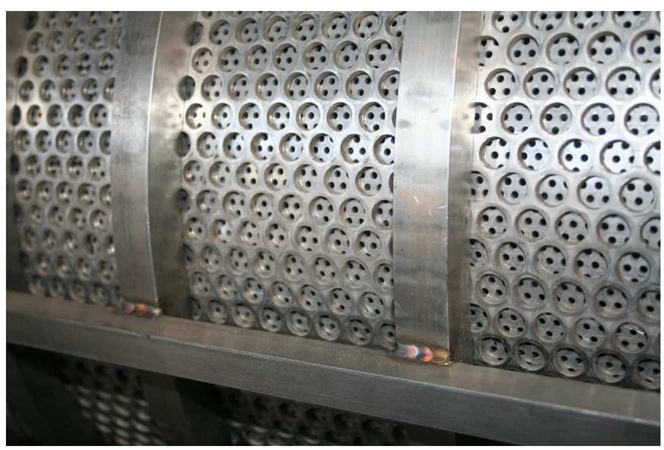
Perforated metal screens are simple sleeves which are held in the screen assembly. These are less durable but inexpensive to replace. Standard perforated screens have a hole size of 3/32" diameter, although material with 0.060", 0.040", down to 0.023" holes can be supplied.

Frequently, increased press capacity can be achieved by changing a perforated screen to one with smaller holes. This unexpected result arises from a combination of factors: (1) smaller hole screens are made of thinner sheetmetal, so that the press liquor has a shorter distance to travel before it falls free from the screen, reducing the chance of sponging backwards through the screen and (2) particles which fall into and plug a larger hole will roll over a smaller hole. Minor rubbing between the screw and screen is normal, although, obviously, hard rubbing will cause wear and premature failure of the screen. With a clearance greater than 3/16", the dewatering performance of the press can start to deteriorate; this depends a lot on the nature of the material being dewatered.

In cases of severe wear or damage, it is common to patch a screen. Stainless sheetmetal is used for this. The reduction in drainage surface is of little consequence as the screens have ample open area.

The most common cause of screen failure ties to failure of the outboard support bearing. If the bearing holding the end of the screw wears out, it can let the screw move enough to rub against the screen.


PROFILE BAR (WEDGEWIRE) SCREEN

PERFORATED SCREEN WITH REINFORING PLATE

SCREW-TO-SCREEN CLEARANCE

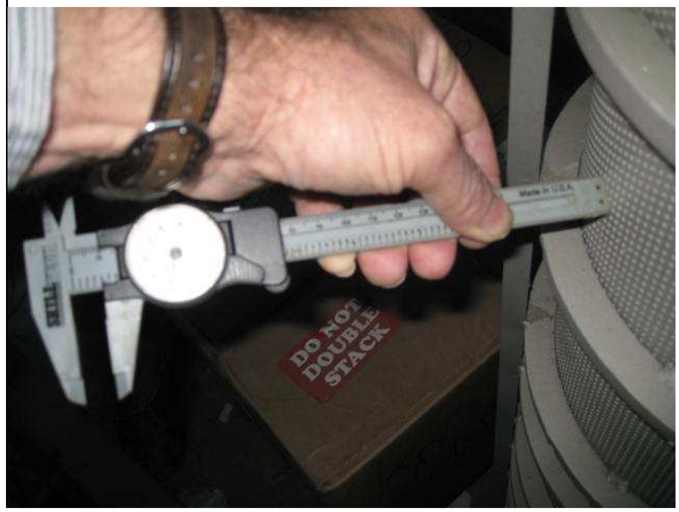
Generally the clearance between the screw and the screen of a Series VP press is 1/16", plus or minus 1/16". The screw should not rub the screen hard, as it can cause wear and premature failure of the screen. Tight clearance is used with materials that blind the screen, such as onion skins. Greater clearance, 1/16", is used with eggshell, pectin, xanthan gum, and corn husk. With a clearance greater than 3/16", the dewatering performance of the press can start to deteriorate; this depends a lot on the type of material being dewatered.

To measure the s2s clearance in wedgewire screens, a feeler gauge can be slipped through and along a slot until it hits the edge of the screw. Measure from the outside of the screen to the edge of the flight; then subtract the thickness of the wedgewire (generally either 0.25" or 375") from the measured depth in order to calculate the clearance.

Alternatively the screw-to-screen clearance can be checked by removing one half of the screen and bolting the other half tight to the resistor bars. Inspection is made from the side from which the screen half has been removed.

In the case of perforated screen installations, a depth gauge can be used to measure the screw-to-screen clearance. This is done by first finding an area where the screw flight is next to the screen; poking a straightened paper clip through the screen is handy for this purpose. The depth from the outside of the screen to the edge of the flight is measured, and then the thickness of the screen is subtracted from that measurement. [3/32" perf is 0.075" thick; 0.050" perf is 0.050 thick; 1/32" perf is 0.024" thick; 0.023" perf is 0.015" thick; 3/8" perf back up screen is 0.120" thick.]

If a screw rubs against the screen in a given area, it may be best to grind some off the OD of the screw. Prussian Blue can be useful in finding the spot that is rubbing.



WEDGEWIRE DEPTH GAGE PERFORATED DEPTH GAGE

CONE BUSHINGS

The cone rides on the shaft of the screw. "Cone Sleeve" is the name given to the portion of the screw on which the cone rides. There will be two bushings in the cone to support and guide it, and to protect the Cone Sleeve journal surface of the screw shaft. Sometimes these bushings are lubricated with liquid from the material being pressed, such as the juice from apples or water from pectin peel.

A grease fitting is provided for lubricating the bushings and to minimize leakage of press liquor through the cone. If a single grease line is used, the grease line goes to a pocket, which serves as a grease reservoir, located between the two bushings.

Bushing lubrication is extremely important when materials that are dry (like paper mill screen rejects) are being pressed. By the time such materials reach the discharge of the press, they do not have enough free moisture left in them to adequately lubricate the cone bushings. In these applications the operator should, at the start of each shift, pump grease in until it comes out between the cone bushing and the screw shaft. Then he should open and shut the cone three times in order to spread the grease.

Rarely, presses are supplied with additional lubrication fittings so that water, in addition to grease, can be metered to the bushings as a lubricant.

Automatic grease systems are available. These should be the high pressure (900 psi) electric or battery variety. Vincent provides these for critical applications, especially pulp & paper.

Liquid leaking past the cone bushings drains out the back of the cone (at the air cylinder end of the press). Almost always it is minimal compared to the flow of press cake. However, a pan can be provided to collect this liquid and drain it into the main flow of press liquor.

WING FEEDERS

Sometimes there are blades welded to the outside tips of the last two flights of the screw. Called "Wing Feeders", these are mounted parallel to the discharge screen surface. Care must be taken that wing feeders are not made so long that they hit the face of the cone when the cone is in the closed position.

Wing feeders can serve two purposes. (1) In the case of materials that want to channel out the discharge of the press, like pineapple and spent brewer's grains, long wing feeders break up the channeling flow. (2) For abrasive applications, short knobby wing feeders are provided as sacrificial wear elements.

When certain materials are fed through a screw press, clumps of dry material may pack in front of the wing feeders. This buildup can cause wear of the screen. Should the problem occur, grind off the wing feeders.

LONG WING FEEDER

KNOBBY WING FEEDER

CLEANING

Commonly, material is cleared from a press by stopping the inbound flow, setting the discharge cone in the withdrawn position, and running the press for a few minutes until no further material is discharged. This will leave some material inside the press, which can be handy for forming a plug at the cake discharge when the press is restarted.

Material will leave a Vincent interrupted flight press only if there is additional inbound material forcing it out. This makes it difficult to clear all material from inside a press without removing the screen. One technique used successfully is to feed crushed ice into the press. Water must be fed along with the ice to prevent jamming. When the ice melts, the press will be relatively clean inside.

There are applications in which the press must be cleaned frequently, such as once a shift, in order to meet sanitary regulations. The screen halves can be hinged to facilitate this. In other cases, the screens are removed from the press. A spare screen assembly may be kept, submerged in cleaning solution, in order to minimize the downtime required.

Cleaning the inside of the screen can be achieved, at least to some extent, by injecting water through the resistor teeth. Holes must be drilled in the resistor teeth to make this possible.

It is unusual that the outside of the screen needs to be cleaned. Spray systems for this can be built into the press at the Vincent factory. Alternatively, a pressure washer or swabbing with acid solution can be used.

SHAFT SEAL

The Seal Plate is bolted to the A Plate. This may be solid UHMW (ultra high molecular weight polypropylene or polyethylene) or it may contain one or two Johns Manville (JM Clipper) lip shaft seals. There may be a grease fitting on this plate; the grease is used to reduce leakage and to help prevent fiber material from entering and damaging the screw shaft.

Generally, seals are allowed to drip once they start leaking. They are replaced only in conjunction with major maintenance, as when the screw is removed from the press.

In some cases we have found that leakage from a shaft seal can be stopped by simply selectively loosening or tightening the four bolts holding the seal housing to the A plate.


SEAL PLATE


SPLIT SEAL PLATE

SCREW REMOVAL

The screw is removed through the hole in the C Plate, at the cake discharge end of the press. The operation can be difficult the first time, so we recommend consulting with the factory before getting started.

Start by removing the four bolts holding the shaft seal plate to the A Plate. This will prevent damage once the screw is loose.

To remove the screw from a Series VP press, the shaft coupling between the gearbox and the screw must be undone. Then the gearbox must be moved out of the way so that the shaft coupling can be pulled from the end of the screw. Falk gear-type couplings are heated to 350º to 500º F so that they can be pulled off; use a temperature stick to measure this temperature.

Next the pillow block bearing is removed.

A hydraulic jack is used to pull the coupling half and the PB bearing from the shaft.so that they can be pulled off; use a temperature stick to measure this temperature.

Next the pillow block bearing is removed.

A hydraulic jack is used to pull the coupling half and the PB bearing from the shaft.

The bars with the resistor teeth must be removed before the screw can be removed.

If the flange bearing is mounted on a circular plate which also holds the air cylinders, do not remove the flange bearing by itself. Instead, leave it on the round plate and remove the air cylinders and bearing as a single unit.

If the coupling half, pillow block bearing, or flange bearing have become seized to the screw shaft, it will be necessary to cut them loose. It is recommended that spare parts be on hand before replacing a screw in a VP press.

SCREW REPLACEMENT

In the case of the Series VP presses, jacking bolts and shims are used to achieve proper alignment. Only after the screw is aligned within the screen can the gearbox be aligned to the screw (not the other way around). When working with gear-type couplings, be sure to leave the prescribed 5/16" gap between the gearbox shaft and the screw shaft. This will protect the gearbox from thrust loads.

Falk gear couplings must be heated to 350º to 500º F in order to slip onto the shaft.

It is important to hand-pack grease into a Falk coupling. Do not rely on the grease fitting because the grease will only lubricate in the path of least resistance.

There are two ways to avoid excessive rubbing between a new screw and the screen: Either shims can be placed between the screen frames and the resistor bars, or the interference can be ground off the edge of the screw. To eliminate the high spots, coat the edge of the screw with Prussian Blue, bolt the screens in place, turn the screw, remove the screens, and grind the screw where interference has occurred.

SCREEN REPLACEMENT

For ease of maintenance, the screen halves are held in frames that are split vertically, being bolted to the resistor bars. This allows the screen halves to be removed from the sides of the press.

In the case of screen failure, frequently a solid patch can be welded onto the screen, from the outside. This is simple as the screen need not be removed from the press.

Wedgewire screens may become smeared from being wiped by the screw or by hard press cake. Wedgewire screens generally work satisfactorily with 30% or even more of their surface smeared over. Usually press liquor will come through a smeared area of a wedgewire screen. If it becomes an issue, it is corrected by running a box cutter blade through the slots.

To replace a perforated screen, the screen frame must be removed from the press. Damaged screens should be removed and discarded. The replacement perforated screen first must be clamped tightly against the supporting frame. This can be done by forcing the new screen against the frame, using C-clamps and wood or steel pieces. Be sure that extra screen material sticks out beyond the edges of the frame, to allow trimming with a hand grinder.

Usually perforated screens are tack welded in place. However, if the perforated screens bolt in place, once the new screen is tight against the frame, look through the screen and locate the holes in the frame where the attachment bolts go. Use a center punch to open holes in the screen. These holes must be large enough to allow the attachment bolts to go through the screen and thread into nuts on the far side of the frame.

Once the new screen is tack welded or bolted tightly in place, beat over and grind off the excess screen material.

There are two ways to avoid excessive rubbing between a new screen and the screw: Either shims can be placed between the screen frames and the resistor bars, or the interference can be ground off the edge of the screw. To eliminate the high spots grind the screw where interference has occurred.

GEARBOX BASICS

The Series VP presses use foot-mounted gearboxes. The foot-mounted gearboxes are most commonly concentric (the motor shaft is in line with the output shaft), although occasionally a parallel shaft reducer is used. The VP presses can use either a C-face motor coupled directly to the gearbox or a foot-mounted motor with either a coupling or a belt drive.

Gearboxes are rated, and sold, by their torque rating. The manufacturers generally offer their designs in progressively larger sized castings, or boxes. The larger the box, the larger the torque rating. Each box size will be available with different gear ratios. In order to keep the torque fairly constant, larger horsepower motors are used with the high speed boxes. Similarly, reduced horsepower motors must be used when a low output speed is selected.

Screw presses are designed around the size of the gearbox that is selected.

PRESS LUBRICATION

Lubrication is something we generally review with customer personnel during start-up. It is pretty straight forward:

CONE BUSHINGS:	Once a shift
BEARINGS:	Weekly
BUSHINGS:	Weekly
SHAFT SEAL:	Weekly
GEARBOX:	Annually
AIR REGULATOR:	Whenever empty (if a lubricator is being used)
GEAR COUPLING:	Whenever opened pack by hand, covering all teeth.
MOTORS:	Never

The most critical lubrication item has to do with the cone bushings. Before starting up a new press, the cone should be run in and out a few times to spread the grease around.

Lubrication of the cone bushings depends a lot on what is being pressed. With orange peel, there is enough press liquor juice acting as a lubricant that the bushings are lubricated only at the end of the processing season (to keep them from locking up on dried-out peel juice). The other extreme is at a paper mill where boiler fuel is made out of reject fiber. There is no free water left in the press cake, so everything is very hot and dry. We automatically supply a 900 psi ATS autolube on paper mill jobs. Another tough application is with vapor tight presses where there is apt to be solvent getting into the cone bushings. The solvent can dissolve and wash out the grease, so we like to see frequent lubrication of the cone bushings. (Food grade grease is used in this application since food ingredients are being produced by the press.)

If Vincent supplies an autolube for the cone bushings, it will be either battery powered or require a hard wired power supply. This should be actuated when the press is first placed in service. It should be set to give one small shot of grease every couple hours. We provide autolubes with large grease reservoirs, so they will go at least two weeks at the maximum greasing schedule. Once operations are stabilized, it may be practical to reset the timer dip switches so that it gets one shot every shift or once a day.

In any case, we tell the operators to run the cone open and closed once a shift because this will spread the grease around. This is done with the press in operation.

If Vincent does not provide an autolube for a critical operation, we generally tell the operators to manually grease the cone bushings once a shift. We also tell them to run the cone in and out when they do the greasing, in order to spread the grease.

The bearings and/or bushings holding the screw get greased on the customer's normal schedule for that type of bearing, maybe once a week, or once a day, or once a month. Whatever grease the customer normally uses will be fine.

The shaft seal housing may have a grease fitting. This grease is to prevent fiber from getting into the seal. The seal should be given a shot of grease whenever the screw support bearings or bushings are greased.

The gearbox oil should be changed once a year. Use mineral oil for a normal 1800/1500 rpm input. Use the same grade oil, but synthetic, for input speeds of 2,400 rpm or more. (Sumitomo Cyclo's, parallel shaft gearboxes, and Brevini and Bonfiglioli planetaries, are exceptions to this. The OEM manuals from these suppliers detail lubrication requirements.)

The air regulator used with the discharge cone air cylinders may have a lubricant jar. If so, Vincent includes a can of light oil along with the air regulator which comes with our screw presses. The jar should be filled when placing the press in service and when the jar is empty, about once a year. It takes very light (sewing machine) oil. The oil helps prevent corrosion inside the air cylinders. (Most air cylinder manufacturers no longer recommend the use of lubricators.)

If there is a Falk gear-type shaft coupling, Vincent packs these with lubricant grease prior to shipment from the factory. The grease is re-packed only if the coupling is opened (which is rare). Packing must be done by hand so that all the gear teeth have grease.

We have never seen nor heard of anyone greasing the motor bearings.

REPLACEMENT PARTS

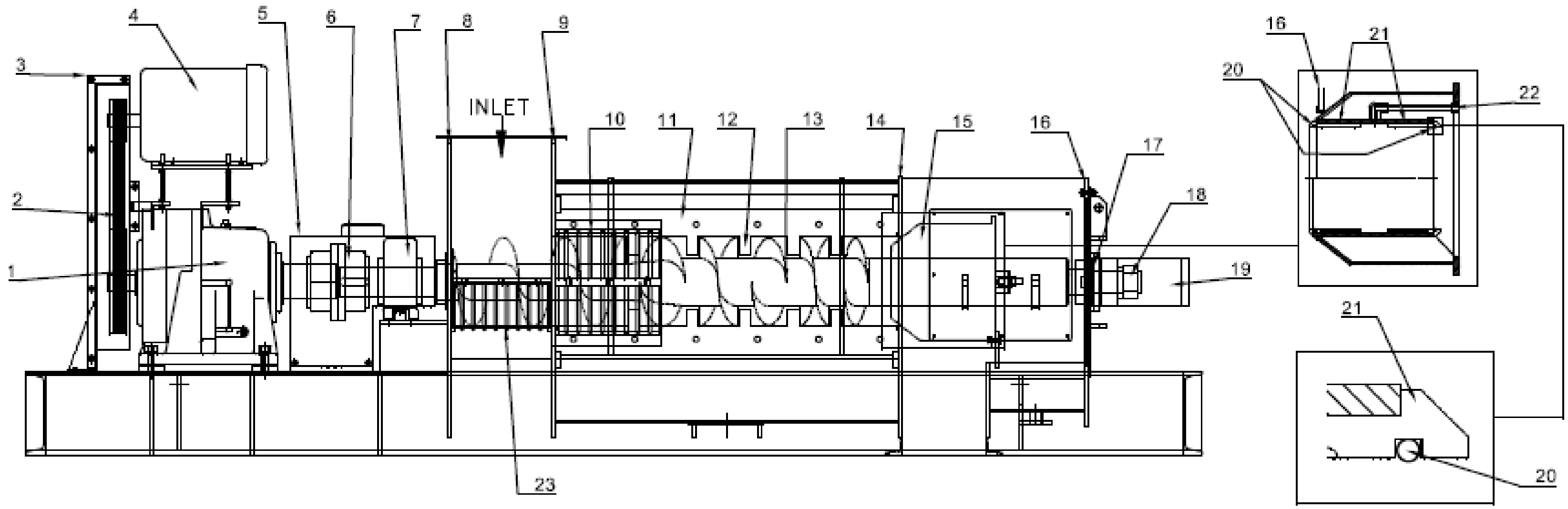
Most replacement parts are standard OEM components that are purchased from their original manufacturer. The specification of these items is included in the O&M Manual. Only shaft seals and bearings are apt to require replacement.

The most common wear parts in the Vincent Press are the screens, the screw, and cone bushings. Vincent stocks these for the more popular models. Screws are generally rebuilt at the Vincent factory. Be sure to specify the Serial Number of your press when ordering replacement parts or repairs.

SAFETY

These Operating Hints have left unstated the obvious safety hazard: A screw press, like any screw conveyor, is totally unforgiving. If clothing or a limb gets caught in a rotating screw, the screw will not stop. Vincent Corporation has heard of only one injury of this nature with a screw press; do no let yourself become the second. The use of common sense is all that is required.

Robert B. Johnston, P.E.



VP SCREW PRESS PART LIST					
1	GEARBOX	9	B-PLATE	17	FLANGE BEARING
2	BELT DRIVE (Opt)	10	MAIN SCREEN (2)	18	SPLIT COLLAR
3	BELT GUARD	11	RESISTOR BAR	19	AIR CYLINDER (2)
4	MOTOR	12	RESISTOR TOOTH	20	O-RING (2)
5	COUPLING GUARD	13	SCREW	21	FRONT AND REAR CONE BUSHING
6	SHAFT COUPLING	14	C-PLATE	22	GREASE TUBE
7	PILLOW BLOCK BEARING	15	CONE	23	HOPPER SCREEN (Opt)
8	A-PLATE	16	D-PLATE		

Vincent CORPORATION
TAMPA, FLORIDA

VINCENT
VP PRESS
NOMENCLATURE

W. O. NO.		DRAWING NO.
N/A		96656
DRAWN PF	DATE 8/1/2012	FILE VP NOMENCLATURE