Smoky Lake
MAPLE PRODUCTS™
SMOKYLAKEMAPLE.COM

Contents

Certificate of Authenticity

This is a genuine Smoky Lake Stainless Steel Filter Press, handcrafted in Hilbert, Wisconsin. Smoky Lake is the manufacturer of the first and only stainless steel Filter Press in the maple industry. We certify the components of this Filter Press are indisputably food grade. This product is lead-free, brass-free and aluminum-free. The Disposable Papers and the Diatomaceous Earth accompanying this Filter Press are also food grade and made in the USA.

Angela K M Schumacher,
Owner

James Schumacher,
Owner

Volunteer Day
The Smoky Lake crew grooms over a mile of trails at the Brillion Nature Center in Northeast Wisconsin.

We at Smoky Lake are so happy to craft this Stainless Steel Filter Press especially for you at our headquarters in Hilbert, Wisconsin.

Thank you so much for supporting American jobs and American-made products. We acknowledge that it is only because of your support that our small business is able to thrive.

Smoky Lake will continue to express our appreciation to you through volunteer work and nonprofit support. Each year, Smoky Lake benefits a wide array of worthy causes such as environmental conservation, cancer research, ALS assistance programs, honor flight sponsorship, and youth arts and literacy programs.

In short, we just want to say "Thanks!"
We are so grateful for your business!
Enjoy your new Filter Press!

Angela K. M. Schumacher
Co-owner of Smoky Lake Maple Products

Filter Presses are a trusted and long-proven method of filtering. Check out this vintage video – courtesy of huntleyarchives.com – to see a Filter Press being used to filter syrup circa 1920. tinyurl.com/maple-filter-press

What is a Filter Press?

A Filter press achieves superior clarity in maple syrup with the help of a filtering material called diatomaceous earth (DE). This is a widely used and trusted purification tool which has been relied upon in many industries including beer, oils, and pharmaceuticals. Filter presses were first invented in the 1800's and they still remain a superior method of filtering today in the 21st century.

Despite the filter press' long history, Smoky Lake is the first manufacturer to bring a totally stainless steel Filter Press to the maple industry.

The stainless steel Filter Press by Smoky Lake is indisputably food grade; made from beautiful, robust stainless steel. Just another way Smoky Lake is pushing to improve the maple syrup production process.

This Is What It Boils Down To™.

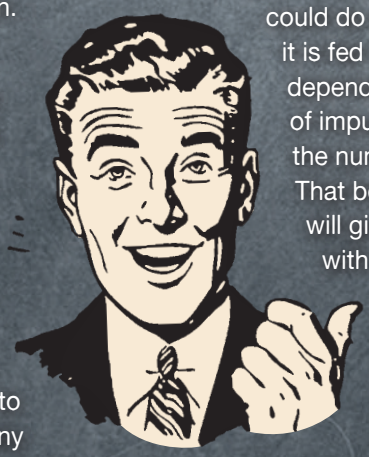
Foundation Concepts

1 As contaminants inside the Filter Press increase, the flow will slow, and the pressure will rise.

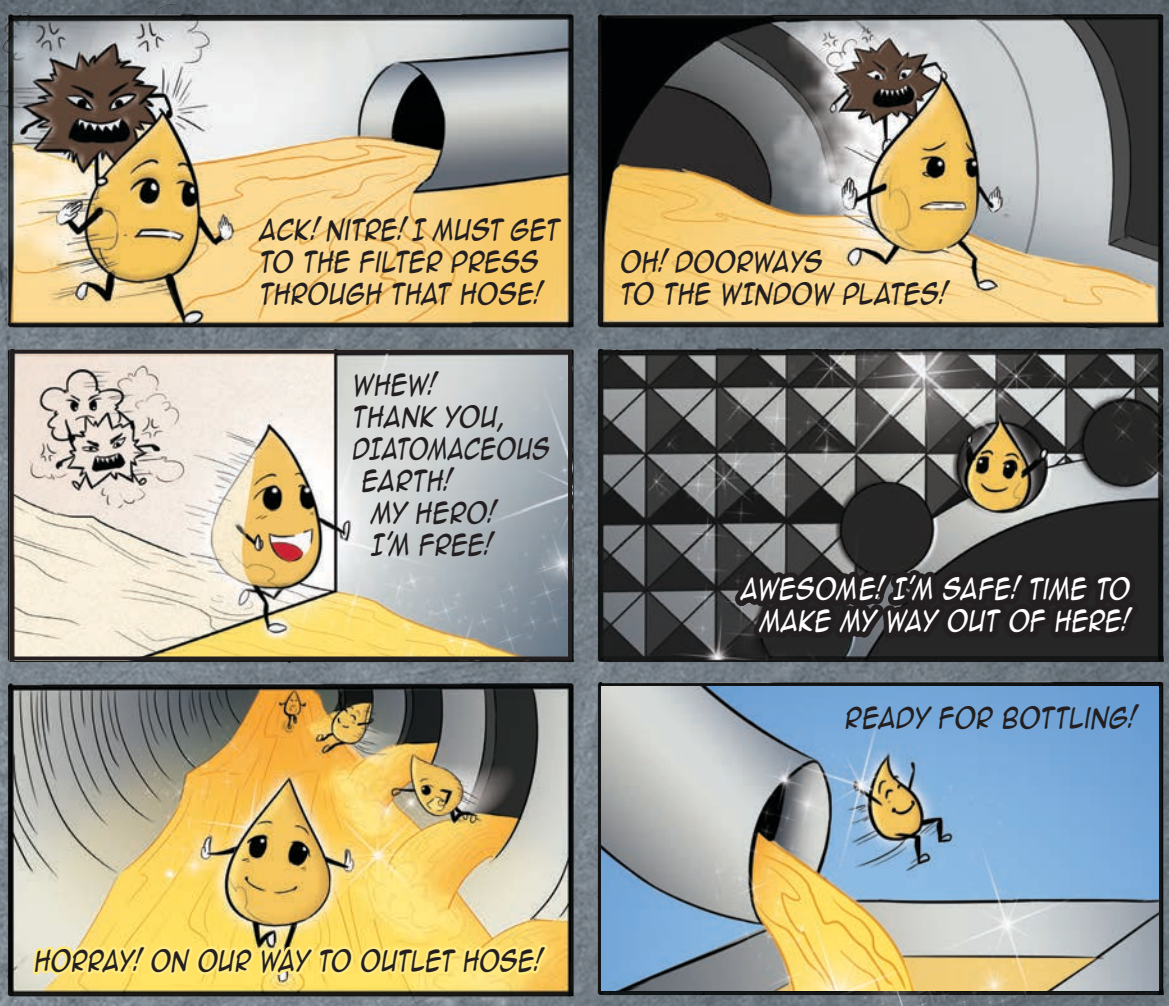
2 Diatomaceous Earth (AKA DE) helps filtration and prevents your paper filters from clogging prematurely. It reduces the pressure in the press so that you can filter more syrup in each session.

3 Many variables will determine how much syrup you can filter before needing to clean out the Press: The amount of impurities in the syrup, the temperature, the amount of DE being used, etc.

4 The hardest variable to determine is how many impurities are in your syrup. Syrup that has settled for several days contains less impurities than syrup from the bottom of a barrel. Syrup directly off the evaporator contains an impurity load somewhere in between those two extremes. A small press might only be able to filter one gallon of "sludge" from the bottom of a barrel, or it could do 20 times that amount if it is fed well-settled syrup. It all depends on the TOTAL amount of impurities in the batch, not on the number of gallons of syrup. That being said, this manual will give you a baseline to start with. Through experience you will be able to make adjustments accordingly.

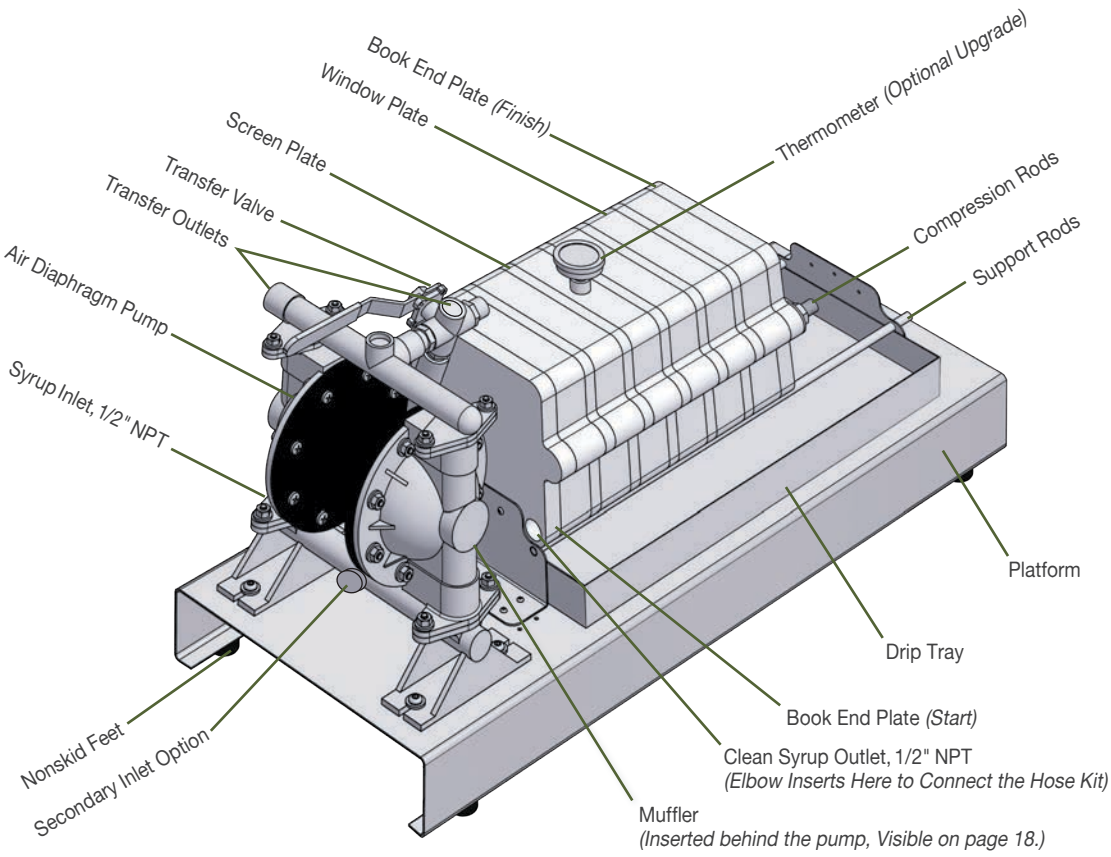


4 Follow syrup's path through the Filter Press below. As you will see, syrup passes randomly through just **one** of many filters. Hence, adding filters to a press increases the press's capacity but does **not** affect filter quality or syrup clarity.



Anatomy

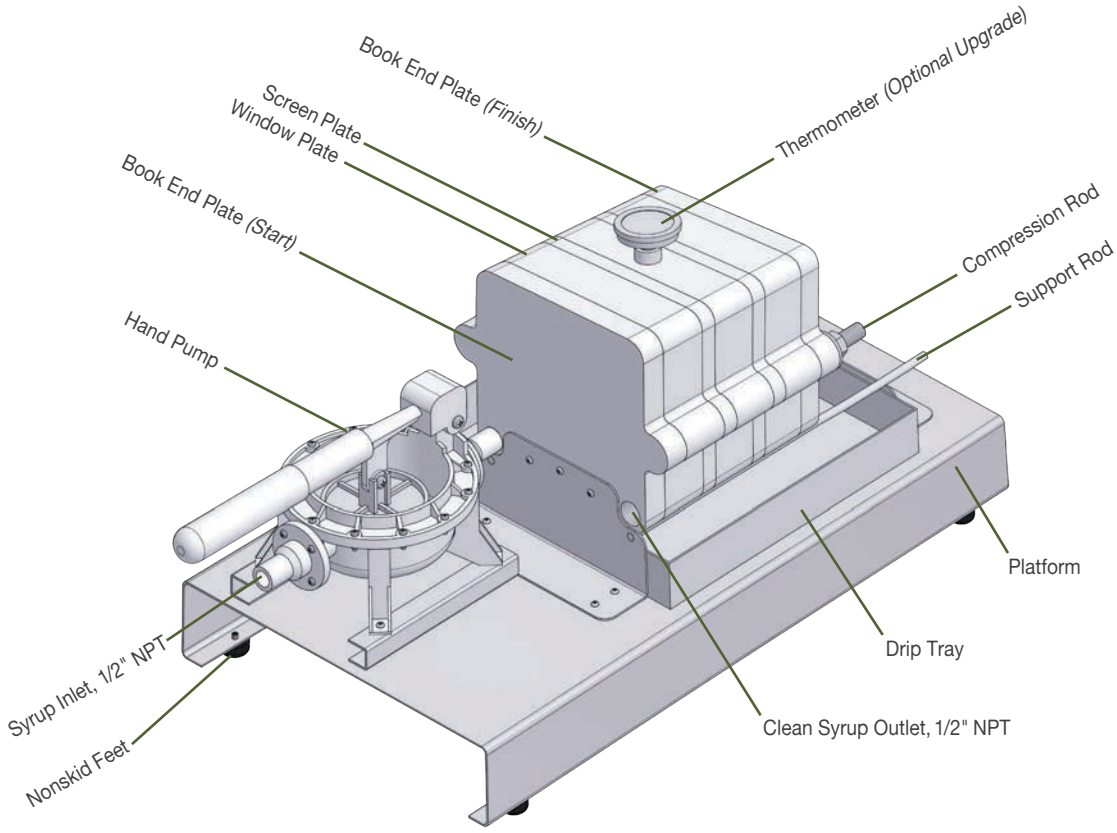
Smoky Lake Filter Press w/Air Pump



Shown Here: Filter Press with Air Diaphragm Pump, Long Platform, 12-Filter Capacity and Optional Thermometer

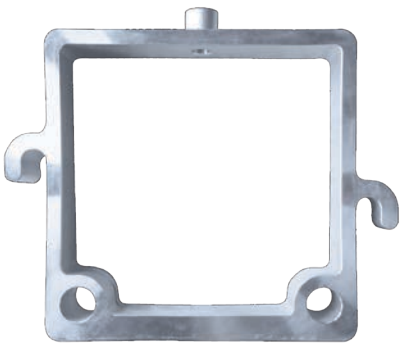
More information related to this Filter Press's Air Diaphragm Pump is available on page 18.

Smoky Lake Filter Press w/Hand Pump



Shown Here: Filter Press with Hand Pump, Short Platform, 6-Filter Capacity and Optional Thermometer

Filter Press Parts



Window Plate with
Optional Thermometer Port

Screen Plate
(This is an upgrade to the traditional "Waffle Plate," enhancing support of your Filter Papers.)

Book End Plate, Start
(This plate should never be removed from your Filter Press.)

Book End Plate, End
(This plate should never be removed from your Filter Press.)

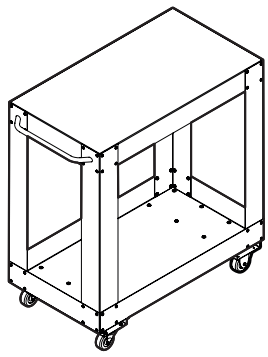
Disposable 7" Filter Paper
(10 sets of papers are included with each Filter Press)

Diatomaceous Earth
(Food grade, 5000 grit. A.K.A. Filter Aide or D.E.)

Hose Kit Includes: 1 Inlet Hose, 1 Outlet Hose, and 2 Cam Lock Fitting Sets
(Color may vary)

0 – 250° F Thermometer
(Optional Accessory)

Shortener Plate
(Optional Accessory)



Industrial Cart
(Optional Accessory)

Safety

- Please read this entire manual before operating your Filter Press.
- Use this Filter Press only for its intended purpose.
- You are going to be using HOT syrup with your Filter Press. Since your syrup is hot, your Filter Press will get hot too. Hot things can burn you. Wear protective gloves and goggles.
- Use a respirator and goggles whenever handling Diatomaceous Earth (DE).
- Only pick up the Filter Press from the Filter Press's platform. Never try to pull or move the Filter Press by the hoses or hand pump.
- Keep hoses away from high traffic, sharp edges, moving parts, etc.
- Make sure your Filter Press is sitting securely on a strong, sturdy surface. For example, a card table is NOT an appropriate surface. *See our Stainless Steel Cart on SmokyLakeMaple.com.*
- Check the condition of your hoses and connections before you start filtering. If you need to replace a hose, make sure it is non-collapsing, food grade material. It should be able to withstand 230ºF.
  NOTE: Hose Kits are available at SmokyLakeMaple.com
- Make sure the end of the hoses are secured. We don't want the hose to splash someone with hot syrup if a hose inadvertently slips out of your pan/bottler.
- During operation drape a towel over the Filter Plates to control any unexpected blurts of syrup from between the filter plates. Blurts would be caused by excessive pressure.
- When you reach 80 psi, stop filtering. Clean out the press and insert fresh disposable filters before continuing. Excessive pressure could also cause filter papers to tear and/or excessive syrup seepage from between the Filter Plates.
- Do not alter or modify the pump or any other components of the press.
- Keep your work area tidy.

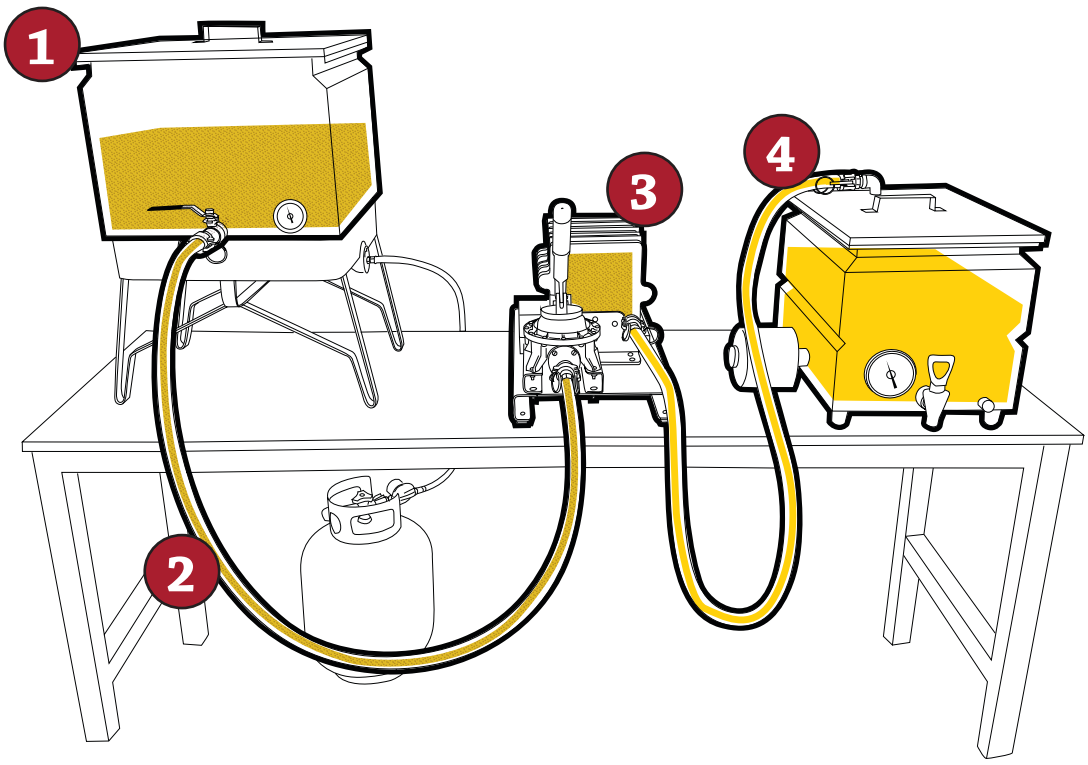
Tools & Setup

Before You Get Started, Gather These Items.

- Maple syrup at bottling temperature *(180 – 190ºF)*
- Smoky Lake 7" Stainless Steel Filter Press w/Hose Kit
- 7" Filter Papers
- Food Grade Diatomaceous Earth
- Bottler *(or other vessel to catch the clean, filtered syrup)*
- Protective Rubber Gloves
- Safety Glasses
- 3/4" Wrench
- Spoon *(for stirring in the DE)*
- Small Brush *(for cleaning)*
- Towel
- Air Compressor with Pressure Gauge, Regulator, and 1/4" Connection *(This item is required only for Filter Presses with Air Diaphragm Pumps)*

Crystal clear maple syrup which was filtered with a Smoky Lake Filter Press.
Photo courtesy of Renee Scola-Lavallee, Upper Michigan

Sample Set Up

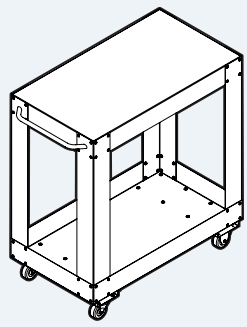


1. Warming Pan w/Unfiltered Syrup
2. Hose Connects the Warming Pan to the Filter Press Pump
3. Filter Press
4. Hose Connects the Filter Press to a Bottler

Step By Step

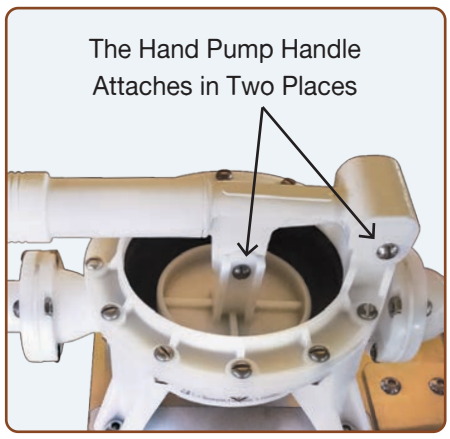
How to Use a Filter Press

1 **Workspace:** Place the Filter Press on a strong, sturdy, level surface. (ie. A card table is not an acceptable surface.) No need to worry about bolting the press in place. The non-skid rubber feet will prevent sliding.



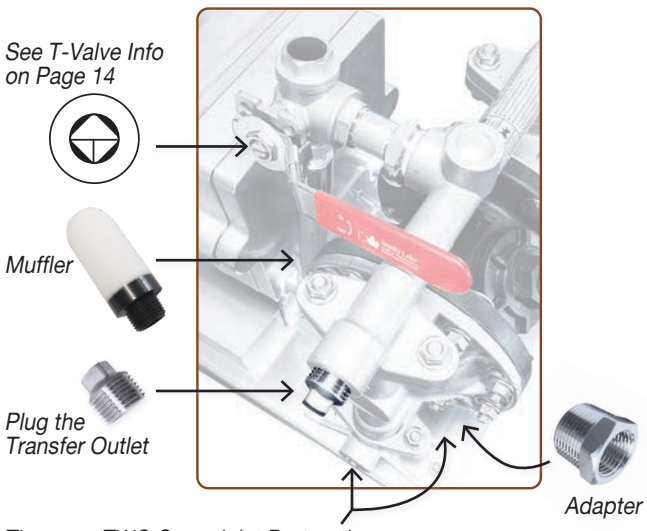
Sturdy, industrial-quality Carts are available at SmokyLakeMaple.com

2 **Pump Assembly:** The pumps typically come preattached to the Filter Press platform. However, if you have a hand pump, the pump handle may have been disconnected for shipping. Simply reattach the handle using the screw, bolt, and tube provided.



3 **Plugs & Muffler (For Air Pumps Only):**

- When filtering syrup, use one of the provided 1/2" plugs in the transfer outlet.
- Insert the provided adapter in the 3/4" NPT inlet port.
- Choose one of the available inlet ports to connect your inlet hose, and plug the second inlet port.
- The threaded connection for the muffler is on the back side of the Air Pump.
- Use plumber's tape on all threaded connections.



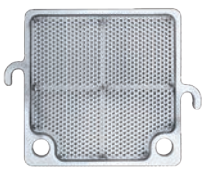
There are TWO Syrup Inlet Port options.

FIG A

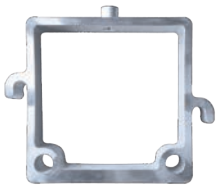
FIG B: Filter Presses with an Air Pump utilize a 90° elbow between the Syrup Outlet and the Cam Lock fitting as shown above. See page 5 to see the location of the Syrup Inlet/Outlet on the overall Filter press.

4 **Hose Kit:** The hoses will come pre-secured to the cam locks. Screw one of the cam locks into the press's Syrup Inlet and the other into the Syrup Outlet as shown. *(The connection looks slightly different depending on which pump your press has. Fig A pertains to Hand Pumps and Fig B pertains to Air Pumps.)*
Again, use plumber's tape on threaded connections to prevent thread binding and to enhance seal.

5 **Filter Plate Installation:** If necessary, use a socket wrench to loosen the 1/2" threaded nuts on the end of the Filter Press's Compression Rods to create space between the plates. NOTE: The Book End Plates should never be removed.

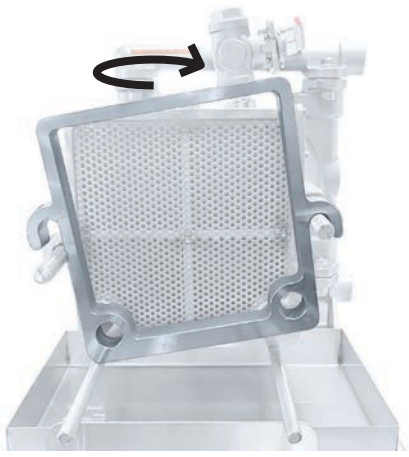


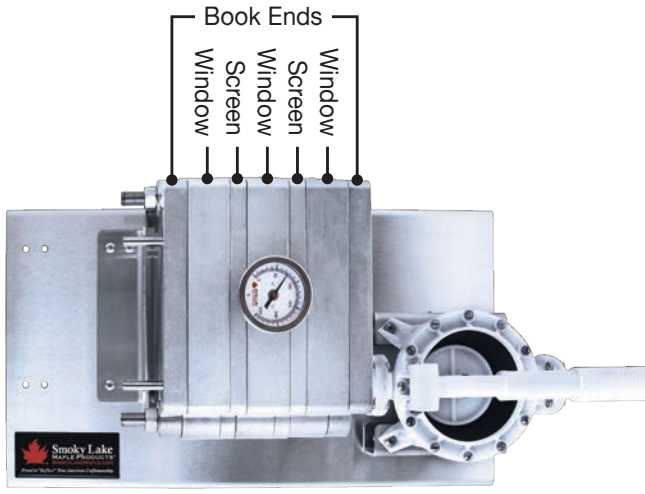
Screen Plate



Window Plate

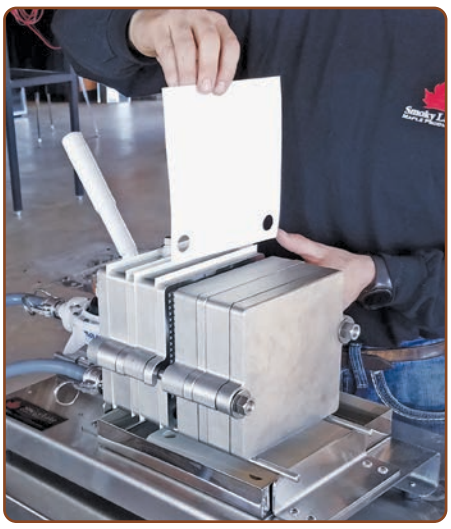
Between the two factory-installed Book End Plates, hang a Window Plate. Then a Screen. Then a Window... Keep alternating until all plates are installed.





NOTE Our unique hanger design ensures you'll never accidentally install a screen or window plate backwards. If a plate isn't seating properly, simply flip it around.

6 **Filter Paper Installation:** Slip one clean filter paper on either side of every window plate. The holes must be at the bottom.



Quantity of Filter Papers Used Based on Quantity of Window Plates Being Used

Qty of Window Plates	Qty of Filter Papers
3	6
4	8
5	10
6	12
8	16
10	20

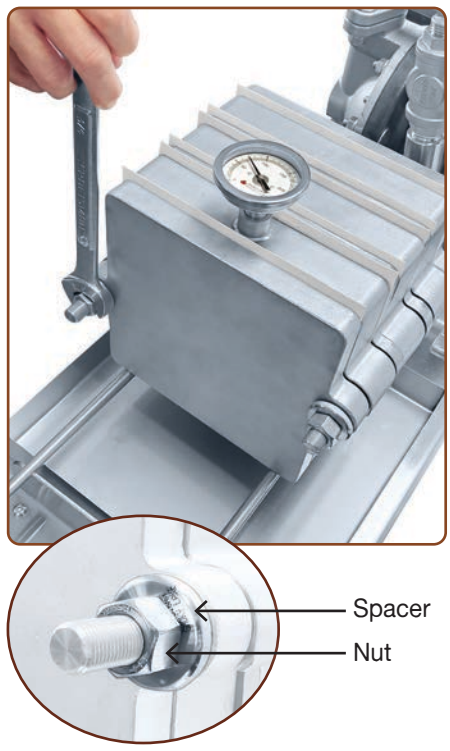
NOTE: Unlike competitor presses, you do **NOT** need to tilt the press vertically to install the filter papers. Your filter papers will conveniently rest on the Support Rods, so you don't need to worry about them falling through.

7 **Final Assembly:** Tighten the nuts evenly on both Compression Rods with a wrench. Turn each nut a quarter turn, alternating until tight.

Smoky Lake has pre-applied a special compound on the Compression Rod threads which will prevent thread binding, so plumber's tape is not needed here. *(See maintenance on page 13 for details.)*

Slide your stainless steel drip tray underneath the bank of filter plates.

If your Filter Press came with the optional thermometer feature, screw it firmly into to the thermometer port using Teflon tape on the threads.



8 **Adding Diatomaceous Earth (DE or Filter Aide):** Using DE in a Filter Press is imperative! It prevents your pressure from maxing out prematurely, so you can filter MORE syrup with each session. DE also displaces syrup in your waffle plates so you can minimize syrup waste.

Use the chart below to determine TOTAL amount of DE you will need per session based on the number of Window Plates being utilized in your Filter Press.

VIDEO ABOUT USING DE: SmokyLakeMaple.com/filter-cake

Let's first focus on building up a nice coating of DE inside the Filter Press right away. Draw off about 1/2 gal. of hot syrup into a separate bowl and mix in enough DE to create a slurry. The consistency should still be loose enough to flow through the inlet hose. Place the free end of the **Inlet** Hose into the slurry. Secure the free end of the **Outlet** Hose into your warming pan. Yes, at this point we will intentionally recirculate filtered syrup back to the warming pan. We'll explain more on the next page...

If using an Air Diaphragm Pump, make sure your Transfer Valve is in the correct position (see Page 14) and start your air compressor. You will only need about 20 psi to start out. Pump the entire slurry into the press.

If using a Hand Pump, start pumping with steady, controlled strokes. Pump the entire slurry into the press.

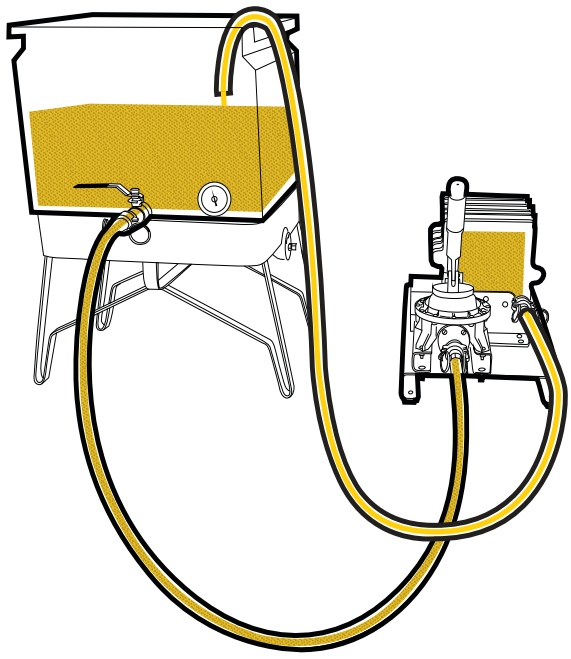
Total DE Used and Average Syrup Filtered Per Session Based on the Number of Window Plates in the Press*

Qty of Window Plates	Max Potential Capacity of DE	Ave Gal Filtered Per Session
3	9-3/4 cups	15 – 24 gal
4	13 cups	20 – 32 gal
5	16-1/4 cups	25 – 40 gal
6	19-1/2 cups	30 – 48 gal
8	26 cups	40 – 64 gal
10	32-1/2 cups	50 – 80 gal

*On average, each window plate filters up to 5 – 8 gallons per session.

9 Recirculate:

Now that the press has a nice initial charge of DE inside of it, we can stir the remaining amount of required DE into the warming pan (unfiltered syrup). Insert and secure the free end of BOTH of your Filter Press's hoses into your warming pan. Pump and recirculate the syrup back into the warming pan for about 2 to 3 minutes. (The press will probably be up to temperature in about a minute).



Next, pump a sample of filtered syrup into a glass to check the clarity. If it is sparkling clear, you are ready to secure the Filter Press's Outlet Hose into your bottler and away you go.

TIP: DE may settle on the floor of your warming pan while you are filtering. Periodically stir the unfiltered syrup to keep the DE suspended.

Why Recirculate?

- This process will warm up the Filter Press. This is important because you want your maple syrup to exit the press between 180 – 190ºF so that it is ready to be bottled.
- Recirculating gives you the opportunity to verify that everything is working perfectly before you direct the syrup into your clean bottler.
- Recirculating flushes particles out of the press which may not have been properly rinsed out last time you cleaned it.

10 Continue Filtering...

until one of the following things happen:

- You run out of syrup to filter.
- Pressure inside the Filter Press gets too high. (For an air pump, this would be about 80 psi. For a hand pump the handle will be difficult to push down.)

At this point, it is time to wrap up this session of filtering.

NOTE: Some folks like to chase their last syrup with a gulp of fresh water in efforts to push as much syrup out of the press as possible. In reality, if you filled your Window Plates with the proper amount of DE during your filtering session, the DE has already displaced all the syrup. Deploying a chaser is NOT a perfect science. We only mention it because, well, "to each their own."

11 Clean The Press

YES, clean it immediately. Do NOT let it sit until the next day. You will thank us later. (See next page)

Learning By Doing...

At the end of each filtering session, we can learn a lot by examining the "cakes" of DE and sediment which developed within the Filter Press's Window Plates.

If you reach your max PSI, but then discover that your window plates do not contain "full cakes", that means you did not have enough DE in your Filter Press.

The photo below is an example of a "full cake".

Cleaning

Let's Turn Up the Tunes & Tackle This Cleaning!

Visit tinyurl.com/cleaning-playlist to listen to a cleaning playlist from Spotify.

1 Transfer the syrup in your drip tray to your warming pan so it can be filtered with your next batch. Wash the tray in warm sudsy water.

2 Loosen the nuts on the Compression Rods. Then, with gloved hands you can remove the screen plates and window plates for washing. The End Plates should NOT be removed. Wash the End Plates IN PLACE on the press. **(CAUTION: Remember the press will be HOT.)**

3 Discard the disposable filter papers as well as the DE cakes inside the plates. Wash each plate with hot water.

4 Run hot water through your hoses and into the bottom of the air pump to flush out all syrup and debris. The pump does NOT need to be running to push the water through.

5 Reassemble and cover the press to keep contaminants off of it while it is not in use.

Maintenance

Lubricate the threads of the Filter Press's Compression Rods to prevent binding. We recommend Jet-Lube White Knight Food-Grade Anti-Seize. Whichever lubricant you choose, follow the manufacturer's recommendation for frequency of application.

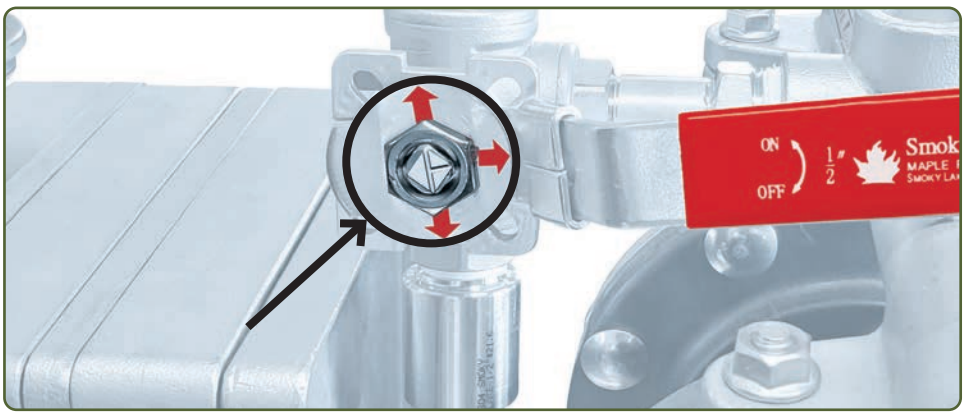
For Air Diaphragm Pumps, add a couple drops of Air Tool Oil in the Air Inlet Port after every 5 hours of operation.

Bosworth Repair Kit for Hand Pump
SKU: BOS-RPRKHP
Available on SmokyLakeMaple.com if ever needed.

Service Kit for Air Diaphragm Pumps
SKU: SL-RPRKAIRPMP
Available on SmokyLakeMaple.com if ever needed. The kit includes two Main Diaphragms (Teflon), two Backup Diaphragms (EPDM), four Check Balls and eight Manifold Seals. See inner pump anatomy on page 18.

Transfer Pumping

Filter Presses with Air Diaphragm Pumps include a T-Valve. This allows you to redirect the path of the liquid so that it doesn't go through the filter plates. This feature is used to pump maple syrup or sap from one place to another.



Look at the pivot point of the handle on the T-valve. You will see an etched "T" which indicates the directions of flow through the valve. NOTE: The handle can be unbolted and positioned in any way convenient for you and the flow positions will remain labeled correctly. If there is a bolt which restricts the movement of the handle, it too can be removed and repositioned.

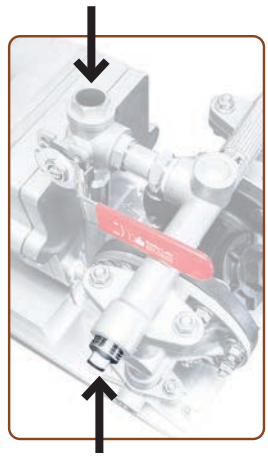
The "T" Indicates the Directions of Syrup Flow

Positioned for Transfer Pumping:
The "arms" of the "T" are pointing:

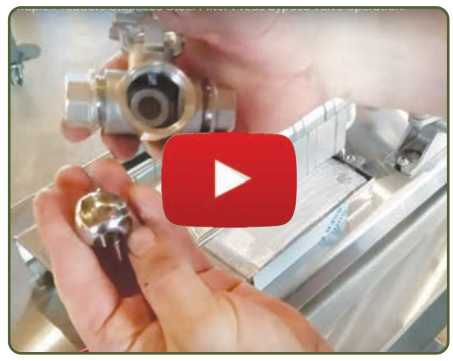
- LEFT (Dead end)
- RIGHT (Allowing syrup to enter)
- UP (Allowing syrup to exit)

Positioned for Filtering:
The "arms" of the "T" are pointing:

- RIGHT (Allowing syrup to enter)
- DOWN (Allowing passage to the filter plates)
- LEFT (Dead end)



Your press has two possible outlets for transfer pumping. Attach your Outlet Hose to your preferred outlet, and plug the secondary outlet. Position the T-Valve as described on this page.



SmokyLakeMaple.com/t-valve

Check out this video for more details. We'll take the valve apart and show you how it works!

Frequently Asked Questions

What Is a Bypass Valve? And Do I Need One?

Many of our competitors use brass gear pumps, also known as “positive displacement” pumps. These pumps are less forgiving and can build up dangerous pressure which needs to be relieved by a bypass valve for safe operation.

In contrast, the Smoky Lake Air Diaphragm Pump offers ultimate control of pressures and pump speeds and does NOT require a bypass valve to relieve pressure. Smoky Lake offers either a hand pump or a stainless steel air diaphragm pump which have a longer lifespan, are easier to use, and are manufactured using superior food grade materials.

Furthermore, Smoky Lake Filter Presses with Air Diaphragm Pumps have a T-valve which allows you to transfer liquids from one place to another without filtering. This is also sometimes referred to as a “bypass”, but it’s purpose is not for relieving pressure. It is just a handy tool for transferring syrup or sap from one place to another. *(See page 14 for more information.)*

What Kind of Air Compressor is Compatible With the Smoky Lake Air Diaphragm Pump?

Any air compressor is fine as long as it can reach 80 psi. You will just need an adapter for your air compressor to connect to the 1/4" NPT of the pump. Also, your air compressor should have a regulator on it so you can monitor and adjust pressure in the pump.

What Is The Minimum Amount of Syrup That Can Be Filtered Each Session?

Generally speaking you can expect to be able to filter 5 – 8 gallons per window plate per session. Use a shortener to decrease the number of window plates being utilized. *(See page 06.)*

Should I add a pressure gauge onto my Filter Press?

No. If you are using an Air Diaphragm Pump, your air compressor’s pressure gauge will tell you how much pressure is being exerted inside the press. Hand Pumps do not require any gauge.

What Are the Min and Max Pressures for the Air Diaphragm Pump?

When you first start out, very little pressure (about 20 psi) is required to create flow. As the filters begin to fill with sediments, the pressure will rise. Do not exceed 80 psi.

Should the Syrup Run to the Press From a Gravity Feed?

Gravity feed is not necessary. Both the air pump and the hand pump could lift the syrup from 6 – 8 feet below if necessary.

Is It Normal For Syrup to Leak Out Between the Filter Plates?

Yes, some leakage is normal. Your drip tray will catch these drips. You can then add the syrup from your drip tray back into your warming tank for your next filtering session.

May I Use Different Brands of Disposable Filter Press Papers With This Filter Press?

Yes, but be sure to first confirm the papers’ *actual* size. Some brands advertise a 7" filter paper but they are actually a bit wider. You will need to trim down oversized filter papers so they don’t bunch up and create issues. The Filter Papers offered on SmokyLakeMaple.com are pre-cut to the perfect size.

May I Use *Any* Type of Diatomaceous Earth to Filter Maple Syrup?

DE comes in many different particle sizes. A larger particle size can hold more impurities. A 2017 article in *Maple Digest* suggested that having too fine of a particle size could actually filter out some of the good maple particles and affect flavor. In conclusion, we suggest using a coarser size such as 5000 or 4200 Dicalite. Also, use only Food Grade DE (AKA Human Grade)! This product is available in convenient resealable buckets on SmokyLakeMaple.com.

If I’m Going to Continue Filtering Tomorrow, Do I Still Need to Clean the Filter Press Today?

YES, clean the Filter Press immediately after each session. NEVER wait until tomorrow.

Troubleshooting

Symptom	Cause	Solution
Filtered maple syrup still has impurities in it.	End Plate is upside down.	Turn the End Plate around so that the holes are on the bottom. In the future, do NOT remove this plate.
	Filter Paper(s) are installed incorrectly.	Make sure the holes are at the bottom. Filters should be flat; not folded or wrinkled.
	Filter Paper(s) are torn or contain a pinhole.	Replace Filter Papers.
	Filter Press was not cleaned thoroughly the last time it was used.	Recirculate your syrup as described on page 12, OR clean the Filter Press and Pump with Hot Water until all debris is removed.
	Maple Syrup is too hot and new sugar sand is precipitating.	Syrup should be 180° – 190°F when it exits the press.
Excessive syrup weeping from between the plates.	Nuts on the Compression Rods are too loose or were not tightened evenly.	Tighten the bolts evenly. See step 7 on page 11.

Symptom	Cause	Solution
Hand Pump is experiencing back flow.	Pressure is too high. Flapper on the pump's inlet check valve is stuck in an inverted position.	Dislodge the flapper in the inlet check valve. Clean the Filter Press to lower the pressure. Ask Smoky Lake about the "Umbrella Valve" option. NOTE: This option is factory installed on all hand presses purchased after 5/31/18.
Pump pressure is already high at the start of filtering	There is a clog or blockage somewhere inside the press or the hoses.	Inspect and clean all equipment.
	The syrup is not hot enough.	Heat your syrup to bottling temperature (180° – 190° F).
	There was not a body of diatomaceous earth built up on the filter papers before filtering.	Insert clean filter papers. Follow the step by step instructions in this manual; especially step 8 on page 11.
	There is too much DE in the press, and it is backing up into the manifolds of the press.	Clean out the Filter Press. Start over and reduce the amount of DE used.

*See next page to troubleshoot Air Diaphragm Pumps

Air Diaphragm Pumps

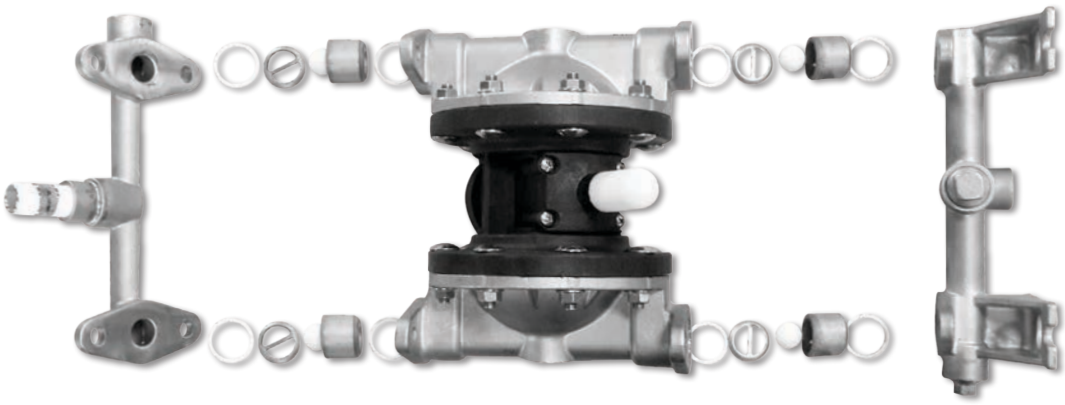
Troubleshooting

Symptom	Cause	Solution
Pump is running but nothing is coming out	Issue with the ball in the pump's check valve	Clean the pump and/or see Service Kit on page 13.
Pump does not have suction	Air compressor is not attached properly	Reconnect
	T-Valve is not in the correct position.	Turn valve handle to the proper position. Further explanation: SmokyLakeMaple.com/t-valve
Pump does not cycle or stops after one cycle	Air valve is stuck or dirty	Clean the Air Valve
	Valve ball is severely worn and is wedged in its seat or manifold	See Service Kit on page 13 or SmokyLakeMaple.com
Unusually high amount of air bubbles in the filtered maple syrup	Mouth of the input hose is not fully immersed in syrup or the hose is clogged.	Clean the hose. Then make sure the mouth of the hose is fully in the syrup
	Diaphragm is ruptured	See Service Kit on page 13 or SmokyLakeMaple.com
	Loose inlet manifold, damaged seal between manifold and seat or damaged o-ring.	Tighten or see Service Kit on page 13. Kit is available at SmokyLakeMaple.com
Pump operates erratically	Suction line is clogged	Inspect and clear
	Sticky or leaking check valve balls	Clean or replace
	Restricted exhaust	Remove restriction
	Diaphragm is ruptured	See Service Kit on page 13 or SmokyLakeMaple.com
Pump fails to actuate at ≥20 PSI	Debris has developed in the actuator body or the lubricating grease has been depleted	Add airtool oil to the pump's airport. You may need to remove the actuator cap — the part where your supply air is introduced through — and clean debris from internal components. It is highly advisable to install an inline filter and water removal devise to the air supply between the compressor outlet and the pump inlet.
	The exhaust port muffler is clogged, restricting air passage	Remove muffler, clean, reinstall.
	A diaphragm has expired within the pump	Replace diaphragm. Service Kits available at Smokylakemaple.com.

Smoky Lake Air Pump Features/Benefits

- Ultimate pressure control
- Indisputably food grade
- Extremely durable, strong and robust structure
- This pump is rated for up to 120psi. (You should not exceed 80 psi in this application.)
- Maximum temperature is 250° F. (Syrup temperature should be 180°F – 190°F for filtering.)
- Does NOT require a bypass valve
- Worry-free idling capability (Competitors' positive displacement pumps are damaged by idling.)
- Leak-free design
- Simple operation
- Easy disassembly for maintenance/repairs

Air Diaphragm Pump Inner Assembly



More details regarding air pump anatomy/assembly: SmokyLakeMaple.com/internal-air-pump

Online Tutorials

Great tips for finishing, filtering and bottling: SmokyLakeMaple.com/barrel-to-bottle