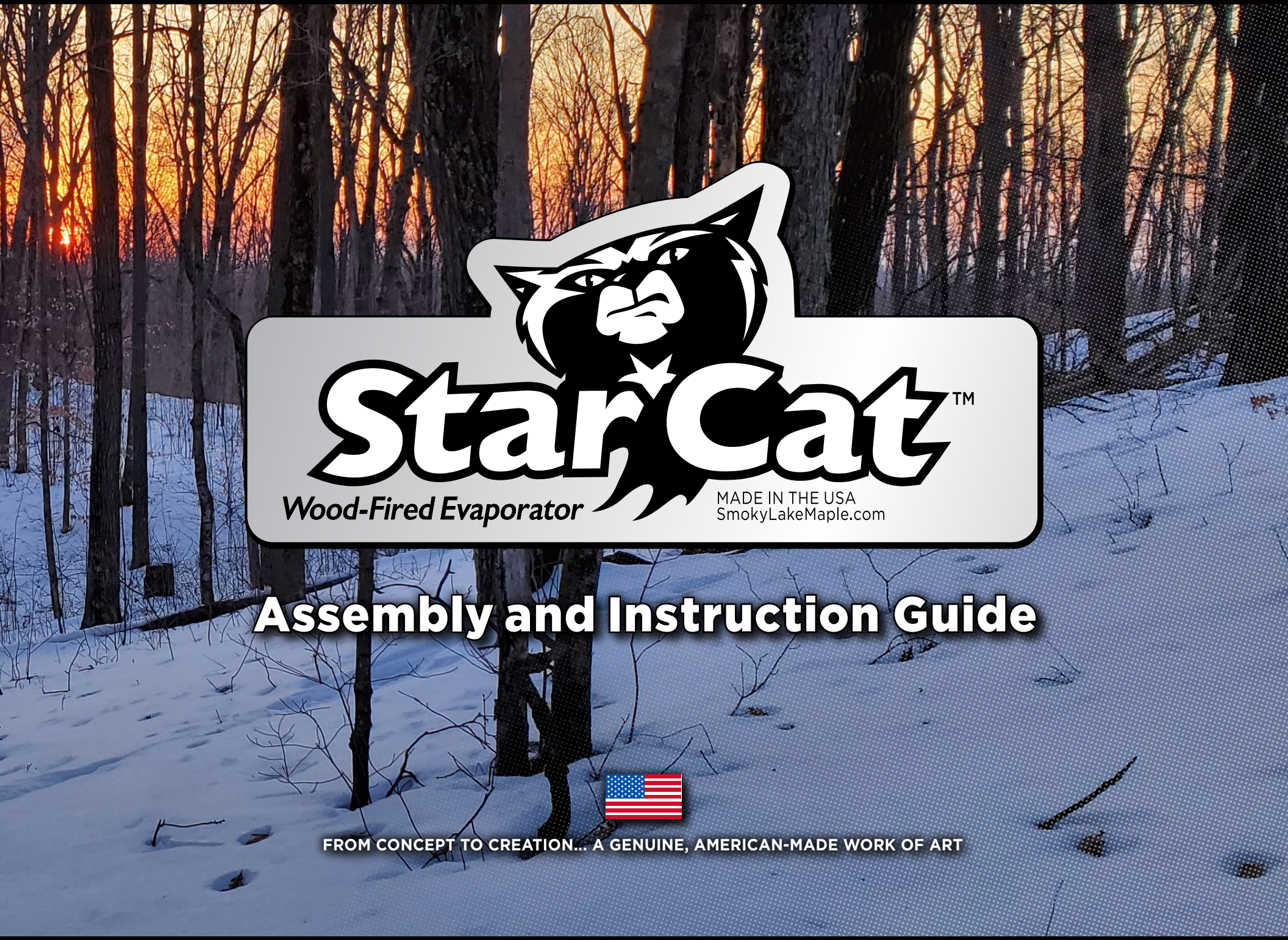


Assembly and Instruction Guide

FROM CONCEPT TO CREATION... A GENUINE, AMERICAN-MADE WORK OF ART

The Smoky Lake Crew volunteers at the Ledge View Nature Center

Dear Fellow Maple Enthusiast,

It has been our absolute pleasure to design and produce this StarCat™ Evaporator just for you. Maple season is such a special time of year, it means a lot to us to have the opportunity to share it with you.

Your purchase is a celebration of American craftsmanship and American dreams. StarCat is the fruit of much hard work by fellow maple lovers in Hilbert, Wisconsin. Accept no imitations!

A portion of the funds from your purchase will support charities who are making the world a better place.

The wide variety of causes we've supported include conservation, veteran assistance, cancer research, animal welfare and youth arts just to name a few.

In short, we just want to give you a big "THANKS!" We are so grateful for your business and we send you our wishes for a happy and bountiful maple season. Enjoy your new StarCat!

Angela K M Schumacher

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

MADE IN USA

Certificate of Authenticity

This product is a genuine Smoky Lake StarCat Evaporator, designed and manufactured by fellow maple syrup lovers in Hilbert, Wisconsin.

The design of this StarCat has satisfied a rigorous battery of criteria to ensure efficiency and high-quality output. Each component is certified to uphold the Smoky Lake standards of excellence and craftsmanship.

As owner of this StarCat Evaporator you are a valued member of the StarCat community; a community of self-starters, mavericks, dreamers and purists. It is a community that inspires others to get off their duff and make something awesome. You are in good company.

This Is What It Boils Down To...™

James Schumacher

James Schumacher
Co-owner of Smoky Lake Maple Products

Table of Contents

BONUS Video Library

StarCat Arch Assembly Video
SmokyLakeMaple.com/starcat-assembly
Assemble your Arch right along side us and pick up some helpful tips along the way.

Leveling the Arch
SmokyLakeMaple.com/backyard/#chap1
Starting with a level foundation is important so that sap depth is consistent throughout your pans.

Stack Pipe and Guy Support
SmokyLakeMaple.com/backyard/#chap3
How and why your Stack Pipe should be supported.

Filling Pans with Sap
SmokyLakeMaple.com/backyard/#chap4
How to take advantage of your pan's Level Assist feature. Plus tips on maintaining depth while boiling.

Light It Up!
SmokyLakeMaple.com/backyard/#chap5
How to load the firebox and boil efficiently. What to expect on start-up. When to use the damper. Preventing coal build up.

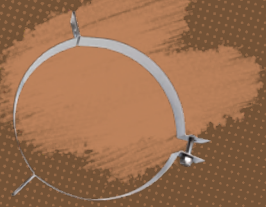
Shutting Down
SmokyLakeMaple.com/backyard/#chap6
Great overview of Jim's process as he shuts down for the day. Concludes with some advice on storage and maintenance.

Firewood
SmokyLakeMaple.com/firewood
If you are struggling to get a nice boil, the culprit is nearly always the firewood.

⚠ Warnings

Always have a fire extinguisher nearby during operation. Make sure everyone working with you knows where it is located too.

NEVER insulate the Stack Pipe nor the Stack Elbow. This will cause the pipe to overheat and collapse or otherwise fail.



The Smoke Stack MUST be supported. See Guy Support information, page 20.

The Stack Pipe manufacturer recommends a MINIMUM clearance of 18″ to combustible materials. With that said, sparks and embers will exit the Stack Pipe during operation and can travel quite far. Be mindful of wind direction and nearby combustibles. Remember that even though sparks are not highly visible in daylight, they are still present.

NEVER store flammable materials in the base of the StarCat. Coals from the firebox could potentially fall through the damper and land in the Arch base.

NEVER stick your face in the HOT steam, and NEVER touch the evaporator with a bare hand during or after operation. It will be HOT. Touching may cause burns.

ALWAYS wear gloves when loading the evaporator with wood and/or interacting with the evaporator in any way. A face shield is also recommended to protect you from heat and sparks when you open the firebox door.

Wear protective gloves, eye goggles, face mask and full body clothing when handling ceramic insulation. Avoid inhaling airborne particles. Wash your hands and clothes after handling insulation.

Read and understand all of the warnings and instructions listed on the cans of Arch Paint before using. Use only as directed in a well ventilated area. Spray cans must be stored in environments that are LESS THAN 120ºF.

Do NOT attempt to lift or otherwise move an evaporator/pan containing hot sap/syrup. Allow the liquid/equipment to cool before handling.

Maintain 2″ of liquid depth in the evaporator pan at all times. This will protect both the pan and your maple syrup.

If an unexpected foam-up occurs while boiling, add ONE small drop of vegetable oil to the pan to instantly quell the surge.

Do not walk away from your evaporator while it is in use.

After the fire in your firebox has been extinguished, your sap/syrup will continue to steam. Watch and maintain sap levels until the steam has completely stopped.

Remove protective vinyl from all pans before use. (If applicable)

Always use plumber's tape on stainless steel threaded connections. This will enhance the seal and will prevent thread binding.

Lots of pieces here! Before unboxing, please clear a large workspace to help keep organized.

We go to great lengths to ensure accuracy of every StarCat package! Every hardware set has been audited by a third party. Every Arch box has been double checked by weight. For your reference, we also include a parts list sticker on the outside of each of the Arch boxes. Please note that some parts may be nested inside each other. If you have any questions or need assistance, just give us a shout at (920) 202-4500.

Hardware Set*

Fender Washer
(Qty 4)

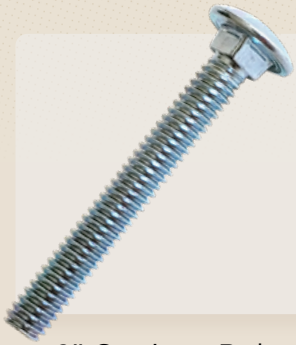
Stainless Steel Washer
(Qty 2)
NOTE: These are THINNER than the other Flat Washers

Flat Washer (Qty 54)

Lock Washer
(Qty 46)

1/2" Carriage Bolt
(Qty 28)

3/4" Carriage Bolt
(Qty 18)



2" Carriage Bolt
(Qty 4)

1" Bolt
(Qty 3)

Quarter Twenty Nut
(Qty 50)

5/16" Lock Nut
(Qty 3)

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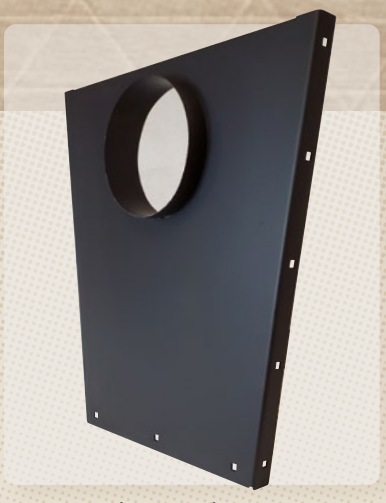
Arch Panels* (Shown Here With Proper Paint Application)



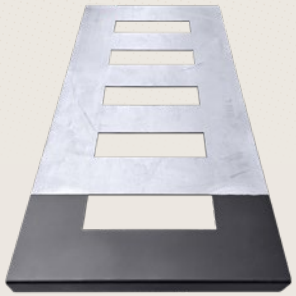
Back Panel (Qty 1)
Paint the entire outside, including edges and circle hub

Front Panel (Qty 1)
Paint the entire outside, including edges and latches

Side Panel (Identical, Qty 2)
Paint the entire outside, including edges

Base Half (Identical, Qty 2)
Paint all over, except for the top, outside lip/edge. More photos pg 14.

Floor (Qty 1)
Paint the outside of the lip on both of the short ends.



Damper Slide (Qty 1)
IMPORTANT: Paint ONLY the end of this part.

Door (Qty 1)
Paint the entire outside, including edges and braces

Handle (Qty 1)
Paint front and back.

Insulation, Stack Pipe, Other*

Back Panel Insulation
(Qty 1)

Front Panel Insulation
(Qty 1) + Inset layer of
Door Insulation (Qty 1)

Additional layer of
Door Insulation
(Qty 1)

Insulation Roll (Qty 2) +
Insulation Strip(s)

Emblem
with Hardware
(Qty 1)

Satin Black
Arch Paint
(Qty 3)

6″ Elbow (Qty 1) +
6″ Snap-Lock Stack Pipe
(Qty 3)

Steel Grates
(Qty 1)

Accessory Kit**
(Qty 1)

Guy Support
(Qty 1)

*The parts shown on these pages are not necessarily shown to scale relative to one another.
**The Accessory Kit is included only with a pan purchase. Kits for Divided Pans and Flat Pans both include a Thermometer and Valve. Kits for the Divided Pans also include a stainless Nipple and Plugs.

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Sold Separately*

4-1/2" x 9" x 1-1/4"
Firebricks
(Qty 20 Required)

Feed Pan
Optional, See pg 25

Casters or Tires
Optional, See pg 28

Sight Glass
Optional, Two Styles,
See pg 26

Float Box
Option for Divided Pans,
See pg 25

1" Rail Gasket
Optional
See SmokyLakeMaple.com

Your StarCat Boxes...

Starla would have recommended upcycling your empty boxes into a kitty hideout.

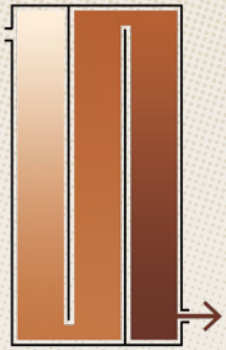
Flat Vs Divided

Smoky Lake offers two different pan style options for your StarCat Evaporator. The biggest difference between the two pans is that a Flat Pan is used for “batch boiling” while a Divided Pan allows for “continuous flow boiling”.

Batch Boiling

Just as the name suggests, “Batch Boiling” means that you are making one big batch of syrup at a time. You must continue boiling until the entire pan has reached the proper density. After your batch is complete, you can either hang it up for the season, or start again making a new batch of syrup.

Generally speaking, Batch Boiling creates darker, more robust-flavored syrup than Continuous Flow boiling because the sap is caramelizing for a longer period of time. If your goal is to make lighter, more delicate-flavored syrup, Divided Pans are the way to go. Note: Regardless of what type of pan you use, late season syrup is typically darker and more robust.



Continuous Flow

This style of pan allows you to draw off small amounts of finished syrup periodically rather than wait for one big batch to finish. (See more explanation on the next page.) When you run out of sap, you stop and then pick up where you left off in a few days when more sap is available.

The Divided Flat Pan is reversible. Reversing the flow of your sap through the channels will help deter sugar sand buildup on the bottom of the pans. (Instructions included with the pan will have more information about this.)

Continuous Flow Boiling allows you to filter and bottle your syrup as you go rather than waiting to do everything at the end.

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How a Divided Pan Works

Throughout the boiling process, raw sap is continuously added to the back corner of the pan; typically using an accessory called a Feed Pan (shown in the photo to the right) or a Float Box (shown on page 25). This fresh sap displaces sap that's already in the pan, pushing it further into the system. Eventually a visible "density gradient" is established. This means the sap near the draw-off valve is closer to becoming finished syrup because it has been in the system the longest period of time. Hence, it will be darkest in color and will have the highest sugar density.

The operator knows when to draw off finished maple syrup based on the temperature reading at the draw-off port. (Syrup finishes at 7ºF above the boiling point of water. See page 23 for more details.) Density should then be verified/fine tuned with a hydrometer. (Sold separately. See page 24.)

When finished boiling for the day, the sap is typically left in the pans until the next boil. The gradient will automatically re-establish itself when you resume boiling/adding raw sap.

How Long Can Sap Be Left in the Pan Between Sessions?

Treat your sap as you would milk. Cold weather helps preserve sap while warm weather and direct sunlight will cause it to spoil much quicker.

ASSEMBLY

Gather These Additional Items Before Starting Assembly:

7/16" Wrench

1/2" Wrench

Crescent Wrench

Mallet

Two Dimes +
Two Nickels
(Spacers for Step 4)

Drill (Choose a bit diameter appropriate for your particular Sheet Metal Screws)

12 Sheet Metal Screws
(Securing the Stack Pipe, Step 7)

Wire/Cable
(If using the Guy Support, Step 7)

7/16" Nut Driver
(Optional, but handy!)

Paper Towels or Rags

1) Paint

WIPE: The panels of the StarCat Arch are shipped with a light coat of oil to protect the steel. Before painting, thoroughly wipe down the panels to remove excess oil. Using solvent/soap is NOT necessary.

READ: Carefully read all of the warnings and instructions on the can of Arch Paint.

GATHER PARTS: Refer to page 6 of this guide to see which parts of the StarCat are intended to be painted.

- Do NOT paint the interior of your StarCat Arch, nor any mirror finish stainless steel pan surface, nor any of the hardware/valves/insulation/bricks.
- Do NOT paint the entire length of the Damper Slide. Paint only the end as shown on page 6.
- The Stack Pipe is pre-painted. However, the Arch Paint can be used for touch ups if necessary.

APPLY: For optimal spray conditions, the surface, ambient air and the aerosol should be between 60 – 90°F.

Shake the can vigorously for at least two minutes. Hold the can 12 – 15 inches from the surface you are painting.

Use steady, even strokes.

Do NOT attempt to apply all the paint in one heavy coat.

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Painting Techniques

Smoky Lake Arch Paint has been specially formulated for your StarCat Evaporator by Forrest Technical Coatings. Their video tutorials for high temp spray paints are relevant to Smoky Lake Arch Paint and are a great reference for proper technique.

VIDEO PAINTING TUTORIALS:
SmokyLakeMaple.com/how-to-paint

TIP: Hold the can 12 – 15 inches from the part.

TIP: Cover the parts with THIN coats of paint, rather than thick, heavy coats.

TDS Forrest Technical Coatings:
tinyurl.com/high-temp-paint-info


Fig 2A


Fig 2B


Fig 2C

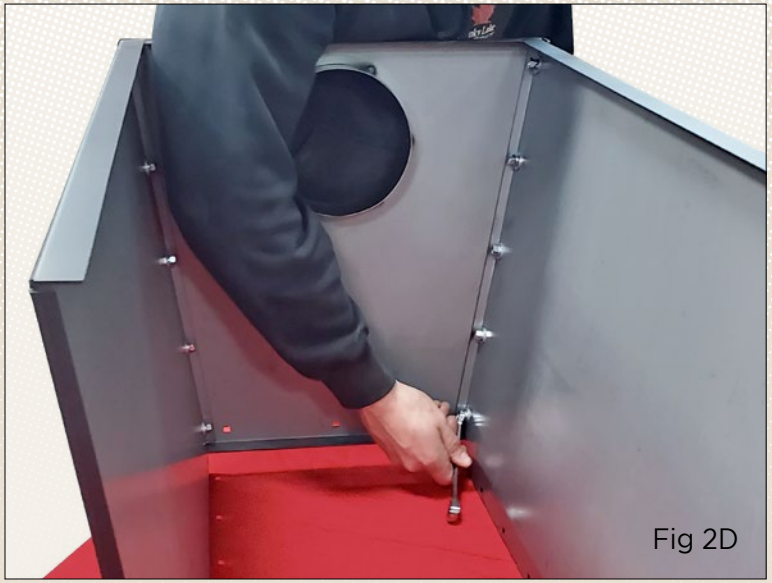
Fig 2D

2) Firebox Assembly

BACK PANEL + SIDE PANEL #1 | See Fig 2A, 2B, 2C
Lay a Side Panel on your work table, facing up as shown in Fig 2A. Slide the Back Panel over the end of the Side Panel so that the two panels form a 90º angle (Fig 2A, 2B). Use a mallet to tap into place if necessary.

To fasten the two panels together, insert the 1/2" Carriage Bolts into the overlapping square holes. Loosely fasten the bolt in place with a Flat Washer, followed by a Lock Washer, followed by a Quarter Twenty Nut (Fig 2C). You will tighten all of the nuts in a later step.

BACK PANEL + SIDE PANEL #2 | See Fig 2D, 2C
Similarly, connect the second Side Panel to the opposite side of the Back Panel. (Fig 2D and 2C)

FRONT PANEL + SIDE PANELS | See Fig 2E, 2C
On the opposite end, connect the Front Panel to the two Side Panels. Again, use a mallet to tap into place so that the square holes overlap perfectly. Again, insert the 1/2" Carriage Bolts into each of the overlapping square holes and fasten each with a Flat Washer, followed by a Lock Washer, followed by a Quarter Twenty Nut. Just as before, do not tighten the nuts completely at this point. We will tighten in a later step.


Fig 2E

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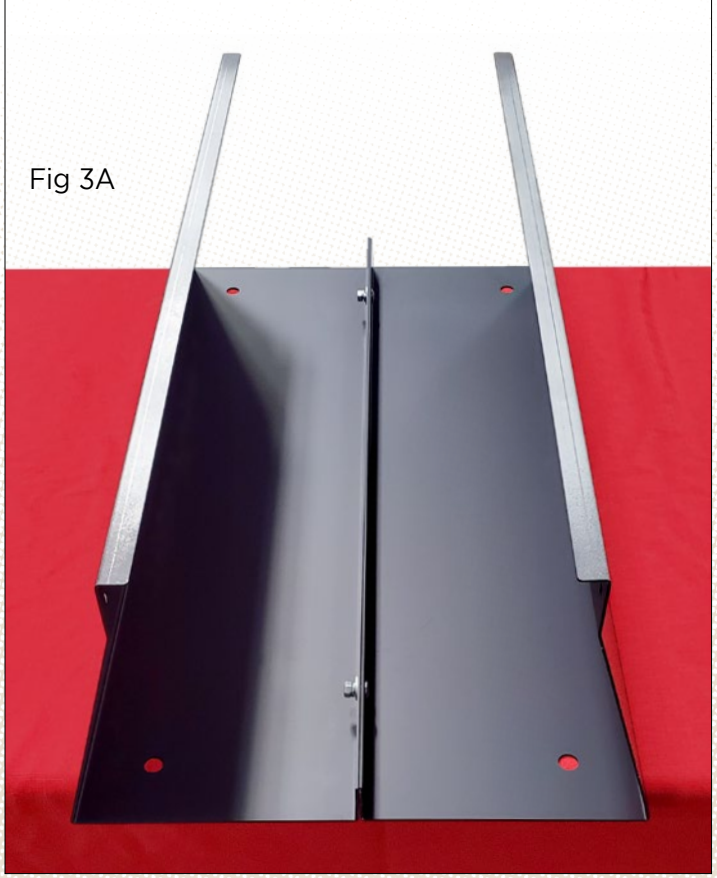
Fig 3A



3) Base Assembly

BASE HALF + BASE HALF | See Fig 3A, 2C
Place the two Base Halves facing each other and join them with two 1/2" Carriage Bolts. Just as before, the bolts will be fastened using a Flat Washer, followed by a Lock Washer, and a Quarter Twenty Nut. (Fully tighten in a later step.)

+ DAMPER SLIDE | See Fig 3B
Place the Damper Slide on top of the Base Halves with the lip pointing downward. The end of the arch with this downward lip will become the front of your evaporator.

+ FLOOR PANEL | See Fig 3C
Place the Floor Panel on top of the Damper Slide. The slots in the Floor Panel should be positioned so that they are toward the front of your Arch — matching the position of the slots on the Damper Slide. The square holes along the length of the Floor Panel should align with the square holes of the Base Halves.

Fig 3B

Fig 3C

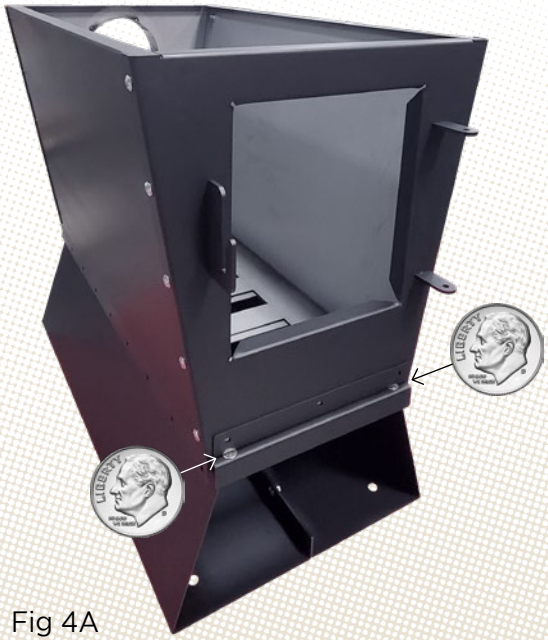


Fig 4A
Front of Arch

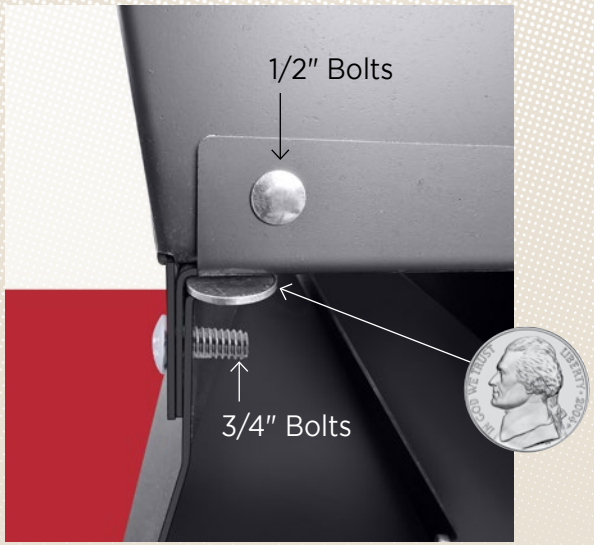


Fig 4B
Back of Arch

4) Joining the Top and Bottom

FIREBOX ASSEMBLY + BASE ASSEMBLY | See Fig 4A
Place the Firebox Assembly on top of the Base Assembly. The doorway of the Firebox should be positioned toward the front, the same end as the slots in the Floor Panel.

DIME SPACERS | See Fig 4A
At the front of the Arch, position the edge of a dime in between the Floor Panel and the Damper Slide; one dime on the left and one dime on the right. These coins are being used as temporary spacers.

NICKEL SPACERS | See Fig 4B
Similar to the dimes in the last step, use two nickels at the back of the Arch. One on the left and one on the right. Without these spacers, the Damper Slide could potentially get too restricted when we tighten all the Side Panel bolts. We want to ensure that the Damper Slide can slide freely — even when the metal expands and contracts during use.

HARDWARE | See Fig 4B, 2C
On the long sides of the Arch, there are now three layers of overlapping metal with matching square holes. Start by installing a 3/4" Carriage Bolt in the first and last set of overlapping holes on each Side Panel. Like before, hand tighten with a Flat Washer, Lock Washer and Quarter Twenty Nut.

Then, continue installing the remaining 3/4" Carriage Bolts on the Side Panels the same way.

Next, install the hardware on the front and back of the Arch. You will be using six 1/2" Carriage Bolts. Again, fasten with a Flat Washer, Lock Washer, and Quarter Twenty Nut.

Now go back and tighten ALL of the nuts that have been installed thus far.

Remove the four coins and test the Damper Slide. You should be able to slide it, open and closed, with ease.

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5) Door Assembly

DOOR + HANDLE | See Fig 5A, 5B
Place the Door flat in front of you with the outside of the Door facing upward and the hinge to the right. Stack two Flat Washers on top of the circular hole in the center of the door. These Flat Washers are spacers that will prevent the Handle from rubbing on the Door.

Slide the Handle through the slot on the left side of the Door so that the round hole on the Handle is positioned directly over the top of the stacked Flat Washers, and the finger grooves are pointing toward you. Stack an additional Flat Washer on top of the hole on the Handle. Then, insert a 1" Bolt through the entire grouping. (The grouping is 1 Flat Washer + the Handle + 2 Flat Washers + the Door)

Hold the 1" Bolt in place and tip the Door up. Fasten it on the back side using a Flat Washer followed by a Lock Nut. (Note: A Lock Nut has a front and back side. See Fig 5B.) Tighten firmly. Test swing the handle up and down. If it is too tight, loosen the nut. If it feels too loose, tighten it up a bit more.

Fig 5A

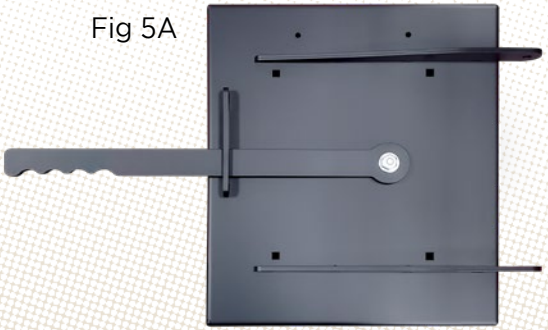


Fig 5B

Fasten the Handle with a Flat Washer and Lock Nut.

Fig 5C

Fig 5D

Fasten the nameplate inside the door

DOOR + EMBLEM | See Fig 5C, 5D
Align the Emblem over the two round holes at the top of the outside of the Door. Fasten using the hardware that was provided with the Emblem.

DOOR + INSULATION #1 | See Fig 5E
We recommend wearing gloves and full body clothes when handling insulation. Direct contact could potentially irritate skin.

You have received two precut rectangular pieces of insulation with your StarCat. Take the larger of the two and pack it into the back side of the door. This piece of insulation is slightly larger than the door itself which allows it to pack firmly into place. Do not flatten or overcompress the thickness of the insulation. It should be the same thickness of the door.

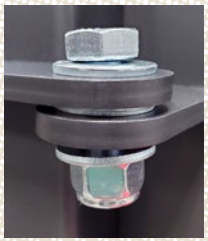
Fig 5E


Fig 5F


Fig 5G

HINGE | See Fig 5F, 5G
Set a Stainless Steel Washer on top of each hinge arm on the front of the StarCat. (Fig 5F) This will be a spacer that prevents the paint from scratching off every time you open and close the door.

Thread one Flat Washer onto each of the two remaining 1″ Bolts. Then insert each 1″ Bolt through the top of the holes on the hinge on the Door. Then set the Door on the hinge on the front of the StarCat, so that the bolts go through the top of the Washers we had just placed. (Fig 5G)



Fasten the Bolts in the door hinge using a Flat Washer followed by a Lock Nut. Tighten until firm. Swing the door open and closed to test how it feels. If it feels too tight, loosen the hinge nuts slightly.

DOOR INSULATION | See Fig 5H, 5I
Close the Door. From inside the firebox, center the smaller rectangle of Insulation over the top of the door's existing rectangle of Insulation. Insert the four 2″ Carriage Bolts through the front of the Door and through the Insulation. Fasten each 2″ Carriage Bolt, inside the firebox, using a Fender Washer and a Quarter Twenty Nut.

Fig 5H


Fig 5I

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6) Inside the Firebox

FRONT AND BACK PANEL INSULATION | See Fig 6A
There are two “wedge” shaped precut insulation pieces. The wedge with the circle cut out gets packed into the back panel of the Arch. The wedge with the rectangle cut out of it gets packed into the front panel of the Arch. The pieces are intentionally cut slightly oversized so that they pack into place firmly. You will NOT need any bolts to hold it in place.

GRATES + BRICKS + INSULATION | See Fig 6A – E
This next step will add a lot of weight to the Arch. Before proceeding, place the Arch in its final resting location, OR install the optional Wheel Kit.

Place the Grates inside the firebox so that the Vs are facing upward. Slide the Grates all the way forward and center them left to right. (Fig 6A)

Place two Firebricks flat on the floor behind the Grates. (Fig 6A)

Starting at the front of the Arch, place Firebricks, standing tall, along the sides of the Grates. They will lean back slightly against the sloped walls of the Arch. (Fig 6B)

Stack a row of horizontal Firebricks on top of the vertical Firebricks from the previous step. (Fig 6C)

The Firebrick does not get stacked all the way to the top rim of the Arch because you will not be stacking your firewood all the way to the top. Instead, the top rim of the Arch is protected using the long strips of Insulation provided with your StarCat. (These strips of Insulation were packaged in rolls and nested inside the Stack Pipe.) Pack these strips of Insulation into place. (Fig 6D)

Use the skinny strip(s) of Insulation (located in the same box as the spray paint) to fill any open cracks in the corners of the firebox. (Fig 6E) If necessary, cut the strip(s) to your required length.


Fig 6A


Fig 6B


Fig 6C


Fig 6D


Fig 6E


Fig 7A


Fig 7B

7) Smoke Exhaust

ELBOW | See Fig 7A

Insert the crimped end of the Elbow into the hub on the back of the StarCat. Drill 4 holes through the hub on the Arch and secure the Elbow with sheet metal screws.

STACK PIPE | See Fig 7B, 7C


Fig 7C

Assemble the three 2-foot-long Stack Pipes by snapping the seam together (Fig 7C). After it is snap-locked, hug the pipe as needed to return it to a circular shape.

Place the tapered end of one of the Stack Pipes into the Elbow on the back of the Arch. (Fig 7B)

Insert the crimped end of the second Stack Pipe into the top of the first Stack Pipe.

Then insert the crimped end of the third Stack Pipe into the top of the second Stack Pipe. Add four sheet metal screws at each connection.

It is important to use all 6 feet of this Stack Pipe because this will create pneumatic draw in your Arch. This helps draw oxygen into the Arch through the Damper to feed your fire.

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SAFETY: The manufacturer of the Stack Pipe calls for 18″ minimum clearance from combustibles. That being said, please keep in mind that burning embers will inevitably be emitted from the pipe during use. Be mindful of wind direction and keep a fire extinguisher on hand at all times.

GUY SUPPORT: Your Stack Pipe must be supported and secured for safe operation. If your evaporator is in a sugarhouse with the Stack Pipe going up through the roof, that is one way to hold the pipe in place, but if you are going to be boiling in your backyard you will need to support the pipe with an alternate method.

In the past, some of our customers have opted to secure their Stack Pipe by attaching a brace to the pole of a basketball hoop or to the pole of a clothesline. However, if you do not already have a plan such as this to secure your Stack Pipe, please use the Guy Support that was supplied with your StarCat.

The stainless steel Guy Support should be tightened high on the Stack Pipe like a belt. Next, attach a cable or wire to each wing of the support and stake each cable to the ground, at least 4′ away from the base of the StarCat. If you don't have stakes, or if the ground is too frozen for stakes, cinder blocks can make great anchors. Attach a ribbon midway down each cable to make them more visible so that nobody walks into them.

For more detail on installing the Stack Pipes and Guy Support, check out our demo video: *SmokyLakeMaple.com/backyard/#chap3*

8) Enjoy!

Ain't she a beaut'?! Your StarCat is now ready for operation. We hope you have enjoyed this journey so far. The most important instruction we can leave you with today is HAVE FUN THIS SEASON!

Please give us a shout if you have any questions about your StarCat. We also have a ton of valuable online resources that you can reference at any time of the day or night. (Links below)

Knowledge Base
SmokyLakeMaple.com/support-starcat

Production Tips
SmokyLakeMaple.com/production-tips

Beginner Maple Syrup
SmokyLakeMaple.com/make-maple-syrup

Smoky Lake
MAPLE PRODUCTS™
SMOKYLAKEMAPLE.COM

A full line of premium equipment for maple syrup production

Frequently Asked Questions

How long does the Ceramic Blanket last?

The blanket is extremely resistant to heat, so you will only need to replace it if it gets torn by firewood or otherwise damaged. Unruly mice can sometimes chew up insulation in the off season. We have no idea why any animal would choose to chew on the stuff but it happens. If you find that your blanket has gotten damaged and it is no longer supplying adequate coverage, have no fear. We have precut, replacement insulation available on SmokyLakeMaple.com.

How Much Longer?

Yes, maple syrup requires a lot of boiling. Our best advice is to enjoy the journey! Monitor density using temp/hydrometer (See pages 23– 24). More information about boiling time available here: SmokyLakeMaple.com/boil-time.

What is a damper for?

A damper allows air into the firebox to fuel the fire. Usually we'll leave the damper all the way open while we are running the StarCat. Close the damper to help extinguish the fire in an emergency shut down situation.

What else can I use my StarCat for besides making Maple Syrup?

Over the course of the last 10 years, we have seen many creative ideas! On the East Coast, some of our customers have used their pans for boiling lobster. Others have used their pans to host "Hot Pot" parties. We have also received reports of Smoky Lake evaporators/pans being used to make sea salt, apple cider/syrup, black walnut syrup and birch syrup. One customer on our Facebook page shared a photo of platform he built for the top of his StarCat for cooking. Very neat!

If you found another unique, creative use for your StarCat, we hope that you will share with us on our Facebook page!

Will ash/coals build up in the firebox and need to be cleared?

Compared to a home wood stove, the StarCat will NOT collect a lot of ash. If you are using well seasoned wood, you should not need to worry about excessive ash/coal. The draft carries much of the ash up and out the smoke stack. As a precaution, keep a fire extinguisher on hand. (See page 4 for additional safe operating tips)

Jim running a StarCat at an event at Riveredge Nature Center in Saukville, WI

MADE IN USA

How do I make Maple Syrup?

In a nutshell, maple syrup is made by boiling maple sap until it has reached at least 66º BRIX (66% sugar density). It is then filtered and hot packed into bottles.

You can find a detailed guide to making maple syrup on our website at *SmokyLakeMaple.com/make-maple-syrup*.

You can also order a paper copy of this guide on our website. Simply type “Beginner Backyard Sugaring” in the product search box on *SmokyLakeMaple.com*.

Follow us on Facebook for tips, tutorials, contests and to hear about upcoming events. It’s a great way to learn and connect with other maple producers.

There are many state maple associations that offer excellent mentorship and year round events for maple producers. You may also find seasonal maple events at your local nature center.

More great resources are listed on pages 3 and 20 of this guide.

How did the StarCat Evaporator get its name?

Traditionally, we have named our evaporators after American, WW2 era fighter planes. (Corsair, Silverplate, Dauntless...) However, in the wake of losing our beloved shop cat, Starla, it felt right to name this feisty, little evaporator in her honor. To be clear, Starla wasn’t just any cat. She was extraordinary. Some even call her “legendary.” And while we all loved her very much, she and Jim had an exceptionally strong bond that was one in a million. That little orange cat followed him everywhere. You could say they went together like maple syrup and pancakes.

We were only able to name this evaporator after Starla because it is an evaporator that we are very proud of. Just like Starla, it has the spunk to overshadow competitors that are twice its size. (Like the time we caught six-pound Starla teasing a big, lumbering raccoon.) The name “StarCat” can assure you that this evaporator was thoughtfully made with great love.

Why is the Stack Elbow twistable rather than static?

If anything pulls on your stack pipe, the twistable elbow has the ability to shift independently of the evaporator. In contrast, if something pulls the stack pipe with a fixed elbow, the entire evaporator could potentially tip.

That being said, heavy duty elbows have their benefits too. Check out “Heavy Duty Elbow” on SmokyLakeMaple.com.

Using A Maple Thermometer*

WHY WE USE IT: Maple syrup finishes at 7ºF above the boiling point of water. What is the boiling point of water? Well, that depends on things like altitude, the current barometric pressure and other factors. Since the boiling point of water fluctuates, we calibrate a maple thermometer in boiling water before each use. Once calibrated, all we need to do is watch for the needle of the thermometer to reach the bold 7 mark, indicating that the syrup is 7ºF above boiling water.

HOW TO CALIBRATE THE THERMOMETER:

Fill a medium-sized pot with **4 inches** of tap water and bring it to a boil. (Note: Smaller sauce pans are typically not deep enough for this.

Find the dimple on the stem of your thermometer. This dimple indicates the minimum amount of the stem that must be submerged in order to get the most accurate reading.

Wear protective gloves and hold the thermometer in the boiling water with a set of tongs, submerging the stem at least up to the dimple mark. Do NOT allow the thermometer's stem tip to rest on the bottom of the pot.

The needle of the thermometer should make one full revolution before coming to rest on the "0". If the needle does not land on zero, use a 6 mm wrench to turn the calibration screw on the back of the thermometer. This will adjust the needle's position. Then re-immerse the stem in the boiling water to check your adjustment.

Now that your thermometer has been calibrated, the bold "7" mark will represent finished syrup. Install the thermometer on your evaporator pan. Use plumbers tape to enhance the seal and prevent thread binding.

Always verify your finished maple syrup's density with a hydrometer and/or refractometer.

*A Maple Thermometer is included with the purchase of a full, complete StarCat evaporator. The thermometer is available separately if you have purchased only the StarCat Arch (without pans).

Achieving Perfect Density**

WHY DENSITY IS IMPORTANT: If your finished product is less than 66% sugar density, it will spoil more quickly. In contrast, if your syrup is over 67% sugar density, you may develop sugar crystals at the bottom of your containers.

HOW TO DETERMINE DENSITY WITH A HYDROMETER:

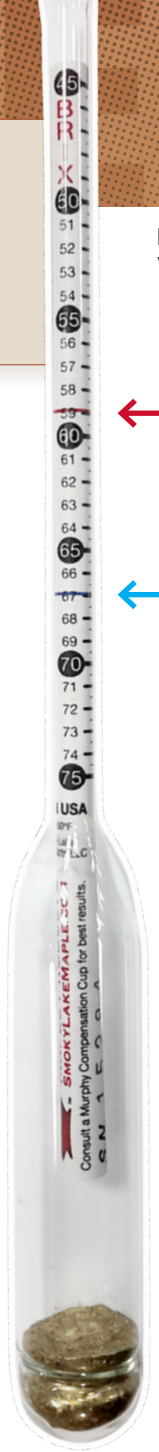
1) Fill a testing cup at least 8" deep with a sample of your maple syrup. (Wear rubber gloves to protect hands from hot syrup.)

2) Since hydrometers are affected by temperature, you will need to quickly determine the temperature of your sample. (Hot syrup cools quickly, especially when placed in a cold cup. Work quickly.) The chart below will tell you what your **target hydrometer reading** is going to be for the next step.

Syrup Temp (Fahrenheit)	209º	190º	170º	152º	133º	114º	95º	77º	58º	40º
Target Hydrometer Reading	59	60	61	62	63	64	65	66	67	68

*If you're testing cup is a **Murphy Compensation Cup**, you can skip this step because the Murphy Dial calculates your target for you. Also, Murphy will update the calculation in real time as your sample's temperature changes.*

3) Slowly lower a clean hydrometer – bulb-side-down – all the way into the testing cup. (A hydrometer is a fragile instrument. Never *drop* it into the testing cup because it may break if it hits the bottom.) Allow the hydrometer to float freely and note the number at which the hydrometer is floating. If your hydrometer reading **matches** your target reading from Step 2, your syrup is at perfect density. If your hydrometer reading is **higher** than your target, slowly mix in sap until perfect density is achieved. If your hydrometer reading is **lower** than your target, continue boiling your syrup.



HYDROMETERS are sold separately.
Visit SmokyLakeMaple.com

← The HOT TEST line indicates finished syrup at 211ºF

← The COLD TEST line indicates finished syrup at 60ºF

66 – 66.9º BRIX
Excellent!

BRIX is a scale used to measure the percentage of sugar in a liquid. If someone says their syrup is "66 BRIX", that means that the syrup is 66% sugar.

NOTE: These instructions assume that you are using a hydrometer with a BRIX scale. It also assumes it is a US hydrometer which are typically calibrated at 60ºF. The calibration temperature is written on the paper inside the hydrometer.

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**This instrument is sold separately from the StarCat, but we have included the information in this book since the two items are so commonly purchased together.

Why Maintain Sap Depth?

Maintaining consistent depth will protect the evaporator pans from overheating, prevent the maple sugars from scorching, and increase boiling efficiency. In order to maintain depth in your pan during the boiling process, additional raw sap must be added to replace the water that was removed via steam.

Methods of Maintaining Sap Depth Based On Pan Style

METHOD 1: POUR BY HAND
Slowly pour sap into the evaporator pan at frequent time intervals to maintain 2" depth. A large influx of cold sap may kill your boil, but the method can work as long as you are diligent. If you have a continuous flow pan, it is imperative to constantly add raw sap near the pan's inlet port to maintain gradient.

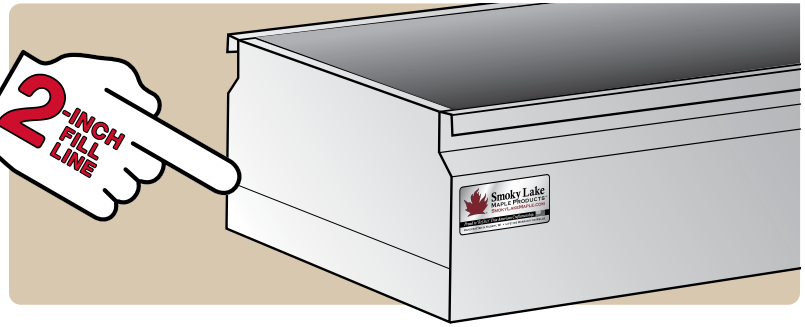
METHOD 2: FEED PAN*
A Feed Pan constantly trickles raw sap into your evaporator pan via a valve whose flow rate is adjusted manually. The constant trickle of sap enhances boiling efficiency and helps establish/maintain the density gradient in divided pans. Feed Pans also help by preheating the sap before feeding it to the evaporator pan. See p 27.

METHOD 3: FLOAT BOX*
The beauty of a Float Box is its ability to maintain sap depth so precisely with virtually no "babysitting". Simply set your desired level and the Float Box automatically regulates incoming sap to maintain your set depth. Includes connection for optional Sight Glass. See photos on p 26.

 **FLAT PAN**	✓	✓ *Optional Add-On*	*Not available at this time.*
 **DIVIDED PAN**	*It's possible, but more difficult to maintain a gradient this way.*	✓ *Optional Add-On*	✓ *Optional Add-On. May be used with or without a Feed Pan.*

*Available on SmokyLakeMaple.com. Sight Glasses also sold separately. See page 26 for details.

Determining Depth



BEFORE LIGHTING THE FIRE

Use the “Level Assist” feature on the end panels of your Smoky Lake evaporator pan to fill the pan 2″ deep with sap. The pan should be sitting level so that the depth is consistent throughout the pan.

AFTER LIGHTING THE FIRE

When sap is at a rolling boil and steam is obscuring the view inside the pan, sap depth can be difficult to determine. This is where a “Sight Glass” comes in handy because it gives a constant, steady reading of the current liquid level. See “Types of Sight Glasses” to the right.

< Steam billows off a StarCat during a test boil at Smoky Lake headquarters, Jan. 2019

Types of Sight Glasses

STYLE 1: SIGHT GLASSES FOR FLOAT BOXES

This style of Sight Glass attaches to the drain on the bottom of the Float Box. It includes a special valve which will allow you to drain the liquid inside the sight glass without draining the entire pan. Draining the Sight Glass protects the glass in between the boils so that sap does not freeze inside the glass.

STYLE 2: SIGHT GLASSES FOR DRAW-OFF VALVES

This style of Sight Glass — also referred to on our website as a “StarCat Sight Glass” — typically attaches to the pan’s draw-off port. (If you have a Divided Pan, you could alternatively attach it to the pan’s Inlet Port.) Remember that if the liquid level ever reaches the 1-inch mark, your level is too low and more sap should be added immediately in order to maintain a 2″ depth.

Your StarCat Tribe

All that steam. All those smiles. And of course all that beautiful liquid gold!

We'd love to hear your success stories! Join us on Facebook.com/smokylakemaple

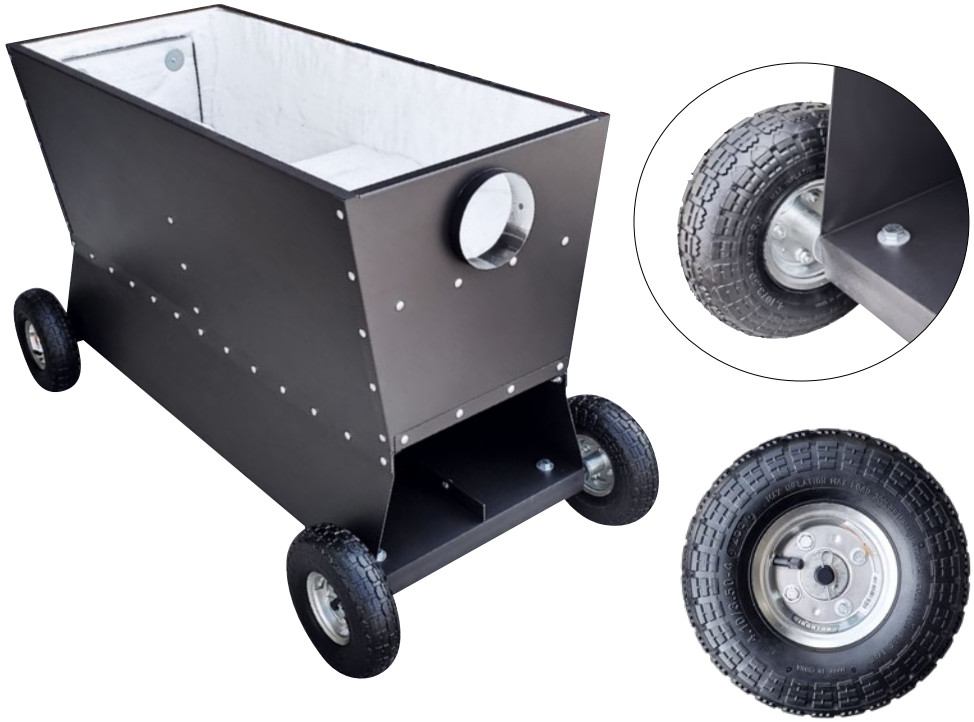
 | Photos courtesy of Jason Engemann, outdoor photographer and StarCat owner in Missouri

Caster Wheel Set SKU SL-CASTERHOBBY

This optional accessory is excellent for paved surfaces! Wheels enable effortless transport between your boiling location and your storage location.

Pneumatic Tire Set SKU SL-TIRESHOBBY

These “straight-runners” are well equipped to traverse uneven surfaces such as gravel or lawn. Off roading!



TIPS FOR SMART USAGE

1. The Wheel and Tire sets are intended to stay attached to the evaporator once they are installed. Place a wedge in the wheel/tire path to ensure that the evaporator remains stationary during operation.
2. Remove pans before transporting the evaporator. Otherwise, the vibrations from movement could cause the pan to shift.
3. Never tie guy wires directly down to your wheel/tire set. Guy wires should be extended out at least 4 feet from the evaporator. See our Backyard Set Up Series for more tips on properly securing your Stack Pipe. *SmokyLakeMaple.com/backyard/#chap3*
4. Due to their larger size and various other engineering considerations, the *Pneumatic* Tire Sets are intentionally fixed. Simply pick up one end of the evaporator to point it in the direction you need to go and roll away. Never force the Pneumatic Tires to turn.
5. Inflate Pneumatic Tires to 30 PSI or as directed on the side of tire.

Smoky Lake
MAPLE PRODUCTS™
SMOKYLAKEMAPLE.COM

Complete Steam Bottler

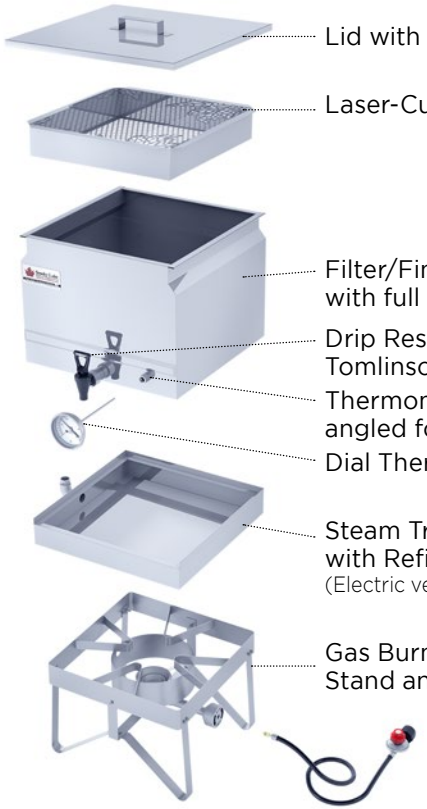
Includes Lid, Filter Tray, Tomlinson Valve, Thermometer, Steam Tray, Flat Filters

Eliminate Sugar Sand...

The Smoky Lake Steam Bottler is one of the most versatile pieces of equipment a maple syrup producer can own. It helps streamline the entire finishing process. So you can go from Filtering to Density Correcting to Bottling with ease.

Best of all, the Steam Bottler maintains and monitors syrup temperatures in order to prevent unsightly sugar sand from re-appearing in your filtered product.

Steam Bottlers available on **SmokyLakeMaple.com**.
Select from either propane or electric models.
An optional Vacuum Applicator System is also available.



- Lid with Handle
- Laser-Cut Filter Tray
- Filter/Finisher/Bottler with full length handles
- Drip Resistant Tomlinson Valve
- Thermometer Port angled for easy viewing
- Dial Thermometer
- Steam Tray with Refill Tube (Electric version also available)
- Gas Burner with Stand and Regulator

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A Guide To
VALUE-ADDED MAPLE PRODUCTS

TOOLS

- Stainless Steel Pot/Kettle (NO COATINGS!)
- Scraper
- Metal Spoon
- Candy Thermometer
- Protective Gloves
- Canola Oil or Butter (Wipe onto pot rim to thwart foam)
- Strainer (Used for Maple Sugar only)
- Candy Molds
- Light Mist Bottle w/Water (Used to disperse bubbles/prevent crystallization on surface of cooling confections)

WARNING!

Hot sugar and hot surfaces can burn you! Wear protective gloves/clothing.

Maple Cream

INSTRUCTIONS

1. Heat maple syrup to approx 235ºF (22º – 24ºF above the boiling point of water) **NOTE**: Lighter, early season syrup typically works best. Not all syrup can make cream.
2. In the same pot, rapidly cool syrup to 75°F and avoid any agitation to prevent premature crystallization.
3. Stir slowly. And stir and stir. The cream is complete when it has become opaque and has the consistency of soft peanut butter. If stirring is stopped too early, larger crystals may develop, creating a more grainy texture.

STORAGE

Store in a wide-mouth, airtight container. Can be refrigerated up to two months or frozen up to a year. If separation occurs, simply stir to reconstitute.

USES

This spread adds amazing flavor to any muffin or toast and can be substituted for jelly. It also serves as a delightful fruit dip.

Maple Sugar

INSTRUCTIONS

1. Heat maple syrup to approx 260ºF (45º – 50ºF above the boiling point of water)
2. Cool to 200ºF
3. Stir until all moisture has evacuated and the sugar is granulated
4. Sift with a course screen to divide into uniform texture.

STORAGE

Dry, airtight container, room temperature.

USES

Maple Sugar is a flavorful substitute for cane sugar or brown sugar in any recipe.

1 Cup Maple Sugar = 1 Cup Cane Sugar = 1 Cup Brown Sugar

Larger bits can be used as sprinkles or ground into finer particles with a blender.

Maple Candy

INSTRUCTIONS

1. Heat maple syrup to approx 245ºF. (32º – 34ºF above the boiling point of water)
2. Cool to between 160ºF – 200°F (Cooler temp = finer sugar crystals, but will allow less time to pour into molds before hardening.)
3. Stir several minutes until crystals form and it becomes more opaque.
4. Pour into the candy molds before hardening, and allow to cool on a level surface.
5. Candies can be removed from the molds within approx. 30 minutes.

STORAGE

Dry, airtight container, room temperature. If frozen, allow to sit/dry before resealing them at room temperature.

USES

Maple Candy stands on its own as a delightful treat. It is also a quick, fun sweetener to stir into your morning coffee.

SEE CANDY MOLDS ON SMOKYLAKEMAPLE.COM
SKU TY-859643005886

Product Support: *SmokyLakeMaple.com/support-starcat*

SmokyLakeMaple.com | Follow us!

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