LEADER EVAPORATOR
2X6 and 2X 8 INFERNO WOOD FIRED ARCH

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**EQUIPMENT DESCRIPTION**

An INFERNO wood fired arch from LEADER EVAPORATOR is designed to maximize the BTU output of your wood through the use of an airtight front with special domed grates and speed controlled air blower(s).

**NOTE:** Pictures, sketches and drawings presented in this document are not to scale.

A left feed evaporator is defined, as the regulator float box assembly will be on the left side of the flue pan when standing facing the firing door. A right feed evaporator is defined, as the regulator float box assembly will be on the right side of the flue pan when standing facing the firing door.

The Leader AMERICAN Evaporator consists of the following parts:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>LEADER ORDER #</th>
<th>DESCRIPTION / PHOTO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch</td>
<td>As Ordered</td>
<td></td>
</tr>
<tr>
<td>Base Taper</td>
<td>To match arch ordered (size and material) – see table below</td>
<td></td>
</tr>
<tr>
<td>Spark Arrester</td>
<td>59202</td>
<td></td>
</tr>
<tr>
<td>Speed Control</td>
<td>68306</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ITEM</th>
<th>LEADER ORDER #</th>
<th>DESCRIPTION / PHOTO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grates</td>
<td></td>
<td>Quantity and size for arch ordered – See table below</td>
</tr>
<tr>
<td>Smoke stack</td>
<td></td>
<td>Quantity and size to meet specifications for arch ordered – see table below</td>
</tr>
<tr>
<td>Flue Brush Rod (8’)</td>
<td>60071 (6’)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>60072 (8’)</td>
<td></td>
</tr>
<tr>
<td>One Gang Electrical Box</td>
<td>68309</td>
<td></td>
</tr>
</tbody>
</table>

**GRATE AND SMOKE STACK INFORMATION**

<table>
<thead>
<tr>
<th>ARCH</th>
<th>Grate Length (inches)</th>
<th>Number of Grates</th>
<th>Stack Taper Height (ft)</th>
<th>Stack Diameter (inches)</th>
<th>Number of Pieces of Stack</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 X 6</td>
<td>18</td>
<td>2</td>
<td>3</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>2 X 8</td>
<td>24</td>
<td>2</td>
<td>3</td>
<td>10</td>
<td>4</td>
</tr>
</tbody>
</table>
## Optional Spare Parts, Setup Parts and Operations Equipment and Supplies

<table>
<thead>
<tr>
<th>ITEM</th>
<th>LEADER ORDER #</th>
<th>DESCRIPTION / PHOTO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leader Roof Jack</td>
<td></td>
<td>[Image of Leader Roof Jack]</td>
</tr>
<tr>
<td>Style</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak or Side of Roof</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jaco Firestop Plus (10.5 oz tube)</td>
<td>65196</td>
<td>[Image of Jaco Firestop Plus]</td>
</tr>
<tr>
<td>INSULBOARD 1” X 1’X3’ (3 sq. ft)</td>
<td>65000</td>
<td>[Image of INSULBOARD]</td>
</tr>
<tr>
<td>3000° Full Brick</td>
<td>65003</td>
<td>[Image of 3000° Full Brick]</td>
</tr>
<tr>
<td>3000° Half Brick</td>
<td>65006</td>
<td>[Image of 3000° Half Brick]</td>
</tr>
<tr>
<td>Refractory Cement</td>
<td>65001</td>
<td>[Image of Refractory Cement]</td>
</tr>
</tbody>
</table>
DIAGRAM OF THE INFERNO WOOD FIRED ARCH

- Arch Rail
- Airtight Front
- Firebox
- Incline
- Blower
- Firebox Door
SETUP OF THE INFERNO WOOD FIRED ARCH

NOTE: The following information pertaining to setup of an arch is to be considered one suggested method. Installations should meet all applicable governmental regulations and standards.

RECEIVING YOUR ARCH:

Upon receipt of the arch, it is recommended the following tasks be performed:

1. Protect all incoming materials from damage and the environment. If possible place the arch at the location where it will be setup (See section titled SUGAR HOUSE SETUP).
2. Unpack all materials and check the received materials against the Equipment Description list provided above.
3. Immediately notify Leader Evaporator or your local dealer if there are questions on the received equipment.

SUGAR HOUSE SETUP:

Prior to setup of the sugar house, it is suggested future needs be considered. The requirements for the setup of the standard arch may not be adequate if in the future additional or larger equipment will be needed. If assistance is needed in determining possible future requirements please contact Leader Evaporator Sales or your local dealer.

The following are minimum clearances recommended for around the arch. When determining the clearances, keep in mind any additional items/equipment (ex. packaging supplies, canner, table(s), chairs) and where they will be located in the sugar house:

1. Front of the arch: six (6) feet
   a. Allows room for firing and cleaning out of ashes
2. Back of the arch: three (3) feet
   a. Allows for cleaning and removal of the stack
3. Sides of the arch: four (4) feet
   a. Allows for draw off and movement

Foundation For the Arch

The following is one suggested method of preparing a foundation for the arch.

1. Standard concrete pad with footings below the frost line should be used under the arch firebox.
2. A layer of 1/8” steel plate at least as wide as the arch and extending 2 feet in front of the arch should be in place to protect wooden floors from hot embers, etc.

Setting The Arch On The Foundation

1. Place the arch with the firebox centered on the concrete pad. Use a plumb bob to center the collar of the arch to the roof jack – if the roof jack is already installed.
2. Thread the leveling bolts into the leveling bolt locations. Thread until they are approximately ½ threaded. Place a steel shim under each leveling bolt to ease adjustment. The locations of the leveling bolts are listed in the table below.
3. Level the arch on the foundation.
   a. Place a 4-foot level on the rail of the arch front to back. (The rail is the part where the pans are rested).
   b. Adjust the level of the arch by raising or lowering the leveling bolts.
   c. Place the level on the rail of the arch side-to-side.
   d. Adjust the level of the arch by raising or lowering the corner leveling bolts.
   e. When the arch is leveled, snug the center leveling bolts to support of the center of the arch.
POWERING THE ARCH

The forced air blower for the arch must be wired to a power source. It is recommended the electrical control box be mounted near the front of the arch. It is recommended an additional ON/OFF switch be added to the circuit. Contact a licensed electrician for installation of the speed control and switch circuits.

<table>
<thead>
<tr>
<th>ARCH WIDTH</th>
<th>BLOWER SIZE (HP)</th>
<th>NUMBER OF BLOWERS</th>
<th>POWER REQUIRED (amps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2’X6’ and 2’X8’</td>
<td>1/6</td>
<td>1</td>
<td>2.3</td>
</tr>
</tbody>
</table>
INSULATING THE ARCH:

General Notes

1. Each of the presented drawings is accompanied by a table of approximate dimensions for cutting and fitting pieces. The ID for each piece to be cut can be cross referenced between the drawing and the table.

2. Layout of the insulation of the arch will be dependent on the type of evaporator pan set to be used. Arches are built for dropped flue and raised flue pan sets. The difference will be in the factory and user installation of baffles for the raised flue pan sets. Dropped flue pan sets do not use baffles. Raised flue pan sets have factory baffles installed. With the exception of a 2X6 (or smaller), arches for raised flue pans have 2 factory installed baffles. The diagrams below illustrate the arches:

3. Obtain the right number of 3000° fire bricks, refractory cement containers and insulation board:
   NOTE: The quantities on the table are approximate usages. Actual quantities will vary depending on the actual techniques and layouts employed.

### Dropped Flue

<table>
<thead>
<tr>
<th>Arch</th>
<th>Half Bricks</th>
<th>Full Bricks</th>
<th>Insulation Board</th>
<th>Refractory Cement (30 lbs. buckets)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 X 6</td>
<td>48</td>
<td>49</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>2 X 8</td>
<td>63</td>
<td>61</td>
<td>12</td>
<td>2</td>
</tr>
</tbody>
</table>

### Raised Flue

<table>
<thead>
<tr>
<th>Arch</th>
<th>Half Bricks</th>
<th>Full Bricks</th>
<th>Insulation Board</th>
<th>Refractory Cement (30 lbs. buckets)</th>
<th>Vermiculite (bags)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 X 6</td>
<td>49</td>
<td>51</td>
<td>12</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2 X 8</td>
<td>63</td>
<td>59</td>
<td>16</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
4. Begin by fitting the insulation board and bricks in the arch “dry” (no cement). This will allow you to cut and fit all the insulation board and bricks into the arch so the cementing can be done in one continuous application.

NOTE: The use of a wet saw or masonry blade in a circular saw is recommended to cut the bricks where required.

NOTE: The use of a mini hacksaw is suggested for cutting the insulation board.

The following sections are the outline for the preparing and sequencing of the fitting of the insulation board and brick into the arch. Adjustments to shown sizes will be required as the installation proceeds. The rule of “Measure twice and cut once” will reduce waste in fitting the pieces. As you go through each of the following pages, cut, “dry fit” then cement the parts into place.

When fitting pieces in the arch there will be bolts and rivets where the pieces are being fit. In order to properly fit for the bolts and rivets either:

- Measure the locations on the sheet and cut out the necessary area for clearance of the rivets/bolts
- Place the sheet in position and press it against the rivets/bolts in order to mark the rear of the sheet then cut out the marked area to allow for clearance of the rivets/bolts.

NOTE: Insulating sheets at the top of the arch when cut may leave a ¾” gap between the sheet top and the bottom of the arch rail. If this occurs, after the cement has dried, fill the gap with rail gasket material.

Cementing of Insulation Board and Bricks

1. Skim coat a layer of refractory cement to the inside arch wall covering the approximate area of the piece of arch board to be mounted. Place the board against the cement.

2. The cement does not need to dry prior to installing the bricks.

3. To install brick, skim coat the rear of the brick and apply a heavier coat to the sides of the brick. Place it into position. As more bricks are added the cement will be forced from the joints. Scrape and smooth off the excess cement. Make sure all openings between the bricks are filled with cement.

4. Allow the cement to dry for 36 hours at room temperature (65°F or higher).

NOTE: THE LAYOUTS AND DIMENSIONS PRESENTED IN THE FOLLOWING PAGES ARE FOR USE AS GUIDELINES. ALWAYS MEASURE AND “DRY FIT” BOARD AND BRICKS PRIOR TO FINAL PLACEMENT.

Bricks

In the drawings standard bricks are labelled as follows:

<table>
<thead>
<tr>
<th>LABEL</th>
<th>BRICK TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FB</td>
<td>Full Brick (9” X 4.5” X 2.5”)</td>
</tr>
<tr>
<td>HFB</td>
<td>Half a Full Brick (4.5” X 4.5” X 2.5”)</td>
</tr>
<tr>
<td>HB</td>
<td>Half Thickness Brick(9” X 4.5” X 1.25”)</td>
</tr>
<tr>
<td>HHB</td>
<td>Half a Half Thickness Brick (4.5” X 4.5” X 1.25”)</td>
</tr>
</tbody>
</table>
The top row of bricks should be cut so they do not prevent the heat from reaching the pans. The bricks will need to be tapered on the top. See the illustration below.

**Considerations For A MAX/COMBO Flue Pan**

In order to properly direct the heat into the flues of a MAX/COMBO flue pan, additional bricking must be added to form baffles at certain locations. Baffles should be located as indicated in the following table. The measurements are from the front of the stack collar to the front of the brick baffle.

<table>
<thead>
<tr>
<th>Flue Pan Length (FT)</th>
<th>Qty of Baffles</th>
<th>Baffle Location (inches in front of collar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>20, 30</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>20, 42</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>20, 54</td>
</tr>
</tbody>
</table>

1. Extra full thickness bricks will need to be ordered to add the baffles. Add three (3) bricks for each baffle.
2. Begin by bricking the arch as described for a dropped flue arch.
3. At the locations specified in the table run a row of full thickness bricks across the arch.
   a. The front of the row of bricks will be at the location specified in the table.
   b. The bricks should be laid face down on the bricks on the floor of the arch.

**Drain Considerations for a Drop Flue Arch or MAX/COMBO Flue Pan**

A drop flue arch is shipped with a flue pan drain hole in the right side of the arch (unless otherwise specified). When installing insulation ensure it is fit to leave the drain hole open.

- Drop flue – center of the drain hole will be 7” down and in line with the front of the collar with a diameter of approximately 2 ¾”
- Max/Combo – 5 ½” down and 1” forward of the front of the collar with a diameter of approximately 2 ½”

**Brick Arrangement**

In the outlines and examples below, the bricks are shown generally installed in one way. Depending of the width of the arch, it may be less cutting/fitting to have the bricks set 90° to the examples. The areas to which this applies;

- Rear floor – rows between the outer rows of bricks
- Incline
- Baffle
- Between the baffles over the vermiculite
Insulating a 2X8 Arch for a Drop Flue Pan Set

In the sections below, a generic recommended procedure for insulating an INFERNO arch for a dropped flue pan set is described. Each section is followed by a detailed example showing a 2X8 INFERNO arch.

The following diagram indicates the sections of the arch to be insulated.

![Diagram showing sections of an arch to be insulated]

**Insulating the Arch**

The order of insulation is as follows:

1. **INSULATION BOARD**
   a. Left Side
   b. Right Side
   c. Back
   d. Incline
   e. Ash Pit Rear
2. BRICKING
   a. Floor behind incline
   b. Left Side
   c. Right Side
   d. Grate area
      i. Front grate shelf
      ii. Install grates
      iii. Rear grate shelf
   e. Incline

**Insulation Board**

*Left and Right Side – General Outline*
Right side shown – mirror for left side.

**Step 1**

1. Measure the distance from the bottom of the ash pit in the arch to the underside of the band iron going between the grate support shelves. (height of the ash pit)
2. Measure the distance from the front of the ash pit to the rear of the ash pit. (width of the ash pit)
3. Using the measurements, determine the best way to use the pieces of insulation board and cut them to fit. Notch out the area for the grate support shelves.
4. Double check the fit then cement the pieces into place.
Step 2

1. Measure the distance from the insulation in the front of the arch to the bottom of the incline (bottom width). If the bottom width is less than 36” then board will need to be cut to fit the incline. If the measurement exceeds 36” place a full insulation board in place and determine the distance from the rear of the insulation board to the incline at the top and bottom.
2. Using the measurements, determine the best way to use the pieces of insulation board and cut them to fit.
3. Double check the fit and cement the pieces into place.

Step 3

1. Measure the distance between the top of the second row of insulation board and the bottom of the arch rail. Measure the distance between the top of the incline and under the arch rail. If the heights are not the same, notch the board at the incline to have the heights meet.
2. Using the measurements, determine the number of and best layout for pieces of insulation to cover the area. Cut the pieces to fit.
3. Double check the fit and cement the pieces into place.

NOTE: If a dropped flue or Max/Combo flue pan is to be used, a drain hole will need to be cut into the insulation board on the right side. The location and size for the drain hole is as follows:

- Drop flue – center of the drain hole will be 7” down and in line with the front of the collar with a diameter of approximately 2 ¼”
- Max/Combo – 5 ⅛” down and 1” forward of the front of the collar with a diameter of approximately 2 ⅛”
Completed Side

**Left and Right Side - Detailed 2X8 Example**

Right Side shown. Mirror for Left side without the flue pan drain cutout.

<table>
<thead>
<tr>
<th>ID</th>
<th>Length</th>
<th>Width</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>31.500&quot;</td>
<td>9.250&quot;</td>
<td>Notch to fit between grate shelves</td>
</tr>
<tr>
<td>R2</td>
<td>Top: 36.000&quot; Bottom: 32.5&quot;</td>
<td>12.000&quot;</td>
<td>Taper Cut starts 8.500&quot; from top</td>
</tr>
<tr>
<td>R3</td>
<td>36.000&quot;</td>
<td>11.000&quot;</td>
<td></td>
</tr>
<tr>
<td>R4</td>
<td>Top: 9&quot; Bottom: 0&quot;</td>
<td>9.000&quot;</td>
<td></td>
</tr>
<tr>
<td>R5</td>
<td>36.000&quot;</td>
<td>10.500&quot;</td>
<td></td>
</tr>
<tr>
<td>R6</td>
<td>29.500&quot;</td>
<td>10.500&quot;</td>
<td>See note on Flue Pan Drain Cutout</td>
</tr>
</tbody>
</table>
Back – General Outline

1. Measure between the insulation board installed on each side of the arch. (Under Door Length)
2. Measure from the angle iron at the bottom of the back to the bottom of the door. (Under Door Width)
3. Cut a piece of insulation board to fit in the area.
4. Double check the fit then cement into place.
5. Measure the distance between the door and the insulation on one side of the arch. (Side of Door Width)
6. Measure the distance from the top of the insulation board installed below the door and the bottom of the arch rail. (Side of Door Height)
7. Using the measurements, determine the best way to use the insulation board and cut them to fit. You will need two side pieces.
8. Double check the fit and cement the pieces into place.

Back - Detailed 2X8 Example

<table>
<thead>
<tr>
<th>BACK INSULATION BOARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>B1</td>
</tr>
<tr>
<td>B2</td>
</tr>
</tbody>
</table>
Incline – General Outline

1. Measure the distance between the insulation on each arch side at the incline. (Width of Incline)
2. Measure the distance from the bottom of the incline to the top of the incline where it meets the rear floor. (Length of the Incline)
3. Using the measurements, determine the number of and the best way to layout the piece(s) of insulation board to cover the area. Cut the pieces to fit.
4. Double check the fit and cement the piece(s) into place.

Incline – Detailed 2X8 Example

<table>
<thead>
<tr>
<th>ID</th>
<th>Length</th>
<th>Width</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN1</td>
<td>22.500&quot;</td>
<td>12.000&quot;</td>
<td>Trim to match rear floor - see Side View</td>
</tr>
<tr>
<td>IN2</td>
<td>12.000&quot;</td>
<td>5.500&quot;</td>
<td></td>
</tr>
<tr>
<td>IN3</td>
<td>10.500&quot;</td>
<td>5.500&quot;</td>
<td></td>
</tr>
</tbody>
</table>

IN1

IN2

IN3

Front of INCLINE (No insulation board on floor beyond this point)

Insulation Board Previously Installed

Top View

Bottom Edge of Incline

Rear Floor

Incline

Side View

TOP VIEW INSULATION BOARD

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INFERNO Wood Fired Arch

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1. Measure from the edge of the blower opening to the insulation on the side of the arch. (Blower Side Width)
2. Measure the distance between the angle iron on the bottom of the front to the underside of the front grate shelf. (Height of Ash Pit)
3. Measure the distance between the bottom of the arch front and the bottom of the blower outlet. (Under Blower Height)
4. Measure the Distance between the top of the blower outlet and the bottom of the grate shelf. (Over Blower Height)
5. Measure the width of the blower opening. (Blower Outlet Width)
6. Using the measurements, determine the number of and the best way to layout the piece(s) of insulation board to cover the area. Cut the pieces to fit.
7. Double check the fit then cement the pieces into place.

### Ash Pit Rear – Detailed 2X8 Example

<table>
<thead>
<tr>
<th>ASH PIT INSULATION BOARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>AP1</td>
</tr>
<tr>
<td>AP2</td>
</tr>
</tbody>
</table>
Bricking

Rear Floor Behind the Incline – General Outline
1. Begin by placing a row of full thickness bricks lengthwise against the rear of the arch.
2. Along each side of the arch, run a row of half thickness bricks parallel to the side of the arch.
3. Trim the last brick over the incline so it is even with the insulation board on the incline.
4. Between the rows of half bricks, run rows of full bricks up to the last full length brick before the incline.
5. Complete the rows of full thickness bricks to the incline trimming so they are even with the insulation board on the incline.
6. Double check the fit and cement the bricks into place.

Rear Floor Behind the Incline – Detailed 2X8 Example

![Diagram of rear floor behind the incline showing brick layout and dimensions.]

Left and Right Side – General Outline

![Diagram showing the left and right side of the rear floor with brick installation instructions.]
The first three rows over the band iron grate spacers will be horizontal rows of full thickness brick. This will be followed by a row of vertically oriented half thickness bricks. Using half thickness bricks in this manner maximizes the area of the syrup pan being heated.

1. Place a full thickness brick with the short end against the insulation of the door and the brick face against the insulation on the side of the arch.
2. Continue placing the bricks end to end until the insulation board on the front of the incline is reached. The last brick against the incline will need to be trimmed to follow the angle of the incline.
3. Start the next row of bricks with a full thickness brick cut in half (4 ½” X 4 ½”).
4. Continue placing the bricks end to end until the insulation board on the front of the incline is reached. The last brick against the incline will need to be trimmed to follow the angle of the incline.
5. Start the third row of bricks with a full brick.
6. Continue placing the bricks end to end until the insulation board on the front of the incline is reached. The last brick against the incline will need to be trimmed to follow the angle of the incline, if necessary.
7. Double check the fit and cement the bricks into place.
8. Begin the top row of bricks by placing a half thickness brick on the top of the third row of bricks with the long edge against the insulation in the front of the arch and the brick face against the insulation on the side of the arch.
9. Continue placing bricks until the rear of the arch is reached. There may be a difference in the length of the brick needed after the top of the incline is reached. The side bricks placed after the top of the incline will rest on the bricks on the rear floor. Additionally it will be necessary to fit the last brick(s) over the full brick on the floor at the rear of the arch.
10. Double check the fit and cement the bricks into place.
11. Fill any spaces between the top brick and the underside of the arch rail with rail gasket.

*Left and Right Side – Detailed 2X8 Example*

Right side shown. Mirror for left side without the flue pan drain hole
**Grate Area**

**Front Grate Shelf – General Outline**

The area to be covered will be:
- From the insulation of the front to 1” from the edge of the grate shelf.
- From the insulation on one side of the arch to the other

1. Cover the area to be bricked with full thickness bricks placed face down against the grate shelf.
2. Fit the bricks, double check the fit then cement the bricks into place.

**Front Grate Shelf – Detailed 2X8 Example**
Install the Grates

Place the two arch grates into the arch so the front of the grates are against the stainless steel front floor plate of the arch. The grates fit between the band irons at the sides of the arch and will rest on the front and back support shelf by approximately 1” each.

NOTE: To obtain the best fit between the side band irons it may be necessary to flip the grates end for end as the widths of the grates will vary slightly along the length.

Obtain a piece of “C flute” cardboard (most common type of cardboard). Fold it into thirds along the length and tape with a non-plastic tape (ex. masking tape). Place it behind the grates toward the rear of the arch. The cardboard will provide the spacing needed to remove the grates after the insulating materials have been fit in place. The cardboard can be left in place as it will be consumed during the first firing of the arch.

PROPER ORIENTATION OF GRATES
Grates should be installed so the flat side is down on the supports.

Rear Grate Shelf – General Outline
The area to be covered will be;
• From the board insulation on the incline tight to the cardboard.
• From the insulation on one side of the arch to the other
1. Cover the area to be bricked with full thickness bricks placed face down against the grate shelf. Generally the best arrangement will be to place the bricks parallel to the edge of the grate shelf.
2. Fit the bricks, double check the fit then cement the bricks into place.

**Rear Grate Shelf – Detailed 2X8 Example**

Inclined – General Outline

The area to be covered will be;
- From the brick on the rear grate shelf to the rear floor brick at the top edge of the incline.
- From the insulation on one side of the arch to the other.
- The insulation on the incline should be fully covered.

Use full thickness brick to cover the area.
The top brick will need to be trimmed to allow a smooth transition from the incline to the rear floor.
Incline – Detailed 2X8 Example

Insulating a 2X6 Arch for a Raised Flue Pan Set

A detailed insulation procedure for the 2X6 arch for a raised flue pan set is presented in this section as the insulating of this arch differs from the arches larger than 2X6. The 2X6 arch is provided with a single factory installed baffle. All larger arches for raised flue pan sets are provided with two factory installed baffles.

The order is as follows:
1. INSULATION BOARD
   a. Left Side Board Insulation
   b. Right Side Board Insulation
   c. Back Board Insulation
   d. Top View Board Insulation
   e. Ash Pit Rear Board Insulation
2. BRICKING
   a. Floor Behind Factory Baffle Brick
   b. Left Side Brick
   c. Right Side Brick
   d. Grate Area Brick
      i. Front Grate Shelf Brick
      ii. Install Grates
      iii. Rear Grate Shelf Brick
   e. Incline to Top of Front Factory Baffle Brick
   f. Rear Baffle
   g. Baffle Area Completion
### Insulation Board

#### Left Side

![Diagram]

**Right Side Insulation Board**

<table>
<thead>
<tr>
<th>ID</th>
<th>Length</th>
<th>Width</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>25.000&quot;</td>
<td>9.250&quot;</td>
<td></td>
</tr>
<tr>
<td>L2</td>
<td>Top: 35.125&quot; Bottom: 27.000&quot;</td>
<td>12.000&quot;</td>
<td></td>
</tr>
<tr>
<td>L3</td>
<td>36.000&quot;</td>
<td>10.250&quot;</td>
<td>Fit bottom rear corner to incline</td>
</tr>
<tr>
<td>L4</td>
<td>Left: 9.00&quot; Right: 0.00&quot;</td>
<td>Top: 6.00&quot; Bottom: 0.00&quot;</td>
<td>Fit between L3 and Incline</td>
</tr>
<tr>
<td>L5</td>
<td>Top: 29&quot; Bottom: 36&quot;</td>
<td>10.500&quot;</td>
<td>Fit front of board to top of incline</td>
</tr>
<tr>
<td>L6</td>
<td>6.00&quot;</td>
<td>10.500&quot;</td>
<td></td>
</tr>
</tbody>
</table>

#### Right Side

![Diagram]

**Right Side Insulation Board**

<table>
<thead>
<tr>
<th>ID</th>
<th>Length</th>
<th>Width</th>
<th>NOTES</th>
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<tr>
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<td>Top: 35.125&quot; Bottom: 27.000&quot;</td>
<td>12.000&quot;</td>
<td></td>
</tr>
<tr>
<td>R3</td>
<td>36.000&quot;</td>
<td>10.250&quot;</td>
<td>Fit bottom rear corner to incline</td>
</tr>
<tr>
<td>R4</td>
<td>Left: 9.00&quot; Right: 0.00&quot;</td>
<td>Top: 6.00&quot; Bottom: 0.00&quot;</td>
<td>Fit between R3 and Incline</td>
</tr>
<tr>
<td>R5</td>
<td>Top: 29&quot; Bottom: 36&quot;</td>
<td>10.500&quot;</td>
<td>Fit front of board to top of incline</td>
</tr>
<tr>
<td>R6</td>
<td>6.00&quot;</td>
<td>10.500&quot;</td>
<td></td>
</tr>
</tbody>
</table>
**Back**

*2X6 INFERNO Arch*

**BACK**

Insulation Board Layout

*NOT TO SCALE*

---

**Insulation Board**

Previously Installed

---

<table>
<thead>
<tr>
<th>BACK INSULATION BOARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
</tr>
<tr>
<td>----</td>
</tr>
<tr>
<td>B1</td>
</tr>
</tbody>
</table>

---

**Incline**

*2X6 INFERNO Arch*

**INCLINE**

Insulation Board Layout

*NOT TO SCALE*

---

**Baffle is continuous with incline.**

---

**Insulation Board**

Previously Installed

**INCLINE** (Angle not shown)

---

**Incline Insulation Board**

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<thead>
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</tr>
<tr>
<td>FV2</td>
<td>26.000&quot;</td>
<td>10.250&quot;</td>
</tr>
</tbody>
</table>

---

*Front of INCLINE (No insulation board on floor beyond this point)*
Ash Pit Rear

2X6 INFERNO Arch
Ash Pit Rear
Insulation Board Layout

NOT TO SCALE

Insulation Board
Previously Installed

<table>
<thead>
<tr>
<th>ASH PIT INSULATION BOARD</th>
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<tbody>
<tr>
<td>ID</td>
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<tr>
<td>AP1</td>
</tr>
<tr>
<td>AP2</td>
</tr>
</tbody>
</table>

Bricking

Floor Behind Factory Baffle

2X6 INFERNO ARCH
Arch Floor Behind Factory Baffle Brick Layout
(view from top)

Not To Scale Back Of Arch

<table>
<thead>
<tr>
<th>HFB</th>
<th>FB</th>
<th>FB</th>
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<td>HB</td>
<td>HHB</td>
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</tr>
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<td>HB</td>
<td>This area left empty at this time</td>
<td>HB</td>
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<tr>
<td>HB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RF1</td>
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<td>RF1</td>
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Insulation Board
Previously Installed

<table>
<thead>
<tr>
<th>FLOOR BEHIND BAFFLE BRICK SPECS</th>
</tr>
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<tbody>
<tr>
<td>ID</td>
</tr>
<tr>
<td>RF1</td>
</tr>
</tbody>
</table>

FACTORY BAFFLE
Shown as solid line at point where floor brick will intersect
the upright portion of the baffle
**Left Side**

2X6 INFERNO ARCH
Left Side
Brick Layout
NOT TO SCALE

<table>
<thead>
<tr>
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<th>Type</th>
<th>Length</th>
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<th>Notes</th>
</tr>
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<tbody>
<tr>
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<td>Full</td>
<td>Top 3.250&quot;/</td>
<td>4.500&quot;</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Bottom 0.750&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LB2</td>
<td>Full</td>
<td>Top 9.000&quot;/</td>
<td>4.500&quot;</td>
<td>Taper cut starts 2.500&quot; from top</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bottom 7.875&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LB3</td>
<td>Full</td>
<td>Top 1.625&quot;/</td>
<td>2.000&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bottom 0.000&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LB4</td>
<td>Full</td>
<td>Top 4.500&quot;/</td>
<td>4.500&quot;</td>
<td>Taper cut starts 0.625&quot; from top</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bottom 6.000&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LB5</td>
<td>Half</td>
<td>Front 9.000&quot;</td>
<td>2.250&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Back 3.250&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LB6</td>
<td>Half</td>
<td>Front 1.000&quot;</td>
<td>4.500&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Back 8.000&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LB7</td>
<td>Half</td>
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<td>Trim to fit behind baffle</td>
</tr>
<tr>
<td>LB8</td>
<td>Half</td>
<td>7.750&quot;</td>
<td>4.500&quot;</td>
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</tbody>
</table>

**Right Side**

2X6 INFERNO ARCH
Right Side
Brick Layout
NOT TO SCALE

<table>
<thead>
<tr>
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<th>Type</th>
<th>Length</th>
<th>Width</th>
<th>Notes</th>
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<td>4.500&quot;</td>
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</tr>
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<td></td>
<td>Bottom 0.750&quot;</td>
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<td></td>
</tr>
<tr>
<td>RB2</td>
<td>Full</td>
<td>Top 9.000&quot;/</td>
<td>4.500&quot;</td>
<td>Taper cut starts 2.500&quot; from top</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bottom 7.875&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RB3</td>
<td>Full</td>
<td>Top 1.625&quot;/</td>
<td>2.000&quot;</td>
<td></td>
</tr>
<tr>
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<td></td>
<td>Bottom 0.000&quot;</td>
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<tr>
<td>RB4</td>
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<td>Top 4.500&quot;/</td>
<td>4.500&quot;</td>
<td>Taper cut starts 0.625&quot; from top</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bottom 6.000&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RB5</td>
<td>Half</td>
<td>Front 9.000&quot;</td>
<td>2.250&quot;</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Back 3.250&quot;</td>
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<td></td>
</tr>
<tr>
<td>RB6</td>
<td>Half</td>
<td>Front 1.000&quot;</td>
<td>4.500&quot;</td>
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<tr>
<td></td>
<td></td>
<td>Back 8.000&quot;</td>
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<td></td>
</tr>
<tr>
<td>RB7</td>
<td>Half</td>
<td>9.000&quot;</td>
<td>4.500&quot;</td>
<td>Trim to fit behind baffle</td>
</tr>
<tr>
<td>RB8</td>
<td>Half</td>
<td>7.750&quot;</td>
<td>4.500&quot;</td>
<td></td>
</tr>
</tbody>
</table>
**Install Grates**

Place the two arch grates into the arch so the front of the grates are against the stainless steel front floor plate of the arch. The grates fit between the grate spacer band irons of the arch and will rest on the front and back support shelves by approximately 1". The grate may need to be flipped around to obtain the best fit as the grate castings vary slightly in size.

Obtain a piece of “C flute” cardboard (most common type of cardboard). Fold it into thirds along the length and tape with a non-plastic tape (ex. masking tape). Place it behind the grates toward the rear of the arch. The cardboard will provide the spacing needed to remove the grates after the insulating materials have been fit in place. The cardboard can be left in place as it will be consumed during the first firing of the arch.

**PROPER ORIENTATION OF GRATES**

Grates should be installed so the flat side is down on the supports.
Rear Grate Shelf

INFERNO Wood Fired Arch
July 2018

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INCLINE

Back Of Arch

Cardboard Spacer

Grate Support Shelf

Insulation Previously Installed

Brick Previously Installed

REAR GRATE SHELF BRICK SPECS

<table>
<thead>
<tr>
<th>ID</th>
<th>TYPE</th>
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<th>WIDTH</th>
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<tr>
<td>GB4</td>
<td>Full</td>
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<td>4.500&quot;</td>
</tr>
</tbody>
</table>

Incline to Top of Front Factory Baffle

INFERNO Wood Fired Arch
July 2018

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INCLINE

INCLINE and Factory Baffle are continuous

Side View

Taper Top of Bricks as Shown in Side View

Insulation Previously Installed

Brick Previously Installed

INCLINE TO FRONT BAFFLE BRICK SPECS

<table>
<thead>
<tr>
<th>ID</th>
<th>TYPE</th>
<th>LENGTH</th>
<th>WIDTH</th>
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</thead>
<tbody>
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<td>IB1</td>
<td>Full</td>
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<td>3.750&quot;</td>
</tr>
<tr>
<td>IB2</td>
<td>Full</td>
<td>6.000&quot;</td>
<td>4.500&quot;</td>
</tr>
<tr>
<td>IB3</td>
<td>Full</td>
<td>6.000&quot;</td>
<td>3.750&quot;</td>
</tr>
<tr>
<td>IB4</td>
<td>Full</td>
<td>9.000&quot;</td>
<td>1.750&quot;</td>
</tr>
</tbody>
</table>

Pitch of INCLINE and BAFFLE flattened for illustration
**Rear Baffle**

2X6 INFERNO ARCH
Rear Baffle Brick Layout
NOT TO SCALE

<table>
<thead>
<tr>
<th>Top View</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Insulation Previously Installed</strong></td>
</tr>
<tr>
<td><strong>Brick Previously Installed</strong></td>
</tr>
<tr>
<td><strong>Brick Baffle</strong></td>
</tr>
</tbody>
</table>

Face View

- This area left empty at this time

| Front of Arch |

<p>| Rear Baffle Brick SPECS |</p>
<table>
<thead>
<tr>
<th>ID</th>
<th>TYPE</th>
<th>LENGTH</th>
<th>WIDTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB1</td>
<td>Full</td>
<td>2.000&quot;</td>
<td>4.500&quot;</td>
</tr>
</tbody>
</table>

**Baffle Area Completion**

To Insulate between and the top of the factory baffle:

1. Using refractory cement, attach a layer of 1” rail gasket across the top of the factory baffle.
2. Fill the open area between the two baffles with vermiculite to 1” below the bottom of the arch rails.
3. Cement a layer of insulation board over the top of the vermiculite. The board should not be higher than the arch rails.
INSTALL TAPER AND STACK

A roof jack should be installed prior to setting up your taper and stack. Leader Evaporator recommends a water tight roof jack for the evaporator. Leader Evaporator offers two styles of roof jack; water tight or with collar in either a peak or side mount.

In order to determine your requirements you will need to know where you will penetrate the roof with the stack and the pitch of your roof.

Roof Penetration and the Type of Roof Jack:

a. Obtain a plumb bob with sufficient line to reach from the roof to the stack collar of the arch.

b. Run the plumb bob from the center of the stack collar to the roof, moving the roof point until the plumb bob is properly positioned. Ensure there are no bends in the line caused by other items.

c. If the plumb bob line end is at the peak of the roof - order a Leader peak mount roof jack. If the plumb bob line end is at the side of the roof – order a Leader side mount roof jack.

d. Prior to taking down the plumb bob, mark the inside of the roof, as this will be used when making the roof penetration for the stack or installation of the roof jack.

e. Roof penetration:

i. When installing a roof jack refer to the LEADER CUSTOMIZED ROOF JACK document.

ii. If not using a roof jack, make a hole at the point marked on the inside of the roof in the previous step. Mark the roof a minimum of 2” out from and around the template. Refer to the applicable governmental regulations as to minimum clearances required dependent on materials of roof construction.

Install the Taper and Stack

NOTE: It is recommended you install all supplied exhaust stack, as a minimum. Additional stack may be required to ensure proper draft.

Draft is correct when:

- The boil is the same in the syrup pan front-to-back and side-to-side
- The fire door is open the flame, sparks, etc. are drawn toward the rear of the arch.

NOTE: When working with stack sections, recognize that the crimped end of the stack section is the upper / top section.
1. Place the base taper on the arch stack collar. If you have difficulty placing the base taper onto the collar, squeeze the base taper by pressing on the long sides at the base.

2. If a roof jack is used,

   a. Insert one piece of stack into the roof jack until it is a lightly wedged. The Leader style roof jack is tapered from larger to smaller. The end to be inserted into the roof jack is the crimped end. NOTE: You will be moving the piece of stack back down by approximately 2 ½” when you connect to the next stack section so ensure it will be able to move.

   b. Measure from the top of the taper to the bead at the bottom of the stack section in the roof jack.

   c. Determine the number of lengths of stack required by dividing the measurement taken in inches by 34”.
   i. For example if the measurement was 68”, then 68” ÷ 34” = 2 so 2 lengths of stack are required.
   ii. For example if the measurement was 60”, then 60” ÷ 34” = 1.76 lengths of stack are required. This would mean one full length and a length measuring 26” would be required. To obtain the 26” length you can either
   iii. Special order a piece of stack the length required or cut a standard length of stack to fit. If you cut a length of stack to fit, measure the length from the bead of the stack and cut off the top crimped end.
3. Install the stack sections starting from the base taper. Ensure you place the crimped end up when connecting the stack sections.

4. When you put the last indoor section in place, lower the stack section from the roof jack (if used) approximately 2 ½” down onto the top piece of stack, or lower a stack section through the penetration in the roof.

5. If a roof jack is used, use all remaining sections of stack by placing the beaded / bottom end over the top of the roof jack.

6. Continue installing stack until all pieces have been installed. Ensure you have a good overlap for each stack joint. Overlap will be 2 to 2 ½”. It is recommended you screw all sections together using self tapping stainless steel screws.

7. Stack above the roof should be guide wired in at least three directions (tripod configuration) to minimize the effects of wind.
   a. It is recommended you install a stack cover on the last / top section of stack. A closed stack cover will minimize the rain and moisture entering the stack and arch. When installing a stack cover refer to the LEADER STACK COVER document.

THE FIRST BOIL
The first boil is done to remove any residual materials from the pans and to “season” the bricking and insulation.

1. Fill the flue pan and syrup pan with a baking soda : water mix (1 pound:200 gallons) to a level of 2 to 3 inches.

2. Check all fittings for leakage. If there is no leakage, insulate around the flue drain with rail gasket material.

3. To season the bricking, start by building a small fire in the fire box and very gradually build to a normal fire.

4. Boil the solution for approximately 30 minutes. Watch the boil carefully and replenish the solution as needed to ensure the solution in the pans remains at the 2 to 3 inch level.

5. Check all equipment:
   a. No leaks at connections and valves
   b. Pans are boiling evenly
   c. Valves work properly
   d. Draft is correct

6. Drain the solution after the evaporator has cooled. CAUTION – ensure the equipment is cool enough to be safely handled for draining.

7. Check the interior of the arch to ensure insulation and bricking are in place.

8. Refill the pans to the 2 to 3 inch level with clean unsoftened, non chlorinated well or spring water.

9. Boil for 30 minutes then after the evaporator has cooled, drain the pans. CAUTION – ensure the equipment is cool enough to be safely handled for draining.
OPERATING THE EVAPORATOR

NOTE: When operating the evaporator be cautious of hazards such as hot surfaces, hot liquids, sparks, and exposed flames.

NOTE: You must be aware at all times of the level of sap in all compartments of the pans. If the level drops too low you can and will damage your pans. If there is too much foam you risk damaging your pans.

NOTE: If you have purchased a scoop or skimmer, do NOT use them to push sap through the evaporator. Doing so will change the gradient in the evaporator.

1. Check the evaporator
   a. Make sure all sap sources are flowing freely i.e. not frozen.
   b. Open hood thimbles and drains, cupolas and stack covers.
   c. Ensure defoamer is usable.
   d. Ensure all fittings are tight.
   e. Make sure all valves are working properly and the float is properly positioned.
   f. Clean the flues with the flue brush every 8 to 12 hours of boiling. NOTE: The rod supplied with the arch has a threaded end. The flue brush can be screwed onto the rod to clean the flues.
   g. Ensure the open area in the grates is clean and free of material
   h. Remove the ashes from below the grates.

2. The arch should be fired with a mixture of hard and soft wood.

3. The wood to be used should be dry and cut to length so as to fit on the grates in the arch (18” length 2x6 and 24” length for 2x8).

4. The wood to be used should be split to a 2” to 3” diameter.

5. Guidelines for firing the arch:
   a. Criss cross the wood for improved air flow
   b. Turn the blower down (not OFF) to fire
   c. Maintain a 150°F range of stack temperature
   d. Fire consistently to maintain an even boil – use of a timer will aid in keeping to a schedule
   e. Maintain the arch ½ to ⅔ full

BLOWER USE

Prior to using the blower it must be adjusted to the rheostat as follows:

1. Turn the Motor Control clockwise as far as it will go.
2. With a fine straight bladed screwdriver, turn the Speed Adjustment Screw until the blower is just turning.
3. Turn the Motor Control counter clockwise until it reaches the maximum setting. The blower should be running at maximum.

- Turn the blower all the way down to fire the arch. Do NOT turn it off as it cools the grates.
- When adjusting during boiling, set the blower so the stack temperature is between 900°F and 1000°F.
DAILY SHUTDOWN

1. There are two factors influencing the shutdown of the evaporator; time and sap volume.
   a. It will require approximately 30 minutes to 1 hour from the last firing to bring the fire down to embers (coals on the grates) in a wood fired arch.
   b. It will require a volume of sap from the last firing to embers and to flood the arch so ensure there is adequate volume left prior to the last firing.

2. Continue to monitor the arch as done for normal operations.

3. When there is no more boil in either the flue or the syrup pans and the fire is down to coals on the grates (in a wood fired arch), add sap until the pans are at a depth of 2”. This is done by holding the float down or by adjusting the float handles and lowering it. If the sap remaining does not cover the pans to the 2” depth then add clean, unsoftened, non-chlorinated well or spring water until the depth is reached.

NOTE: The extra sap depth is required as the insulation of the arch (ex. bricks) will hold heat and continue the evaporation process until the heat has been dissipated.
MAINTENANCE

NOTE – prior to performing maintenance make sure the surfaces have been cooled.

DAILY
1. Remove spills and splashes from the pans by wiping with hot water.
2. Clean the grates
3. Check all fittings for leakage. Repair / replace as necessary.

PERIODIC
1. Using the supplied brush and rod, brush the underside of the flue pan to remove accumulated material. Cleaning will allow the heat to better reach the sap in the pan.
2. Inspect the rail gasket and pan gasket for areas where heat and smoke maybe escaping. Replace if necessary.
3. Clean out the ash chamber.

END OF SEASON
1. Discard the rail gasket and pan gasket.
2. Inspect all arch insulating materials (brick, insulating board, blanket). Replace if missing or damaged.
3. Clean the grates.
4. Raise the flue pan out of the arch and finish draining.
5. Thoroughly brush the soot from the flues of the flue pan.
6. Set 2X4s across the rail of the arch where the flue pan is usually placed then set the flue pan right side up on the 2X4s.
7. Set 2X4s across the rail of the arch where the syrup pan is usually placed then set the syrup pan right side up on the 2X4s.
8. Cover the pans and arch with plastic, a tarp or hoods.

BEGINNING OF SEASON STARTUP
1. Remove the cover and take the pans and 2X4s off from the arch.
2. Install a new rail gasket.
3. Place the pans on the arch and install a new pan gasket between the pans.
4. When filling the pans for the first time, check all fittings for leakage and repair if necessary.

FEEDBACK
Please use the following e-mail address (feedback@leaderevaporator.com) to suggest improvements or enter comments on this document. Reference the document title in your note. You may also contact LEADER Customer Service.

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