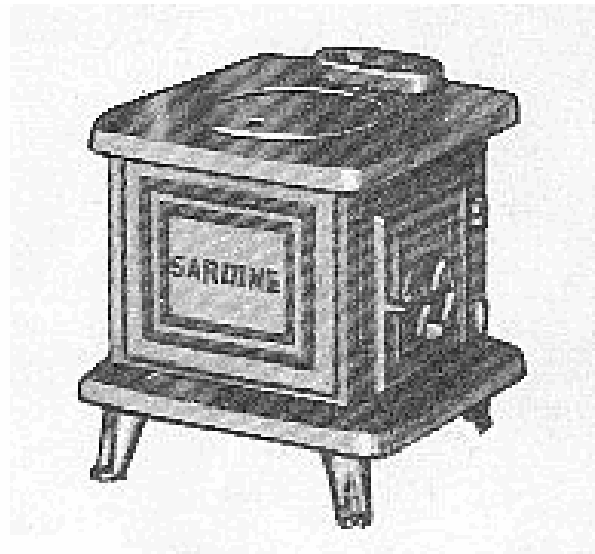


Navigator Stove Works, LLC.

www.marinestove.com



Model # NSW1. Marine Stove

Installation and Operating Instructions

SAFETY NOTICE: IF THIS SOLID FUEL MARINE STOVE IS NOT PROPERLY INSTALLED AND OPERATED, A BOAT OR HOUSE FIRE MAY RESULT. FOR YOUR SAFETY, FOLLOW THE INSTALLATION DIRECTIONS. CONTACT YOUR LOCAL COAST GUARD, MARINE SURVEYOR, BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN YOUR AREA.

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WARNING

DO NOT LEAVE THIS STOVE
UNATTENDED WHILE IN OPERATION

SAFE EFFICIENT OPERATION OF THIS
MARINE STOVE IS THE PRODUCT
OF TWO FACTORS:

A CAREFULLY TENDED FIRE AND
PROPER INSTALLATION

General Information

This owner's manual describes the installation and operation of Navigator's **Model # NSW1. Marine Stove** for wood. This marine stove may be installed within a boat or a land-based residence. As a result, there are **two sets of instructions** which detail the proper installation and operation for each application. Please follow the instructions which apply to you. **Do not** interchange installation requirements.

Codes and Regulations compiled from the following sources serve as the basis for the instructions contained in this document:

ABYC "A-7"	*1
NFPA "302"	*2
NFPA "211"	*3
40 CFR 60 - AAA	*4
CAN/CSA B365-M91	*5

(See Appendix for Details)

Navigator's Model #**NSW1**. Marine Stove has met the **U.S. EPA's emission standards for residential wood heaters sold after May 15, 2015 (crib wood standard)**.

Not approved for sale after May 15, 2020

It has also passed Washington State emission standard # WAC 150-31-200.

This stove has a particulate emission rating of **3.5 G/Hr. @ 86% Efficiency**.

This efficiency rating was determined as a result of testing based on EPA Test Method 28 / Sec.5.1 & Sec.5H / Cat.2 and CSA B415.1

Btu Rating of 11,400 – 19,400.

This wood heater needs periodic inspection and repair for proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this manual.

This wood heater has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instructions in this manual.

When installing, operating, and maintaining your **#NSW1**, follow the guidelines given in these instructions. Save these instructions and make them available to anyone using the stove.

A number of areas in the USA & Canada require a building permit to install a solid-fuel burning appliance. NFPA 211 (National Fire Prevention Association, Standard for chimneys, fireplaces, vents and solid-fuel

burning appliances) or CAN/CSA B-365 (Installation code for solid-fuel burning appliances & equip.) may apply to the installation of solid-fuel burning appliances in your area. Your stove dealer has knowledge of your local codes and can provide assistance in making sure your installation is safe and legal. Also contact your insurance representative, building inspector, marine surveyor, US & CDN Coast Guard, or local fire officials to determine what regulations apply in your area.

MARINE INSTALLATION

1. Possible Hazards to Avoid

Any use of fire in a boat represents a certain danger. With intense over firing, temperatures on the surface of the **#NSW1**. can exceed 1000° F. (536° C).

Comply with the following guidelines:

- Never install a **#NSW1**. in a boat that is powered by a gasoline engine.
- Never over fire the stove. If any part of the stove or chimney glows, you are over firing, and a boat fire or serious damage to the stove or chimney could result. Immediately close down the air controls if you notice this condition.
- Teach children that the stove is hot and must not be touched.
- Never use gasoline, or gasoline-type lantern fuel, kerosene, diesel, charcoal lighter fluid or similar liquids to start or “freshen up” a fire in the stove. They can ignite with explosive force, causing bodily injury or death. Keep all such liquids far away from the stove while it is in use.
- Never use the stove if there are combustible vapours in the boat. The vapours from certain cleaning fluids, adhesives, and polyurethane paints are a few examples of combustible vapours. Remember that operating a solid-fuel fired marine stove is a source of “open flame”.
- Keep combustible materials far away from the stove.
- A vent system or other means shall be provided to allow the discharge from the boat of hydrogen gas released by the battery. Battery boxes with a cover that forms a pocket over the battery shall be vented.
- Do not locate traditional marine oil lamps directly over the stove. Oil spillage onto a hot stove will cause a fire.
- Do not dry clothes over the stove, since they could fall and ignite.
- Fabrics located above and within 39” of the stove used for decorative or other purposes shall be flame resistant in accordance with NFPA 701, *Standard methods of fire tests for flame-resistant textiles & films*.
- To prevent injury, do not allow anyone to use this stove who is unfamiliar with the correct operation of the stove.

- Avoid creating a “Low Pressure” condition in the space where the stove is operating, such as by operating an exhaust fan. A low pressure condition could cause poisonous gasses to be drawn out of the stove and into the room. **Carbon monoxide (CO)** is toxic, so please follow the guidelines in this manual to avoid smoke “roll out” from the burn chamber. You can prevent a low pressure condition by providing adequate outside combustion air within 24 inches of the stove. Keep a port, hatch, or window open while operating the stove!

Install a smoke/carbon monoxide monitoring device in the space the stove is installed and in any and all adjacent cabins. Maintain the device as directed by the manufacturer.

- If for some reason smoke “rolls out” of the stove, it might activate a smoke alarm or carbon monoxide detector.
- To avoid smoke or flame spillage, open the air adjuster and the stove pipe damper before opening the door to fill the stove with fuel.
- Never operate the stove if it is damaged, missing parts, or has been modified in any way.
- Always use protective gloves when adding fuel to the fire.
- Do not operate the stove during severe storm conditions at sea. Stow cook surface cover plates, air adjuster and handles.

***Please note:** The attached CO data submitted in the stove certification application and the expected variations for different operation conditions from Min.Low Output to Max.High Output.

2. Installation

SAFETY NOTICE: IF THIS SOLID FUEL MARINE STOVE IS NOT PROPERLY INSTALLED AND OPERATED, A BOAT FIRE MAY RESULT. FOR YOUR SAFETY, FOLLOW THE INSTALLATION DIRECTIONS. CONTACT YOUR LOCAL COAST GUARD, MARINE SURVEYOR OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN YOUR AREA.

Please read this entire manual before you install and use your new stove. Failure to follow instructions may result in property damage, bodily injury, or even death.

We recommend that you have your #NSW1. Installed by a professional installer of solid-fuel marine stoves.

Remove Stove From Crate

When removing the stove, **Do not lift the stove by it's stainless steel "sea rail."** This part is only designed for keeping cook pots in place while at sea. Lift the stove free from the crate by grasping the outer-most edges of the cast iron top.

Carefully remove the cover plate, and cover plate handle from inside the foam packing.

Use a soft cloth or mat and "tip" the stove onto one of it's sides (an old piece of carpet works well to protect the porcelain). Watch the door as you do this!

Before you carefully right the stove, check to see that the four thru-bolt wing nuts are just "**hand tight**".

Under no circumstances should you tighten these fasteners with a wrench or pliers. This could cause one of the castings to fracture when the stove heats up.

Place the circular cover plate in its place on the cook surface.

Planning the Installation....

If you are considering installing a #NSW1. in a vessel which has had a previously installed stove hearth and/or chimney pipe, it is critical that you have the existing components inspected for safety.

Safe stove installation involves several aspects: (A) the chimney pipe / deck iron combination. (B) protecting combustible materials in the vicinity of the stove. (C) securing the stove. Each of these aspects is equally important for a safe and secure installation. Consult with a Marine Surveyor. If your craft is insured, please also check with your agent regarding installing a marine stove.

Efficient use of this stove will be assured by installing it in a location where its heat output will contribute the greatest impact to the space(s) requiring heat.

A. Chimney Pipe

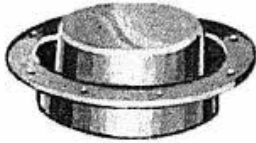
The chimney pipe should be of 4" Dia. stainless steel with a minimum thickness of 26 gauge. Secure sections of pipe together with three sheet metal screws per joint to insure that the sections will not separate.

Generally, chimney pipe sections must be attached to each other with the crimped end toward the stove. This allows any small amount of condensed creosote to run down toward the hot stove rather than onto the outside of the pipe. The pipe connection at the oval flange on the stove top should however go OVER the oval collar.

Single-wall smoke pipe and stacks shall have a **minimum clearance of 9 inches (23 cm.) from combustible materials including painted materials** or shall be separated by fire resistant thermal insulation that is acceptable to the authority having jurisdiction. *NFPA Standards #302 / 211*

Consult with a Marine Surveyor to determine the protection system best suited for your installation if you cannot maintain the minimum 9" clearance. This system will commonly consist of a layered panel, made from 20 Ga. sheet stainless and 5/8" mineral board, spaced 1" from the combustible surface to which it is attached.

***Exception: at decks equipped with a water iron. (NFPA 302, 6 - 3.3)**

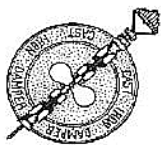


Water Deck Iron

Either a bronze or a cast iron "water deck iron" shall be used. This traditional fitting contains water in a trough which surrounds and cools the chimney pipe as it passes through the deck. Follow manufacturer's installation & operation instructions when installing this hardware. Keep the trough filled with water while operating the stove.

Permanent installations shall make use of double or triple wall stainless pipe or shall have a safety grille attached to the outside of single wall pipe which will eliminate accidental direct contact with hot piping. Double or triple-wall stove pipe meeting the requirements of UL 103, *Standard for Safety Factory-Built Chimneys for Residential Type and Building Heating Appliances*, shall be installed in accordance with the specifications of the manufacturer.

A flue damper shall be installed in the pipe roughly 30" above the cook surface of the stove. The damper is a critical component which will enable the user to control the stove's draft. **Do not install a #NSW1. without a damper.**



Flue Pipe Draft Damper

Do not use aluminum or galvanized pipe as chimney pipe. These materials cannot withstand the operating temperatures of a fire and can give off toxic fumes when heated. Round stove pipe must be hand formed to an oval shape which will then slide onto the stove's oval flue collar.

The connection between the 4" chimney pipe and the stove's oval flue collar should be sealed (from inside) with stove cement after the pipe is installed. Design the piping so that no more than a total of two 90 degree bends are utilized. Horizontal runs shall rise at 1/4 inch per foot.

Chimney piping may not be run through a closet, locker or other concealed space. Always connect this stove to a chimney and vent to the outside of the vessel. Install a Smoke Head which is designed to minimize water entry, spark emission and back draft. In very bad weather do not operate the stove. Safely

stow the smoke head and install a plug which will effectively seal the deck iron's opening in the event of the vessel overturning.



Smoke Head

Additionally, install a UL listed spark arrester if the smoke head you have chosen does not incorporate one into its design.

Do not position the deck iron / smoke head combination within 20" of deck mounted fuel refill fittings or fuel tank vents. Position the smoke head to minimize exhaust re-entry into the boat.

B. Clearances to Combustibles

Floor Protection....

The **#NSW1**. shall be mounted on a non-combustible base (preferably a composite panel of 20Ga. stainless steel and non-asbestos mineral board).

As well as being non-combustible, the base **must have a minimum R-Value (thermal resistance) of R2.**

For example, 1/2" of Thermafiber's K-FAC 19 has an R-Value of 1.28.

TO ORDER PLEASE CONTACT: Foundry Service @ 562-945-6511 / foundryservice.com / Speak with Dave or Blake.

A minimum clearance of **1"- 25mm** shall be maintained between the composite panel and the "decking" to which it shall be securely fastened. Mounting hardware which extends from the panel into combustibles may be used only at the lateral extremities of the panel. Mounting hardware must allow full ventilation of the air space between the "deck" and the composite panel.

The non-combustible base, or "deck protector panel", shall extend out from the sides and back of the stove to exactly **1"** from all adjacent vertical surfaces surrounding the stove. (i.e., walls, bulkheads, hull, cabinetry, furnishings which will normally be protected by an engineered protection system. See Diagram #3).

The "deck protector panel" shall extend out from the front of the stove a distance equal to the dimension of the underlying platform.

Floor protection shall also be used under the stove pipe and must extend 2” beyond either side of the pipe.

CAUTION: First install a non-combustible stove base and/or wall shielding to provide a safe underlayment for ceramic tile. Tile must not be used as the sole form of thermal protection due to its ability to conduct significant heat to combustible materials to which it may be directly attached. Ceramic tile shall be incorporated into a hearth design **only as a decorative surface treatment.**

Plastics, fiberglass reinforced plastics, wood, or paper products are combustible and must not be used.

Clearances to Adjacent Combustible Materials....

Three basic requirements determine the clearance values necessary for the stove’s installation. Failure to follow these requirements may result in property damage, bodily injury, or even death.

RULE 1. Exposed materials and finishes within **24” (61Cm)** of heat generating surfaces of the stove **shall have a “*flame spread index*” of not more than 75** as determined in accordance with NFPA 255, *Standard Method of Test of Surface Burning Characteristics of Building Materials*.

RULE 2. The sides, back, and front surfaces of the **#NSW1**. shall have a **minimum clearance of 9” (23Cm) from the exposed combustible materials and finishes which shall meet the requirements of RULE 1**, or shall be separated by an engineered protection system acceptable to the authority having jurisdiction. Engineered systems installed for the protection of combustible material shall reduce the temperature of such materials to 90°F (50°C) rise above ambient. System design shall be based on applicable heat transfer principles, taking into account the geometry of the system, the heat loss characteristics of the structure behind the combustible material, and the possible abnormal operating conditions of the heat-producing sources.

RULE 3. Minimum clearance to combustible ceilings or materials above the cook surface of the **#NSW1**. shall be **36” (92Cm)**, or shall be separated by an engineered protection system acceptable to the authority having jurisdiction. Engineered systems installed for the protection of combustible material shall reduce the temperature of such materials to 90°F (50°C) rise above ambient. System design shall be based on applicable heat transfer principles, taking into account the geometry of the system, the heat loss characteristics of the structure behind the combustible material, and the possible abnormal operating conditions of the heat producing sources.

Marine installations will normally require considerable heat-shielding due to the fact that most boatbuilding materials or finishes located within 9” of the sides and back of the stove WILL NOT HAVE the required rating of FSI 75 or less.

Common Bldg. Materials & Flame Spread Indices:

White Oak	100
Douglas Fir	83 - 100
Eastern White Pine	85
Southern Yellow Pine	130 - 195
Western Spruce	100
1/2" Exterior Douglas Fir Plywood	130- 150
3/4" Birch Plywood (veneer core)	114
1/2" Particleboard	156
1/4" Lauan Plywood	150
3/8" FRP (polyester & glass fiber)	200+

K FAC 19 Mineral Fiber Board **25**

Insulation material used as part of a clearance reduction system shall also have a thermal conductivity (**K-Value**) of **1.0 (Btu-in.) / (ft 2 -hr-°F) or less.** Insulation board shall be formed of noncombustible material.

Also see for further information:

http://hearth.com/articles/64_0_1_0_M1.html

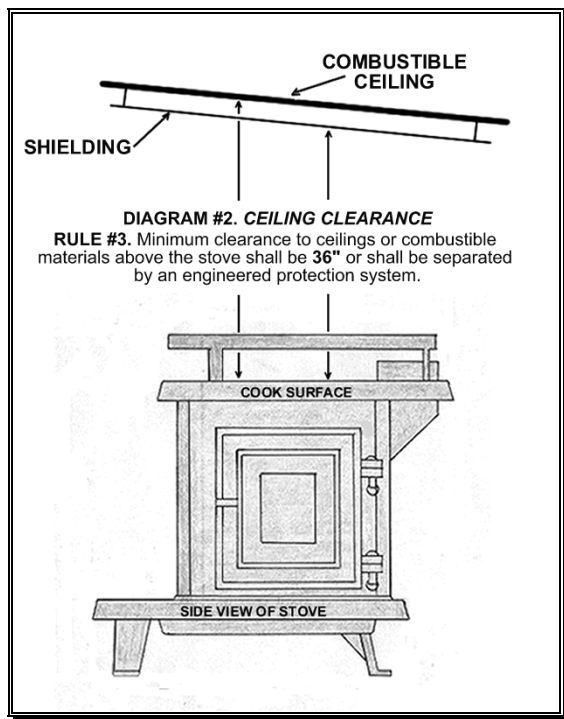
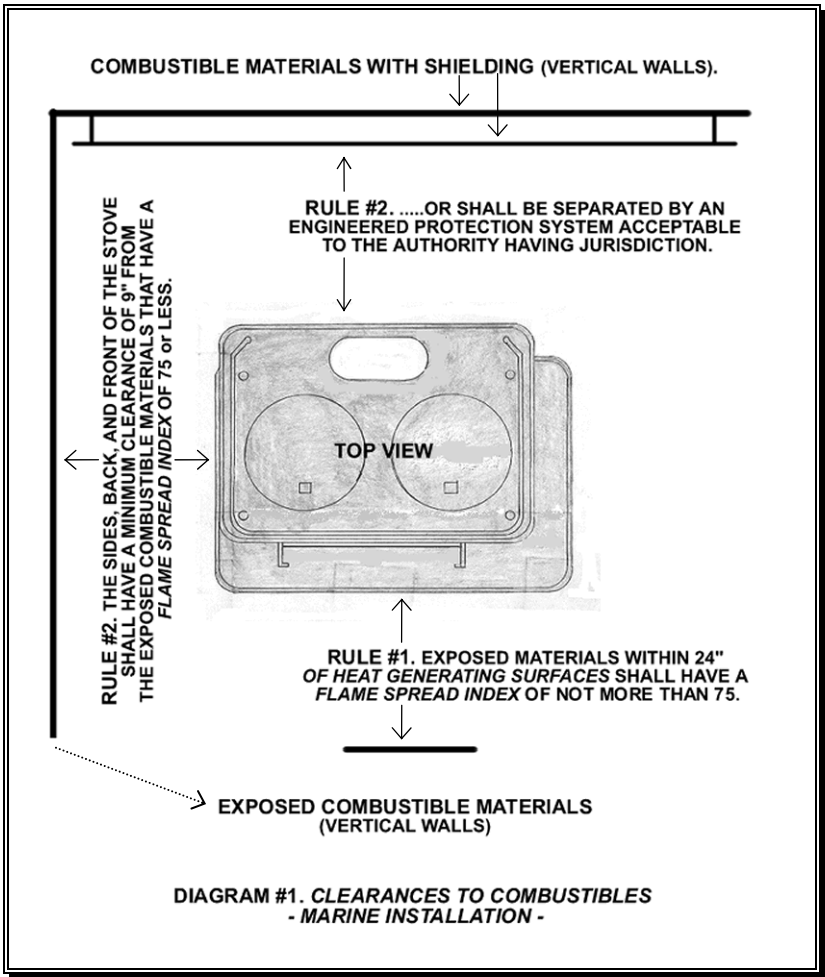
Please Remember....

A combustible is anything that can burn. In the case of stove installations, these materials **may not be plainly visible.** Consult your local fire officials if you are unsure about the combustible nature of a material in the vicinity of your planned stove installation. Fire resistant materials are difficult to ignite but they will burn!

Diagrams #1 & #2 give the required clearances that must be maintained from unprotected combustible materials or finishes.

Diagram #3 illustrates an example of an *engineered protection system* that would be used to shield combustible materials.

Consult with your local Marine Surveyor to determine suitable design parameters for your particular vessel



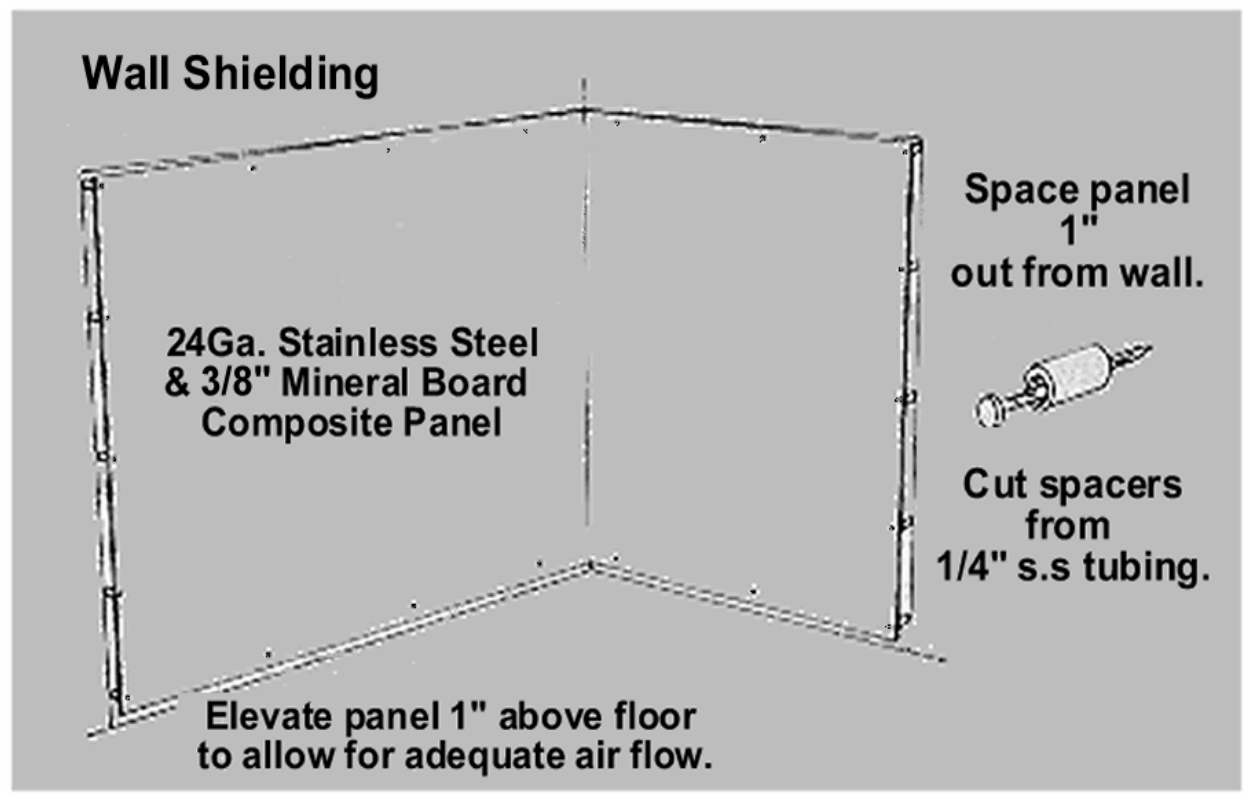


DIAGRAM #3.

Shield Construction Specifications:

- 1) Minimum space between shield and combustibles: 1" - 25 mm
- 2) Minimum clearance along the bottom of shield: 1" - 25 mm
- 3) Maximum clearance along the bottom of shield: 3" - 75 mm
- 4) Minimum clearance along the top of shield at ceiling: 3" - 75 mm
- 5) Edge clearance for ceiling shields: 3" - 75 mm
- 6) Adhesives used in shield construction must not ignite or lose adhesive qualities at temperatures likely to be encountered.
- 7) Mounting hardware must allow full vertical ventilation.
- 8) Mounting hardware must not be located closer than 200 mm (8 in.) from the vertical centre line of the appliance.
- 9) Mounting hardware which extends from the shield surface into combustibles may be used only at the lateral extremities of the shield.

NOTE: Workshops which fabricate stainless restaurant equipment are great (cost effective) sources for stainless shielding materials. Make plywood templates of the required shields and have your local supplier quote a price. Consider hiding the mineral board edges by bending-over the edges of the

metal by 3/4". Doing so will require minimal welding at each of the four corners which these shops are normally set up to do. Also, consider orienting the surface texture, or grain of the metal either all horizontal, or all vertical (if you care). This method of dealing with the shielding issue has yielded high quality results which would have been hard to match otherwise.

C. Securing the Stove....

The stove's legs have holes which shall allow you to safely anchor it in place. We suggest that you use #10 stainless steel bolts with oversize washers, lock washers, and all-metal locking nuts. **Do not use plain screws** as they might not hold the stove in place during a violent storm. Attach the stove to its base before installing the smoke piping. Carefully observe the required clearances to combustibles.

3. Operation.

Before building a fire in your new stove, please read the following section carefully.

Mount the supplied "Warning" plaque in the vicinity of the stove such that it is clearly visible while operating the stove.

Fill the depression centrally located in the bottom of the fire-box with 3/4" of coarse dry sand. This will protect the iron directly below the fire. Castable firebrick may be used as an alternative but adds unnecessary complexity to a simpler solution.

This stove is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air-dried seasoned hardwoods as compared to softwoods. The best way we have found to determine green from seasoned wood is to inspect the wood end grain cuts to see if shrinkage cracking is present. If so, the wood has lost a great percentage of it's original moisture content and should be adequate to burn. Any wood as such that will not readily burn when added to the fire and or exhibits "steaming" out the log end grain is not sufficiently dry for burning. To confirm that your firewood supply is adequately dry, the use of a moisture meter will greatly aid in this determination. Wood suitable for burning should be at a moisture content of **20% or Less**.

Please consult this or other thorough resources on the subject:

<https://www.youtube.com/watch?v=qGpxh9q665A>

<http://www.burndryfirewood.com>

WARNING. Do not burn:

- Garbage, Lawn Clippings or Yard Waste
- Painted or Unseasoned Wood
- Railroad Ties or Pressure Treated Wood
- Rubber or Plastics
- Plywood or Particleboard
- Paper / Cardboard (The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire.)
- Waste Petroleum Products / Solvents / Paint Thinner / Asphalt / Asbestos.
- Any synthetic fuel or logs that have not been approved for wood stoves.
- Saltwater Driftwood or other previously saltwater saturated materials
- Manure or Animal Remains

Burning any of the above may result in the release of toxic fumes or render the heater ineffective and cause smoke.

Never use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid, or similar liquids to start or "freshen up" a fire in this heater.

Keep all such liquids far away from the heater while it is in use.

Wood Storage.

When storing wood, it should be covered and stored off the ground to protect it from the elements. Make certain that the wood-pile has good air circulation through it in order to promote drying to aid in the seasoning process.

To obtain the best performance from your stove, we recommend using seasoned hardwood that has been dried and stored under cover for at least one year. Burning unseasoned or wet wood causes the rapid development of creosote and reduces the heat value of the wood being burned.

Creosote and Soot Formation and the Need for Removal.

When wood is burned slowly, it produces tar and other organic vapors which combine with expelled moisture to form creosote. These creosote vapors condense in the relatively cool chimney flue of a slow burning fire. The creosote that accumulates in the flue is highly flammable and is the fuel of chimney fires. **To prevent a chimney fire, the creosote needs to be removed by sweeping the chimney and flue connector. The frequency of sweeping will depend on how you operate your stove, but it is important to inspect the flue after every two weeks of use. An accumulation of 1/4" or more on the sides of the flue or connector is considered hazardous and should be removed.**

In the event that creosote in your chimney ignites, the resulting fire is often accompanied by a roaring noise and a crackling sound as flakes of burned creosote break loose. If you suspect you are having a chimney fire, immediately close the draft damper and sliding air control, making sure the

stove door is closed. Call the “fire department” and get everyone safely out of the boat.

Trying to extinguish the fire in the stove will not help. In fact it can make the matter worse by allowing oxygen through the door, which then supports the fire in the chimney. When the roaring and crackling has stopped, you should resist the temptation to open the door and look at the fire. The fire may have suffocated, but could rekindle when you open the door. After a chimney fire, do not use your stove until the chimney and the flue connector has been cleaned and inspected to ensure that no damage has been sustained.

Breaking in Your Stove

A cast iron stove should be "broken in" gradually. Five consecutive small fires must be built in the stove prior to operating the stove continuously. Each fire should be a little larger than the previous one, and the last fire should be a full-sized load. Allow the stove to cool completely between fires.

Controls

The door latch for the side-loading door is conveniently located to the left of the door's center. To open the door, firmly raise the latch and pull the door toward you. To shut the door, raise the latch, push the door closed, and lower the latch. Make sure the door catch is securely engaged.

Air Controls

1. The “dial type” air control is located on the stove’s fuel feed door.

Turning the control **CW** closes the air control and decreases the heat output; turning it **CCW** opens the control and increases the heat output.

Turn the dial to the maximum open position when first starting or reviving a fire, or when maximum heat is required.

2. The stove pipe draft damper shall be located approximately 30” above the stove top in the chimney pipe. **Do not install a #NSW1. without a draft damper.**

Turning the handle parallel to the pipe increases the stove’s draft and turning it perpendicular decreases the draft. **Always fully open the damper when starting or before refueling a fire.**

You will determine the best settings for your particular needs as you gain experience with your stove.

Building a Fire

A good fire will efficiently utilize your fuel keep emissions and creosote to an absolute minimum, require less work, and be very predictable. Make sure the air control is fully open. Open the front door and cover the bottom of the stove with tightly crumpled newspaper. Criss-cross a generous double handful of dry kindling, ideally such as split pieces of scrap cedar or alder on

top of the paper. If you don't have scrap cedar or alder, split some of your best dry, lighter weight wood down to finger-sized pieces and use that. Then, place three or four 1" - 2" split pieces of dry wood on top of the kindling. Light the paper evenly across the door opening. Continue to add 1" - 2" pieces of split dry wood until a healthy bed of glowing coals has formed. You can now add three or four small-to-medium pieces of wood. Allow this wood to burn for several minutes. Once you are sure the wood is burning well, adjust the air controls to your desired heat output level.

If the fire dies out, the cause is most likely an insufficient bed of coals, reducing the air supply too soon, or using wood that is either too large or not dry enough.

HOT WHILE IN OPERATION. KEEP CHILDREN, CLOTHING, AND FURNITURE AWAY. DO NOT STORE FUEL WITHIN THE CLEARANCES LISTED PREVIOUSLY.

Reloading

Reload the stove while it is still hot and there are plenty of hot coals to ignite the fresh fuel load. It is a good idea to include a smaller piece or two of wood at the base of the new load to help the stove recover more quickly to its operating temperature.

Reloading Procedure

- Always wear gloves when tending the stove.
- Turn the air control counter clockwise to the full open position.
- Open the pipe damper to the full open position.
- Wait a few seconds and open the door.
- Use a stove shovel or similar tool to break up any remaining charcoal.
- Load the fuel (smaller pieces first).
- Close the door.
- Wait 5 minutes and adjust the air controls to desired setting.

Note: If the charcoal bed present at reloading time is relatively deep (1"-2") and your wood is well seasoned, it is possible to add the fresh fuel load, close the door and reset the air control for the desired heat output within 5 minutes.

Monitoring & Inspection

It is important that you ensure that your stove is operating as designed. When running properly, after a fire has been established, there should be little visible smoke exiting the chimney cap. With a small stove such as this, it is wise to ensure hourly that all is well with fuel load and burn rate. If any abnormal operation is observed, correct its cause before adding more fuel.

Ash Removal

Ash removal will be required every few days during normal operation, and is most easily done when the fire has burned down and out. Remove ash if it has accumulated to 1".

Use a shovel to move any hot coals first to one side. Shovel out the exposed ash, and push or rake the hot coal to the other side. Be careful to not remove the sand which is in the bottom of the trough. Remove the ash from the second side as well, and then spread the hot coals evenly across the firebox. Wood may now be added to start a new fire.

When removing ash from a stove that is in operation, close and latch the door before taking the ashes outside for safe disposal. It is always a good idea to wear heavy protective gloves while removing and disposing of the ashes from your stove.

Ashes should be placed in a **metal** container used exclusively for ashes, with a tight fitting lid. The closed container of ashes should be placed outdoors, well away from all combustible materials, pending final disposal. The ashes should be kept in the closed container until all cinders have thoroughly cooled.

OVERFIRING WILL RESULT IF THE STOVE IS OPERATED WITH THE DOOR OPEN AND THE PIPE DAMPER IN THE FULLY OPEN POSITION. DO NOT OVER FIRE THIS STOVE.

Attempts to achieve heat output rates that exceed stove design specifications can result in permanent damage to the stove or lead to a boat fire. Over firing will necessarily void the stove warranty.

WARNING:

OPERATE THE #NSW1 ONLY WITH THE DOOR FULLY CLOSED. KEEP THE DOOR FULLY CLOSED EXCEPT WHEN LOADING FUEL OR REMOVING ASHES. A PARTIALLY OPEN DOOR MAY ALSO RESULT IN OVERFIRING.

Draft is the force which moves air from the appliance up through the chimney system. The amount of draft in your chimney depends on the length x diameter of the chimney, local geography, weather, nearby obstructions and other factors. Too much draft may cause excessive temperature in the appliance. Inadequate draft may cause back puffing into the room. "Plugging" of the chimney will certainly cause inadequate draft. Inadequate or negative draft will cause the appliance to leak smoke back into the room through the appliance and chimney connector joints. An uncontrollable burn or excessive temperature indicates excessive draft. You as the operator have the responsibility to maintain an even draft through the stove as it is being operated.

4. Maintenance

General

Clean the stove's porcelain surface with a soft cloth and soap to remove any accumulations of dirt. **Do not use any abrasive cleansers or aggressive scrubbing pads that might scratch the porcelain.** Clean the stove when it is cool to the touch.

Or, apply as necessary, black stove polish to a plain iron stove to keep it rust free. By polishing your stove just prior to a period of non-use, you will decrease the chances of your stove rusting while you're away! **An aluminum foil covered top surface will protect a plain iron finish when cooking!!**

Also, make sure that water will not find its way down the chimney pipe. Remove the smoke head and cap the deck iron. Water sitting in the sand trough will rust the bottom of the stove.

Check periodically to see that there is enough sand in the trough and fill to 3/4" if necessary.

At least once a year, perform a routine maintenance check. A good time to do this is when you are cleaning the chimney and smoke head. You should clean the chimney pipe whenever accumulations of soot and **creosote reach 1/4"** thick, which may be several times a year, depending on how the stove is operated.

1. Thoroughly clean the entire stove. Brush all ash and soot out of the stove. It is better to brush out the ash and soot than to vacuum it out because soot particles are small enough to pass through most vacuum bags. Keep a small wire brush handy to remove any accumulated soot off of the inside of the door.
2. In a dark room, use a strong light to inspect the stove inside and out for cracks or leaks at corners and joints. Cracked parts should be replaced.
3. When necessary, adjust the machine screw which attaches the air adjuster disc to the door. Tightening the friction nut slightly will assure that the disc stays in the position desired for a specific heat output.

WARNING:

IF THIS SOLID FUEL STOVE IS NOT PROPERLY MAINTAINED, A CHIMNEY FIRE MAY RESULT. FOR YOUR SAFETY, FOLLOW THE MAINTENANCE DIRECTIONS AND CLEAN YOUR CHIMNEY FREQUENTLY.

Appendix

*1 ABYC "A-7"

American Boat & Yacht Council Inc.

"A-7" Liquid and Solid Fuel Boat Heating Systems.

*2 NFPA "302"

National Fire Prevention Association

302, Fire Protection Standard for
Pleasure and Commercial Motor Craft 1998 Edition.

*3 NFPA "211"

National Fire Prevention Association

211, Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances 2000
Edition.

*4 40 CFR 60 - Subpart AAA

Code of Federal Regulations (USA)

Title 40, Volume 6, Part 60 Revised as of July 1, 1999

Standards of Performance for New Residential Wood Heaters.

*5 CAN/CSA B365-M91

Canadian Standards Association Installation Code for Solid Fuel Burning Appliances.

RESIDENTIAL INSTALLATION

SAFETY NOTICE: IF THIS SOLID FUEL STOVE IS NOT PROPERLY INSTALLED AND OPERATED, A HOUSE FIRE MAY RESULT. FOR YOUR SAFETY, FOLLOW THE INSTALLATION DIRECTIONS. CONTACT YOUR LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN YOUR AREA.

5. Possible Hazards to Avoid

Any use of fire in a home represents a certain danger. With intense overfiring, temperatures on the surface of the **#NSW1**. can exceed 1000° F. (536° C).

Comply with the following guidelines:

- The **#NSW1** shall not be installed in alcoves or enclosed spaces less than 512 cubic feet. The space or room shall be of ample size to allow adequate circulation of heated air. The stove shall be so located as not to interfere with the proper circulation of air within the heated space.
- The **#NSW1** shall not be installed in any location where gasoline or any other flammable vapors or gases are likely to be present. Do not install in any residential garage.
- Never overfire the stove. If any part of the stove or chimney glows, you are overfiring, and a house fire or serious damage to the stove or chimney could result. Immediately close down the air controls if you notice this condition.
- Keep combustible materials far away from the stove.
- Never use gasoline, or gasoline-type lantern fuel, kerosene, diesel, charcoal lighter fluid or similar liquids to start or “freshen up” a fire in the stove. They can ignite with explosive force, causing bodily injury or death. Keep all such liquids far away from the stove while it is in use.
- Never use the stove if there are combustible gases in the home. The fumes from certain cleaning fluids, adhesives, and polyurethane paints are a few examples of combustible gasses. Remember that operating a solid-fuel fired stove is a source of “open flame”.
- Teach children that the stove is hot and must not be touched.
- Do not dry clothes over the stove, since they could fall and ignite.
- To prevent injury, do not allow anyone to use this stove who is unfamiliar with the correct operation of the stove.

- Avoid creating a “Low Pressure” condition in the room where the stove is operating, such as by operating an exhaust fan. A low pressure condition could cause poisonous gasses to be drawn out of the stove and into the room. **Carbon monoxide (CO)** is toxic, so please follow the guidelines in this manual to avoid smoke “roll out” from the burn chamber. You can prevent a low pressure condition by providing adequate outside combustion air within 24 inches of the stove.

Install a smoke/carbon monoxide monitoring device in the room the stove is installed and in any and all adjacent bedrooms. Maintain the device as directed by the manufacturer.

- If for some reason smoke “rolls out” of the stove, it might activate a smoke alarm or carbon monoxide detector.
- To avoid smoke or flame spillage, open the air adjuster and the stove pipe damper before opening the door to fill the stove with fuel.
- Never operate the stove if it is damaged, missing parts, or has been modified in any way.
- Always use protective gloves when adding fuel to the fire.

***Please note:** The attached CO data submitted in the stove certification application and the expected variations for different operation conditions from Min.Low Output to Max.High Output.

6. Installation

SAFETY NOTICE: IF THIS SOLID FUEL STOVE IS NOT PROPERLY INSTALLED AND OPERATED, A HOUSE FIRE MAY RESULT. FOR YOUR SAFETY, FOLLOW THE INSTALLATION DIRECTIONS. CONTACT YOUR LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN YOUR AREA.

Please read this entire manual before you install and use your new stove. Failure to follow instructions may result in property damage, bodily injury, or even death.

We recommend that you have your #NSW1. installed by a professional installer of solid-fuel room heaters.

Remove Stove From Crate

When removing the stove, **Do not lift the stove by it's stainless steel "sea rail"** if supplied/ordered.

This part is only designed for keeping cook pots in place while at sea. Lift the stove free from the crate by grasping the outer-most edges of its cast iron top.

Carefully remove the cover plate and cover plate handles from the foam packing.

Before you install the stove, check to see that the four thru-bolt wing nuts are just **"hand tight"**.

Under no circumstances should you tighten these fasteners with a wrench or pliers. This could cause one of the castings to fracture when the stove heats up.

Place the circular cover plate in its place on the cook surface.

Planning the Installation.

If you are considering installing **NSW1**. within a home which has a previously installed stove hearth and/or chimney pipe, it is critical that you have the existing components inspected for safety. Safe stove installation involves several aspects: (A) The chimney connector, (B) the chimney itself, (C) the connection between the chimney and chimney connector, (D) Protecting combustible materials in the vicinity of the stove. Each of these aspects is equally important for a safe and secure installation. Consult with a licensed stove installer if you have any questions or concerns.

Efficient use of this stove will be assured by installing it in a location where its heat output will contribute the greatest impact to the space(s) requiring heat.

NOTE:

Clearance values measured in Inches are for US installations and in Centimeters for Canadian installations. *These measurements may not be equivalent as required minimum clearances are different for each country.*

A. Chimney Connector (stove pipe).

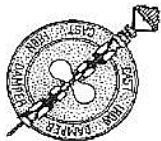
Always connect this stove to a chimney and vent to the outside of the house.

The chimney pipe should be of 4" Dia. black or stainless steel with a minimum thickness of 26 gauge.

Secure sections of pipe together with three sheet metal screws per joint to insure that the sections will not separate.

Chimney pipe sections must be attached to each other with the crimped end toward the stove. This allows any small amounts of condensed creosote to run toward the hot stove rather than onto the outside of the pipe. NOTE: At the stove to pipe connection, the pipe is hand formed to fit **OVER the stove's cast collar.**

Single-wall chimney connector shall have a **minimum clearance of 18 inches (45cm.) from combustible materials**. Clearances from connectors to combustible material shall be permitted to be reduced, provided the combustible material is protected by an engineered protection system acceptable to the authority having jurisdiction, by the use of materials or products listed for protection purposes, or in accordance with NFPA Standard # 211 Table 6-5.1.2 and Figure 6-5.1.1 chimney or vent connectors. A flue damper shall be installed in the pipe at least 30" above the cook surface of the stove. The damper is a critical component which will enable the user to control the stove's draft. **Do not install a #NSW1. without a damper.** Additionally, very tall chimneys may require a draft balancing regulator.



Flue Pipe Draft Damper

Do not use aluminum or galvanized pipe as chimney pipe. These materials cannot withstand the operating temperatures of a fire and can give off toxic fumes when heated.

Round stove pipe must be hand formed to an oval shape which will then slide over the stove's oval flue collar.

The connection between the 4" chimney pipe and the stove's oval flue collar shall be sealed (from inside) with stove cement.

Design the piping so that no more than a total of two 90 degree bends are utilized. Horizontal runs shall rise at 1/4 inch per foot.

The connector shall be as short and straight as practicable and the stove shall be located as close as practicable to the chimney or vent.

The horizontal length of the connector to a natural draft chimney serving the stove shall be not more than 75 percent of the height of the vertical portion of the chimney or vent above the connector.

Do not use chimney connector pipe as a chimney.

No part of the chimney connector may pass through an attic or roof space, closet or other concealed space, or through a floor or ceiling. Whenever possible, avoid passing the chimney connector through a combustible wall.

Install a Smoke Head which is designed to minimize water entry, spark emission and back draft.



Smoke Head

Additionally, install a UL listed spark arrester if the smoke head you have chosen does not incorporate one into its design.

Wall Pass-Throughs

When your installation unavoidably requires that the chimney connector pass through a combustible wall to reach the chimney, extreme care must be taken. In the US, the National Fire Prevention Association's publication NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel Burning Appliances*, four methods for passing through a combustible wall are outlined in detail. In Canada, refer to CAN / CSA B356. Before beginning the installation, contact local building officials to make sure the proposed pass-through method meets local building code requirements.

A commonly used method to pass through a wall directly to a masonry chimney requires the removal of all combustible material from at least 12" around the entire chimney connector. The space is then filled with at least 12" of brick around a fireclay liner. Be sure to locate it so that the top of the chimney connector will be at least 18" below the ceiling. To construct the brick pass-through, you will need an opening of 28" x 28" minimum. It will be necessary to cut wall studs, install headers, and construct a sill frame to maintain proper dimensions to hold the weight of the brick. Minimum 3-1/2" thick solid bricks are to be used. The fireclay liner (ASTM C315 or equivalent), minimum 5/8" wall thickness, must not penetrate into the chimney beyond the inner surface of the chimney flue liner and must be firmly cemented in place. If it is necessary to cut a hole in the chimney liner, use extreme care to keep it from shattering. Refractory mortar must be used at the junction of the chimney liner. Another approved method of installation uses a section of listed solid fuel insulated factory-built chimney as a pass-through for the chimney connector. The chimney section must have an inside diameter which is 2" larger than the chimney connector, have a minimum length of 12" and must have at least 1" of insulation thickness. The chimney section is installed with at least 2" of air space between the outer chimney wall and adjacent combustible materials.

Sheet steel support plates are used on both ends of the chimney section to keep the connector centered. The opening around the chimney section is closed on both sides of the wall with sheet steel plates and the chimney section is securely fastened to the plates. Fasteners used to support the chimney section should never penetrate the inner flue liner.

Consult NFPA-211 for other approved wall pass-through methods.

B. Chimneys

There are two types of chimneys suitable for the **#NSW1**. An approved masonry chimney, or a listed residential-type building heating appliance chimney.

When selecting a chimney type and the location for the chimney in the house, please remember that it is the chimney that makes the stove work, not the stove that makes the chimney work. This is because a chimney creates suction, or draft, which pulls air through the stove.

Several factors affect draft: the height, cross-sectional area, and temperature of the chimney, as well as the proximity of surrounding trees or buildings.

In general, a short masonry chimney on the exterior of the house will give the poorest performance. This is because it can be very difficult to warm up, and in extremely cold Northern areas it may not function properly at all. A tall masonry chimney inside the house is easier to keep warm and will work best.

These guidelines give the necessary chimney requirements based on the US national code NFPA-211. However, many local codes differ from the national code to take into account climate, altitude, or other factors. It is important that you check with your local building officials to find out what codes apply in your area before constructing a chimney.

Masonry Chimneys

The minimum requirements for a properly constructed chimney include the following:

- **The cross-sectional area of the chimney shall be no more than three times the cross-sectional area of the chimney connector.**
- Masonry chimneys shall be supported on properly designed foundations of masonry or reinforced Portland or refractory cement concrete or on noncombustible material having a fire resistance rating of not less than 3 hours, provided such supports are independent of the building construction and the load is transferred to the ground.
 - The masonry wall of the chimney, if brick or modular block, must be a minimum of 4" nominal thickness. A natural "rubble" stone wall must be at least 12" thick.
- The chimney must have a fireclay flue liner (or equivalent) with a minimum thickness of 5/8" and must be installed with refractory mortar. There must be at least 1/2" air space between the flue liner and the chimney wall.
- Square fireclay flue liners should be a minimum of 4" x 4" but not be larger

than 6" x 6". If round fireclay liners are used, the inside diameter should be not larger than 6".

If an existing chimney with larger tiles is used it should be relined with an appropriately sized liner.

- No other appliance shall be vented into the same chimney which serves the **#NSW1**.
- An airtight cleanout door shall be located at the base of the chimney.
- A chimney inside the house must have at least 2" of clearance to the combustible structure. A chimney outside the house must have at least 1 " clearance to the combustible structure.
- **Firestopping.** All spaces between chimneys and the floors and ceilings through which the chimneys pass shall remain fully open but shall be firestopped with noncombustible material. The firestopping of spaces between chimneys and wood joists, beams, or headers shall be of galvanized steel not less than 26 gauge [0.019 in. (0.483 mm)] thick or of noncombustible sheet material not more than 1 /2 in. (12.7 mm) thick.

Remember that there must be an air space around the chimney, and that insulation must be located 2 or more inches from the chimney

- A chimney, whether masonry or prefabricated metal must be the required height above the roof or other obstruction for safety and for proper draft operation. The requirement is that the chimney must be at least 3' higher than the highest point where it passes through the roof and at least 2' higher than the highest part of the roof or structure that is within 10' of the chimney, measured horizontally.

Chimneys shorter than 14' may not provide adequate draft. This could result in smoke spilling into the room from the door or joints in the stove or pipe. In addition, inadequate draft can cause backpuffing. Excessive draft, on the other hand, can cause excessive stove temperatures and can shorten burn times. Excessive drafts can be corrected by having your dealer install a barometric damper set at 0.1" of water column. If you suspect you have a draft problem, consult your dealer.

Listed Metal Prefabricated Chimneys

The heater must be connected to a listed Type HT per UL 103 or ULC S629 prefabricated chimney. When a metal prefabricated chimney is used, the manufacturer's installation instructions must be followed precisely. You must also purchase (from the same manufacturer) and install the ceiling support package or wall pass through, the "T" section package, the firestops (when needed), the insulation shield, the roof flashing, the chimney cap, etc. Maintain the proper clearance to the structure as recommended by the manufacturer. This clearance is usually a minimum of 2", although it may vary by manufacturer or for certain components.

There are **two methods** of metal chimney installation. One method is to install the chimney inside the residence, passing the piping through the ceiling and the roof.

The second method is to install an exterior chimney that runs up the outside of the building.

C. Connection to the Chimney

Masonry Chimneys

When connecting to a masonry chimney, the chimney connector must slide completely inside the chimney thimble (or breach) to the inner surface of flue liner. However, make sure that the connector does not protrude past the inside of the flue liner as this will cause problems with your chimney system due to a reduction in draft. The chimney connector should be sealed into the thimble with refractory cement and the connector should also be mechanically fastened to the chimney.

Prefabricated Chimneys

Always follow the chimney manufacturer's instructions and use all the components required by the manufacturer. Do not take shortcuts or use make shift methods for securing the chimney connector to the chimney.

D. Clearances to Combustibles

Floor Protection....

One of the following four methods shall be utilized when installing the **#NSW1**:

1. A floor protector **Listed** by a recognized testing laboratory which is installed in accordance with its installation instructions shall be permitted to be employed on floors of combustible construction.

SEE: www.hearthclassics.com, Thermashield Type Hearth.

2. The **#NSW1** may be placed on floors of combustible construction, provided the floor under the stove shall be protected with one course of hollow masonry units not less than 4 in. (102 mm) in thickness. The masonry units shall be laid with ends unsealed and joints matched in such a way as to provide a free circulation of air through the core spaces of the masonry. The top surface of the masonry shall be covered with sheet metal not less than 24gauge [0.024 in. (0.61 mm)].

The floor protection shall extend not less than 18" (457 mm) beyond the stove on all sides.

The **#NSW1** shall be permitted to be placed without floor protection in any of the following two manners:

3. On concrete bases adequately supported on compacted soil, crushed rock, or gravel.

4. On concrete slabs or masonry arches that do not have combustible materials attached to the underside.

The concrete bases, slabs or masonry arches shall extend not less than 18”(457 mm) beyond the stove on all sides.

Floor protection shall also be used under the stove pipe and must extend 2” beyond either side of the pipe.

CAUTION: First install a non-combustible stove base and/or wall shielding to provide a safe under-layment for ceramic tile. Tile must not be used as the sole form of thermal protection due to its ability to conduct significant heat to combustible materials to which it may be directly attached. Ceramic tile shall be incorporated into a hearth design **only as a decorative surface treatment.**

Clearances to Adjacent Combustible Materials - Residential Installations.

Failure to follow these requirements may result in property damage, bodily injury, or even death.

The #NSW1. shall be installed so that its use cannot create a hazard to persons or property. Clearances from combustible materials shall be not less than specified in **Rules 1 & 2.**

RULE 1. The sides, back, and front surfaces of the #NSW1. shall have a **minimum clearance of 36” (120Cm) to combustible materials.**

RULE 2. Minimum clearance to combustible ceilings or materials above the cook surface of the #NSW1. shall be **36” (150Cm).**

Diagrams #1 & #2 give the required clearances that must be maintained from unprotected combustible materials or finishes.

Clearances shall be permitted to be reduced if the combustible material is protected as described in NFPA 211, Table 9-6.2.1 Reduction of Appliance Clearance with Specified Forms of Protection and in Figures 9-6.2.1(a) through (d) or CSA Standard B365-1991, Table 4, Page 27.

After reduction, clearances shall be not less than **12 in.(41Cm)** to combustible walls and not less than **18 in. (76Cm)** to combustible ceilings.

Refer to Diagram #3 for specifications regarding one method of protecting combustible materials.

Insulation material used as part of a clearance reduction system shall have a thermal conductivity of **1.0 (Btu-in.) / (ft 2 -hr-°F) or less**. Insulation board shall be formed of noncombustible material. TO ORDER Thermafiber's **K-FAC 19**, PLEASE CONTACT: Foundry Service @ 562-945-6511 / foundryservice.com / Speak with Dave or Blake.

Please Remember.

A combustible is anything that can burn. In the case of stove installations, these materials may not be plainly visible. Consult your local fire officials if you are unsure about the combustible nature of a material in the vicinity of your planned stove installation. Fire resistant materials are difficult to ignite but they will burn!

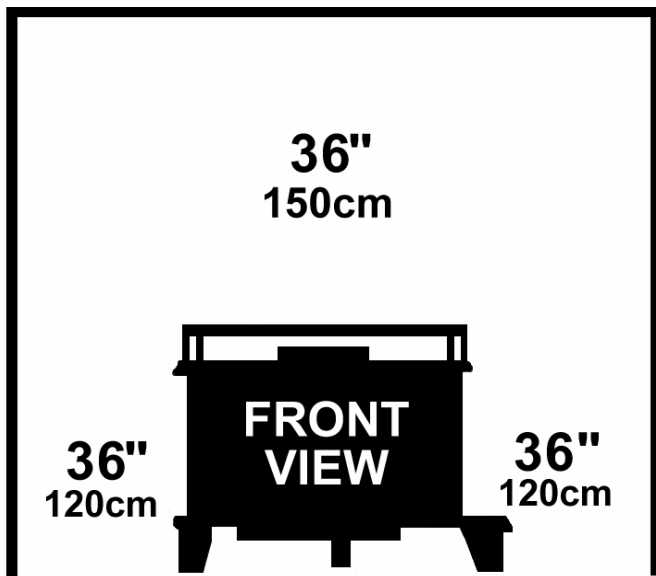


Diagram #1

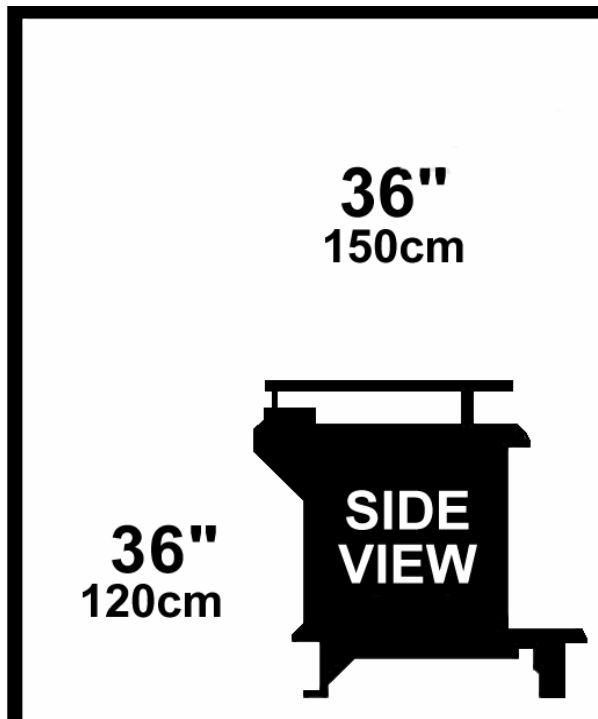


Diagram #2

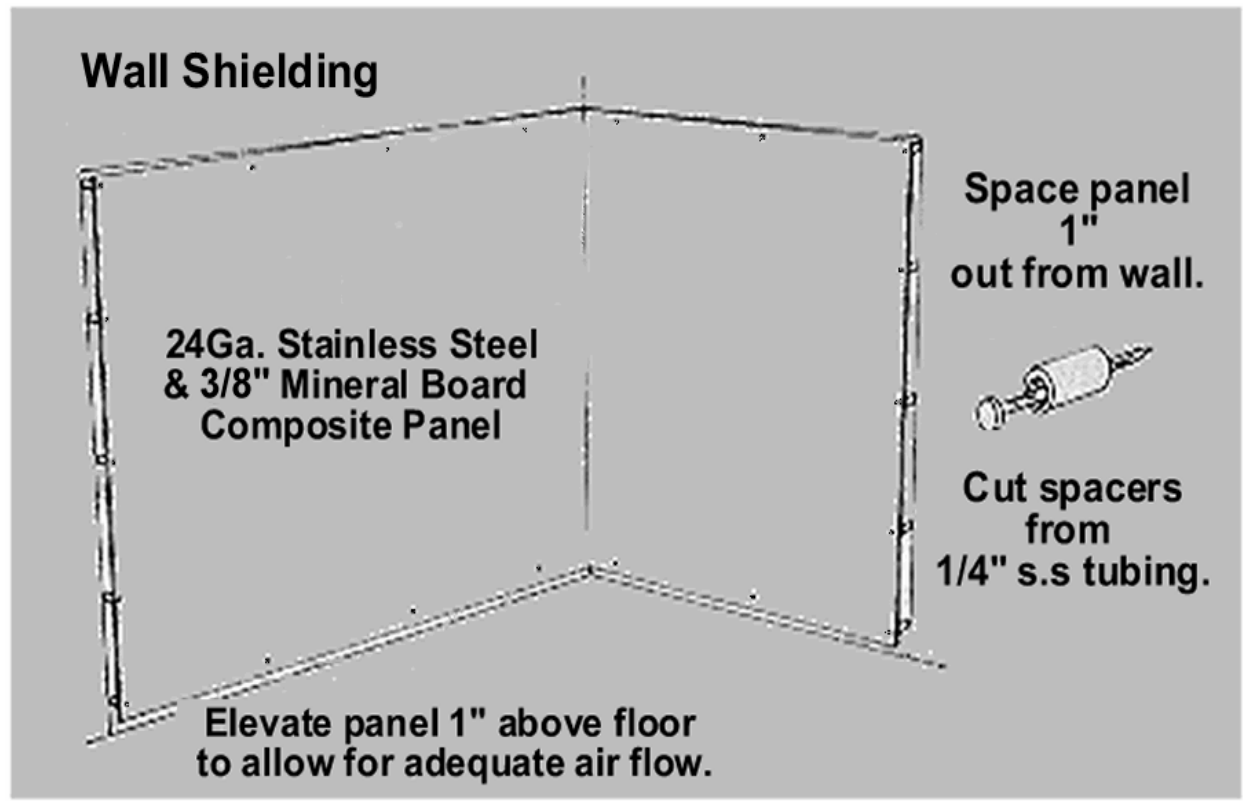


DIAGRAM #3.

Shield Construction Specifications:

-
- 1) Minimum space between shield and combustibles: 1" - 25 mm
 - 2) Minimum clearance along the bottom of shield: 1" - 25 mm
 - 3) Maximum clearance along the bottom of shield: 3" - 75 mm
 - 4) Minimum clearance along the top of shield at ceiling: 3" - 75 mm
 - 5) Edge clearance for ceiling shields: 3" - 75 mm
 - 6) Adhesives used in shield construction must not ignite or lose adhesive qualities at temperatures likely to be encountered.
 - 7) Mounting hardware must allow full vertical ventilation.
 - 8) Mounting hardware must not be located closer than 200 mm (8 in.) from the vertical centre line of the appliance.
-

9) Mounting hardware which extends from the shield surface into combustibles may be used only at the lateral extremities of the shield.

NOTE: *Workshops which fabricate stainless restaurant equipment are great (cost effective) sources for stainless shielding materials. Make plywood templates of the required shields and have your local supplier quote a price. Consider hiding the mineral board edges by bending-over the edges of the metal by 3/4". Doing so will require NO welding at each of the four corner. Also, consider orienting the surface texture, or grain of the metal either all horizontal, or all vertical (if you care). This method of dealing with the shielding issue has yielded high quality results which would have been hard to match otherwise.*

Securing the Stove....

The stove's legs have holes which shall allow you to safely anchor it in place. We suggest that you use #10" stainless steel bolts with oversize washers, lock washers, and all-metal locking nuts. Attach the stove to its base before installing the smoke piping. Carefully observe the required clearances to combustibles.

7. Operation.

Before building a fire in your new stove, please read the following section carefully.

Mount the supplied "Warning" plaque in the vicinity of the stove such that it is clearly visible while operating the stove.

Fill the depression centrally located in the bottom of the fire-box with 3/4" of coarse dry sand. This will protect the iron directly below the fire. Castable firebrick may be used as an alternative but adds unnecessary complexity to a simpler solution.

This stove is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air-dried seasoned hardwoods as compared to softwoods. The best way we have found to determine green from seasoned wood is to inspect the wood end grain cuts to see if shrinkage cracking is present. If so, the wood has lost a great percentage of its original moisture content and should be adequate to burn. Any wood as such that will not readily burn when added to the fire and or exhibits "steaming" out the log end grain is not sufficiently dry for burning. To confirm that your firewood supply is adequately dry, the use of a moisture meter will greatly aid in this determination. Wood suitable for burning should be at a moisture content of **20% or Less**.

Please consult this or other thorough resources on the subject:

<https://www.youtube.com/watch?v=qGpxh9q665A>

<http://www.burndryfirewood.com>

WARNING. Do not burn:

- Garbage, Lawn Clippings or Yard Waste
- Painted or Unseasoned Wood
- Railroad Ties or Pressure Treated Wood
- Rubber or Plastics
- Plywood or Particleboard
- Paper / Cardboard (The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire.)
- Waste Petroleum Products / Solvents / Paint Thinner / Asphalt / Asbestos.
- Any synthetic fuel or logs that have not been approved for wood stoves.
- Saltwater Driftwood or other previously saltwater saturated materials
- Manure or Animal Remains

Burning any of the above may result in the release of toxic fumes or render the heater ineffective and cause smoke.

Never use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid, or similar liquids to start or "freshen up" a fire in this heater.

Keep all such liquids far away from the heater while it is in use.

Wood Storage.

When storing wood, it should be covered and stored off the ground to protect it from the elements. Make certain that the wood-pile has good air circulation through it in order to promote drying to aid in the seasoning process.

To obtain the best performance from your stove, we recommend using seasoned hardwood that has been dried and stored under cover for at least

one year. Burning unseasoned or wet wood causes the rapid development of creosote and reduces the heat value of the wood being burned.

Creosote and Soot Formation and the Need for Removal.

When wood is burned slowly, it produces tar and other organic vapors which combine with expelled moisture to form creosote. These creosote vapors condense in the relatively cool chimney flue of a slow burning fire. The creosote that accumulates in the flue is highly flammable and is the fuel of chimney fires. **To prevent a chimney fire, the creosote needs to be removed by sweeping the chimney and flue connector. The frequency of sweeping will depend on how you operate your stove, but it is important to inspect the flue after every two weeks of use. An accumulation of 1/4" or more on the sides of the flue or connector is considered hazardous and should be removed.**

In the event that creosote in your chimney ignites, the resulting fire is often accompanied by a roaring noise and a crackling sound as flakes of burned creosote break loose. If you suspect you are having a chimney fire, immediately close the draft damper and sliding air control, making sure the stove door is closed. Call the "fire department" and get everyone safely out of the house.

Trying to extinguish the fire in the stove will not help. In fact it can make the matter worse by allowing oxygen through the door, which then supports the fire in the chimney. When the roaring and crackling has stopped, you should resist the temptation to open the door and look at the fire. The fire may have suffocated, but could rekindle when you open the door. After a chimney fire, do not use your stove until the chimney and the flue connector has been cleaned and inspected to ensure that no damage has been sustained.

Breaking in Your Stove

A cast iron stove should be "broken in" gradually. Five consecutive small fires must be built in the stove prior to operating the stove continuously. Each fire should be a little larger than the previous one, and the last fire should be a full-sized load. Allow the stove to cool completely between fires.

Controls

The door latch for the side-loading door is conveniently located to the left of the door's center. To open the door, firmly raise the latch and pull the door toward you. To shut the door, raise the latch, push the door closed, and lower the latch. Make sure the door catch is securely engaged.

Air Controls

1. The "dial type" air control is located on the stove's fuel feed door.

Turning the control **CW** closes the air control and decreases the heat output; turning it **CCW** opens the control and increases the heat output.

Turn the dial to the maximum open position when first starting or reviving a

fire, or when maximum heat is required.

2. The stove pipe draft damper shall be located 30" above the stove top in the chimney pipe. Do not install a #NSW1. without a draft damper.

Turning the handle parallel to the pipe increases the stove's draft and turning it perpendicular decreases the draft. **Always fully open the damper when starting or before refueling a fire.**

You will determine the best settings for your particular needs as you gain experience with your stove.

Building a Fire

A good fire will efficiently utilize your fuel keep emissions and creosote to an absolute minimum, require less work, and be very predictable. Make sure the air control is fully open. Open the front door and cover the bottom of the stove with tightly crumpled newspaper. Criss-cross a generous double handful of dry kindling, ideally such as split pieces of scrap cedar or alder on top of the paper. If you don't have scrap cedar or alder, split some of your best dry, lighter weight wood down to finger-sized pieces and use that. Then, place three or four 1" - 2" split pieces of dry wood on top of the kindling. Light the paper evenly across the door opening. Continue to add 1" - 2" pieces of split dry wood until a healthy bed of glowing coals has formed. You can now add three or four small-to-medium pieces of wood. Allow this wood to burn for several minutes. Once you are sure the wood is burning well, adjust the air controls to your desired heat output level.

If the fire dies out, the cause is most likely an insufficient bed of coals, reducing the air supply too soon, or using wood that is either too large or not dry enough.

HOT WHILE IN OPERATION. KEEP CHILDREN, CLOTHING, AND FURNITURE AWAY. DO NOT STORE FUEL WITHIN THE CLEARANCES LISTED PREVIOUSLY.

Reloading

Reload the stove while it is still hot and there are plenty of hot coals to ignite the fresh fuel load. It is a good idea to include a smaller piece or two of wood at the base of the new load to help the stove recover more quickly to its operating temperature.

Reloading Procedure

- Always wear gloves when tending the stove.
- Turn the air control counter clockwise to the full open position.
- Open the pipe damper to the full open position.
- Wait a few seconds and open the door.
- Use a stove shovel or similar tool to break up any remaining charcoal.

- Load the fuel (smaller pieces first).
- Close the door.
- Wait 5 minutes and adjust the air controls to desired setting.

Note: If the charcoal bed present at reloading time is relatively deep (1"-2") and your wood is well seasoned, it is possible to add the fresh fuel load, close the door and reset the air control for the desired heat output within 5 minutes.

Monitoring & Inspection

It is important that you ensure that your stove is operating as designed. When running properly, after a fire has been established, there should be little visible smoke exiting the chimney cap. With a small stove such as this, it is wise to ensure hourly that all is well with fuel load and burn rate. If any abnormal operation is observed, correct its cause before adding more fuel.

Ash Removal

Ash removal will be required every few days during normal operation, and is most easily done when the fire has burned down and out. Remove ash if it has accumulated to 1".

Use a shovel to move any hot coals first to one side. Shovel out the exposed ash, and push or rake the hot coal to the other side. Be careful to not remove the sand which is in the bottom of the trough. Remove the ash from the second side as well, and then spread the hot coals evenly across the firebox. Wood may now be added to start a new fire.

When removing ash from a stove that is in operation, close and latch the door before taking the ashes outside for safe disposal. It is always a good idea to wear heavy protective gloves while removing and disposing of the ashes from your stove.

Ashes should be placed in a **metal** container used exclusively for ashes, with a tight fitting lid. The closed container of ashes should be placed outdoors, well away from all combustible materials, pending final disposal. The ashes should be kept in the closed container until all cinders have thoroughly cooled.

OVERFIRING WILL RESULT IF THE STOVE IS OPERATED WITH THE DOOR OPEN AND THE PIPE DAMPER IN THE FULLY OPEN POSITION. DO NOT OVER FIRE THIS STOVE.

Attempts to achieve heat output rates that exceed stove design specifications can result in permanent damage to the stove or lead to a house fire. Over firing will necessarily void the stove warranty.

WARNING:

OPERATE THE #NSW1 ONLY WITH THE DOOR FULLY CLOSED. KEEP THE DOOR FULLY CLOSED EXCEPT WHEN LOADING FUEL OR REMOVING ASHES. A PARTIALLY OPEN DOOR MAY ALSO RESULT IN OVERFIRING.

Draft is the force which moves air from the appliance up through the chimney system. The amount of draft in your chimney depends on the length x diameter of the chimney, local geography & weather, nearby obstructions and other factors. Too much draft may cause excessive temperature in the appliance. Inadequate draft may cause back puffing into the room. "Plugging" of the chimney will certainly cause inadequate draft. Inadequate or negative draft will cause the appliance to leak smoke back into the room through the appliance and chimney connector joints. An uncontrollable burn or excessive temperature indicates excessive draft. You as the operator have the responsibility to maintain an even draft through the stove as it is being operated.

8. Maintenance

General

Clean the stove's porcelain surface with a soft cloth and soap to remove any accumulations of dirt. **Do not use any abrasive cleansers or aggressive scrubbing pads that might scratch the porcelain.** Clean the stove when it is cool to the touch. Or, apply as necessary, black stove polish to a plain iron stove to keep it rust free. By polishing your stove just prior to a period of non-use, you will decrease the chances of your stove rusting while you're away!

Also, make sure that water will not find its way down the chimney pipe. Remove the smoke head and cap the deck iron. Water sitting in the sand trough will rust the bottom of the stove.

Check periodically to see that there is enough sand in the trough and fill to 3/4" if necessary.

At least once a year, perform a routine maintenance check. A good time to do this is when you are cleaning the chimney and smoke head. You should clean the chimney pipe whenever accumulations of soot and **creosote reach 1/4"** thick, which may be several times a year, depending on how the stove is operated.

1. Thoroughly clean the entire stove. Brush all ash and soot out of the stove. It is better to brush out the ash and soot than to vacuum it out because soot particles are small enough to pass through most vacuum bags. Keep a small wire brush handy to remove any accumulated soot off of the inside of the door.

2. In a dark room, use a strong light to inspect the stove inside and out for cracks or leaks at corners and joints. Cracked parts should be replaced.

Limited Warranty

Navigator Stove Works, LLC. warrants, to the original retail purchaser, that this Model # NSW1 will be free of defects in material and workmanship for a period of FIVE YEARS from the date of purchase on the terms and conditions set forth herein will repair or replace, at its sole option, any part or stove found to be defective. The customer must, at his/her own expense, arrange to deliver or ship the stove or part to NSW and arrange for pickup or delivery of the stove or part after the repairs have been made. If upon inspection, the damage is found to be the fault of the manufacturer the repair or replacement will be made. Any # NSW1 or part thereof that is repaired or replaced during the limited warranty period will be warranted for a period to not exceed the remaining term of the original limited warranty or six (6) months, which ever is longer. This warranty is not transferable and is extended only to, and is solely for the benefit of, the original retail purchaser of the stove. Please retain your dated sales receipt in your records as proof of purchase.

NOTE: The warranties are void if the stove is used to burn materials for which the stove is not certified by the US EPA and void if the stove is not operated according to the owner's manual.

Exclusions & Limitations

This warranty does not cover the following:

Damage due to external causes, not attributable to manufacture or material defect.

Repair or replacements of parts which are subject to normal wear and tear during the warranty period or to parts that may require replacement in connection with normal maintenance.

Damage due to incorrect installations not in conformity with installation instructions, local Coast Guard regulations, ABYC recommendations, NFPA Regulations, EPA Regulations.

Damage due to overfiring; causing any part to glow red. Overfiring can be identified by warped plates, or by bubbling, cracking and discoloration of the enamel finish.

Damage caused by unauthorized modification, use or repair.

Damage made while the stove is in transit is not covered by this warranty but is subject to claim against the common carrier (do not operate the stove as this may negate the ability to process the claim with the carrier)

NSW offers no warranty on chipping of enamel surfaces.

Inspect your Stove prior to accepting it from shipper for any damage to the enamel.

IN NO EVENT SHALL Navigator Stove Works, Inc. BE LIABLE FOR SPECIAL INCIDENTAL OR CONSEQUENTIAL DAMAGES. ALL IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE, ARE LIMITED IN DURATION TO THE LENGTH OF THIS WRITTEN WARRANTY. NO ORAL OR OTHER WRITTEN WARRANTY IS ENFORCEABLE.

If you believe that your stove is defective, you should contact NSW, who will process a warranty claim. This warranty is given by Navigator Stove Works, LLC. 509 Double Hill Road, Eastsound WA. 98245

360 566 2418 / marinest@marinestove.com

The customer agrees that Navigator Stove Works, LLC. will not be liable for any consequential and/or incidental damages arising from any cause associated with the goods or services purchased from Navigator Stove Works, Inc.