



STOVES ON BOATS

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From the time of Henry the Eighth and before, special stoves / heaters have been designed and used on boats.

There is a re constructed example of the one used on the Mary Rose at the Portsmouth Historic Dockyard in the museum dedicated to the Flagship.

The stove manufacturers Esse have a stove museum which has further examples of cookers used on the great trans-Atlantic Ocean liners with many advanced design features, because of the fact that the Esse cookers were used on liners, the low flue height problems, discussed later, did not exist.

For those who visit the beautiful Isle of White there is a superb example of a very expensive, high quality, 1920's yacht stove in a pub called the Spy Glass Inn at the western end of the promenade in Ventnor.

The Spy Glass was originally conceived by Mr. Neil Gibbs who is now a major shareholder in a very successful chain of nautical themed gastro pubs at Arreton Manner, Sandown and Newport.

Mr. Gibbs also owned a variety of vessels including a Gaff Rigged Cutter and a lovely 1930's racing yacht and he also collected early boat stoves, hence the one on show in the pub.

The Spy Glass stove is wonderful and incorporates special integrated design features necessary for marine use.

Currently we are receiving a few enquiries regarding CE marking and the new 2022 Domestic Regulations and as a consequence here are our thoughts on the matter.

The first problem is that in general CE tests are carried out on a flue height of around 4.5metres minimum height which under normal conditions can't be achieved on a boat.

There is no CE regulation covering the testing of stoves specifically designed for marine use only.

(Marine use generally means on a typical boat flue which is normally about 2 meters tall and typically 4 or 5ins diameter.)

Almost all stoves fitted on boats are not designed for installation on flue vacuums attainable on a 2 meter high flue and if there were to be an incident, manufacturers would refer any complainant to this fact.

HETAS regulations for the installation of domestic stoves state that the flue diameter should be at least equal to the appliance outlet adaptor, there are hundreds of stoves with 5” flue outlet diameters that are fitted with 4 inch twin wall flue systems currently on boats that have been fitted within the last five years in contravention of this HETAS regulation.

There are quite a few differences between stoves designed for houses and stoves designed for boats mainly this is how we see it:-

STOVES DESIGNED FOR USE IN BOATS which can move. (TYPICAL CHIMNEY HEIGHT 2 METRES)

STOVES DESIGNED FOR USE IN HOUSES which don't move. (TYP CHIMNEY HEIGHT 4.5 METRES MIN)

CRITERIA USED IN OUR MARINE SPECIFIC STOVE DESIGNS:-

1. Must operate on a typical boat flue of min 2 meters in height.
2. Must not allow smoke to spill out through the open re-fueling door whilst the appliance is being re-fueled.
3. Must be so designed as to stop ash and hot coals falling out when refueling or opening the fuel loading door.
4. Must be capable of all night burning minimum of 10 hours. (Solid smokeless fuel.)
5. Must be provided with a means of securely fastening the appliance down.
6. Must have any internal baffle plates securely fastened so as to prevent flue blockage when impacting lock gates etc.
7. Must have integral rear heat shield or shields made from heat resisting stainless steel.
8. Must have a door lock capable of withstanding engine vibrations.
9. Must have substantial ash pan capacity to hold at least 24 hrs. continuous burning.
10. Must have integral fiddle rail option where stove top cooking is possible.

11. Must be provided with an appliance specific, full marine fitting instructions written by the manufacturer.
12. Must have a full and safe twin wall chimney system available with marine fitting instructions provided and following normal protocol where flue minimum diameter is equal to appliance manufacturers stated flue outlet diameter, i.e. 5" flue outlet = 5" flue system.
14. Must be provided with an optional and safe means of twin wall chimney transition through a typical boat roof construction with a means of maintaining safe distance from combustibles where flue passes through combustible boat roof lining.
15. Appliance manufacturer must be able to supply purpose made chimney terminal to minimize the effect of cross winds on typical short flue.

NOTES ON CE MARKING.

Do not be under the impression that CE marking is the ultimate **GOLD SAFETY STANDARD**

It tests emissions, efficiency, output and a sundry other items but it does not test the **material thickness** that appliances are manufactured from.

This is left to a declaration of material and process conformity (form no DE1) signed by the manufacturer.

(We know of at least one case where an appliance was CE marked BY AN APPROVED TEST HOUSE when it did not comply.

When challenged, the test house declared that they did not have to test material thickness and confirmed to us that all they needed was a declaration of material and process conformity signed by the manufacturer.

SO WHERE DOES THIS LEAVE US?

The quick answer is in a bit of a mess.

Firstly the chimney height available to a boat builder would not comply with the manufacturers fitting instruction supplied with every stove.

This would then mean that the appliance is not installed in line with the stove manufacturer's instruction.

Non Compliance with manufacturers fitting instructions would then nullify the manufacturer's warranty on the basis that the appliance is not fitted correctly.

Secondly, a situation where the stove could spill smoke into the boat when the front door of the stove was opened during the refueling operation.

Thirdly, the stove might not stay in for longer unattended periods because the short chimney could not provide enough constant steady vacuum to draw adequate combustion air through the appliance leading to a situation where incomplete combustion could occur, creating the possibility of **carbon monoxide production** which could then effect other boat users in the immediate vicinity creating the requirement for additional monoxide alarms to be fitted in all sleeping areas which we believe has just been implemented by BSS.

2022 DOMESTIC STOVE REQUIREMENTS.

In an attempt to reduce air pollution the new regulations will come into force Jan 1 2022.

This will mean that stove manufacturers will have to make sure that their products can comply with the new reduced levels of particulate emissions.

The key to reducing particulate emissions is to burn them off during the course of high temperature combustion.

To achieve this most manufacturers are lining combustion chambers with a material known as vermiculite boarding which acts as a substantial insulator so keeping the heat in the combustion chamber thus promoting the high temperature combustion required to burn off most of the damaging particulates.

Unfortunately, as with all well intended legislation there are problems.

High temperature combustion of wood requires constant attention and if the combustion chamber temperature falls below the desired temperature, when the stove is refilled with a fresh charge of wood, particulate emissions return in the form of smoke.

So the cycle starts again, the stove has to come up to high temperature and then the emissions fall and when the stove is ready for its next re fueling the same thing happens on an inevitable repetitive cycle.

The correct way to run the stove is to make sure that the refueling does not kill the high temperature which means a little and often, probably every half hour or so which is achievable in the laboratory conditions of a test house, but almost never available in the real world, this then possess the following issues :-

If I want to leave my new 2022 stove and go out for a few hours, how can I ensure that it is still in when I return? Well you could turn it down but then it would just smolder for 4 hours and annoy neighbors and still emit loads and loads of particulates.

Everything is hunky-dory, I have the stove up to high temperature combustion but the boat is way too hot and it's going to cost me a fortune in wood and by the way, after 2022 you will only be allowed to burn wood supplied by an approved supplier, to the correct moisture content which will be lower than the current recommendation of 20% maximum.

My 2022 compliant stove was only tested on a 15 foot tall flue and it doesn't seem to draw too well on my 6 foot boat chimney (which will have to be of twin wall construction) and undoubtedly smoke back when I open the re fueling door.

Incidentally if the flue outlet on my 2022 stove is 5ins diameter then under HETAS regulations I will have to fit a 5ins bore twin wall chimney, otherwise it will be illegal.

Note that the flue must be 5ins throughout its whole length, some current and popular boat flue systems do not comply with this requirement.

If the appliance is manufactured with a 4ins flue outlet then a 4ins bore twin wall flue system can be used.

So to keep the stove in for a long period of time it looks like I will have to bow to the inevitable and burn an approved smokeless fuel.

In which case what are the new regulations about?

Answer is mainly those who want to burn wood of the correct moisture content and have the time and way with all to run the stove correctly.

If you don't want to burn wood then it is unlikely that a 2022 stove would make any difference to emissions but it will increase the cost of a new stove.

Most boat owners allow their stoves to slumber on smokeless fuels!

FURTHER COMPLICATIONS

BS8511:2010

Code of Practice for the installation of solid fuel heating and cooking appliances in small craft states that:-

“Any stove tested and approved to the current CE test no 13240:2001/AS: 2004 would be suitable for installation in a boat.”

This statement effectively means that you could safely install a 20 kW stove into your boat, on a 2 meter flue and bearing in mind that the manufacturer of such a stove would call for an 7ins dia flue which when twin walled would equal 9ins OUTSIDE diameter!

*Doesn't make much sense but it's in **BS8511:2010**.*

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