

Explanatory Notes for the draft AALS code "Gas Firing for Small Models".

With the assistance of Brian Carter and Allan Wallace, a proposed code for gas firing of small models has been compiled which incorporates much of the information received from previous requests as well as from documents published by the UK Model Power Boats association and the G1 MRA. Some information has also been obtained from the online 16mm gauge forum.

In the course of sifting all this data it became apparent that the code should be restricted to butane containers (ie not mixed gases) and that commercial suppliers would be exempted as they would have their own systems in place to ensure safe gas containers.

The important factor in determining the pressure that the gas container needed to withstand, is determined by the potential temperature of the container. The UK documents used a temperature based on BS5355, a standard that applies to all forms of gas containers, including oxygen, LPG, acetylene etc. The temperatures to be applied varied depending on which part of the world you were in. The temperatures applying to Australia were very high indeed.

As the small containers we were considering are quite different to commercial cylinders in use and application, we went back to basics to determine the temperature. As a result of various tests supported by mathematical modelling of the heat inflows and outflows from the container, it was considered that 50C was an adequate temperature.

Given that all pressure vessels have a factor of safety, hydrostatic testing to twice working pressure would be applied, as common on AMBSC boilers.

This factor of safety can also be applied to the butane container. Thus on one hand we believe that in normal operation 50C will not normally be exceeded, but should an abnormal situation occur, the twice working pressure safety factor would cover a temperature rise to about 80C.

The adoption of 50C then allows the pressures to align with that for the AMBSC Code Part 3 for Medium Pressure Boilers, and accordingly that document is referenced for structural aspects of the gas container. Aligning the stress requirements with this code is sensible, promotes a general knowledge of acceptability that comes from working to a common document and eliminates potentially multiple standards. The only variance to this is the permissible use of brass, and the authorisation for 20 x 1.2 extruded brass section to be used, both items not usually permitted as part of an AMBSC pressure vessel.

As users need to be aware of the temperature issue there are some words in the Code about this. It is also noted that the disposable canisters used for filling our models, also have a 50C maximum.

Finally, the records that need to be kept are kept as simple as possible. It is proposed that sheets will be able to be downloaded from the AALS website, so no need for bound books, etc. Hopefully this will promote computerised records.

The code is intended for watercraft as well as garden gauge locomotives, however input from watercraft users in this area has been a bit light on. Accordingly some generalised safety precautions have been included, but any additional input would be appreciated.

Comments on this draft have already been provided by those who responded to the initial request for information. To those who have contributed, many thanks.

Please respond with comments by 30 November 2015. This is to permit me to do any final updates and then publish a final version for proposal and hopefully adoption by clubs at the next AALS AGM at Easter 2016.

Comments can be emailed to me please. wallison@pnc.com.au

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