

# National Woodheater Audit Program

## Action Plan



**Australian Government**

**Department of the  
Environment and Heritage**



**Department of  
Environment and  
Conservation (NSW)**



**Department of  
Environment**



**Government  
of South Australia**



**Tasmania**

**DEPARTMENT of  
PRIMARY INDUSTRIES,  
WATER, and ENVIRONMENT**



**AUSTRALIAN  
HOME HEATING  
ASSOCIATION INC.**

## **Introduction**

Along with motor vehicles, woodheaters are a major contributor to particle pollution in Australia. In some regions, woodheaters can contribute as much as 85% of the atmospheric particle pollution during the cooler months, and can lead to the National Ambient Air Quality standard for particles being regularly exceeded. Woodheater emissions are also a significant source of many air toxics, including benzene, formaldehyde and polynuclear aromatic hydrocarbons.

Current strategies to manage woodsmoke pollution in most States and Territories are principally based on regulations which require that woodheaters for sale are certified to comply with the Australian/ New Zealand Standard for woodheater emissions (AS/NZS 4013). This Standard specifies a maximum allowable particle emissions of 4g per kilogram of wood burnt, under controlled test conditions. The Standard also stipulates that models tested must comply with (a) design drawings submitted by the manufacturer and (b) specified labelling requirements.

However, there are doubts that the emissions performance of woodheaters available for retail purchase actually comply with the Standard, as testing for certification purposes is conducted on a prototype model rather than a mass-produced model. To address this issue, woodheaters are routinely audited in many states in the US but, until recently, audits have not been conducted in Australia.

Purchased woodheaters may not perform in accordance with their certification because woodheater models sold may differ from the models tested in the laboratory, either as a result of poor quality assurance/quality control, or manufacturers not being cognisant of the requirements of certification. For example, woodheaters may be modified from their design drawings to achieve longer burn times between refuelling. This would have adverse implications for air quality. The discrepancy between certified and actual performance would also create uncertainty in the calculation of woodsmoke emissions inventories and, consequently, the development of air quality management plans.

With the above issues in mind, the Australian Government, along with NSW, Victoria, WA and Tasmanian governments developed a program to audit the most popular woodheater models available in Australia – the National Woodheater Audit Program. The program was implemented by the Australian Home Heating Association, on behalf of the Australian Government and participating States. Results from the Program demonstrated that the degree of non-compliance, in terms of emissions performance, engineering design specifications and labelling requirements, is significant and needs to be addressed by industry. The importance of these results has been recognised by governments, the Australian Home Heating Association and individual manufacturers.

This action plan, which addresses the key findings of the National Woodheater Audit Program, is a joint initiative of the Australian, NSW, Victorian, South Australian, Western Australian and Tasmanian governments, and the Australian Home Heating Association.

## **Program design**

12 models representing four popular models available from NSW, three from Victoria, two from Tasmania, and one each from ACT, Queensland and WA, were selected for particulate emissions and efficiency testing. These models were also tested for design specifications (eg air inlet dimensions, construction materials) against manufacturers' drawings that were submitted when initially certified, and for labelling compliance.

Woodheaters representing the above 12 models were purchased from retailers, at their premises, by Australian Home Heating Association (AHHA) staff. To ensure impartiality, environment protection agency officers from relevant jurisdictions accompanied AHHA staff to retailers' premises and supervised the random selection of woodheaters.

A further 35 models were assessed for design specifications and labelling compliance alone – emissions testing was not conducted on these models. Again, relevant environment protection agency officers supervised the random selection of retail models to be assessed.

## **Program objectives**

Overall, the program sought to:

- deliver a better understanding of the true emissions performance of woodheaters available for retail sale;
- establish design parameters for a low-cost audit procedure if it could be demonstrated that engineering design compliance equates with emissions performance compliance; and
- determine the root cause in cases of non-compliance – QA/QC shortcomings or deliberate tampering with appliance settings (air flow etc).

## **Major findings**

Results from the Program showed that the extent of non-compliance was significant:

- 58% (7 out of 12) of woodheaters failed to meet AS/NZ 4013 particle emission limits;
- 55% (26 out of 47) of woodheaters had one or more serious design faults that could affect performance; and
- 72% (34 out of 47) of woodheaters had one or more labelling faults that could affect emissions performance.

The presence of engineering design faults was a good indicator of emissions compliance:

- 100% (7 out of 7) of woodheaters that failed to comply with AS/NZ 4013 emission limits had one or more serious design faults; and
- 20% (1 out of 5) of woodheaters that complied with AS/NZ 4013 emission limits had one or more serious design faults.

The most common engineering design fault associated with emissions and engineering design non-compliance was primary air inlets that were smaller than originally specified in design drawings at the minimum air settings. This has the effect of reducing air flow within the woodheater, which leads to the firewood smouldering and generating more particle emissions.

The above results indicate that the degree of non-compliance, in terms of emissions performance, engineering design specifications and labelling requirements, is significant and needs to be addressed by manufacturers.

## **Key Issues**

The audit program revealed a number of shortcomings in manufacturing and certification procedures for woodheaters. The principal issues arising from the Program's findings are:

- Certification procedures require improvement to ensure that certified models truly comply with stated specifications
  - Testing procedures need to be amended to ensure that modifications made to prototypes during testing are incorporated into production models;
- Certification procedures need to be clearly documented to ensure that manufacturers understand their responsibilities regarding certification;
- Manufacturers need to improve QA/QC procedures;
- A follow-up audit program is needed to fully assess compliance across the woodheating industry and to determine the effectiveness of manufacturers' actions to rectify identified non-compliances;
- Action is required to address stocks of non-compliant woodheaters that have already been sold and installed in homes; and
- The Australian Standard for the design and construction of woodheaters needs to be amended to include anti-tampering provisions.

## **Agreed Actions**

Government and industry both recognise that the degree of non-compliance found in the audit program is serious, and that concerted action is required to ensure future compliance of woodheaters with the Australian Standard. The following actions have been agreed by Government and the Australian Home Heating Association to address the major issues arising from the Audit Program report:

### AS/NZS 4013 certification test procedures

- Future certification will involve a two-stage process, comprising of a complete AS/NZS 4013 test on a prototype, followed by design specification/labelling test on a factory warehouse model.
- Certification is only to be granted after the factory warehouse model passes the design specification/labelling test.

### Certification process documentation

- The certification process will be comprehensively documented to identify procedures that manufacturers need to follow before certification can be granted. The documentation will incorporate the new certification procedures, as outlined above.

### Follow-up audit program

- A voluntary follow-up audit program will be conducted to audit all certified models over two years. This program will be jointly administered by the Australian Government (on behalf of participating jurisdictions) and the AHHA.
  - Non-AHHA affiliated manufacturers will be requested to participate in the audit program.
  - States and Territories may conduct mandatory audits to assess compliance against regulatory requirements, particularly in cases where manufacturers are unwilling to participate voluntarily.
- The audit will consist of a comparison of each woodheater model against design drawings submitted for the initial certification testing, and an assessment to determine if the model complies with AS/NZS 4013 labelling requirements. Testing will be conducted at manufacturers' warehouses (rather than at retailers' premises). The audit will also include three full emissions test over two years, to be conducted on randomly selected models, which will also be selected from manufacturers' warehouses.
- If woodheaters fail the initial audit, they will be reaudited at the manufacturer's expense. If the model also fails the second audit, then an emissions test will be carried out at the manufacturer's expense.
- Certification will be immediately suspended if any non-conformances that can affect emissions performance are revealed during the audit (including labelling), until it is demonstrated that non-conformances have been rectified. This will be established by a subsequent audit from models chosen through the same procedure as the initial selection.

- Funding responsibilities under a follow-up audit program will be as follows:
  - Testing costs will be borne by manufacturers;
  - the AHHA will fund the costs for emissions testing; and
  - administration costs will be shared between governments and the AHHA.

#### Anti-tampering provisions

- Governments and the AHHA will write to Standards Australia to request the inclusion of anti-tampering provisions in the Australian Standard (AS 3869 - Design and Construction), so that it is more difficult for operators to modify factory-set appliance operating parameters (eg minimum air flow settings).

#### Non-compliant woodheaters already sold and installed

- Government environment agencies may refer the issue of non-compliant woodheaters already sold and installed to the consumer protection agencies within their jurisdiction.