

TN_0023

HETAS Technical Note – TN_0023 - Installations in Leisure Accommodation Units

General Guidance for the Installation, Risk Assessment & Commissioning of Solid fuel Batch Fed Appliances fitted in LEISURE ACCOMMODATION UNITS

1.0 SCOPE

The following technical note sets out the relevant practice guidelines for the installation of closed solid fuel burning heating appliances in transportable leisure accommodation units, having a confirmed nominal rated heat output of 7kW or below. The document covers the principal considerations for the relevant installation and commissioning practices required to ensure a safe and efficient installation of solid fuel burning appliances is maintained at all times.

The contents of this guidance document are only applicable to installations of batch fed closed room heater appliances, and can be applied to some of the more common accommodation unit types available in the UK, examples of which include:

- Residential Park Holiday Homes
- Caravan Holiday Homes
- Log Cabin Accommodation Units
- Yurts
- Shepherd Huts

This document excludes installations of open fires, as well as appliances with boilers and independent boilers that provide heating and hot water to a central heating system. Although this document excludes wet system appliance installations, some of the general principles within this document may be applicable to the installation of an appliance with boiler. Any wet system work should always be undertaken by a competent installer with requisites to carry out work on solid fuel wet system applications.

2.0 BUILDING REGULATION REQUIREMENTS

Although the regulatory requirements currently stipulate that leisure accommodation units fall outside the remit of Schedule 2 of the UK Building Regulations, installers should always ensure under their responsibilities as a competent engineer that installations are done in a manner that is deemed safe, and meet the fundamental safety and efficiency requirements as laid out in regulations J1 to J5 of Approved Document J where practical. Page 9 of ADJ sets the legal precedents as follows:

J1 Air Supply: *Combustion appliances shall be so installed that there is an adequate supply of air to them for combustion, to prevent overheating and for the efficient working of the flue.*

J2 Discharge of Products: *Combustion appliances shall have adequate provision for the discharge of products of combustion to the outside air.*

J3 Detection of CO: *Where a fixed combustion appliance is provided, appropriate provision shall be made to detect and give warning of the release of carbon monoxide*

J4 Protection of Building: *Combustion appliances and fluepipes shall be so installed and fireplaces and chimneys shall be so constructed and installed as to reduce the reasonable level the risk of people suffering burns or the building catching fire in consequence of their use.*

J5 Provision of Information: *Where a hearth, fireplace, flue or chimney is provided or extended, a durable notice containing information on the performance capabilities of the hearth, fireplace, flue or chimney shall be affixed in a suitable place in the building for the purpose of enabling combustion appliances to be safely installed.*

3.0 PRINCIPLE RESPONSIBILITIES

In support of the regulatory requirements stated within the UK Building Regulations, the following due considerations are to be met for the installation of appliances in leisure accommodation units;

- ✓ Combustible materials within the leisure unit shall be protected against heat from the appliance, connecting flue pipe and chimney system at all times, ensuring any clearance distances to combustible materials stated within this document, the appliance and chimney manufacturer installation instructions are adhered to at all times.
- ✓ A suitable chimney system is installed as to allow for the appropriate discharge of products of combustion from the appliance to the outside atmosphere, designed in a way that reduces both the risk of blockage of the chimney throughout its entire length and ignition of combustible materials in close proximity.
- ✓ A CO alarm in compliance with BS EN 50291-2 is permanently affixed in the leisure accommodation unit in a location that will allow for detection of the release of CO from the appliance.
- ✓ The fundamental provisions within this document are followed in relation to appliance selection and sizing, chimney and flue design, hearth requirements and installation distances to combustible materials.
- ✓ Appropriate commissioning, including smoke and spillage tests are undertaken to confirm that the appliance operates in a means that remains safe and its performance is not hindered.

4.0 INSTALLATION BEST PRACTICE

Over recent years, there has been a significant increase in the installation of woodburning and solid fuel mineral burning appliances in lightweight construction leisure accommodation units in the UK. The benefits of an independent fuel source, as well as the advantages of being a more easily maintainable and cost-effective way to heat an acquired habitable space has seen a rise in their specification within residential and holiday accommodation, including Yurts, Log Cabins & Residential Park Homes. Although the current UK Building Regulations cover installation of solid fuel appliances into fixed dwellings, it must be understood that although the fundamental design principles can be adopted, there are some additional considerations that need to be factored in when dealing with more lightweight construction units.

4.1 Appliance Selection

It is important before commencing any works that an appropriate assessment is made to ensure the correct type and sized appliance, hearth and chimney system are specified for the unit, as to maintain protection of the structure at all times during continued appliance operation.

When specifying the type of appliance, the manufacturer installation instructions and technical data should be referenced before commencing works to ensure the appropriate heat output, suitability and clearance distances can be adhered to within the leisure unit habitable space without blocking any access or escape routes.

The selected appliance should be of a freestanding type, and be appropriately CE marked and meet the minimum efficiency requirements within Building Regulation requirements of above 65%. A confirmed list of appliances that meet this criteria can be found on the HETAS website at www.hetas.co.uk/find-appliance

4.1.1 Appliance Sizing

It is important to ensure that the appliance is correctly sized to provide the required heat output to the room or unit in which it is situated. Generally, appliances up to 7kW in size will provide enough heat to attain comfortable living temperatures within the more common types of leisure accommodation units, however *Table 1* below can be used as a general guide to establish the minimum nominal heat output of appliance required, however assessment should always be made on the insulation properties of the leisure accommodation unit when determining appliance size, and manufacturers instructions should also be observed to see if any guidance is given for specific appliances:

		APPROXIMATE ROOM VOLUME - L x W x H						
		≤30m ³	40m ³	50m ³	60m ³	70m ³	80m ³	≥90m ³
KW Output Required		3kW	4kW	4.5kW	5kW	5.5kW	6.5kW	7kW

Table 1. Appliance Sizing based on Kilowatt Output

It is important to choose an appliance with an appropriate nominal output to suit the likely demand placed upon it. If the appliance is too large it may cause the appliance to be run for extended periods at low output which is detrimental to emissions, as well as not being optimal for efficiency which will likely increase running costs.

A full list of available appliances and verified outputs can be found on the HETAS website at: www.hetas.co.uk/find-appliance

4.1.2 Fundamental Considerations for Determining Appliance Suitability

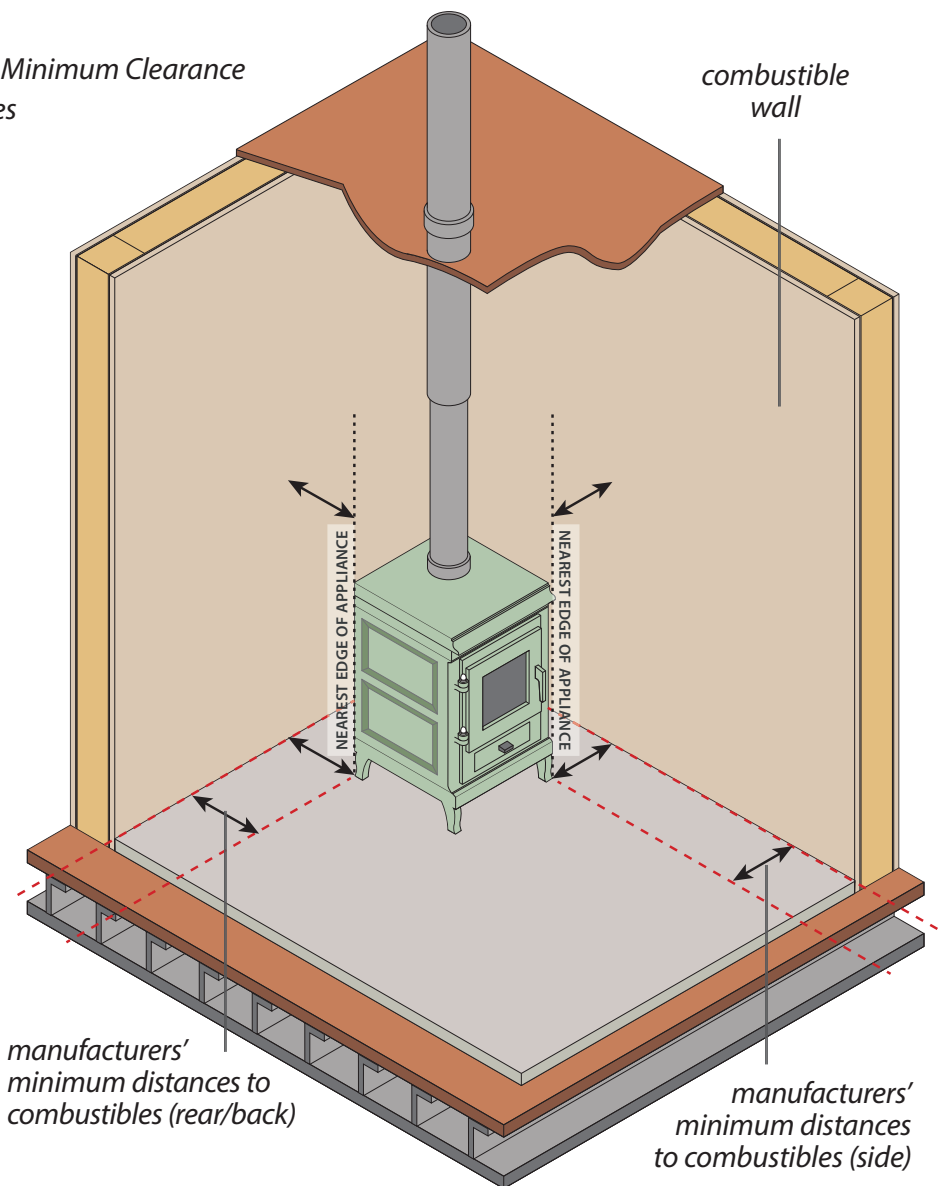
Only those appliances that have been appropriately tested to the required CE type test standards (i.e. BS EN 13240) and have a measured gross efficiency of above 65% shall be installed. Due to the space constraints and lightweight constructional properties of leisure unit accommodation, it is advised that only those appliances that have been verified to confirm that the surface temperatures of the hearth do not exceed temperatures of 100°C should be installed. This will allow for a minimum 12mm hearth to be installed while ensuring any combustible material beneath the hearth is not put at risk.

In some cases, transportable leisure accommodation unit manufacturers will line internal walls with combustible materials for increased visual effect, however doing this results in a significant increase to the safety risks of installed solid fuel burning appliances igniting combustible materials in close proximity.

Fig.1 Appliance Manufacturer Minimum Clearance Distances to Combustibles

Manufacturers of solid fuel burning appliances under CE type test requirements will undergo testing to verify the suitable safety distances from the sides and rear of the appliance, and these distances should be obtained and referenced during the design stage to ensure adequate room is available for the installation in close proximity to combustibles.

In instances whereby the manufacturers declared clearance distances cannot be achieved, then the provisions detailed within section 4.4 "Shielding" may be used to reduce these distances further whilst maintaining adequate protection.



4.1.3 DEFRA Smoke Control Zones

If the leisure accommodation unit is either situated in a smoke control area, or has adequate provision to be transported and sited in a designated smoke control area, then it is important for the appliance to be appropriately exempted if the user is intending to burn unauthorised fuels, such as wood logs in compliance with the Clean Air Act 1993. These types of appliances have been independently verified as being able to burn unauthorised fuels without causing excessive smoke. It is an offence to emit smoke from any chimney of a building that services a domestic heating appliance if located in a designated smoke control area. **Responsibility of the offence lies with the occupier of the building; if found guilty they could be liable for a fine.**

A full list of exempt appliances can be found at: <https://smokecontrol.defra.gov.uk/appliances>

4.2 Siting & Escape Routes

The installation of the appliance shall not be sited in a position that may cause increase risk of ignition to the building fabric, nor in a position that may block or obstruct passages and/or escape routes for the unit's occupants. If the proposed location has the potential to inhibit free movement of the occupants during any evacuation of the leisure unit during emergency, then consideration should be given to a different, safer location that does not prohibit occupant escape. This include access to any doors, windows or other escape measures of the unit.

4.3 Hearth Requirements

4.3.1 Hearth Type

The hearth should be designed of suitable non-combustible material, which can support the weight of the appliance and associated chimney system, and designed to accept and transfer the weight into the leisure unit's structure.

The appliance should be permanently fixed to the hearth in instances whereby the appliance may be prone to movement, either during general operation of the appliance or transport of the accommodation unit from one site to another.

A suitable hearth is one that can both withstand and transfer the weight of the appliance into the accommodation units structured support without deflection or cracking. In most cases a non-combustible hearth is acceptable as long as the appliance has been independently tested and verified to not exceed surface temperatures at its base of more than 100°C.

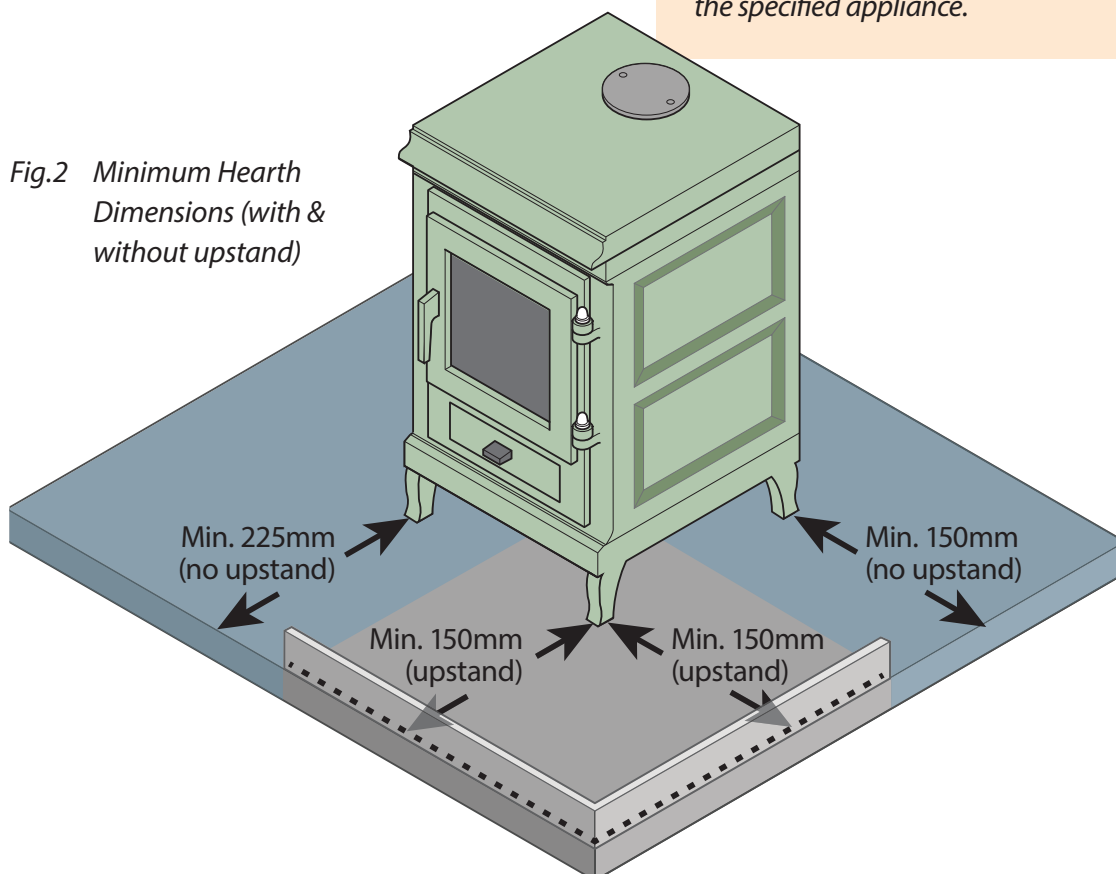
4.3.2 Hearth Sizing

The hearth should extend at least 150mm at each side of an appliance and at least 225mm from the front of the appliance. In some cases, the hearth may incorporate an upstand of minimum 50mm in height to the sides and front of the appliance, in which case the distances to the front of the appliance can be reduced - see Fig.2.

In corner configurations, the same minimum installation distances given above shall be adhered to, and be measured from the closest point of the appliance to the front surface of the shield or wall.

Note: Some appliance designs, particularly those with large, shallow style combustion chamber doors may require the minimum distances in front of the appliance to be increased to those specified by the appliance manufacturer. If in doubt, consult the appliance manufacturers installation instructions for further guidance on appropriate hearth dimensions required for the specified appliance.

Fig.2 Minimum Hearth Dimensions (with & without upstand)



4.3.3 Hearth Installation, Fixing & Siting

The appliance should not be capable of coming into contact with furnishings, curtains, blinds or linen, and the appliance manufacturer's clearance distances to combustible materials shall be maintained at all times (see Fig.1) or alternative shielding provisions used as detailed in Section 4.4 of this document. The appliance should be fitted or provided with an appropriate means to be fixed to the hearth if the unit is susceptible to movement during general operation or transportation of the leisure accommodation unit from one site to another.

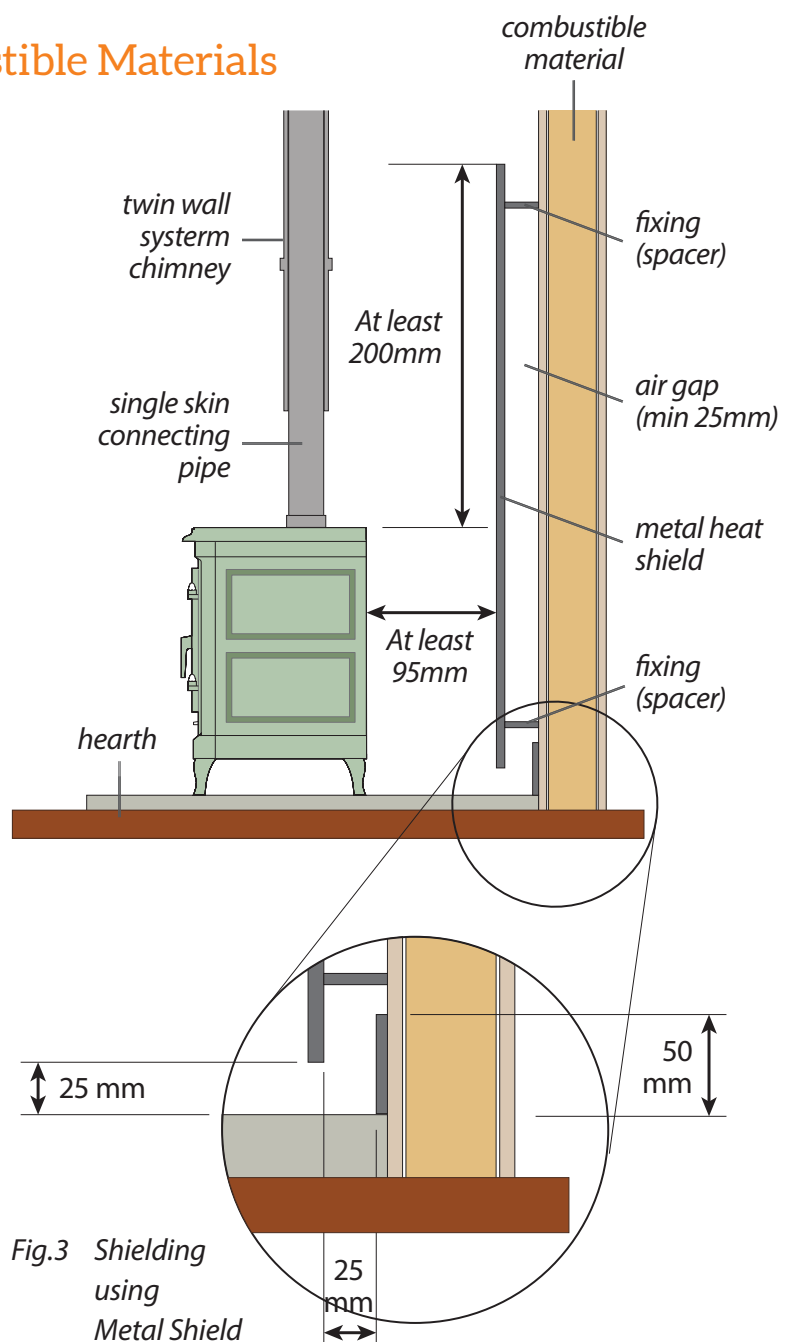
Important Note: *The consumer shall be advised against the storage of any combustible material, including fuel, within the designated hearth area as this will lead to increased risk of fire.*

Further information on fuel storage can be found in *HETAS Advice for glamping site owners*.

4.4 Heat Shielding of Combustible Materials

An assessment of the risk should always be made to prevent combustible materials within the surrounding leisure unit from igniting via the heat from any solid fuel appliance or chimney system. The manufacturer of the appliance will state within their installation instructions a suitable clearance distance from both the sides and rear of the appliance, that must be adhered to in order to ensure any adjacent combustibles do not exceed temperatures of around 85°C.

In some cases, and due to the size limitations within leisure accommodation units, these prescribed distances may not be practically achievable. If the manufacturers specified clearance distances to the rear and sides of the appliance are stated to be below 700mm in distance, then an appropriate heat shield can be used to reduce the clearance distances to combustible materials as required. This will be fully dependent on the type of material used in providing the appropriate heat shield. Further information can be found within this document, aligned with shielding practices found within BS 8511 *Installation of solid fuel appliances in small craft standard* and BS 8303 *Installation of domestic heating appliances*.



4.4.1 Metal Heat Shield

The most typical material used for shielding of solid fuel appliances is metal. In saying that, it is important as within any component that an appropriate air gap of suitable distance is maintained between the combustible material and shield to allow for cool air to circulate and provide adequate protection from the heat emitted from the rear and sides of the appliance.

In this configuration, a sheet of 1.5mm steel can be used with an air gap of 25mm between the front face of the combustible material and rear face of the heat shield. This distance should be maintained at all times by applying appropriate metal fixings or a bracket. Under no circumstances should combustibles materials be used to maintain the required air gap.

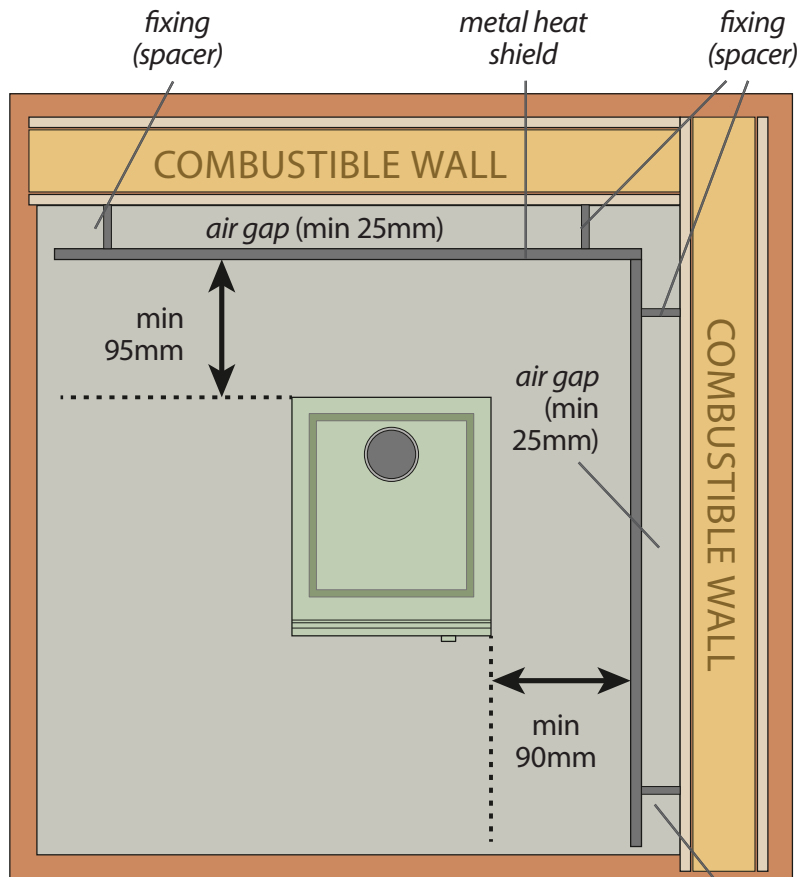


Fig.4 Minimum Shielding Distances using Metal Heat Shield

4.4.1.1 SHIELD SIZING - METAL

The heat shield should extend up to the extremities of the hearth, at least 150mm either side of the appliance and 200mm above the top surface of the appliance, with no protrusions above the heat shield to hinder the flow of cool air behind the shield (i.e. shelf or cupboard). Where the shield provides protection for any single skin connecting flue pipe, it is important to ensure that clearance distances of the connecting flue pipe are maintained at a distance of 1.5 x the connecting flue pipe diameter from the connecting pipe to the combustible material throughout its entire length.

The heat shield should be open top and bottom to allow an appropriate air flow behind the shield, ensuring distance of 25mm is maintained at all times.

4.4.1.2 APPLIANCE DISTANCES - METAL SHIELD

In applications using a metal heat shield, the clearances to the sides and rear of the appliance as specified by the appliance manufacturer can be reduced to 95mm from the rear of the appliance to the shield and 90mm from the side of the appliance to the shield. The distance measured is from the outer surface of the appliance to the front face of the metal heat shield.

If the appliance installation is in a corner configuration at an angle greater than 30°, then it is permissible to ensure distances from the outer surface of the shields to each of the corners of the appliance are at least 65mm.

4.4.2 Insulation Board Shield

Another option is to use an insulation board material as a heat shield in line with the prescribed requirements of the BS 8511 standard. The clearances to the sides and rear of the appliance to the combustible material can be reduced to as little as 70mm (side) and 80mm (rear), dependent on the type of insulation board used, its thickness, the air gap required and its confirmed thermal conductivity. The table below denotes the relevant distances, air gaps and thicknesses dependent on the thermal conductivity of the board.

INSULATION BOARD THERMAL CONDUCTIVITY	INSULATION BOARD THICKNESS	MINIMUM AIR GAP	MINIMUM CLEARANCE TO SIDE (90° CONFIGURATION)	MINIMUM CLEARANCE TO REAR (90° CONFIGURATION)	MINIMUM CLEARANCE TO SIDE & REAR (≥30° CONFIGURATION)
No more than 0.286	6mm	34mm	110mm	120mm	70mm
No more than 0.18	25mm	20mm	110mm	120mm	70mm
No more than 0.06	25mm	10mm	70mm	80mm	65mm

Table 2. Clearance Distances to Combustibles using Insulation Board

For further guidance on shielding using insulation board materials, please reference HETAS technical note *TN0024 Insulation Board Materials – Installation Requirements & Guidance*.

4.4.3 Shield Sizing – Insulation Board

The heat shield should extend up to the extremities of the hearth, at least 150mm either side and 200mm above the top surface of the appliance, with no protrusions above the heat shield to hinder the flow of cool air behind the shield.

The heat shield should be open at the top and sides to allow an appropriate air flow behind the shield, ensuring distances given in Table 2 are maintained at all times, however can be closed off top and sides with appropriate non-combustible material if desired.

4.4.4 Appliance Distances – Insulation Board

In applications using an insulation board heat shield, the clearances to the sides and rear of the appliance as specified by the appliance manufacturer can be reduced to those given in Table 2. The distance measured in this scenario is from the outer surface of the appliance to the front face of the combustible wall or material it is served to protect.

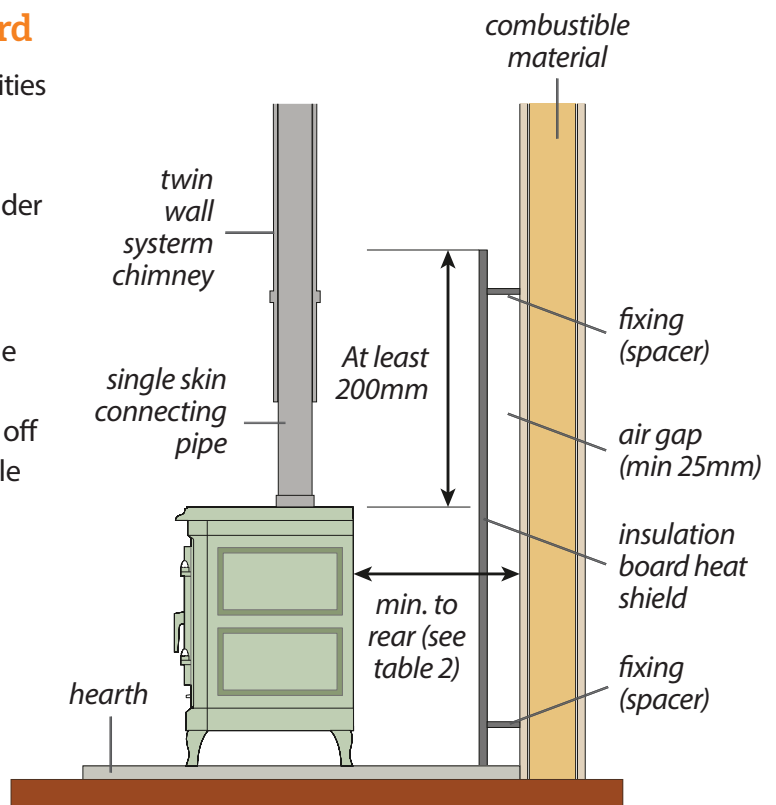


Fig.5 Shielding using Insulation Board Materials

If the appliance installation is in a corner configuration, then it is permissible to ensure distances from the outer surface of the shield to each of the corners of the appliance are those distances specified in Table 2. Again, the distance measured is from the outer surface of the appliance to the front face of the combustible wall or material it is intended to protect.

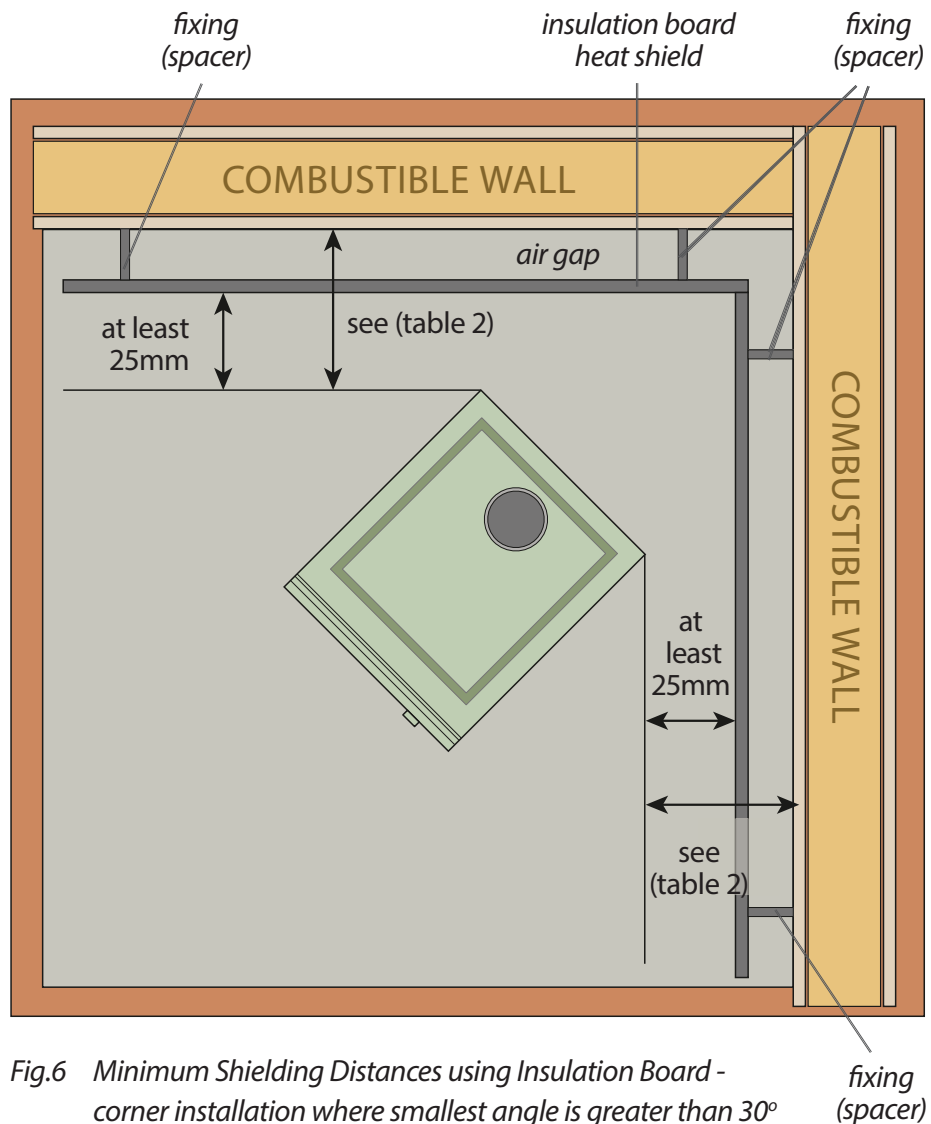


Fig.6 Minimum Shielding Distances using Insulation Board - corner installation where smallest angle is greater than 30°

4.4.5 Fireguard

In most circumstances, a suitable fireguard shall be provided to protect ignitable materials from coming into direct contact with the appliance, as well as protecting young and/or infirm persons from risk of touching hot surfaces during appliance operation.

A suitable fireguard manufactured to BS 8423 will provide the adequate protection required.

4.5 The Chimney

Chimney systems in leisure accommodation units are likely to be lower in overall height than the minimum prescribed measurements detailed in current Building Regulation guidelines. With that, it is extra important to ensure that when installing solid fuel appliances into leisure accommodation units, that the requirements of J2 Discharge of Products and J4 Protection of Building are adhered to in protecting the structure of the unit and ensuring products of combustion safely disperse into the outside atmosphere as required.

It is important that the chimney is adequately supported throughout its length, in line with the chimney manufacturers installation instructions. The appliance should not support the weight of the chimney except where the appliance manufacturer confirms the load bearing capacity as sufficient and where cleaning/sweeping of the system can be undertaken without dismantling the chimney.

4.5.1 Chimney Selection

Due to the close proximity of combustible materials that the chimney is likely to be situated, the chimney and should be of twin wall insulated metal type, correctly designated against the prescribed requirements within BS EN 1856-1. The minimum designation for solid fuel appliance use is T450 N2 D3 Gxx and should be confirmed as suitable for use before commencing works. The minimum diameter of the chimney may be dependent on the nominal heat output of the appliance, and shall be of a minimum size as given in *Table 3* below:

MAXIMUM APPLIANCE OUTPUT	FUEL TYPE	MINIMUM FLUE DIAMETER
3kW	Wood and/or Smokeless Mineral Fuel	100mm
4kW	Wood and/or Smokeless Mineral Fuel	100mm
5kW	Wood and/or Smokeless Mineral Fuel	125mm
6kW	Wood and/or Smokeless Mineral Fuel	125mm
7kW	Wood and/or Smokeless Mineral Fuel	150mm

*Table 3.
Minimum Flue
Diameter for
Chimney
System*

Due to the overall height of the chimney system being relatively lower in a leisure accommodation unit, it is important to ensure that the flue operates correctly and safely at the time of commission, and any products of combustion are discharged from the appliance to the outside atmosphere. A smoke draw test (Smoke Test II) should always be carried out during the commissioning procedure, as detailed under point 5 “Commissioning” of this document.

4.5.2 Clearance Distances to Combustibles

All twin wall metal system chimneys will have on the CE data plate or Declaration of Performance (DoP) a designation, which will include a Gxx distance which gives prescribed distances to combustible materials to keep surrounding temperatures below the required 85°C. Clearances to the chimney should be in compliance with this Gxx measurement at all times.

4.5.3 Connecting Flue Pipe

In some cases, a small section of single skin connecting flue pipe may be required in order to provide a means for inspection and cleaning of the chimney or to obtain a required flue draught reading during the commissioning phase. This shall be a maximum length of 1m between the outlet of the appliance and twin wall metal chimney, however best practice dictates to keep any connecting pipe measurement as short as possible to reduce the risk of ignition of combustibles in close proximity. Any single skin section must be at least 3x the diameter of the connecting pipe away from combustible materials at all times.

The connecting flue pipe shall have been tested and comply with the requirements of BS EN 1856-2, information of which can be confirmed on the connecting pipe CE data plate or DoP.

In cases where a twin wall metal insulated chimney is used throughout the entire length, then the chimney should be connected directly to the appliance spigot using an appropriate adapter in accordance with the chimney manufacturer’s instructions.

The diameter of the connecting flue pipe should not be smaller than the outlet of the appliance.

4.5.4 Chimney Design

The chimney height shall be a minimum of 2.0m in height, measured from the top of the appliance spigot to the terminal.

The chimney should be kept as straight as possible, avoiding bends where possible, as to not hinder the flow of the flue gases being drawn up the chimney, and to allow for a sufficient draught to be maintained, especially in instances where the designed flue is shorter in length. This can be best achieved using an appliance with a top flue outlet configuration, with a straight chimney through the roof to the termination.

If a rear outlet flue is required, then no more than two bends shall be used, of no more than 45° each, directly from the rear of the appliance, ensuring a means of debris collection is also included. The remaining flue/chimney should then be as straight as possible, avoiding further changes in direction until termination.

Any joints within the twin wall insulated metal chimney shall be so installed with the sockets facing upwards in accordance with the chimney manufacturer's instructions, and be suitably sealed.

The chimney shall be provided with a means to appropriately inspect and be swept throughout its entire length, either through a sweeping access within a connecting flue pipe or if penetrating through a side wall, cleaning access through a debris collection point in a 135° T-Piece.

Under no circumstances should single skin connecting flue pipe be used to construct the chimney system, particularly in cases where the chimney passes through the ceiling or side wall constructed of combustible materials, as these components are designed and tested as a means of simply connecting an appliance to an appropriate chimney system.

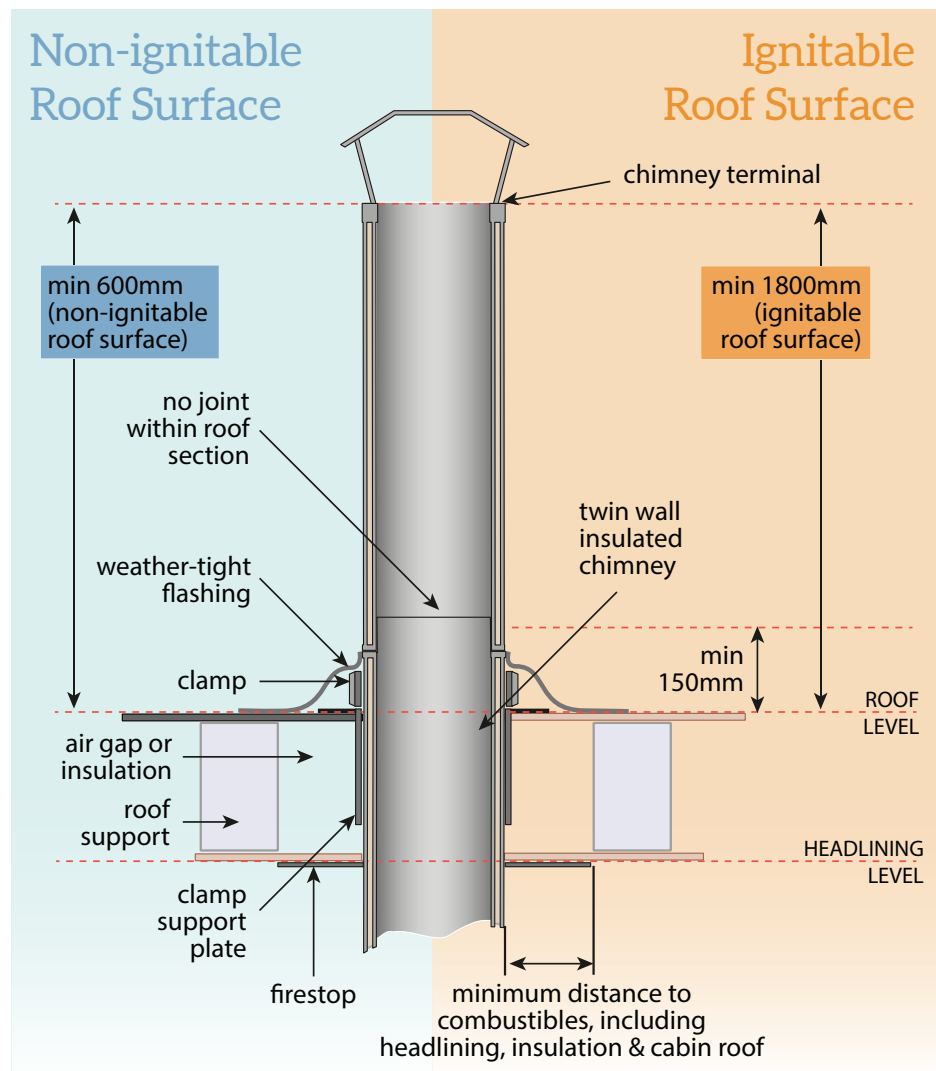
4.5.5 Chimneys Penetrating through Combustibles

In the majority of cases, the chimney/ connecting flue pipe will require to penetrate the structure of the building in order to design and route the chimney to give an effective length and discharge products of combustion correctly. Due to the leisure unit's lightweight construction properties, this will likely mean the chimney/flue being passed through an area containing combustible materials, either directly through the roof for an internal chimney or through a side wall if external, so extreme caution should be taken to ensure the installation remains in compliance of J4 of the Building Regulations.

Important considerations include:

- Ensuring an appropriate air gap around the chimney is maintained at all times, in conjunction with the Gxx distances stated by the chimney manufacturer.
- A metal firestop is used to close off any internal and external areas and to give a level of fire resistance required if needed. These will normally be constructed of 1.5mm galvanized steel or equivalent however should not be constructed of combustible materials.
- In the cases of some custom leisure chimney systems kits, the chimney manufacturer will require and supply appropriate insulation material within the void to reduce the risk of condensation within the roof space.

Fig.7 Chimney termination minimum distances with ignitable and non-ignitable roof surface



4.5.6 Termination

The termination shall be a minimum of 600mm above the point of the weather surface, if the weather surface is constructed of non-combustible materials, measured from the top of the weather surface to the top of the chimney. In some circumstances, such as solid fuel installations in Yurts, the termination distance will need to be increased to a minimum height of 1.8m if the weather surface below is constructed of combustible or easily ignitable materials to avoid ember ignition of the material during continued solid fuel appliance use.

For installations in leisure units where there is a pitched roof, it is practical to ensure the termination point of the chimney is at least as high as the roof ridge.

A chimney cowl under normal circumstances is not recommended, particularly where the weather surface is constructed of combustible material, as ejected embers from the appliance poses a higher risk of coming into contact with ignitable roof materials. However, there may be times where an assessment is made and based on risk a cowl is required. In some scenarios, a cowl can be used to protect the chimney from rain penetration, however it is important that any cowl used does not hinder the flow of the flue gases dispersing into the atmosphere, nor create a nuisance to any nearby neighbouring properties or units.

Any rain cap should have been appropriately tested and conform to the principles of BS EN 16475-7 and be specified as suitable for use with solid fuel installations.

4.5.7 Custom Leisure Chimney System Kits

Some manufacturers on the market provide a custom chimney system specifically for use in small leisure units. It is important to always ensure that the system has been appropriately tested and provides the designation of the chimney to confirm its suitability, whilst at the same time ensuring that the system is installed in compliance of the chimney manufacturers installation instructions and guidelines within this document.

4.6 CO Alarm

CO alarms provide a level of protection in circumstances whereby the appliance may function incorrectly or whereby the flue has become blocked from a lack of servicing, which is even more important in installations where the appliance is operating on a shorter than normal chimney system length.

A suitable CO alarm is one that has been independently tested and CE marked against the requirements BS EN 50291-2. Improper selection of a CO alarm may result in CO detection being limited, and decrease the time available for occupants to vacate the unit safely. The CO alarm should be affixed into a permanent position, within a distance of 1m to 3m away from the appliance.

4.7 Ventilation & Air Supply

In the majority of cases, the leisure unit will have enough adventitious ventilation to fully operate the appliance (between door/window seals and through building fabric), whilst at the same time providing the necessary habitable ventilation required. This is particularly the case in Yurts, Log Cabins & Shepherds Huts, however it is never safe to assume without undertaking the necessary checks to determine that the appliance will operate correctly under the relevant conditions.

For solid fuel burning appliances, air for combustion is vital and should be provided by means of permanent air ventilators that have the facility to remain open at all times if enough adventitious air is not available. The ventilation area should be divided as equally practical between high & low level and positioned so they cannot be easily obstructed or blocked. Ventilators should be positioned as close as possible to the appliance, but at least 300mm away from the chimney outlet and any other flue outlets.

The amount of ventilation for each specified appliance shall be calculated based on the basic principle of ensuring 550mm² of ventilation is present per kW output of the appliance. In installations in leisure units such as Yurts, ventilation may be provided by other means than an installed permanent vent, however it is important to ensure that at least the amount of ventilation given in *Table 4* is provided and confirmed by required commissioning checks:

APPLIANCE kW OUTPUT	FUEL TYPE	MINIMUM AMOUNT OF VENTILATION
3kW	Wood and/or Smokeless Mineral Fuel	1650mm ²
4kW	Wood and/or Smokeless Mineral Fuel	2200mm ²
5kW	Wood and/or Smokeless Mineral Fuel	2750mm ²
6kW	Wood and/or Smokeless Mineral Fuel	3300mm ²
7kW	Wood and/or Smokeless Mineral Fuel	3850mm ²

Table 4. Minimum Air Supply for Solid Fuel Burning Appliances

Confirmation of the amount of ventilation can be verified by undertaking the necessary smoke and spillage tests detailed in the commissioning & handover instructions of this document. If the result of either of these tests fails, then more ventilation may be required and can be confirmed by opening any doors or windows in increased stages until smoke starts to evacuate up the chimney. From here the required ventilator size can be determined, and a permanent ventilator may need to be fitted in line with the minimum ventilator size determined.

5.0 COMMISSIONING & HANDOVER

It is important to ensure that all installations into leisure accommodation units are commissioned appropriately as to ensure that the appliance operates safely at all times, and the consumer is informed of the relevant operating principles, appropriate fuels and lighting procedures to maintain this safety.

The commissioning procedure shall be carried out by a competent person who has the relevant experience and training. HETAS operates a scheme of competent installers who are trained and qualified to self-certify that work comply with the Building Regulation requirements. A searchable installer register can be found on the HETAS website at www.hetas.co.uk/find-installer

5.1 Commissioning

The relevant checks and assessment shall be made to ensure the installation is safe, fit for use and operates efficiently in line with this document and the appliance and chimney manufacturers installation instructions. These will consist of visual checks including:

- The installer has read and understood this guidance document and has taken account of the guidance contained within this document and the appliance/chimney manufacturer's installation instructions.
- The appliance is installed in a position that does not block any escape routes or hinder the evacuation of occupants should an emergency situation occur.
- There is no physical damage to any appliance components or the surrounding structure of the leisure accommodation unit.
- The separation distances to combustible materials conforms to this document, appliance declared distances within installation instructions and the Gxx distances stated by the chimney manufacturer.
- The chimney has the ability to be swept throughout its entire length, either through the appliance as confirmed within the manufacturer installation instructions, or through a debris/inspection point in the chimney or connecting flue pipe.
- Penetration of the chimney through combustible materials (roof or side wall) are fully protected, with an air gap conforming to the minimum measurements specified in this document and/or chimney manufacturer instructions.
- A CO alarm has been securely fixed in a suitable position.

5.1.1 Flue Draught Reading

In most cases the appliance manufacturer will state a minimum flue draught required for the appliance to operate sufficiently.

In leisure accommodation units, reduced chimney height can mean that the flue draught recorded at the time of commissioning falls outside of manufacturer stated tolerances. It is therefore important to ensure the appliance passes the relevant smoke draw and spillage tests detailed on page 16 of this document and ensure clarification on the required flue draught for the appliance is obtained from the appliance manufacturer.

The following smoke & spillage tests will also be carried out and confirmed with a pass result as follows:

Step 1 – Smoke Draw Test; Appliance Door Shut

1. Close all external doors and windows, internal doors to the room the appliance is located in and ensure all openable ventilators are closed and any devices that extract air from the dwelling are off.
2. Preheat the flue by lighting a small fire using kindling, a blow lamp or electric heater.
3. Take a flue draught reading to ensure sufficient draught is available for optimal performance of the appliance
4. Light a small smoke pellet (24m³/60 sec), place into the appliance and shut the appliance door. All air-controls should be set to their maximum open position.
5. Check that all of the smoke enters the flue and none comes back into the room through any part of the stove, connecting flue pipe or air supply duct.

Note: If visible smoke enters the room then repeat the flue preheat detailed in point 2 above, to generate additional flue draw. If the test still fails, progressively open a window in the room the appliance is installed. If the flue starts to draw the smoke, this will indicate a fault due to air starvation and the appliance is not being provided with adequate air for the flue to function correctly. Note the additional area of ventilation required and add permanently open ventilation into the room by that amount to correct the problem.

6. Repeat this test with any extraction fans running and internal doors closed
7. If applicable, correct any highlighted issues and re-test using steps 1-4 above. If smoke continues to spill after opening a window, this indicates a more serious problem (i.e. flue blockage) which must be addressed and then this commissioning process repeated.

Step 2 – Hot Spillage Test; Refuelling

Now that initial chimney draw has been verified as adequate, light a fire in the appliance using the recommended amount of kindling/small logs and manufacturer's recommended air control position and allow the appliance to reach its normal operating temperature. At the end of the banking period and before refuelling:

1. Close all external doors and windows, ensure all openable ventilators are closed.
2. Open the appliance door and with a smoke match/pen (15 sec burn time) pass over the top and side edge of the opening of the combustion chamber, observe and record if the smoke/combustion products are drawn into the chimney or spill back into the room. Once the smoke is extinguished, close the appliance door
3. Repeat this test with all extraction fans running and internal doors closed

Note: If smoke or combustion enter the room, then additional ventilation may be required to compensate for the extraction device(s). This can be tested by gradually opening a window and observing the relevant smoke patterns during operation.

If the smoke continues to fail to draw up the flue, or fails with additional ventilation beyond that calculated, thoroughly inspect the flue/chimney and termination for other faults.

Check the appliance/flue/chimney draw with a flue draught gauge and ensure draught is within manufacturer's guidelines.

Other remedial checks include assessment on the increase in chimney height or termination height as required.

Commissioning results should be recorded on the commissioning form provided in Appendix 1 of this document.

5.1.2 Notice Plate

It is important to ensure that upon completion on any works, that a notice plate is affixed to the leisure accommodation in a suitable place, detailing details on the appliance, chimney system, hearth and any materials used to shield the appliance from combustible material in close proximity to the appliance.

5.2 Handover

After commissioning has been completed, it is important to ensure the relevant handover procedures are undertaken and any maintenance/operating instructions are left with the user. An explanation on how to light the appliance, operate the air controls and any other precautions in terms of safety should be given.

HANDOVER CHECKLIST

Careful instruction should also be given to the following:

- Regular maintenance of the appliance, advising the chimney system to be swept at least twice a year, preferably before lighting the appliance after prolonged period of non-use.
- Advise on what to do should the CO alarm sound, including vacating the leisure unit in the first instance until further investigation can be taken on the source of the issue
- Ensuring any clothes or material are not dried on the appliance directly
- That any ashes are disposed of safely and immediately taken outside the accommodation unit upon de-ashing of the appliance
- That other materials (including bed linen, curtains, tables etc.) are kept a suitable distance away from the appliance during continued operation
- Ensuring fuel is not situated directly next to or in close proximity to the appliance, and is stored in an area where it can remain in a dry condition. Fuel should never be stored in areas that may block passageways and escape routes.
- That the appliance is not used to burn waste or scavenged materials
- That a fireguard conforming to BS 8423 is provided in situations whereby the leisure unit is to occupied by old/infirm persons or children.

Further information can be found in HETAS Glamping consumer leaflet ref: *HETAS Advice for glamping site owners*

5.3 Appropriate Fuels

The use of dry seasoned fuels will not only prolong the life of the appliance and subsequent chimney system, but will also ensure that the appliance burns as efficiently as possible and gives the required heat demand into the leisure unit. Only those fuels prescribed as suitable for use by the appliance manufacturer should be used, ensuring wood logs have a moisture content of below 20%. Installers can advise of obtaining fuel with the "Woodsure Ready to Burn" logo, certified as suitable for use with a moisture content within the relevant parameters.



HETAS recommend using only those fuels prescribed by the appliance manufacturer and discourage the burning of any waste wood or scavenged materials due to the increased safety risks of blocking the chimney under continued use.

5.3.1 Fuel Storage

It is important to ensure that the leisure unit has the facility for the storage of fuel for burning on the appliance, in a location that will not block escape routes or areas required for the safe evacuation of the leisure unit.

Under no circumstances should the fuel be stored next to or in close proximity to the appliance. The hearth provides an appropriate designated area in which to not place combustible materials, which should remain clear at all times. Only in circumstances whereby the appliance is supplied with an integrated log store, and has been tested to verify that the temperatures underneath will not exceed 100°C, should logs be stored within the designated hearth area.

Precaution should also be taken to ensure any petrol, hazardous liquids or petrol burning equipment is not stored within the unit at the risk of petrol fumes igniting during solid fuel appliance use. This is especially in the case of smaller motor home units.

LOG CABIN/SHEPHERDS HUT INSTALLATION

Example with Metal Heat Shield in Corner Configuration

This example focuses on a small wood-burning appliance in a shepherds hut; it is a **corner installation** where the **appliance is at an angle of 30° or less to a metal heat shield**.

KEY

- 1) Combustible Wall/Structure
- 2) Non-Combustible Shield Fixings and ensuring air gap is maintained
- 3) Heat Shield Extended to be in line with the hearth. 150mm minimum from each side of the appliance and 200mm above
- 4) Hearth Minimum 225mm projection from the front of the appliance (reduced to 150mm with 50mm upstand) and minimum 150mm projection to sides of the appliance
- 5) Firestop support plate, Roof Plate, Flashing & Storm Collar Gxx distances maintained with suitable air gap when penetrating through roof/side wall. Suitably sealed with non-combustible firestop plate to give 30 minutes fire resistance and suitably sealed from weather via storm collar and/or flashing
- 6) Appliance Tested and verified to BS EN 13240 with a CE mark
- 7) Air Vent Providing sufficient air in line with Table 4
- 8) Twin wall system chimney designated minimum T450 N2 D Gxx installed in accordance with chimney manufacturer instructions
- 9) Connecting Flue Pipe Maximum 1m to allow for inspection/cleaning access
- 10) Air Gap Minimum 25mm (metal)
- 11) Rear Upstand
- 12) **Height** of highest point of roof surface (the ridge)
- 13) Termination Minimum 600mm measured vertically from ridge
- 14) CO Alarm Suitable CO alarm conforming to BS EN 50292, permanently affixed between 1m and 3m away from the appliance
- 15) Point of the ridge nearest to the chimney terminal
- 16) Support Plate

PLEASE NOTE:

If a chimney termination is **over** a 2300mm distance horizontally from the ridge then the ****vertical height of the chimney from the roof surface to the termination point (not from the ridge) must be at least 1.8 metres**. For log cabin installations where there is a pitched roof, it is practical to ensure the termination point of the chimney is at least as high as the roof ridge.

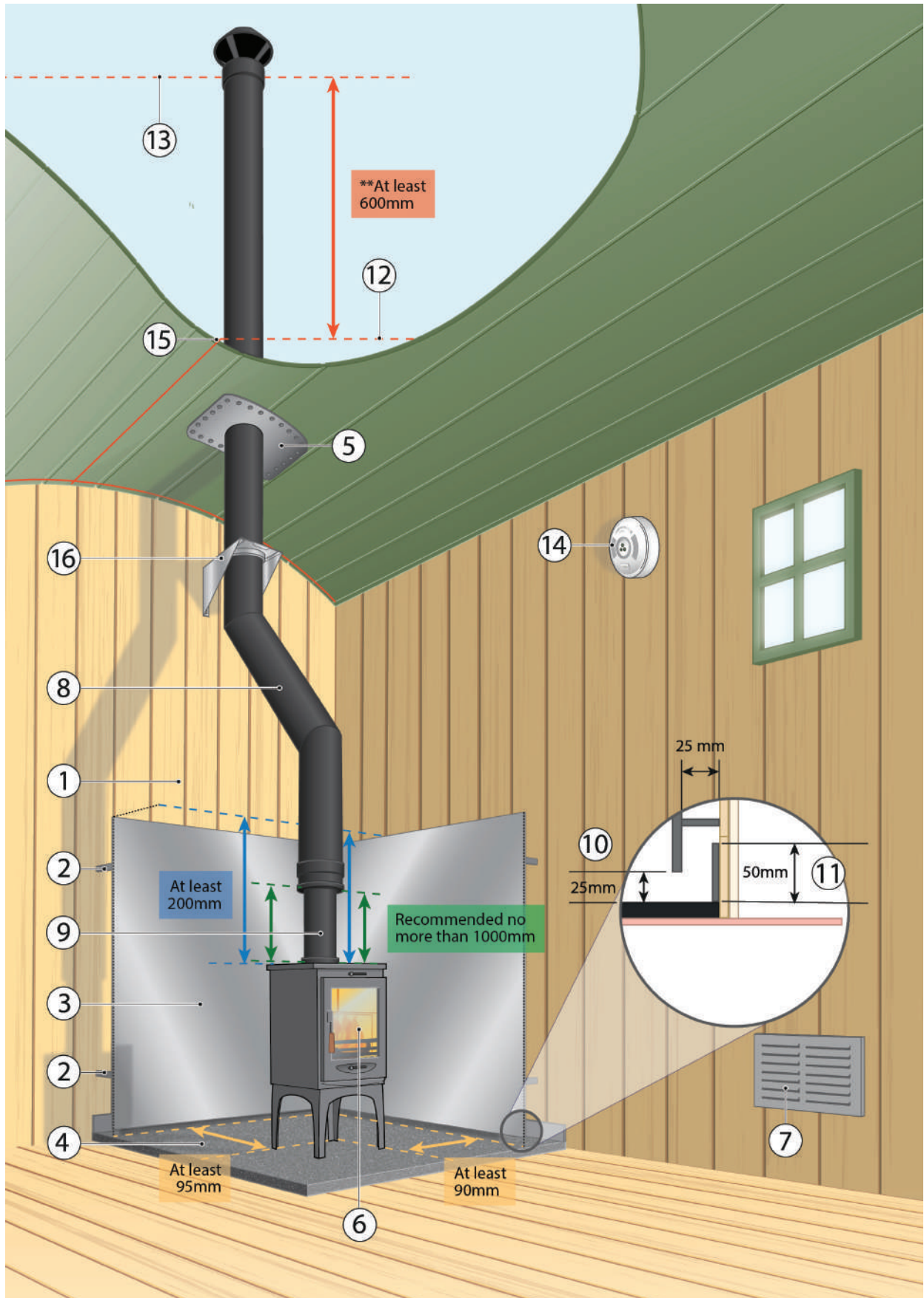


Fig.8 Example shepherd's hut installation

YURT INSTALLATION Example with Metal Heat Shield in Freestanding Configuration

This example focuses on a wood-burning appliance in a glamping yurt; it is a freestanding installation using a metal heat shield.

KEY

- 1) Combustible Wall/Structure
- 2) Non-Combustible Shield Fixings and ensuring air gap is maintained
- 3) Heat Shield Extended to be in line with the hearth. 150mm minimum from each side of the appliance and 200mm above
- 4) Hearth Minimum 225mm projection from the front of the appliance (reduced to 150mm with 50mm upstand) and minimum 150mm projection to sides of the appliance
- 5) Firestop support plate, Roof Plate, Flashing & Storm Collar Gxx distances maintained with suitable air gap when penetrating through roof/side wall. Suitably sealed with non-combustible firestop plate to give 30 minutes fire resistance and suitably sealed from weather via storm collar and/or flashing
- 6) Appliance Tested and verified to BS EN 13240 with a CE mark
- 7) Air Vent Providing sufficient air at minimum that prescribed within Table 4
- 8) Chimney System Twin wall stainless steel designated minimum T450 N2 D Gxx installed in accordance with chimney manufacturer instructions
- 9) Connecting Flue Pipe Maximum 1m to allow for inspection/cleaning access
- 10) Air Gap Minimum 25mm (metal)
- 11) Rear Upstand
- 12) **Height** of highest point of roof surface (the ridge)
- 13) Termination Minimum 600mm measured vertically from ridge
- 14) CO Alarm Suitable CO alarm conforming to BS EN 50292, permanently affixed between 1m and 3m away from the appliance
- 15) Highest point of roof surface

PLEASE NOTE:

*if a chimney termination is **over** a 2300mm distance horizontally from the ridge then the
vertical height of the chimney from the **roof surface to the termination point (not from the ridge) must be at least 1.8 metres. For Yurt installations where there is a pitched roof, it is practical to ensure the termination point of the chimney is at least as high as the roof ridge.

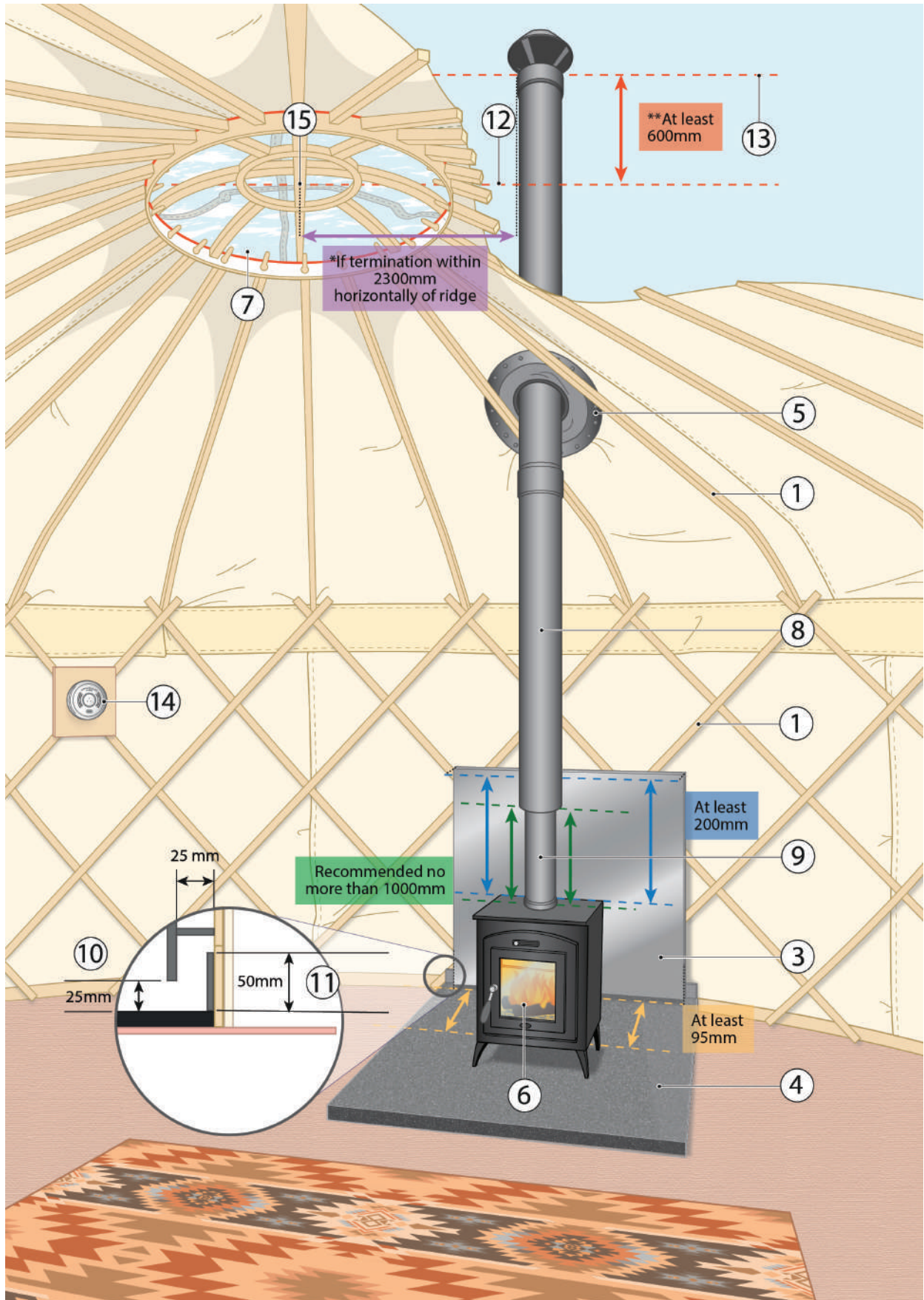


Fig.9 Example glamping yurt installation

RESIDENTIAL PARK HOME INSTALLATION

Example with Insulation Board Shield in Freestanding Corner Configuration

This example focuses on a wood-burning appliance in residential park home; it is a **corner installation** where the **appliance is at an angle greater than 30° to an insulation board shield**.

KEY

- 1) Combustible Wall/Structure
- 2) Shield Fixings Non-Combustible and ensuring air gap is maintained
- 3) Heat Shield Extended to be in line with the hearth. 150mm minimum from each side of the appliance and 200mm above
- 4) Hearth Minimum 225mm projection from the front of the appliance (reduced to 150mm with 50mm upstand) and minimum 150mm projection to sides of the appliance.
- 5) Firestop support plate, Roof Plate, Flashing & Storm Collar Gxx distances maintained with suitable air gap when penetrating through roof/side wall. Suitably sealed with non-combustible firestop plate to give 30 minutes fire resistance and suitably sealed from weather via storm collar and/or flashing.
- 6) Appliance Tested and verified to BS EN 13240 with a CE mark
- 7) Air Vent Providing sufficient air at minimum that prescribed within Table 4
- 8) Chimney System Twin wall stainless steel designated minimum T450 N2 D Gxx installed in accordance with chimney manufacturer instructions
- 9) Connecting Flue Pipe Maximum 1m to allow for inspection/cleaning access
- 10) Air Gap Minimum Table 2 dimensions (insulation board)
- 12) Height of roof surface
- 13) Termination Minimum 600mm measured from roof surface
- 14) CO Alarm Suitable CO alarm conforming to BS EN 50292, permanently affixed between 1m and 3m away from the appliance
- 15) Combustible wall

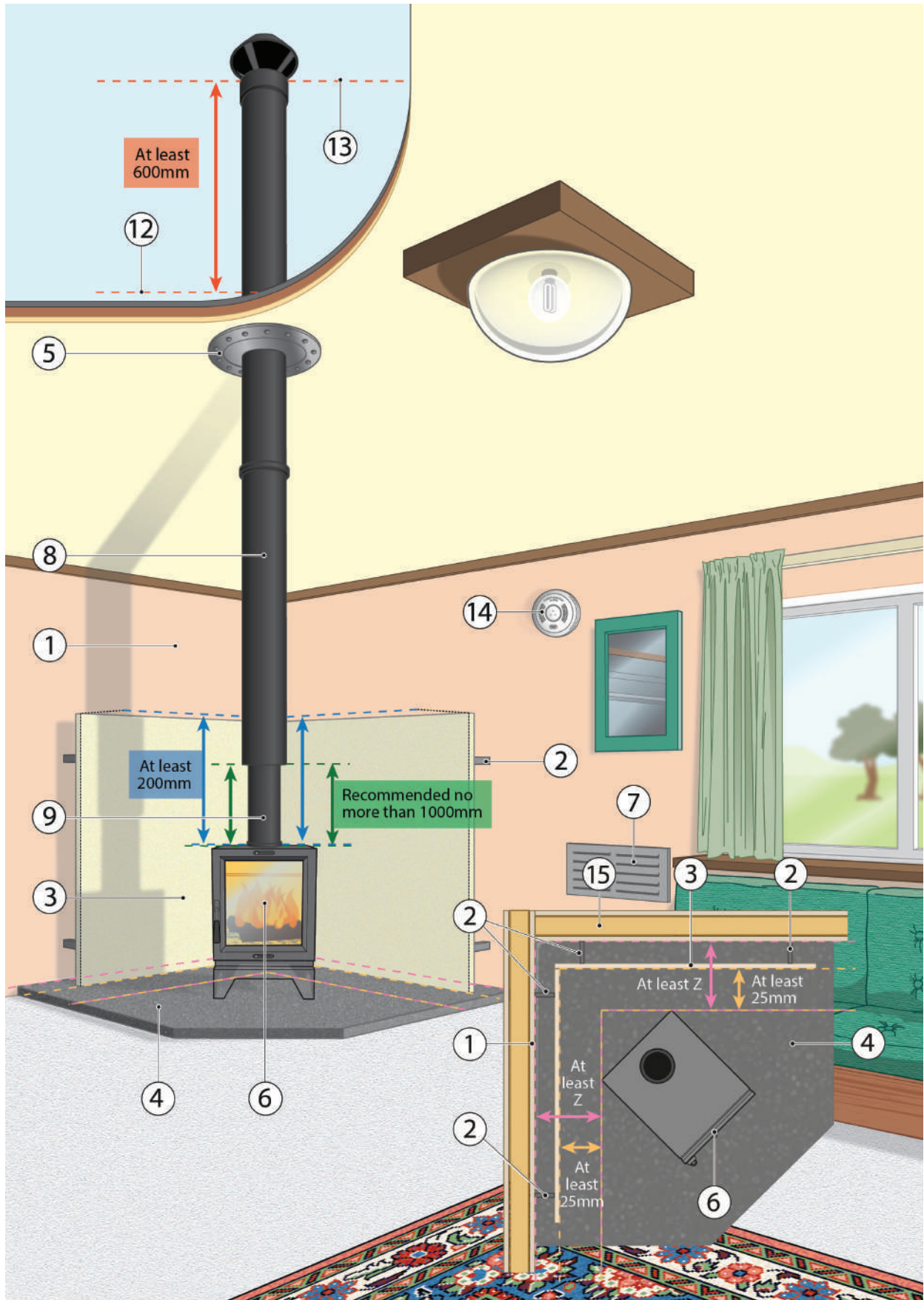


Fig.10 Example park home installation



LEISURE ACCOMMODATION UNITS - COMMISSIONING RECORD

1. PROPERTY DETAILS				
Address:			Completion Date:	
			Installing Company:	
			Installer ID:	
Location Type (please circle):	Residential Park Home / Log Cabin / Yurt / Shepherd's Hut			

2. APPLIANCE DETAILS	
Appliance Type:	
Make/Model:	
Fuel (please circle):	Wood / Mineral Fuel / Pellet / Chip
Nominal Output (kW):	
Gross Efficiency (%):	
Appliance Style:	Freestanding / Inset
DEFRA Exempt:	Yes / No

3. CHIMNEY, HEARTH & SHIELDING DETAILS			
Chimney Dimension:			
Chimney Designation:			
Hearth Material & Thickness:			
Fireguard Present:			
Shielding Provided & Type:	Yes / No	Type:	Metal / Board
Clearance Distances:	Side:	mm	Rear: mm
Additional Ventilation Required:	Yes / No	Air Provided:	mm ²

4. COMMISSIONING DETAILS			5. INSTALLATION DETAILS		
	Compliance (please circle):		Notes / Measurements	Compliance (please circle):	
	Completed	Result		User Instructed on correct use of appliance?:	Yes / No
Joints/Seals Check:	Yes / No	Pass / Fail*	User Instructed on essential sweeping/maintenance?:	Yes / No	
Cold Spillage Test:	Yes / No	Pass / Fail*	Operating instructions left with owner?:	Yes / No	
Hot Spillage Test:	Yes / No	Pass / Fail*	Notice plate completed and fixed in position?:	Yes / No	
			CO alarm has been fitted in permanent location?:	Yes / No	

This document is to be signed and dated when the above tests are proven to be satisfactory. If at commissioning stage the appliance cannot be confirmed as operating safely, and the fault cannot be rectified at the time, a warning notice shall be issued informing the consumer that the appliance could not be fully commissioned and advise not to use the appliance until the required remedial works are completed. A warning notice should be left with the consumer and a copy of the notice obtained for records.

6. DECLARATION			
As the competent person responsible for the work described above, I confirm that the appliance and associated work has been installed in accordance with the HETAS rules of registration, and that the work complies with all appropriate guidelines within TN_0023 and the relevant caveats detailed within the appliance and chimney manufacturer's installation instructions.			
Name:		Company:	
Signed:		Date:	HETAS Operative No:
Other Notes/Comments:			

Technical Note TN_0023

Installations in Leisure Accommodation Units

April 2020



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