

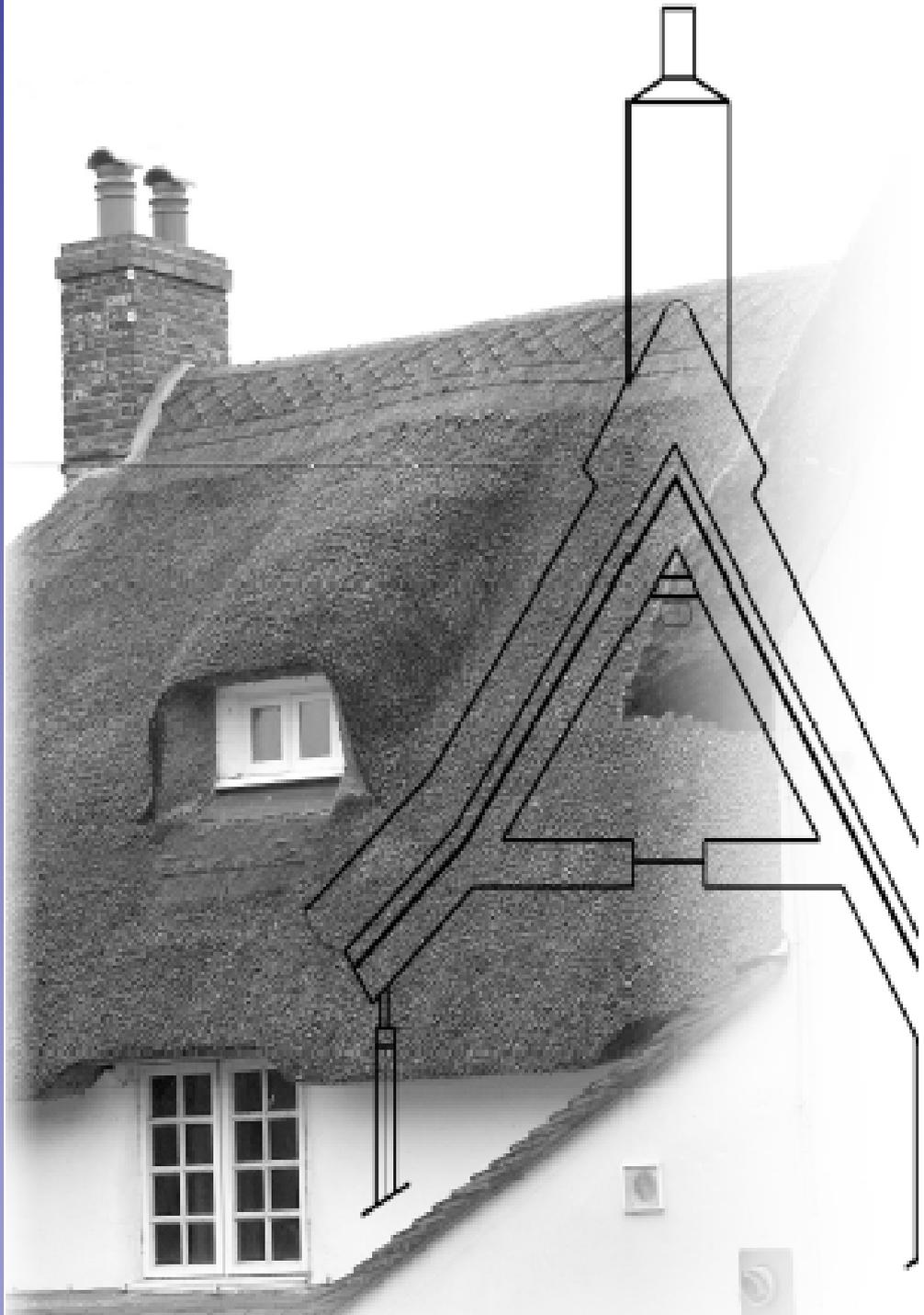


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A Guide to Fire Safety in Thatched Dwellings



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INDEX

1. INTRODUCTION
2. THE DORSET THATCHING REPORT
3. CHIMNEYS AND FLUES
4. THE ROOF VOID
5. FIRE ALARM
6. ELECTRICAL SYSTEMS
7. DECORATING
8. TRADESMEN
9. SMOKING
10. THE DORSET MODEL
11. ROOFS FOR NEW THATCHED
12. FIRE FIGHTING EQUIPMENT
13. IN THE GARDEN
14. LIGHTNING
15. IN CASE OF FIRE
16. APPENDIX A – DIAGRAM SHOWING ROOF CONSTRUCTION
17. APPENDIX B – LIST OF USEFUL INFORMATION
18. APPENDIX C GENERAL FIRE SAFETY FOR THE HOME



1. INTRODUCTION

Of the approximate 50,000 thatched homes in the UK, we have 2446 'listed' thatched properties in Dorset and about the same number unlisted.. This number is increasing as many new-build thatched houses are being constructed in the county. Insurance company statistics indicate that nationally approximately 1.5% are likely to suffer thatch related fires in any one year and that 70% of these are likely to involve the burning of solid fuel.

Although thatched fires are given a high profile in the media, this is mainly due to their spectacular nature, rather than their frequency. With good Fire Safety practices in place they are no more likely to catch fire than any other property of the same age but, should a fire occur, the potential for fire damage is that much greater.

This guidance note covers advice for both new and existing properties and it should be noted that the responsible authorities for any new structural work are the Building Control Bodies. Under the Building Regulations application must be made for approval for all new building work, including new structural work on existing buildings.

The guidance in this note is offered as 'goodwill advice' and is not mandatory. It is applicable to all types of thatch, but where alterations to a listed thatched building are proposed, then reference should first be made to the Conservation Officer of the Local Authority for the area in which the premises is sited.

A diagram showing roof construction for new building work is included (Appendix A).

2. THE DORSET THATCHING REPORT

The 'Dorset Thatching Report' is a report concerned with the conservation of Dorset's thatching heritage. It gives detailed information on the whole subject of historic thatched buildings and includes a Code of Practice on Planning matters requiring listed buildings consent, together with guidelines on all related topics. A free 'Thatching Report Advice Leaflet' is available from Dorset Local Authority Conservation Officers.

3. CHIMNEYS AND FLUES

The major source of fire, where the thatch is the first item to be ignited, is the chimney.

The causes of ignition from this source are:

- **Faulty Chimney**
- **Heat Conduction**
- **Chimney Fires and Sparks**
- **Timbers Built into the Chimney**

Faulty Chimneys

Faulty chimneys are an only too frequent occurrence in properties of any age. The effects of weather on the outside and acidic fumes on the inside, together with years of sweeping, can lead to a deterioration in the mortar joints and pointing of the brickwork. The breaking down of mortar flashings allows rainwater access, which accelerates the wear process. This deterioration allows soot and tars to leach through from the flue to the exterior face of the chimney, providing an easy path for fire to follow.

The outside of chimneys should be visually examined for poor jointing and staining, both outside and inside the property. The higher parts of the chimney are more easily examined by using binoculars. Whenever the roof is re-thatched, or re-ridged, consideration should be given to stripping out the thatch alongside any stack so that the condition of the brickwork

can be checked. The stripped thatch should be examined for any signs of charring. If faults are found they must be rectified before using the chimney again.

New chimneys should be tested to BS 6461.

Heat Conduction

Heat conduction through the chimney leading to ignition of the thatch has been the subject of recent research. In properties constructed prior to 1966 it was normal for an unlined single 4½" (112mm) brick chimney to be constructed, and work by RHM Technology Ltd. has shown that in certain conditions a single brick flue can reach such a high temperature during normal use that ignition of the thatch can occur.

The roofs primarily at risk are those whose single brick chimneys serve a solid fuel or wood-burning appliance, and are completely surrounded by thatch in excess of 1m deep at the thatch/chimney interface. This depth can occur due to re-thatching over the life of the building. Frequently old thatch has not been stripped off to the base coat and a single spar coat applied, but new thatch has been added on top of the old, with only minimum stripping.

A spar coat fixed to a single base coat, or a single coat fixed directly to the timbers, is the ideal to aim for from the Fire Safety aspect, and this depth should be maintained over future re-thatchings. This small depth not only helps prevent heat build up in the chimney, but also allows for easier removal by the Fire Service when fighting a fire. However, there are instances where deep thatch is of historical importance and in these cases the advice of the Local Authorities Conservation Officer should be sought before removal.

Self Contained Insulated Stainless Steel Chimneys

Ignition from conduction can also occur from the use of insulated stainless steel chimneys being allowed to come into contact with the roof. In all cases they must be adequately sleeved to allow an air gap to be maintained between the outside of the chimney and the thatch.

It is insufficient to dress the thatch away from the un-sleeved outer skin when it is passing in close proximity to the eaves, as over a period of time the thatch may settle into contact. Such dressing back can also lead to water penetration at the wall plate unless a deep flashing is fitted that extends back to the thatch fixings of the layer immediately behind the chimney. An alternative is to step the chimney out at the eaves so as to give a good clearance.

It is not advised to fit this type of chimney completely through the body of the thatch. However, if this method is to be proceeded with, a non-combustible sleeve with an adequate air gap must be fitted, which protrudes both above and below the thatching line. Manufacturers should be asked for their advice on the size of the air gap necessary to guarantee safe usage of their product in conjunction with thatch. It may be found difficult to obtain this in writing!

Any factory-made insulated chimney must be constructed and tested in accordance with BS 4543 and be installed in accordance with the manufacturers' instructions, or to BS 6461.

The Building Regulations regarding chimneys must be complied with for any new construction and Listed Planning Permission sought where appropriate.

Condition of the Flue

The first precautionary measure to take is to ensure that the chimney is safe for the purpose to which it will be put. This can vary with; the type of fuel, the type of fire, whether a stove is fitted, the size of the flue and the existing condition of the chimney. If a stove is to be used with an old chimney it will often be necessary to line the flue with an insulated flue liner.

It is advisable to get expert advice from a reliable chimney installer with specialist experience of thatched properties, who can carry out a smoke test to BS 6461 and/or a survey of the flue, including internally. With a chimney properly constructed, or upgraded, to current Building Regulation standards, no excessive heat transfer to the outside face of the chimney will take place, and this is the safest route. Prevent the problem from occurring rather than having to treat it!

Chimney Liners

◆ Size, Type and Installation

It is vital that the correct size and type of liner is specified for the appliance to be used, as the requirements for burning wood are different to those for solid fuel, gas, or oil.

It is also important that the liner is installed correctly, with the parts the correct way up and with the liner spaced off the flue to create an air or insulation gap. To ensure correct spacing on bends the chimney must be opened up and, for wood burning appliances, this space must be filled with an insulating material.

Spigoted joints must be fitted with the socket upwards and any internally protruding ring of cement/sealant at the joints must be removed during installation. Steel flues must be fitted so that the overlapping spirals lie facing downward, with the indication arrows pointing up.

For all liners it is essential that the manufacturers design direction is followed, otherwise flue products can enter the joint and allow tars to leach through to the outside of the liner, or lie within the joints, to catch fire or cause premature failure by corrosion.

If chimneys are not properly swept prior to the fitting of a liner that is either inadequately insulated and/or spaced off the existing flue, it is possible for a chimney fire to occur in this gap. These are difficult to extinguish without demolishing the liner.

Whichever type is chosen it is essential that the liner is continuous throughout the stack and that no make-shift junction occurs before the top of the chimney due to narrowing of the flueway. This is especially important with a thatched roof, as this join is likely to occur as the chimney passes through the thatch. Also the unlined part is likely to clog with tar when the hot flue gases are rapidly cooled upon reaching this colder part of the flue.

Further guidance can be obtained from two useful guides available free from the BFCMA and details of these and other useful contacts are given in Appendix C.

◆ Inappropriate Liners

There have been problems with various types of inappropriate liners used in conjunction with solid fuel and wood burning appliances, with failure often due to incorrect installation. Pumped concrete and steel liners have proved particularly sensitive to being correctly fitted and do not always survive a chimney fire, especially when the flue is subjected to the cold shock of extinguishing water.

Steel liners in frequent use generally have a guaranteed life span of only 10 years and can deteriorate more rapidly than this if used with a slow burning stove.

Pumped concrete liners can be difficult to join on to at the bottom with a section of stove-pipe, as the offtake pipe from the stove protruding into the flue has to have the gap sealed with a coil of non-combustible heat-resisting rope. This seal must be perfect to avoid creosotes and tars running down the outside of the pipe.

Some pre-formed pumice liner blocks can absorb the tars and creosotes resulting from wood burning, and subsequently ignite.

◆ Liner Insulation

Dry backfilling of insulant is prone to settlement, leading to condensation of aggressive flue products at the top level of the fill, and this may well cause early failure of steel liners. If settlement is avoided, by using a weak wet insulant/cement fill, a liner cannot easily be replaced, or increased in size, should this prove necessary in the future.

◆ The Best Option

Steel liners are sometimes chosen as a cheaper option, but if installed with the correct spacing by opening up the flue, and if insulated properly, can work out dearer than using pre-formed sections of High Alumina cement liner constructed with kiln burnt or pumice aggregate. This type of liner, for use with an open fire or an enclosed stove, comes in pre-formed lengths and meets the requirements of the Building Regulations for use with a solid fuel appliance or an open fire. Liners made from other materials must have an independent test certificate as proof that they are fit for the purpose.

These pre-formed pipe type liners can be left protruding down into an open fireplace or an inglenook so that a socket can be fitted, which in turn fits inside the stove offtake pipe. Any creosotes and tars can then only run down the inside of the pipe.

Chimney Fires and Sparks

Ignition of the external surface of the thatch by sparks is only probable in still air conditions and when the thatch is dry, and neither of these occur frequently during the time of year that the majority of fires are lit. However as the possibility exists it is prudent to do something about it.

Chimney fires will create a lot of burning brands so prevention is far better than the cure! Don't be tempted to use a fire in a thatched property as a handy incinerator to dispose of waste paper, cardboard, old Christmas trees, etc. as burning brands might emerge from the flue and can also readily ignite any thick flue deposits. **Never** leave an open fire unattended without a fireguard.

Correct Use of Wood

The Forestry Commission produces a useful leaflet. See Appendix C.

Some timber, such as elder and unseasoned pine, are more prone to sparking than others and logs burnt in an open fire basket will emit more sparks than if burnt on a bed of ash on the hearth.

For wood to burn efficiently it must first be seasoned properly by being cut, split and stacked outside. The stack should ideally face south, be off the ground and have only its top layer protected from rain. The ideal drying out period is three years, but should be a minimum of 12 months.

The logs should then be brought into an inside store for 3 months for final drying off. This will lower the moisture content of the wood, thus reducing the amount of tars and creosotes to

be driven off when burnt and lessening the amount of sparks. The calorific value is also much increased, giving extra value.

Ventilation Air

For a fire to burn safely and efficiently it must have sufficient oxygen available. If there is not enough ventilation into the room where a fire is sited then the speed of the flue gases will slow down. This results in higher deposits of tars, creosotes and soot, and the slower exiting of brands from the chimney, possibly leading to them falling onto the thatch. Another major consideration is that the invisible, odourless and poisonous gas Carbon Monoxide can be emitted into the room, with tragic consequences. Guidance on the ventilation area necessary can be obtained from appliance manufacturers and Approved Document J of The Building Regulations.

Register Plates

These are non-combustible horizontal plates fitted to close off large flues and allow a much smaller flue pipe to exhaust into them.

Care should be taken when an earlier adaptation of an inglenook fireplace has taken place with a register plate installed above the lintel and a short length of stove-pipe fitted to protrude just a short way above the plate. This method is inherently dangerous if used in conjunction with a woodburning appliance. The difference in temperature between the hot gases leaving the stove and the relatively cool, large volume of air in the flue, will cause significant amounts of condensation of the tars in the smoke on the inside of the flue. These deposits are likely to catch fire.

If this method is to be used, in conjunction with a solid-fuel (i.e.coal/smokeless fuel) burning appliance for example, it is essential that proper inspection hatches, at least 250mm square, are cut into the register plate for cleaning access. If the plate is large, two hatches should be cut, one on either side of the flue pipe, as soot sometimes accumulates on one side only.

The plate must be non-combustible and the pipe must have its own cleaning access unless the flue is designed to be swept via the appliance.

Type of Stoves

When the purchase of a stove is being considered seek specialist advice so that any new installation will work properly. Choosing a wood or coal burning stove with a 'clean-burn' system, so that a secondary burn occurs above the fire-bed, will not only give up to 20% more efficiency, but will lead to less flue deposits. However, these stoves have higher flue gas temperatures and an insulated flue is therefore essential.

It is also important that any stove is not oversized for its intended use and the size of the room served. Long periods of slow burning allow the flue gases to drop in temperature to a point where they will readily condense on any surface which is cool enough- such as an uninsulated flue - leading to an increased likelihood of chimney fires.

The appliance offtake pipe connection should be made using a female connection on the appliance so that distillates run into the stove.

Chimney Sweeping

◆ Frequency

It is vital that flues are regularly swept. Owners should assure themselves that their sweep is experienced in the type of fire, flue and fuel combination in use. Intervals between sweeping

will depend on the fuel burnt and the frequency of burning, but must be a **minimum** of twice a year. Call the sweep in once towards the end of a burning 'season' and again prior to the start of the next, (to ensure a flueway clear of any obstructions, such as nests, as well as flue deposits). If wood is burnt, the frequency of sweeping should be increased according to experience of the amount of deposits removed by cleaning, in consultation with the sweep. Note that dropping soot is a sign that the sweep is overdue.

◆ **Qualifications**

It may be prudent to employ a sweep who has a relevant NVQ and/or City and Guilds/Construction Industry Training Board qualification, especially when these become more common. Until then at least membership of one of the national organisations catering for them would indicate a professional attitude. These are listed in Appendix B as NACS/NACLE and the Guild of Chimney Sweeps.

◆ **Coal and Smokeless Fuel**

If coal is burnt, smokeless fuel is the safest to use as it forms less deposits, and these are usually fly ash and unlikely to catch fire, as smokeless fuels burn with a shorter flame. Bituminous coal can leave hard tar deposits, so flues must still be swept regularly, but it has the benefit of a higher calorific value than timber and so less has to be burnt to provide the equivalent heat.

Smokeless fuels, burnt regularly together with wood in 'multi-fuel' stoves, will reduce the amount of flue deposits, but coal based fuels are not suitable for 'wood-only' appliances as the design of the grate will not allow sufficient primary air flow. However some manufacturers can supply a grate adaptor.

◆ **Chemical Flue Cleaners**

Effective chemical flue cleaners are available to help remove and loosen tar deposits, but care must be taken if used with a stainless steel flue liner as some can cause serious corrosion. Normal frequency for a fire in regular use would be monthly for an open fire, and fortnightly for stoves with a lined flue. A few teaspoons of chemical should be sprinkled on the embers last thing at night and, especially, the night before the flue is swept.

Chemical Fire Retardants

Some years ago soaking bundles of thatch in a retardant solution prior to placing them on the roof was considered the only option available as a defence against fire spread. However, there are practical difficulties in using this method. These led to their general demise and include; ensuring adequate quality control for on-site treatment, the problems caused to thatchers by thatching material with too high a moisture content and fears that treatment could shorten the service life of the roof.

They have been largely replaced by a sprayed external surface coating of fire tested silicon based compounds onto the completed thatched roof. Due to the leaching effects of the weather, and the natural wearing of the thatch surface, the life expectancy is guaranteed for just ten years. As this is less than the life of the roof, testing, and possibly re-treatment, is recommended after five years.

They would seem especially ideal for indoor thatch application and these are seen primarily in licensed premises for over-bar decoration of country pubs.

Balanced Flues

These must have a separation distance from the eaves, or nearest thatch, to allow exhaust heat to safely dissipate, and 500mm is suggested. Where this cannot be achieved there are examples where a substantial heat deflector has been fitted between the flue outlet and the thatch, but neither this method, or the separation distance, has been subject to any testing.

Spark Arrestors

Spark arrestors are available from a few manufacturers and consist of a wire mesh 'cap' fitted to the flue outlet. They can be either single, or twin wall, but currently none have been independently tested to discover the optimum mesh size needed to restrict the passage of burning brands whilst avoiding the premature blocking of the mesh by soot and tars.

However, there is evidence that they do prevent sparks from emerging. If fitted it is essential that they are cleaned regularly to prevent the gradual blockage of the mesh, as any restriction of the flue gases will slow them down. This will lead to a higher rate of deposit in the flue, which not only leads to a increased probability of chimney fires, but can be the cause of Carbon Monoxide poisoning.

The cleaning of the arrestors can be somewhat problematical as some sweeps are reluctant to allow their brushes to enter in case they push them off the chimney. The outside mesh of the twin wall type need to be cleaned externally, and it is unlikely that most owners will own a ladder of sufficient length. Also, if the chimney is not on a gable end, the ladder will have to be laid on the thatch, possibly causing damage at what is already a vulnerable spot for wear. An owner must therefore be sure that proper cleaning will take place prior to the fitting of one of these devices and, due to the reasons given, DFRS do not generally recommend them.



Height of Chimney

An alternative method is to allow any brands that emerge time to cool before they reach the thatch. This is achieved by not allowing any restriction to the free flow of smoke at the flue outlet, so that sparks flow up and away, and by ensuring that the flue outlet is high enough above the thatch. A vertical distance of 1.8m between the flue outlet and the thatched ridge is sufficient for this and this dimension is also applicable whether the chimney is sited at the eaves, the ridge, or at any point between.

T-shaped pot terminals, or slabs supported by bricks at each corner, tend to direct sparks downwards and they should not be fitted.

Any increase in the height of the chimney should not be achieved by the use of a chimney pot exceeding 600mm, but by increasing the height of the stack. Tall pots will lead to condensed flue gases forming soot and clinker at the outlet, with a consequent reduction in flue diameter, and they should therefore be kept as short as practicable. They should not be tapered internally and should ideally have at least their base the same size and profile as the flue outlet on which they sit.

When a roof is first thatched an adequate chimney height is often allowed for, but re-thatching over the years frequently increases the thickness of the thatch to remedy an inadequate pitch, so that only a minimum height of chimney remains. Once the correct flue outlet height has been achieved it can be maintained at re-thatching by stripping off an equal amount of thatch to that being applied.

Remember that any changes to a listed building should be cleared with the Local Authority's Conservation Officer.

Timbers Built Into The Chimney

Timbers built into the chimney are usually joists or ridges suspended off the chimney breast. These have sometimes been built in with little, if any, separation from the flue, and over the years these become so dry that they can eventually ignite. The timber lintel over many fireplaces can also be at risk, especially with lower openings.

Usually any problem can be detected by the smell of smouldering timber, or by visual examination, and the inspection of joists is especially recommended when they are at right angles to the chimney breast. Charred lintels can be covered on their vulnerable faces by cladding with a fire-resistant insulating board.

4. THE ROOF VOID

The space immediately under a thatch roof is a high risk area, especially if there is no fire-resisting barrier.

Timber Treatments

Many timber preservatives and insecticides are highly flammable and extreme care must be taken after application to avoid any source of ignition until they have completely dried.

Storage

Lofts should be kept free of storage to allow ease of access in case of fire and to keep the fire loading (and weight on old joists) as low as possible. Any collection of old thatch straws and straw dust that falls down should be periodically removed.

Hot Work

No work involving a naked flame, or heat source, should be allowed near thatch and it would be prudent to make this part of any contract involving outside tradesmen. In the roof space plumbers must only use compression, solvent weld, or push-fit fittings, and not soldered joints, and electricians must not make any soldered connections.

Frozen pipes should only be thawed by using cloths soaked in hot water and not with a blowtorch, hot air stripper, or hairdryer. Alternatively, leave the loft hatch open.

Do not allow smoking, or use a candle, lighter, or match as an emergency light. It must be remembered that wisps of straw and the inevitable dusty cobwebs ignite extremely easily.

Wiring

It is possible to design electrical circuitry so that there is no wiring within the roof space, by having wall mounted instead of ceiling mounted lighting for example, and this is the best option. Do not have recessed ceiling lights on the upper floor, unless separated from the loft by 30 minutes of fire resistance, with allowance made for ventilation to prevent over-heating of the fitting. However, if wiring in the loft cannot be avoided then the following precautions are advised to minimise the likelihood of an electrical fault fire.

Squirrels, mice and rats all seem to enjoy gnawing PVC cable. Unless the loft can be made vermin free, which is difficult to guarantee with thatch, wiring should either be contained in conduit, or proof against attack itself, (e.g. steel wired armoured). Fire resisting cables are not necessarily vermin proof as they are not all protected by a hard metal sheathing, (copper sheathing is comparatively soft). Metal conduit is satisfactory and good results have been reported with the use of high impact plastic pipe with a minimum diameter of 20mm. Soft plastic, or smaller diameters, would allow penetration by biting and should therefore be avoided.

Any light in the loft should be of the bulkhead or well-glass design, be sited on a central post away from the thatch and have its switch on the landing. Wiring should not be fixed to the side of rafters, to avoid possible penetration by thatching spikes/crooks, and junction boxes should be avoided so that all cable within the roof space is a continuous length.

Smoke Detection

A smoke detector should be sited at high level in the roof space and be connected to another on the landing to provide early warning of fire.

This detector should be powered by mains electricity, with integral rechargeable battery back-up, and be linked to those in the rest of the premises (See Section 5 Fire Alarm below).

Ceilings

The underside of the ceiling of the top floor, including any sloping part, should be constructed to give a minimum fire resistance of 30 minutes.

Access

All parts of the roof void should be made accessible to a firefighter in breathing apparatus by the provision of loft hatches having a minimum size of 900mm x 600mm. The hatch(es) should also be 30 minute fire resisting. If the ceiling joists are old and somewhat 'shaky' it may be advisable to fit crawl (duck) boards so that a firefighter can safely gain access to all the roof space without being at risk of falling through the ceiling.

5. FIRE ALARM

All living accommodation should be covered by a domestic fire alarm system to give early warning of a fire. Self contained smoke detectors constructed to BS 5446 should be provided, installed to protection level LD3 of BS 5839 : Part 6.

In practice this means incorporating detectors in all circulation spaces that form part of the escape routes. It would also be prudent, particularly with a thatched property, to consider siting extra detectors in all rooms or areas that present a high fire risk to occupants, to level LD2. This would mean fitting extra detectors in bedrooms where people smoke, living rooms, dining rooms, and rooms where portable or solid fuel fires are used at night. Specific attention should be paid to rooms where the occupants are very young, or elderly, especially if they use electric blankets.

It is recommended that detectors should be the linkable type, powered from the mains, with integral rechargeable battery back-up. This means that whichever unit detects a fire they will all sound, ensuring that occupiers will wake up, even if the fire is remote from the bedroom. They will also continue to give protection in a power cut, when the risk of ignition from candles is higher, and they do not have batteries that need replacing. They should be tested monthly and cleaned annually with a vacuum cleaner. They can be obtained from suppliers listed under 'Fire Alarms' in 'Yellow Pages' and are normally professionally fitted.

A fire alarm can also be fitted, either on it's own or in conjunction with an intruder alarm incorporating a common control panel, to the higher standard of BS 5839: Part 1.

6. ELECTRICAL SYSTEMS

Inspections

All electrical systems will deteriorate over a period of time and should, therefore, be inspected on a regular basis. A visual inspection by the householder is comparatively easy and any physical damage to wiring, both internally and externally can usually be spotted. It is recommended that this is carried out annually. A full inspection by a qualified electrician is advised after the first 10 years following a complete rewiring and then every 5 years thereafter. You may wish to be assured that any contractor is NICEIC approved.

Electrical Supply

All wiring connections to a property, including aerial leads and supply cables to external chimney smoke extract fans, must be spaced a minimum of 300mm away from the thatch and any wire netting. If the mains connection is by an older type of supply using 2 or more separate wires, instead of the modern single, black PVC covered cable, it would be advisable to contact the supply company for advice.

Early Warnings

Should 'early warnings' of electrical faults occur, such as frequently blowing fuses or light bulbs, or warm plugs or cables be noticed, then have them investigated immediately.

Residual Current Device & Miniature Circuit Breakers

The fitting of a Residual Current Device (RCD) is the best safeguard if fitted at the consumer unit (fuse box) to cover all circuits. Some modern consumer units are available with a built in RCD so that any 'essential', or lighting, circuits can be excluded from the parts of the electrical system automatically switched off when the RCD detects a fault and trips out. As we are concerned with the prevention of fire, and not just electrical shock, it is recommended that no circuits are excluded in a thatched property.

The use of miniature circuit breakers (MCBs) instead of fuses is also recommended.

Security Lights

External security lighting gets very hot, especially the popular halogen bulb types; make sure it is sited well away from the thatch.

Socket Adaptors

Do not allow the use of socket adaptors for the 'stacking' of plugs, but follow the rule of **one socket, one plug**. Unplug any non-essential appliances before going to bed, or on holiday. Due to the number of fires that start in washing machines, tumble driers and dishwashers it is inadvisable to leave them running whilst out, or asleep.

Electric Blankets

Switch off electric blankets before getting into bed unless they are the type which are designed to stay on all night. Have them serviced every 2 years, or as recommended by the manufacturer, and ensure there are no sharp creases in the electrical wiring elements woven into the blanket when folded for summer storage.

7. DECORATING

Do not allow any burning off of paint by hot-air paint strippers or blow torches, especially on a floor level in contact with the thatch.

8. TRADESMEN

Ensure all tradesmen who are employed to work in your property are aware of the risks involved when working in proximity to thatch. Obtain written proof that they carry full indemnity insurance against causing a fire in your premises, and have a contract drawn up with all the necessary restrictions and precautions written in.

9. SMOKING

Never allow anyone in proximity to the thatch to smoke and discourage smoking on the upper floor, especially in bed.

10. NEW BUILDING WORK - THE DORSET MODEL

A guide known as the 'Dorset Model' has been agreed between all Dorset Local Authority Building Control Authorities, following consultation with relevant bodies, including Dorset Fire and Rescue Service. The 'Model' provides guidance to allow a relaxation of the distance requirement of the Building Regulations, (which disallows thatch within 12m of a property's boundary). Volume 1 – Dwellinghouses, Approved Document B4 paragraph 10.9 of the Building Regulations refers to the 'Dorset Model'. Copies are available free of charge from Dorset Building Control Departments.

Unlike the 'Dorset Model', which primarily concerns itself with allowing an application to be considered acceptable for approval under the Building Regulations, this Fire Safety Note goes much deeper in its advice for new building work than the Model is able to, so that protection to both property and fire fighters is covered.

11. ROOFS FOR NEW THATCHED EXTENSIONS AND NEW-BUILD THATCHED BUILDINGS

The following advice is considered applicable by DFRS whether or not the building is within 12m of its boundary, and thus falls foul of The Building Regulations, which do not allow combustible roofing materials within this distance.

Fire Resisting Barrier

Tests by the Fire Research Station (FRS) at the Building Research Establishment (BRE) have shown that a thatched roof constructed so that the thatch is separated from the roof void by a fire resisting barrier is both easier to extinguish and suffers far less damage from fire-fighting water. There is a high probability that the roof structure will remain intact, thus allowing subsequent re-thatching on the original rafters.

The separation can be either above (overdrawn), beneath (underdrawn), or between the rafters, but overdrawing is easier to construct as a fire-tight roof, particularly when a room is partly constructed within the roof space. Underdrawing also introduces a larger air gap between the material used for separation and the underside of the thatch. This allows a bigger flue effect in a fire, possibly leading to a fiercer blaze for Firefighters to deal with. For these reasons, when discussing new-build construction, overdrawing only is detailed in this note.

Impermeable Membranes

The BRE has also investigated the effect of an impermeable membrane in close contact with the underside of the thatch, in relation to its moisture content, and have issued a Good Building Guide (GBG) on the subject. See Appendix C (A membrane is taken to mean any type of rigid, or flexible sheet, between the thatch and the roof space).

An impermeable sarking membrane, e.g. polythene or bituminous felt, is sometimes fitted over the rafters for weather protection prior to completion of the thatched roof. This membrane is often left in position after thatching on the understanding that it will reduce the risk of rain penetration. However, these impermeable membranes interfere with the natural transfer of water vapour through the thatch and their use should therefore be discouraged. Water vapour condensing as moisture, either on this membrane, or within the depth of the thatch, can result in acceleration of the normal fungal decay process and lead to earlier deterioration.

However, if this membrane is also required to prevent bits and pieces subsequently dropping into the roof space, then only a permeable type must be used. To allow adequate ventilation of the thatch it should be left short of the eaves and roof apex and either be draped over the rafters, allowing a clear cavity of nominally 50mm under the thatch, or be fixed to the underside of the roof timbers.

Where a higher risk of moisture retention in the thatch has been identified then this cavity should be ventilated at the eaves on both elevations by a continuous air gap equal to at least 25mm. Consideration should also be given to additional ridge ventilation equivalent to a 5mm continuous strip. Note, however, that with a roof with no increased risk, the eaves could be sealed to reduce the ingress of oxygen to a fire, provided that this action is thought not to shorten the life of the thatch by decreasing the ventilation.

Standards

Fire resisting membranes should either have passed a 60 minutes minimum fire penetration test, or have been subjected to the same thatch test specification as those carried out by the FRS. At the end of the test, where a thatched roof is allowed to burn for 2 hours under test conditions before being extinguished, the membrane should not have been penetrated. (At the time of writing no manufacturer had submitted their products for this new test).

Although the Dorset Model will allow 30 minutes fire resisting membranes to be used, this is because the Building Regulations are primarily concerned with means of escape for the occupants, not property protection. It should also be noted that in the FRS fire test the 30 minute generic building board used had been penetrated by fire by the end of the test, although no collapse of the roof structure had occurred.

Bearing in mind that the tests are carried out with no wind to increase the severity of the fire, the length of time it takes to deal with thatch fires and the small percentage difference in cost to a project between 30 and 60 minute membranes, DFRS feel that 60 minutes of fire resistance is the minimum that should be specified.

As one of the main causes of property damage in a thatch fire is the inevitable penetration of the property by fire fighting water then any fire resisting membrane chosen should be water resistant, unless a vapour permeable ('breathable') roofing felt is also used. It would be advisable to ensure that the membrane retained its strength and rigidity when subjected to the application of water, so as not to sag and collapse under its own weight when wet.

New Build

The diagram in Appendix A shows the usual method of roof construction when using solid fire resisting boards. The counter-battening, using the same battens as the rest of the roof, provides the necessary air gap for ventilation. Careful back-filling of the thatch will ensure that the gap is uninterrupted.

To help thatchers avoid penetration of the fire resisting board when fixing through to the hidden rafters below, the counter-battens should be fixed down the length of every rafter by aligning one edge of the counter-batten with the centre line of the rafter below. The same edge, left or right, should of course be used throughout. Thatchers using metal fixings/spikes/crooks to fix the base coat, rather than tying it to the rafters, can then align them down the side of the counter-batten. Once the roof is counter-battened cross-battens are then fixed overall at normal spacing.

The boards can be butt jointed throughout, but vertical joints must coincide with a rafter. With some flexible and/or thinner boards, horizontal joints can be overlapped for extra protection.

If a fire resisting flexible curtain type membrane is used instead of boards the inherent drape of the material might provide the necessary ventilation gap without counter-battens. The material should be waterproof and, if fitted in close contact with the underside of the thatch without counter-battening, 'breathable'. It is important that manufacturer's joining and fixing instructions are followed.

The use of a 50° roof pitch will encourage the use of single layer thatch, or base coat and single layer, and avoid the necessity of thatchers applying multi-layers to correct a low pitch. Lead flashings are more efficient than mortar in the prevention of rain water access to the flue/thatch interface of brickwork joints and are ideal when used with single layer, or base coat and single layer.

Where New Thatch Meets Old

The design of the roof construction for a new extension should be such that a single layer of thatch, or base coat and single layer, will give sufficient depth to meet the existing roof line, even where this is a deep multi-layer roof. The common method of constructing the extension's timbers to meet the original roof timbers should be avoided, unless the existing is already an adequately pitched single layer roof.

Where an extension has new 'protected' thatch butting-up to existing 'unprotected' thatch some thought needs to be given as to how to prevent fire spread from one to the other. A fire in the extension's thatch could easily enter the roof void by travelling horizontally and ignite the old, unprotected roof, and vice versa, completely negating the fitting of the fire resisting membrane.

As overdrawing would only be possible on existing roofs if it was necessary to strip the thatch back to the timbers, underdrawing of the existing thatch with a fire resisting barrier within the roof space is one possible solution. The fixing of rigid fire resisting board to the underside of pole rafters is not easy to achieve, although by no means impossible, by the utilisation of packing strips. However, there are various flexible fire resisting membranes which would be easier to attach. If one of these is used it should be extended where the new thatch meets the old, so as to pass over the new membrane fixed to the top of the new rafters by at least 300mm. It should, however, be noted that no tests have yet been carried out on this method. Unless this underdrawn membrane is waterproof it is advisable to supplement it by one of the 'breathable' roofing 'felts'.

Netting

If galvanised wire netting is used to protect the thatch against bird and vermin attack then it should be laid vertically from ridge to eaves with selvedge's flush, and not overlapping, before the edges are joined by being twisted together with a metal hook. This facilitates easier removal in case of fire.

Although plastic netting is available, as it is fitted as a single roof covering it cannot be removed in the same manner, but has to be cut free.

It should be noted that the fast removal of thatch is one of the main techniques that the Fire Service use to prevent fire spread. Anything that slows down this removal is obviously not going to be of assistance in this. Deep thatch, netting fixed by a non-standard method, or the use of steel sways, instead of the traditional hazel, (the horizontal rods under the top layer used to fix the thatch to the rafters), all mean that the thatch will take longer to strip off.

Terraces

To avoid excessive fire spread it is recommended that where terraced dwellings are proposed the **maximum** number thatched in a continuous row should not exceed three. Should a terrace of more than three be required then a non-combustible roof such as slate should be used for every fourth dwelling. The separating wall between each property must continue up to meet the underside of the thatch and must have no openings.

12. FIRE FIGHTING EQUIPMENT

Extinguishers and Fire Blankets

Fire extinguishers are given a code rating according to the size and type of fire they are able to put out, with code A being the correct type for paper, wood, fabrics and furniture, etc., (but

NOT electrical fires), and size 13 being the right capacity for a house. It is advisable, therefore, to have a fire extinguisher of 13A capacity sited just inside the normal final exit door. This is achieved by a water extinguisher of 9 litres, or by smaller extinguishers having various other contents or additives. The code will be found printed on the extinguisher body.

A small dry powder extinguisher of 2.5kg and a fire blanket should be sited by the exit from the kitchen, but not in close proximity to the cooker.

Hand-held fire fighting equipment should comply with the Standard listed in Appendix C.

Hose Reels

In the garden, a hose reel should be provided, of sufficient length so that a jet from a nozzle will reach all parts of the roof, and allow water to be directed on to a fire whilst awaiting the arrival of the Fire Service. It will also enable wetting of the roof, should there be any threat from an external source; sparks from a bonfire, or crop fire, etc. The hose must be drained in frosty weather and the tap should be lagged.

Sparge Pipes

Roof sparge pipes have been fitted along ridges on some properties to allow the roof to be wetted should a fire occur. There have been problems with lack of water pressure, corrosion and the blocking of the small outlet holes. Also, adequate fixing to a roofing material that settles over its life can prove problematical. It must be remembered that thatch is designed to shed water as efficiently as possible and water penetration of a well-found roof should not exceed about 50mm. Water applied from outside to a burning thatched roof in the form of a trickle of water will, therefore, not extinguish the fire. However, it could be used to wet the roof against sparks landing on the thatch.

13. IN THE GARDEN

Do not have bonfires on your property unless you are fortunate to own a few acres and can ensure adequate space separation from sparks, should the wind change direction. The same applies to fireworks- go to a properly organised display instead.

Barbecues are another regular source of fires. Keep them well away from your house and **never** be tempted to speed things up by adding lighter fuel, paraffin, diesel, or petrol. When finished, carefully damp down by sprinkling with water before leaving it unattended.

It is advisable to discuss with your neighbours the risk to your property from these sources, so that they do not put you at risk either.

14. LIGHTNING

Lightning will always find the easiest path to earth to discharge itself. A tall spike connected to the ground by a good conductor could be just what it's looking for, and should this be attached to your house, it might result in a strike to your property instead of it 'choosing' a nearby tall tree. However, your property might be the tallest object for miles and you might then wish to consider easing the lightning's path to earth. This is a job for a specialist company and you should specify that any conductor fitted should be installed to the British Standards in Appendix C.



15. IN CASE OF FIRE

Fire Routine

It would be wise to work out in advance what you would do in the event of a fire in your property. Consider how everyone would escape from their rooms and discuss this with them. It would be a good idea to rehearse your fire routine, particularly if any children or elderly persons live with you. Your plan should take into account the possibility that your normal way out may be obstructed by fire and that you might need to consider such means of escape as lowering people from windows, dropping onto a mattress, escape via flat roofs, etc.

Ensure all residents, including guests, know your routine and the risks of thatch fires. It is wise to keep a note by your telephone of your address, any helpful landmarks and, if especially remote, your 6 figure Ordnance Survey map reference. The person calling us, who may be in a flustered state, can then just dial 999 and read the information to our Control Room Operators. When calling, include the information that the fire involves a thatched property. Know the location of the next nearest phone in case you can't reach yours, or the line has been damaged.

Local Knowledge

Know the location of your water, gas and electricity cut off points and the nearest accessible water supply, whether a hydrant, or open water source such as a pond, stream, or swimming pool, so that you can inform the crew of the first fire engine to arrive. Also inform them if your roof is protected by a fire resisting membrane.

If your property is off the highway send someone to the junction with the public road, if possible, to direct responding crews. The access to your premises should be sufficiently wide and free from overhead obstructions to allow a fire engine to approach close to the property, and thereby avoid any delay on arrival.

Do not remove any thatch as this will allow air to reach the fire and increase the blaze.

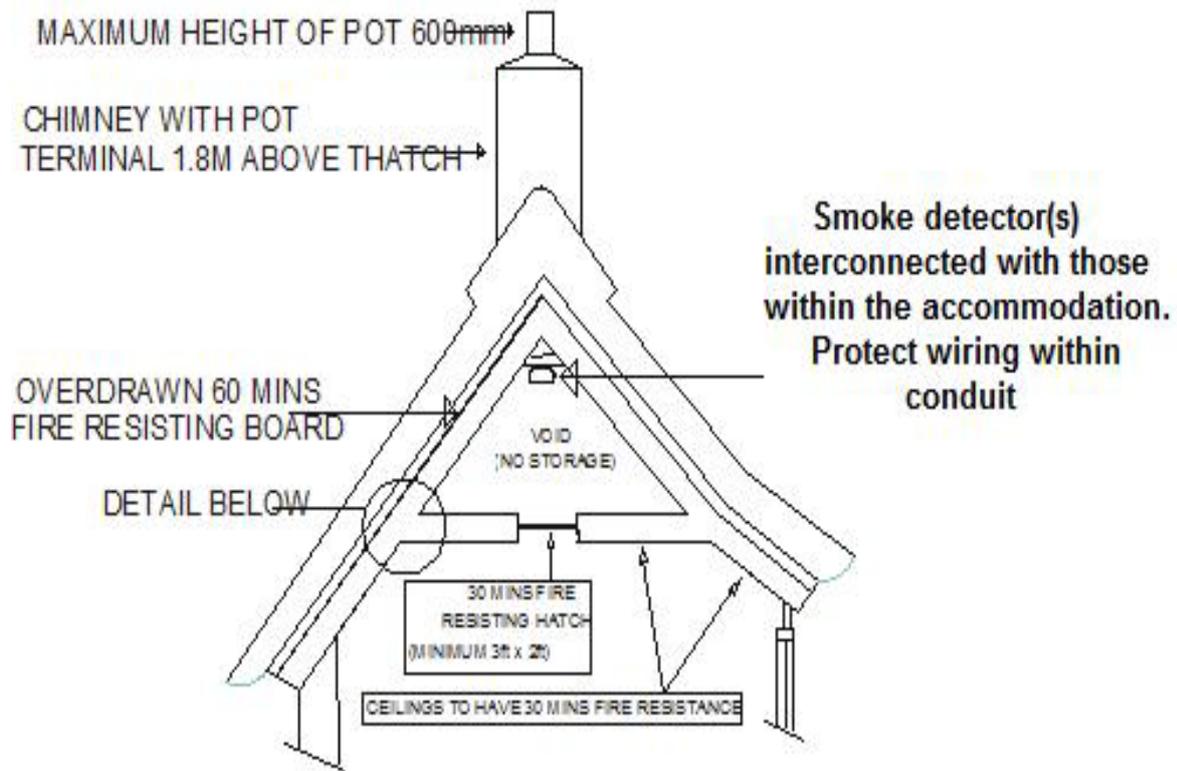
GET OUT, GET US OUT, STAY OUT!

Better still, follow all the advice in this note and don't have a fire at all!

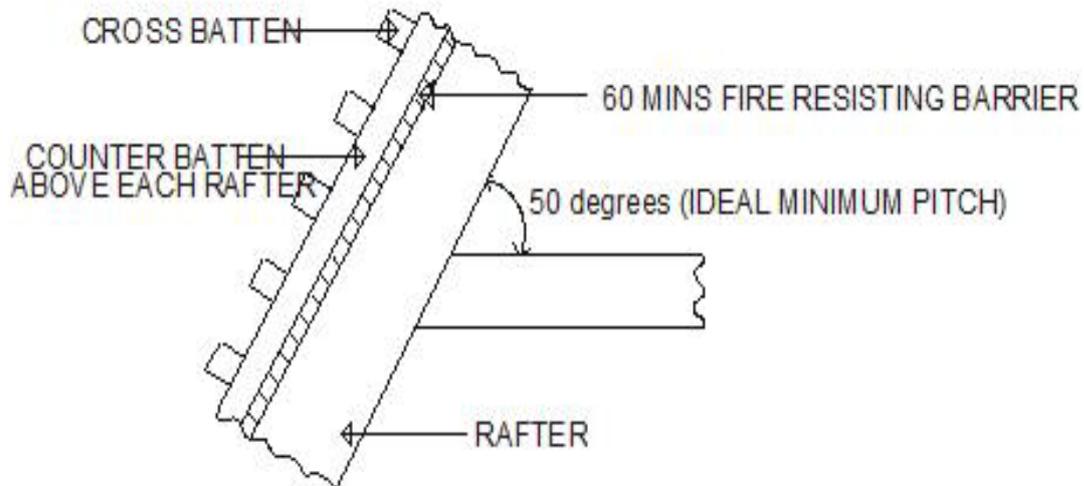
Free leaflets on all aspects of fire safety in the home are available from the contact telephone numbers of Dorset Fire and Rescue Services Fire Safety Department listed in Appendix C.

16. DIAGRAM SHOWING ROOF CONSTRUCTION

APPENDIX A



ROOF SPACE ELECTRICAL WIRING SHOULD BE MECHANICALLY PROTECTED



SECTION

17. GENERAL FIRE SAFETY FOR THE HOME

It's worth walking into every room of your house specifically to check for fire risks. If you go looking for dangers, you might be surprised by how many you find.

Electrical systems

- All electrical systems will deteriorate over time and should, therefore, be inspected on a regular basis. Should early warnings of electrical faults occur, such as frequently blowing fuses or light bulbs, or warm plugs or cables be noticed, then have them investigated immediately.



- **Overloaded plugs**
Fit one plug per socket unless you use a bar adapter on a lead. Don't plug appliances into the adapter that use more than 13 amps of current altogether. See electricians for more information.
- **Electric cables**
Check for worn or taped up cables or leads. These can be dangerous so you should replace them. Don't put cables under carpets or mats where they can become worn.
- **Dangerous wiring**
Watch out for hot plugs and sockets, fuses that blow for no obvious reason, flickering lights, scorch marks on sockets or plugs. They're all signs of loose wiring or other problems.
- **Electric Blankets**
Switch off electric blankets before getting into bed unless they are the type that are designed to stay on all night. Have them serviced every 2 years, or as recommended by the manufacturer, and ensure there are no sharp creases in the electrical wiring elements woven into the blanket when folded for summer storage.
- **Lights**
Make sure lights aren't positioned near curtains and other materials that could burn.
- **Matches and lighters**
Keep matches and lighters where children can't reach them.
- **Ashtrays**
If someone smokes in your house, use proper ashtrays and make sure they can't be knocked over easily. Avoid a build-up of ash, butts and used matches. Wet the contents of the ashtray before putting it in the bin.
- **Inflammables**
Don't keep inflammable materials, like solvents (such as some glues or aerosols) or paraffin, in direct sunlight or near a heat source. If you're using something inflammable, make sure the room is well ventilated, and don't light a flame nearby.
- **Cooking Safely**
The most important point about cooking is to avoid being distracted. Most kitchen fires occur when people leave things unattended.

IN CASE OF FIRE

Local Knowledge

Know the location of your water, gas and electricity cut off points and the nearest accessible water supply, whether a hydrant, or open water source such as a pond, stream, or swimming pool, so that you can inform the crew of the first fire engine to arrive. Also inform them if your roof is protected by a fire resisting membrane.



If your property is off the highway send someone to the junction with the public road, if possible, to direct responding crews. The access to your premises should be sufficiently wide and free from overhead obstructions to allow a fire engine to approach close to the property, and thereby avoid any delay on arrival.

Do not remove any thatch as this will allow air to reach the fire and increase the blaze.

Before Bed Routine

Half of the deaths in home fires take place between 10pm and 8am. That's why it's important to check your home before you go to bed.

- **Switch off and unplug appliances**
Only leave on those appliances that are designed to be left on, like some video recorders.
- **Check the cooker**
Make sure the grill, hobs and oven are all turned off.
- **Don't leave the washing machine on**
Or the tumble drier or dishwasher. Their high speed of operation, friction and motors mean they can be a fire risk.
- **Turn heaters off**
And put a guard in front of an open fire.
- **Check candles**
They can go on smouldering and set off a fire. Double-check they're out. Never leave one burning when you go to sleep.



- **Put cigarette ends right out**
Make sure cigarettes and pipes are out, wetting them to be sure. Never smoke in bed where you could accidentally fall asleep or catch fire to bedding.
- **Check the escape route**
It should be clear of obstacles (and make sure the keys are where they're meant to be).
- **Close doors**
Closed doors slow down the spread of a fire.
- **Turn off your electric blanket**
Unless you're absolutely sure it can be left on safely, for example if it has a thermostat that is designed to be left on.

ESCAPE

- Do you know what you should do if there's a fire?
- Are you sure?
- Does everyone who lives in your home know?

There's no time to stop and think and wonder what's the best thing to do. The situation can change in seconds. Half a minute after the smoke alarm goes off, an entire floor of your house could be filled with dense smoke.

Making your plan

- Include everyone.
- Choose the best escape route and one other, and keep both clear.
- Tell everyone where the keys are.
- Go through what to do in a fire.

GET OUT, STAY OUT, DIAL 999

Better still, follow all the advice in this note and don't have a fire at all!

18. USEFUL INFORMATION**Dorset Fire and Rescue Service, Fire Safety Departments**

for Bournemouth, Christchurch, East Dorset, Poole areas:

**Dorset Fire and Rescue Service,
The Joint Emergency Services Building, Wimborne Road, Poole BH15 2BP**

tel: 01305 252600

fax: 01305 753100

for North Dorset, West Dorset, Purbeck and Weymouth and Portland areas:

**Dorset Fire and Rescue Service Headquarters,
Peperell Avenue West, Poundbury, Dorchester DT1 3SU**

tel: 01305 252600

fax: 01305 252799

**Rural Development Commission
141, Castle Street, SALISBURY, Wilts**

tel: 01722 336255

Government body teaching thatchers. Can help with information on thatching.

TESTING and RESEARCH AND DEVELOPMENT ESTABLISHMENTS

**Building Research Establishment (BRE)
Garston, WATFORD, WD25 9XX**

tel: 01923 664000

For Fire Testing Information.

BRE publications, as listed below, are available from their bookshop:

FIREPLACES, STOVES, CHIMNEYS AND FUELS

**National Fireplace Association
McClaren Building, 35, Dale End, BIRMINGHAM, B4 7LN**

tel: 0121 200 1310

Publish a series of Guides on fireplaces and associated work, including chimneys

**British Flue and Chimney Manufacturer`s Association (BFCMA)
Henley Road, Medmenham, MARLOW, Bucks, SL7 2ER**

tel: 01491 578674

Produce 2 useful free guides-

‘A Guide to Choosing and Using Flues and Chimneys for Domestic Gas Burning Appliances’
and ‘Choosing and Using Flues and Chimneys for Domestic Solid Fuel and Wood Burning Appliances’.

**Heating Equipment Testing and Approvals Scheme (HETAS)
PO Box 37, BISHOPS CLEEVE, Glos, GL5 24TE**

Published annually - 'The Official Guide to Approved Solid Fuel Products and Services', which has a comprehensive list of factory made chimney systems and flues.

The Forestry Commission tel: 01626 890666
Mamhead Castle, Mamhead, Nr Exeter, Devon, EX6 8HD fax: 01626 891118
'Wood as Fuel' leaflet, giving good advice on burning wood.

The Technical Department, Solid Fuel Association tel: 0800 600000
7, Swanwick Court, ALFRETON, Derbyshire, DE55 7AS
Advice on fireplaces, Carbon Monoxide related incidents and fumes relating to poor installations where Solid Fuel is used. Publish a series of free guides on prefabricated and masonry chimneys, solid fuel appliance installation and 'Curing Chimney Problems'.

Council for Registered Gas Installers (CORGI) tel: 01256 372300

Health and Safety Executive tel: 0171 717 6816
'Gas Appliances, Get Them Checked, Keep Them Safe' leaflet.

Oil Firing Technical Association for the Petroleum Industry (OFTEC) tel: 01737 373311
Century House, 100, High Street, BANSTEAD, Surrey, SM7 2NN
Administer Oil Firing Technicians' registration scheme.

Department of the Environment, Transport and the Regions (DETR) tel: 08456 585080
DETR Free Literature, P.O. Box 236, WERTHBY, N. Yorks, LF23 7NB
'Solid Fuel, Wood and Oil Burning Appliances- Get Them Checked and be Safe' leaflet ref. Carbon Monoxide poisoning.

THATCHERS ASSOCIATIONS

National Society Master Thatchers tel: 01923 818822
73, Highenden Drive, DOWNLEY, Bucks, HP13 5SL

National Council for Master Thatchers Association tel: 07000 781909
12, Greenfinch Drive, MOULTON, Northants, NN3 7HX

SPARK ARRESTORS

Diss Ironworks tel: 01379 643978
Norfolk House, St. Nicholas Street, DISS, Norfolk, IP22 3LB

Flues and Flashings tel: 01299 250049
Unit 25A, Ikon Estate, Droitwich Rd., Hartlebury,
KIDDERMINSTER, Worcs, DY10 4EU

The Loft Shop Ltd. have outlets nationwide on same no. tel: 0870 604 0404
nearest branch -
351 Alder Road, Poole, Dorset, BH12 5BJ tel: 01202 859550

Stonecraft tel: 01263 733322
Burgh Road, AYLSHAM, Norfolk, NR11 6AR

CHIMNEY SWEEPS ASSOCIATIONS:

Guild of Master Sweeps tel: 01953 455512
26, West End, Whittlesford, CAMBRIDGE, Cambs, CB2 4LX

18. RELEVANT BRITISH STANDARDS

- BS 4543 Specification for factory made chimneys.
- BS 6461 Installation of chimneys and flues for domestic appliances burning solid fuel (including wood and peat).
Pt 1- Code of practice for masonry chimneys and flue pipes.
Pt 2- Code of practice for factory- made insulated chimneys for internal applications.
- BS 8303 Installation of domestic heating and cooking appliances burning solid fuel mineral fuels.
- BS 5446 Pt 1 Specification for self-contained smoke alarms and point-type smoke detectors.
- BS 5839 Pt 1 Code of practice for installation and servicing of fire detection and alarm systems in buildings.
- BS 5839 Pt 6 Code of practice for the design and installation of fire detection and alarm systems in dwellings.
- BS 5306 Pt 3 Code of practice for maintenance of portable fire extinguishers.
- BS 5306 Pt 8 Code of practice for selection and installation of portable fire extinguishers.
- BS 6651 Code of practice for protection of structures against lightning.
- BS 7430 Code of practice for earthing.