

Flemings Chimney System

Revetment de cheminee en beton leger Schornsteinauskleidung

The **Irish Agrément Board** is designated by Government to issue European Technical Approvals.

Irish Agrément Board Certificates establish proof that the certified products are '**proper materials**' suitable for their intended use under Irish site conditions, and in accordance with the **Building Regulations 1997 to 2002**.

The **Irish Agrément Board** operates in association with the **National Standards Authority of Ireland (NSAI)** as the National Member of UEAtc.



PRODUCT DESCRIPTION:

This Certificate relates to Flemings Chimney System - a prefabricated insulated chimney system for use in domestic accommodation. The chimney systems are available in five options as described in Section 2.1. The design of the Flemings Chimney System is based on a 3-layer construction. The first inner layer consists of a flue liner manufactured in accordance with IS EN 1457:1999. The mid layer is manufactured from flexible rock wool insulation of density 90 kg/m³ and is designed to maintain the temperatures of the flue gases and allow them to pass freely up the chimney. The insulation also allows the clay flue liner to expand and contract without damage. The third and outer layer is a pre-cast block manufactured from lightweight concrete which is a mix of lightweight aggregate sand and cement and encases the system and provides additional insulation. The system is also fitted with a stainless steel termination unit which

allows for expansion and contraction of the flue liners. The picture shown above illustrates the 3-layer construction. The clay flue liners are manufactured in accordance with IS EN 1457:1999 *Chimneys, clay/ceramic flue liners: Requirements and test methods*.

USE:

The Flemings Chimney System is designed to offer fast and efficient erection on site and is suitable for all types of domestic heat appliances. They can accommodate both open fire and closed appliances using fuels with an output of up to 45 kW. The system is delivered to site in block lengths on pallets and contains all the materials necessary to construct a chimney from the base to chimney pot. A chimney system is installed on site by the main contractor under the guidance of Flemings Fireclays Manufacturing Ltd. The systems are suitable for use in domestic prefabricated constructions such as

Readers are advised to check that this Certificate has not been withdrawn or superseded by a later issue by contacting the Irish Agrément Board, NSAI, Glasnevin, Dublin 9 or online at <http://www.irishagrementboard.com/certs.php?no=010129>



Timber and Steel frame as well as traditional masonry construction. One fuel appliance only is to be used for each chimney system.

It is essential that all Flemings Chimney System is constructed in accordance with the requirements of this Certificate and the manufacturer's instructions.

MANUFACTURE AND MARKETING:

The chimney systems are manufactured and marketed by:

Flemings Fireclays Manufacturing Ltd.,
The Swan,
Athy,
Co. Kildare.

1.1 ASSESSMENT

In the opinion of the Irish Agrément Board (IAB), the Flemings Chimney Systems if used in accordance with this Certificate can meet the requirements of the Building Regulations 1997 to 2002 as indicated in Section 1.2 of this Certificate.

1.2 BUILDING REGULATIONS 1997 to 2002 REQUIREMENT:

PART D – MATERIALS & WORKMANSHIP

D3 – The Flemings Chimney Systems, as certified in this Irish Agrément Board Certificate, are comprised of proper materials fit for their intended use (see Part 4 of this Certificate).

D1 – The Flemings Chimney System, used in accordance this Irish Agrément Board Certificate, can meet the requirements for workmanship.

PART A – STRUCTURE

A1 – Loading

The systems have adequate strength and stability and can satisfy the regulation provided they are correctly installed and supported and the maximum height restrictions are observed as shown in Table 3 (see Parts 2 and 3 of this Certificate).

PART B – FIRE SAFETY

B3 (1) – Internal Fire Spread (Structure)

The Flemings Chimney System will retain its stability for a reasonable period of time in the event of fire.

B3 (2, 3) – Internal Fire Spread (Structure)

The Flemings Chimney Systems used in accordance with this Certificate will inhibit the spread of fire and smoke within the building.

PART C – SITE PREPARATION & RESISTANCE TO MOISTURE

C4 – Resistance to Weather and Ground Moisture

The Flemings Chimney Systems are composed of durable materials and when built in accordance with this Certificate using conventional flashing dpc methods can meet the requirements of this regulation. The chimneys must be protected from contact with the ground by a traditional Damp Proof System.

PART E – SOUND

E1 – Airborne Sound (Walls)

Party walls and Compartment walls incorporating the Flemings Chimney Systems are constructed to meet the airborne sound requirements of this regulation. As the chimney systems do not breach the walls which they are secured to, the sound insulation values of the walls are not reduced.

PART J – HEAT PRODUCING APPLIANCES

J1 – Air Supply

The Flemings Chimney Systems can meet this requirement; however, attention is drawn to the need to locate air ducts to obviate draughts within the room where the chimney is located. The installation of the chimney system should comply with the conditions set out in Section 2.4 and Part 3 of this Certificate.

J2 – Discharge of Products of Combustion

The Flemings Chimney System has adequate provision for the discharge of the products of combustion to the outside air, as the flue liners, and chimney blocks of the system have been assessed as being of:

- Sufficient size.
- Contain openings only necessary for inspection, cleaning and efficient working of the appliance.
- Are lined with suitable materials.
- Are constructed at roof level so as to discharge in a safe manner.

Where chimney stacks are constructed at roof level so as to assist in the discharge of products of combustion, the heights of the chimney stack should be in accordance with Table 3 of this Certificate.

J3 – Protection of Building

When used in accordance with Part 4 of this Certificate the Flemings Chimney Systems can meet the requirements of this regulation.

2.1 PRODUCT DESCRIPTION

The Flemings Chimney Systems are factory-made insulated chimneys which are available in five options. Each chimney is delivered to site on pallets containing all the materials required to construct a chimney from base to chimney pot, apart from the fireback which is not provided with the system. The five Flemings Chimney Systems available are as follows:

1. Open Fire Internal Chimney System.
2. Back to Back (Party Wall) Chimney System.
3. Open Fire External Chimney System.
4. Central Heating Chimney System.
5. Chimney Incorporating Bends.

1. Open Fire Internal Chimney System

This is a single chimney system for use in timber and steel frame construction along with traditional masonry construction. All components to the chimney stack from base to chimney pot are included in the chimney pack. The standard chimney breast is 1350mm wide. The Fleming Open Fire Internal Chimney System can accommodate both open fire and closed appliances. The system is suitable for all types of fuels such as gas, oil, and solid fuel, which includes wood and peat. Figures 1 and 2 show the Fleming Open Fire Internal Chimney System installed in Masonry and Timber Frame Construction respectively.

2. Back to Back (Party Wall) Chimney System

This system facilitates the construction of back to back chimneys on both sides of a party wall. The system is available in two options, one for timber and steel frame constructions and one for traditional masonry construction. The flues from each chimney can be combined into one chimneystack at roof level. Figure 3 shows the Back to Back Chimney System used in Timber Frame Construction.

3. Open Fire External Chimney System

This system provides for the building of the chimney on an external wall. The system fundamentally works on the same principles as the Fleming Open Fire Internal System. Figures 4 and 5 show how the system can be installed in a timber frame construction at both ground and first floor level.

4. Central Heating System

The central heating option is suitable for use with all central heating boilers and stoves with a maximum output of 45kW. The system has the added benefits of providing back ventilation,

which makes it suitable for use with condensing boilers. The back ventilation in the system provides optimum air conditions within the chimney. Figure 6 shows this system installed.

5. Chimney Incorporating Bends

The Flemings chimney system can be supplied with bend kits which allows the chimney flue to be offset. The bend kit is designed for use within the chimney breast and has a standard offset of 455mm. Figure 7 shows a standard bend kit installed.

2.1.1 Typical List of Elements in a Flemings Chimney System

The typical chimney system is composed of the following elements:

- Inner refractory clay flue liners manufactured to IS EN 1457:1999
- Clay pot
- Rockwool Insulation of density 90 kgm³
- Outer lightweight concrete made from a mixture of lightweight aggregate and cement
- Concrete corbels and capping
- Lead DPC trays (by others)
- Stainless steel movement plate
- Stainless steel wall tie fixings
- High temperature fireproof sealant
- Reinforcement kit (when deemed necessary)

2.1.2 Description of Flemings Chimney Block

The lightweight precast chimney block units are 440mm wide with a nominal flue dimension of 200mm as shown in Table 1.

Component	Size	Weight	Crushing Strength
Chimney Block	440x440x215	23.9kg	5.3N/mm ²
200mm Flue Liner	440x200	15.56kg	
Hollow Block	440x215x215	22kg	3N/mm ²
Concrete Block	440x215x100	18kg	5N/mm ²
Internal Flue Gatherer	900x440x200	130kg	30N/mm ²
External Flue Gatherer	595x800x300	110kg	30N/mm ²
Single Chimney Cap	825x825x75	22kg	30N/mm ²
Double Chimney Cap	1465x825x75	112kg	30N/mm ²
Corbel	715x715x25	68kg	30N/mm ²
Timber Frame Corbel	715x563x75	55kg	30N/mm ²
Chimney Block Bend	440x650x440		
Rockwool Insulation	30mm thick		

Table 1: Nominal Characteristics

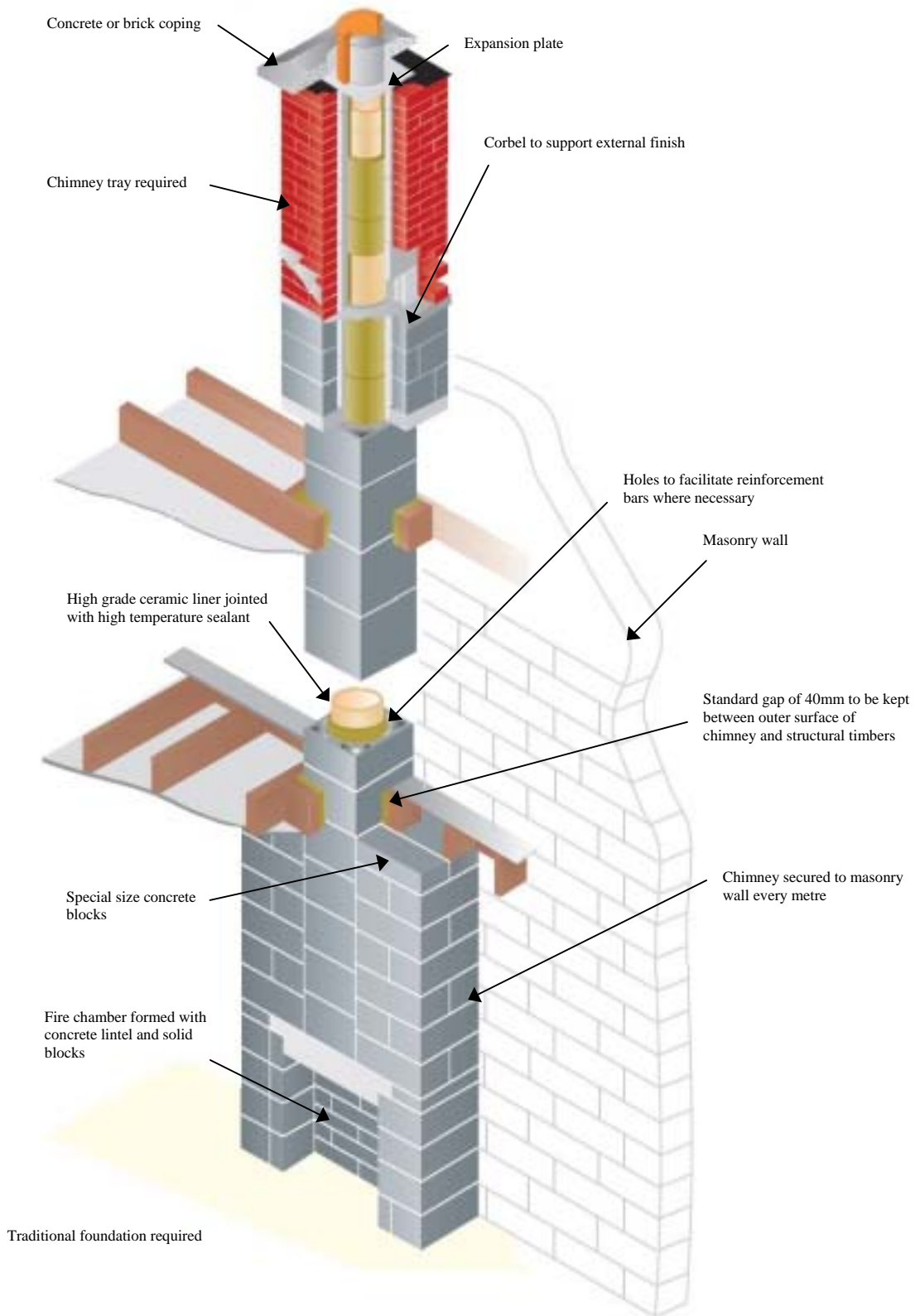


Figure 1: Flemings Open Fire Internal Chimney System for use in Masonry Construction

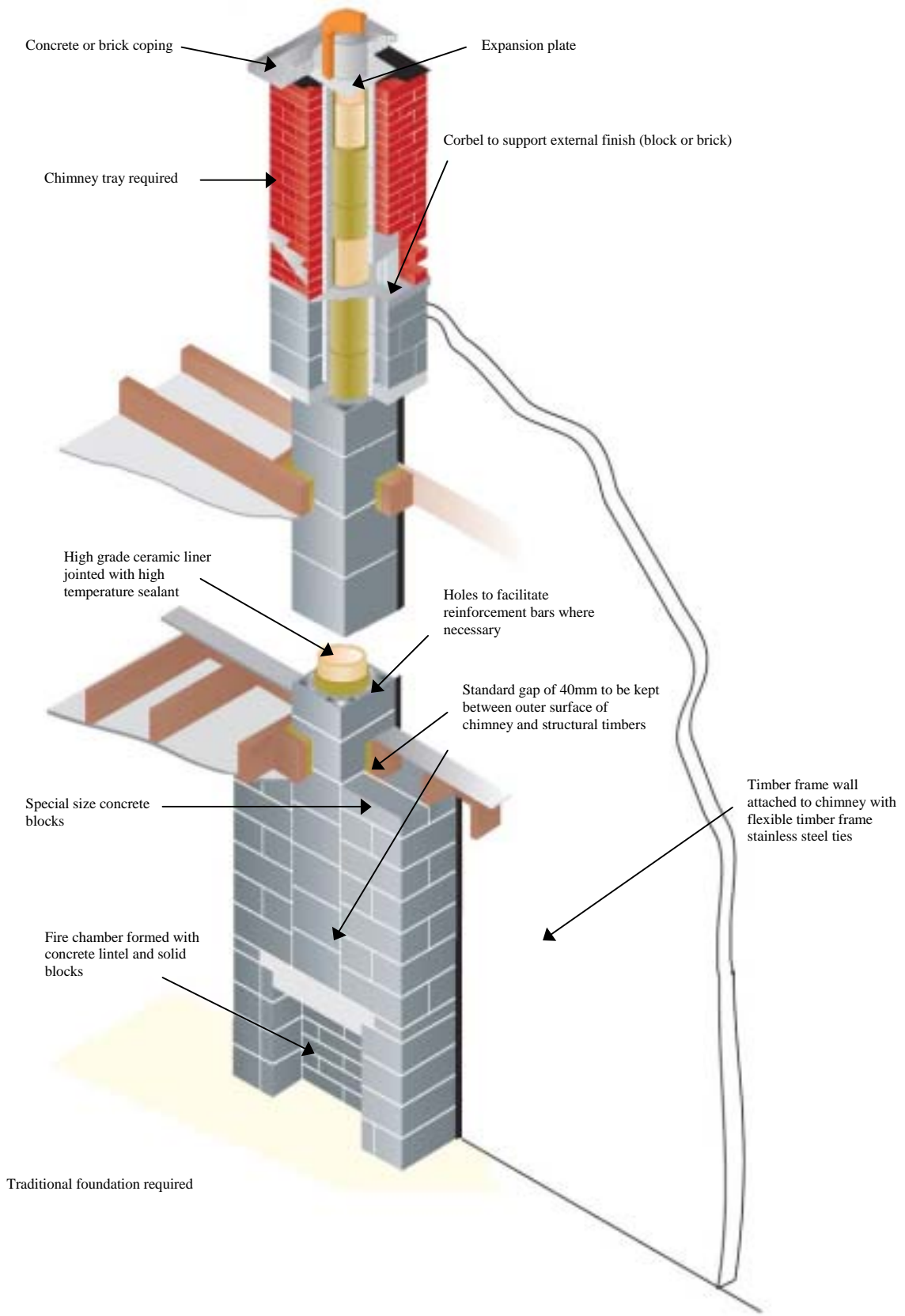


Figure 2: Flemings Open Fire Internal Chimney System for use in Timber Frame Construction

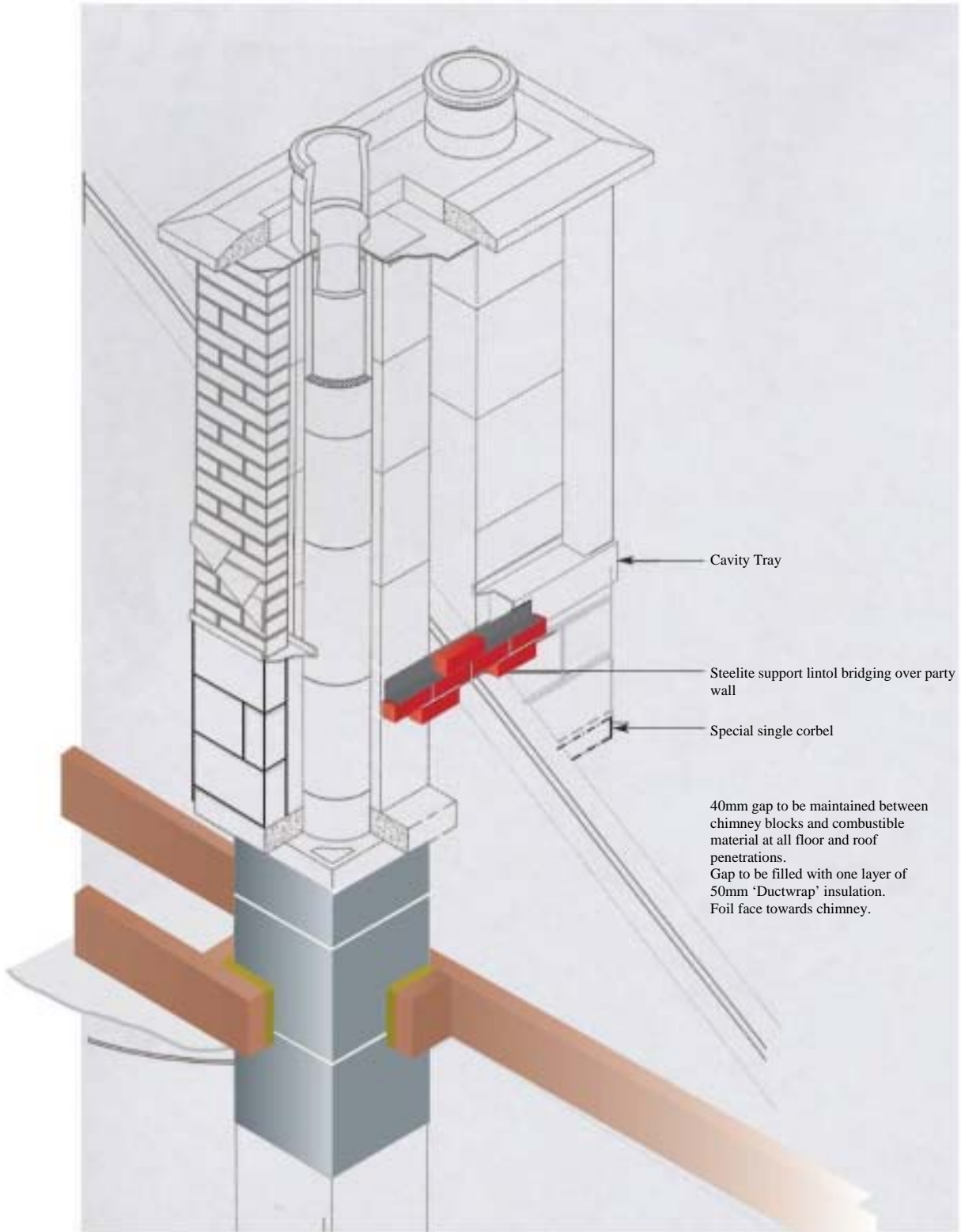


Figure 3: Flemings Back to Back Chimney System for use in Timber Frame Construction Party Wall

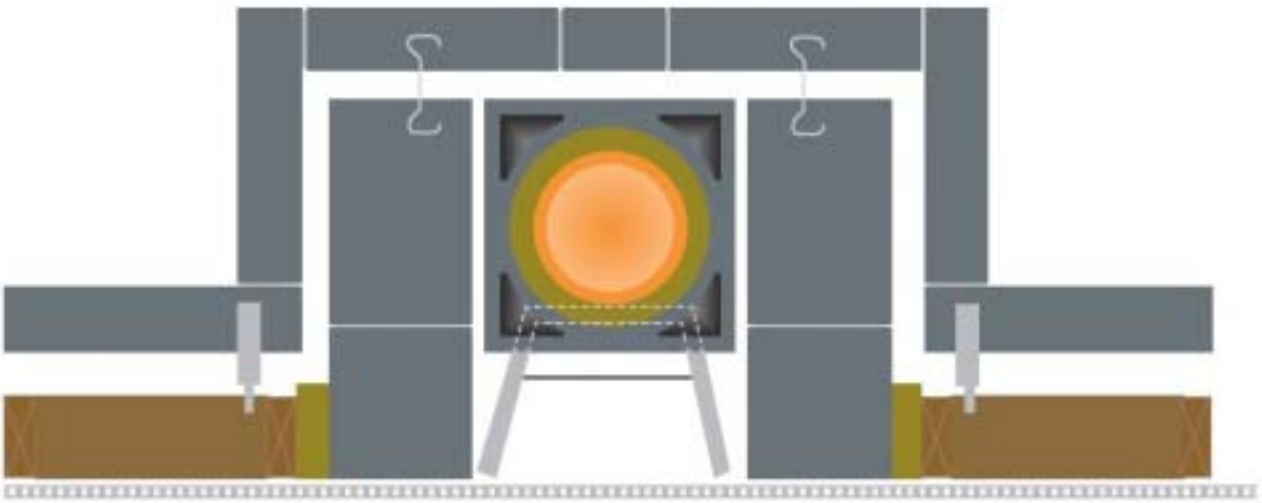


Figure 4: Section through Chimney System at Ground Floor of Timber Frame External Wall

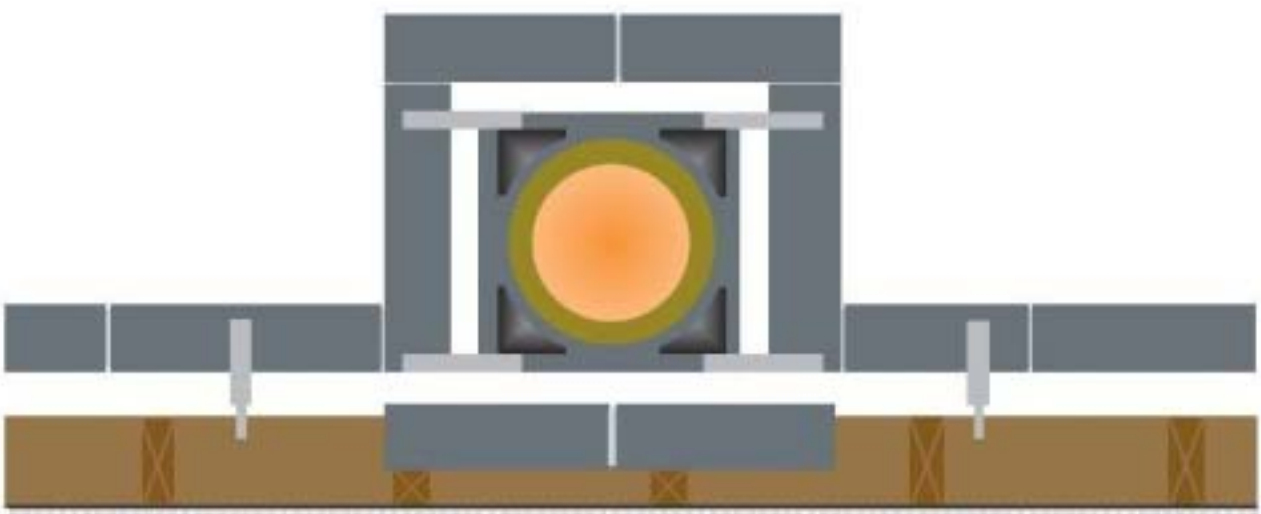


Figure 5: Section through Chimney System at First Floor of Timber Frame External Wall

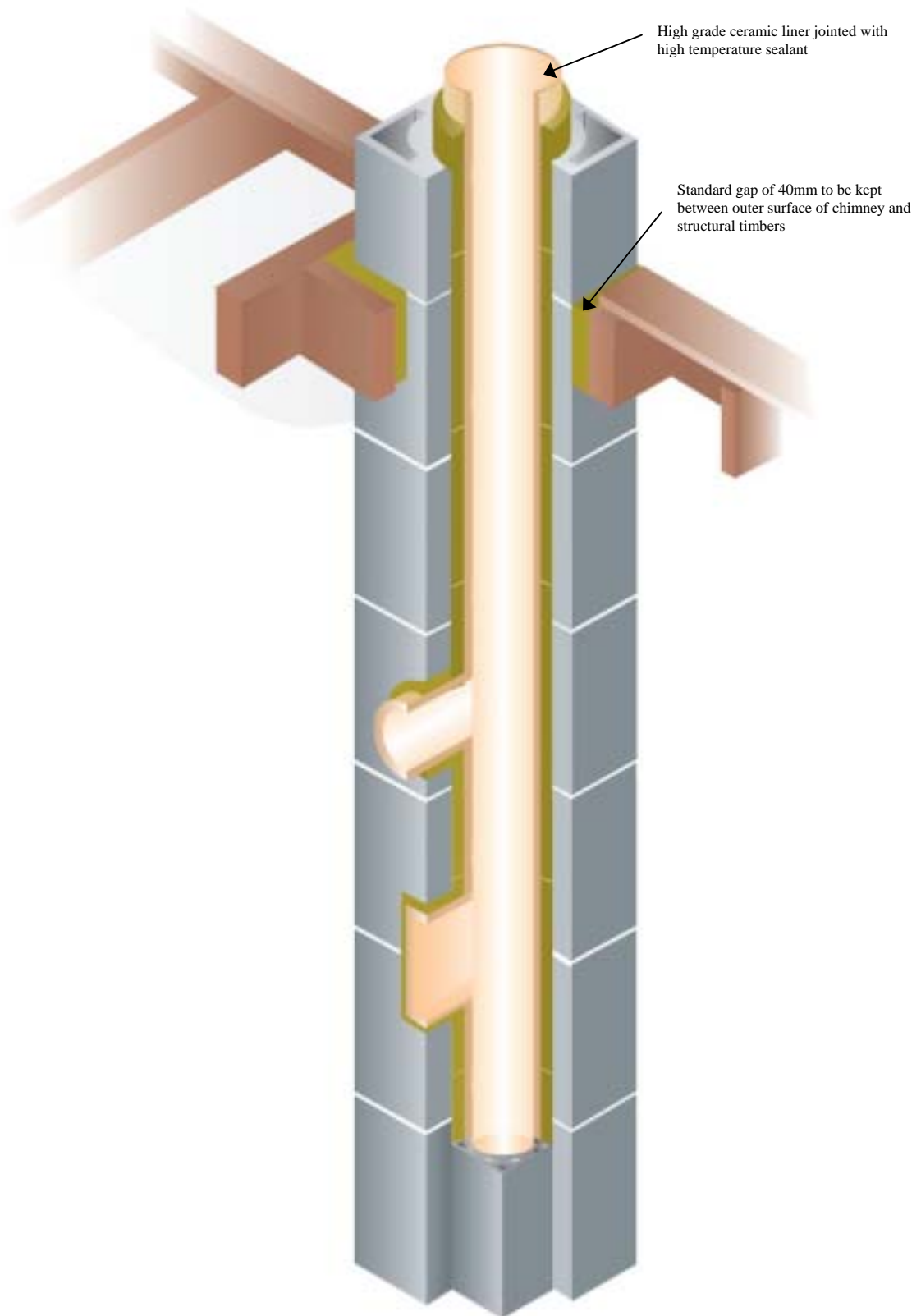


Figure 6: Section through the Flemings Central Heating Chimney System

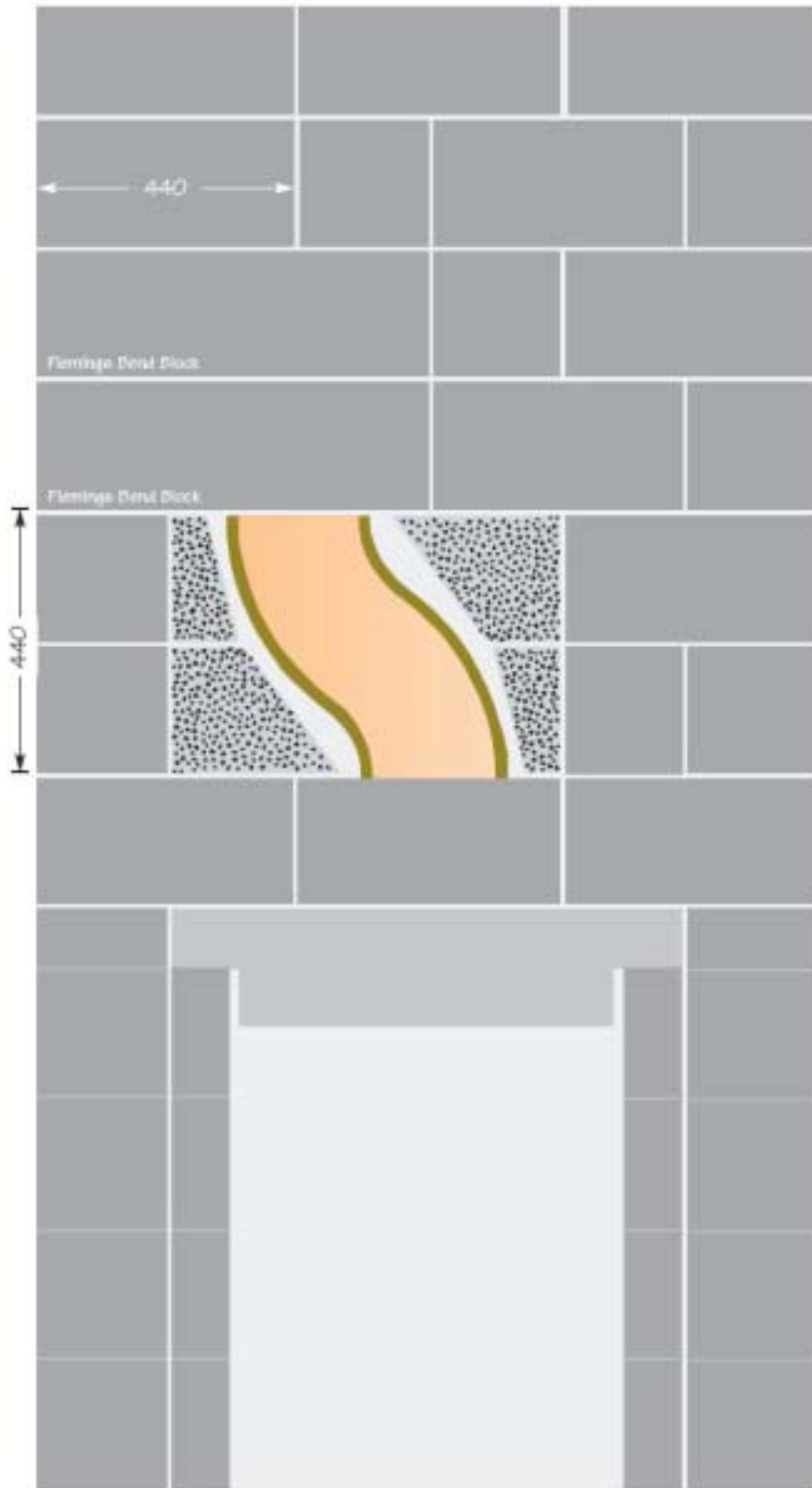


Figure 7: Section through the Flemings Chimney System showing the construction of a Bend

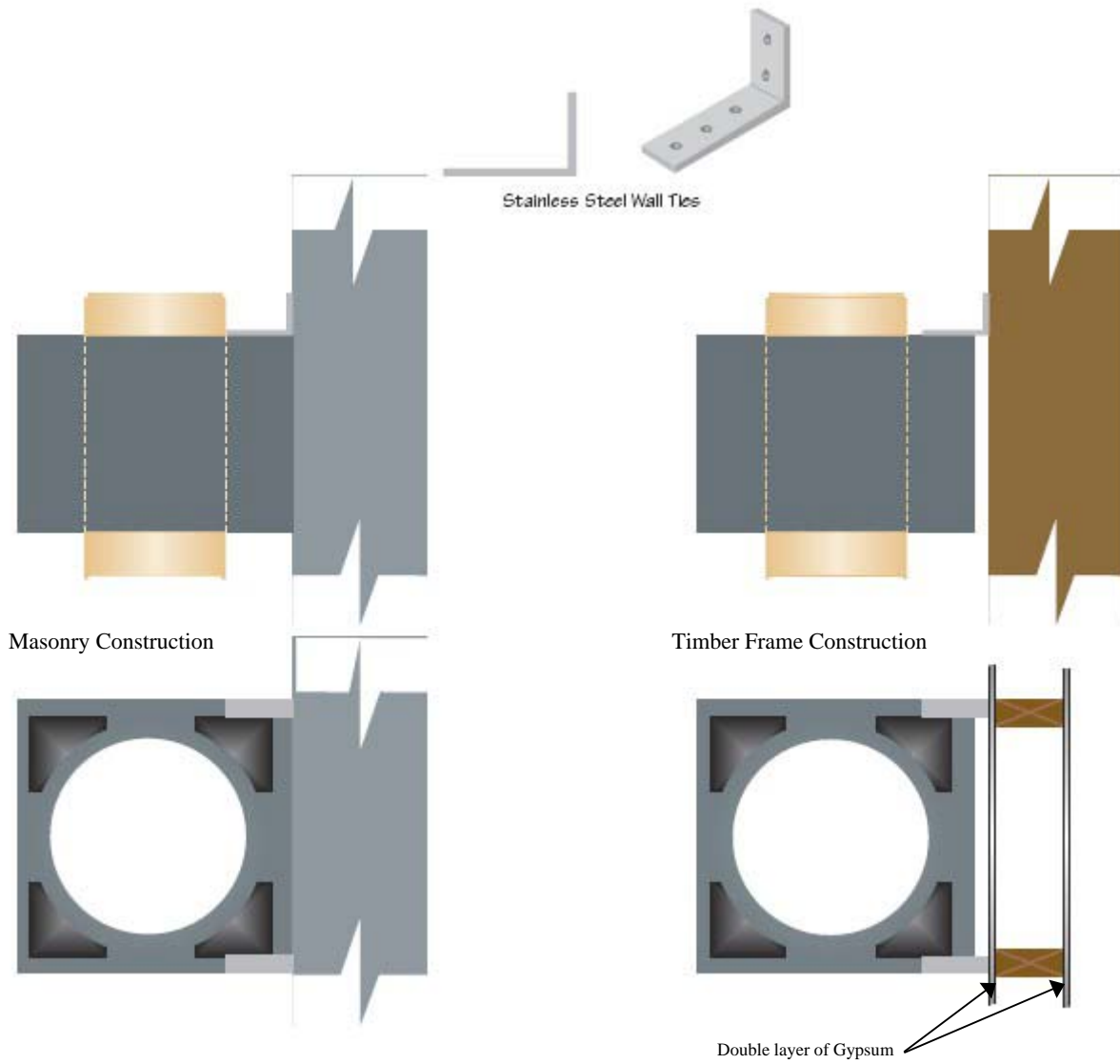


Figure 8: Detail of Location and Fixing of Stainless Steel Wall Ties in Masonry and Timber Frame Construction

2.1.3 Ancillary Items

- Fireproof cement for joining flue liners
- Corrosion resistant stainless steel grade 316 expansion plate
- Damp proof trays Code 5 lead (By Others)
- Clay flue terminals
- Ordinary mortar for joining lightweight blocks
- Masonry stainless steel ties
- Timber frame tie stainless steel flexible wall tie
- Reinforcement kit for chimney stack - 8mm diameter austenitic stainless steel

2.2 MANUFACTURE

2.2.1 Clay Flue Liner

The inner clay liner is manufactured from a blend of suitable refractory clays, using normal heavy clay working machinery, i.e. grinding, blending, add water, de-airing and extruding. This is followed by a drying process and finally through a kiln and fired to a temperature of 1040°C. All flue liners are manufactured and tested in accordance with IS EN 1457: 1999 *Chimneys - Clay and ceramic flue liners - Requirements and test methods*.

2.2.2 Lightweight Chimney Block

The outer casing or flue block is manufactured from lightweight concrete incorporating a lightweight aggregate. A standard egg-laying process is used for the manufacture of the blocks.

2.2.3 Rockwool flexible insulation of a density of 90 kgm³ is specially made for the Fleming Chimney System by Deutsche Rockwool Mineralwool GmbH. The insulation is used to maintain the temperature of the flue gases which inhibits the risk of condensation.

2.2.4 The precast flue gatherer is manufactured from OPC, sand and aggregate with steel reinforcing.

2.2.5 The precast chimney corbel and copings are manufactured from normal density mix concrete. Other accessories e.g. expansion plates, inspection doors are manufactured to a British Standard or equivalent European Standard. The steel used in these products has been assessed as being suitably corrosion resistant for use in chimneys. The high temperature fireproof sealant used in the joints between liners is a proprietary product specially manufactured for the Flemings Chimney Systems. It is supplied in special disposable tubs. Ordinary mortar is used for joining the blocks together.

2.2.6 Quality Control

Quality control on manufactured items includes checks on weight, dimensions, crushing strength and density. Flemings Fireclays Manufacturing Ltd. has a full in-house quality control system in operation.

2.3 DELIVERY, STORAGE AND MARKING

The Fleming Chimney System is ordered by the required chimney height. Each chimney system (pack) is delivered to site on a series of pallets and contains all the materials necessary to construct a chimney from the base to the chimney pot. The pack for a standard chimney can be fitted on two pallets. Pallets should be stored on a firm level base until required. The pallets are shrink wrapped and are clearly labelled which shows the manufacturers name, flue size, chimney height, production batch number and the IAB identification mark incorporating the number of this Certificate and contains instructions on storage and installation.

When pallets are unwrapped, components should be carefully offloaded. They should be stored off the ground and under cover in such a manner that they are protected from accidental damage and adverse effects of weather.

The system has the advantage of being able to deliver a full chimney to a specific building on pallets. This method of delivery allows for easy storage on site and avoids unnecessary breakage of flue liners and pots as is common with traditional built chimneys on construction sites.

2.4 INSTALLATION

2.4.1 General

Installation/assembly of the Flemings Chimney System is carried out in accordance with the requirements of this certificate and the manufacturer's instructions. Installation on site is carried out by the main contractor. Installers of the system must be familiar with the system and at least one operative installing the system must have received some formal training on the principals of installing the system. Flemings Chimney Systems offer a full technical back up service to operatives installing the system. Installation of the chimney does not present any undue difficulty either in terms of their accommodation within traditional or system-built dwellings or their compatibility with accepted operational sequences. The weights of the chimney components are such that mechanical handling equipment is not normally required (see Table 1). The Fleming Chimney System affords appreciable saving in construction time and sealing against subsequent smoke penetration when compared with conventional masonry construction.

2.4.1.1 Foundation

The Flemings Chimney Systems when constructed are lighter than traditional masonry chimney systems and a conventional concrete foundation is adequate.

2.4.1.2 Constructional Hearths

A constructional hearth must be provided to all Flemings Chimney Systems. The constructional hearth should be constructed in accordance with Technical Guidance Document Part J section 2.18 and 2.19 of the Building Regulations 1997 to 2002. The installation of the constructional hearth is the responsibility of the main contractor.

2.4.2 General Installation Criteria

2.4.2.1 Installation of the Fleming Open Fire Internal (Timber/Steel Frame & Traditional Masonry) Chimney System

- First ensure that the constructional hearth is adequate to build the Fleming Chimney System.
- Place a ring of the high temperature fire proof cement around the flue recess in the gatherer.
- Make a bed of mortar on the gatherer for the first chimney block.
- The chimney breast is next constructed by placing the first chimney block on the bed of mortar.
- Then position the insulation around the inside of the chimney block carefully.
- Clean the flue end with a sponge, place the fire proof sealant round the socket end and place the flue pipe into the chimney block.
- Once it is positioned wipe the sealant away from inside the flue.
- The Flemings chimney blocks are tied to masonry walls using stainless steel brackets as illustrated in Figure 8, or alternatively with a stainless steel tie of similar cross section to a masonry wall tie. The Fleming Chimney System is tied to timber frame walls using stainless steel timber frame wall ties. Ties should be used every third vertical hollow block and chimney block with a maximum spacing of 1 metre for both masonry and timber frame.
- Put expanded metal between the chimney block and infill masonry to prevent cracking, if not dry lining the chimney breast.
- Continue building chimney blocks as above until the top of the chimney breast is reached (ref Figures 1, 2 and 3). Insulation is inserted into the chimney blocks which form the flue in the chimney breast.
- It is important to ensure that the fire proof cement is put on the top of each flue rebate and the insides are wiped clean with a sponge.

2.4.2.2 Trimming at First Floor Level

- Floor joists running parallel or perpendicular to a chimney stack must be trimmed around the stack.
- Where the chimney passes through the ceiling a gap should be left, this gap shall be 40mm for structural timbers or 30mm for a concrete ceiling. The gap is then filled with

mineral wool or a non-rigid, non-combustible material.

- To comply with the Building Regulations 1997 to 2002 the chimney must be constructed so that:
 - (a) There is a minimum separation distance of 200mm between the flue and combustible material.
 - (b) There is a minimum separation distance of 40mm between the outer surface of the chimney and any combustible material. Floorboards, skirting, dado, picture rail, mantle shelf or architrave do not need to be taken into account in condition (b).
- The chimney is then built as a single block up to the stack.

2.4.2.3 Chimney Stack with Brick or Brick Cladding

- For chimneys that require a brick or block cladding a corbel is provided with the system. Wall weeps are also required but are not provided with the system.
- The concrete corbel and lead tray (supplied by others) are placed on the Flemings chimney block. This gives a stack of 715mm x 715mm. Lay the required number of brickwork courses to reach chimney tray level, generally two courses of brickwork is sufficient.
- Continue to build the chimney blocks on the corbel, inserting the DPC tray at the appropriate level.
- The lead chimney tray (supplied by others) is then placed over the chimney block and let to rest on the bricks as shown in Figure 3. The apron of the chimney tray should always be on the sloping side of the chimney. The high upstand and cavity maintain the damp proofing of the inner chimney.
- Continue to build up the outer brickwork and inner chimney block on top of the chimney tray. Weep holes should be incorporated into the brick joints to ventilate and remove any trapped moisture.
- On the last chimney block make sure the last flue liner is 40mm below the underside of expansion plate.
- After cutting the last flue liner put the expansion plate on the chimney block. Now add mortar on top of the expansion plate and place the coping on top.
- Place the chimney pot into the coping to a depth of at least 75mm in good quality mortar and seal the space around the base. Use similar material to seal the gap inside between the pot and the expansion plate.
- Finally inside the chimney pot seal the space between the pot and expansion plate with mortar or other non-porous material.

2.4.2.4 Height of Chimney Stacks

Where it is required to clad the portion of an internal chimney above the roofline with brickwork, a corbel unit is incorporated in the

construction just below the roofline. The opening in the roof must be suitably trimmed by timber fixed to the roof members.

- The height of a chimney stack of a Fleming Chimney System should be in accordance with Table 2.
- Depending on wind zone, the chimney stack in the Flemings Chimney Systems meet the requirements in all areas of the Wind Zone map of the technical Guidance Document to Part A of the Building Regulations 1997 to 2002 when installed in accordance with this Certificate and the manufacturers instructions.

Zone A	Without reinforcement	1.4 m
Zone B	Without reinforcement	1.1m
Zone C	With reinforcement*	1.5m
* Reinforcement is possible with a corbel/brick chimney		

Table 2: Maximum Heights of Chimney Stacks without Reinforcement

2.4.2.5 Installation of Reinforcement

The reinforcement bars must start below the lateral support. Start by inserting the plastic stoppers into the holes on the underside of the first block with bars. Fix the bars together and insert equal lengths into two opposite holes in the chimney block. The liquid grout should then be poured around the bars to ensure stability. Table 2 describes where and when reinforcement is required.

2.4.2.6 Installation of the Back to Back Chimney System (Party Wall)

The Fleming Back to Back Chimney System for use in party wall construction is available in two options. Option 1 is used in timber or steel frame after the plasterboard slabbing of the party wall and before the tile/slating of the roof. The chimneys are constructed on either side of the party wall and therefore do not break the party wall. The two chimneys remain independent of each other until they reach the top of the party wall then using a steel reinforced lintel they join together to become one externally above roof level. The lintels ensure that no vertical load is applied to the party wall. Special pre-cast cut corbels are used to support the brickwork masonry. A special cavity tray element is provided by others to prevent moisture from rain penetrating through the brickwork to the level of the corbel. The flashings are installed in a conventional manner. The height of the projection of the chimney above roof level should be in accordance with Table 2. The system is designed to bring two chimneys into one chimney stack with a brickwork or blockwork finish. The system meets the fire performance requirements of the Building Regulation 1997-2002 by providing the following: The system when installed must show at least 40mm distance between combustible

material and the surface of the chimney blocks in accordance with the TGD to Part J, Clause 2.15 (b) of the Building Regulations 1997-2002. The 40mm space must be filled with compressed duct wrap insulation or similar non-combustible material.

The void between the top of the timber (or steel) frame and the underside of the chimney lintel must also be sealed with duct wrap insulation or similar non-combustible material.

Option 2 is used in masonry construction. The corbel used in this form of construction is supported by the masonry party wall in a conventional manner.

2.4.2.7 Installation of Open Fire External Chimney System

The External Chimney cladding at the base of the chimney must be at least 1.46m wide by 440mm deep on the outside gable wall. The brickwork may be reduced higher up by tumbling in. Figures 1, 2 and 3 show three examples of Flemings External Chimney Systems with a brickwork finish.

- The fire chamber should be built in a traditional manner and be a minimum of 600mm wide by 550mm deep.
- The fire chamber and inner and outer blocks are built on a suitable foundation. The sides of the fire chamber are formed with standard concrete blocks laid on their flat side and built to the appropriate height complete with flue gatherer.
- Place a ring of the high temperature fire proof sealant around the flue opening in the lintel.
- Make a bed of mortar on the lintel for the first chimney block.
- Place the first chimney block in position on the bed of mortar and ensure that it is flush with the inside of the cavity.
- Then position the insulation around the inside of the chimney block. Clean the flue ends with a sponge. Put the fireproof sealant around the socket end and place the flue pipe into the chimney block, keeping the socket to the top. Once it is positioned wipe the sealant away from the inside of the flue.
- Place standard concrete blocks on a bed of mortar on either side of the chimney block.
- Cavity wall ties are now used to tie the chimney to the outside brick skin.
- Concrete blocks are now placed on top of the lintels forming the inside wall.
- Continue to build chimney block and concrete block up to roof level.
- When the top of the cavity is reached the brickwork is increased from 2 to 3.5 bricks in the chimney stack while maintaining the cavity throughout the stack. The chimney tray is then installed in the traditional manner.

2.4.2.8 Installation of Flemings Chimney System for a Central Heating Boiler Flue

- First mark out a location for the chimney and build a suitable constructional hearth to the same level as the finished floor.
- Place a layer of damp proof course on the constructional hearth.
- Apply a bed of mortar to this base.
- Place and level the base block on a bed of mortar. Fill the voids with mortar.
- Place the first pre-cut chimney block with ventilation opening on the mortar.
- Bend the insulation and insert into the block keeping the slots of the mineral wool into the inside.
- Cut the insulation flush with the top of the block.
- Apply a bed of mortar to the block.
- Place the pre-cut inspection door block on top of the bed of mortar.
- Bend the insulation around the inside of the chimney block again keeping the slots of the mineral wool to the insides.
- Once fitted cut the insulation along the ventilation channel taking care to keep the joints of the insulation out of the ventilation channel.
- Clean the ends of the flue liner with a sponge before putting the supplied high temperature sealant provided around the bottom rebate.
- Then place the flue liner into the chimney block making sure that the socket end is at the top.
- Place the standard chimney block on the bed of mortar, bend and insert the insulation.
- The junction flue can now be installed.
- Place the next pre-cut chimney block on a bed of mortar, bend the insulation around the inside of the chimney block and once fitted cut the insulation along the ventilation channel.
- Clean the ends of the junction flue with a sponge before putting the supplied high temperature sealant around the socket end then place the flue into the chimney block making sure the socket end of the rebate is at the top.
- Then place the next chimney block on top followed by the insulation and the flue.
- Once the flue liner is in position wipe away any excess sealant from the inside of the flue.
- Continue building chimney up to corbel using standard chimney blocks, insulation and ceramic flue liners.
- Follow guideline for trimming at floor level and building chimneystack as previously described under section 2.4.2.2 to section 2.4.2.5.
- It is recommended using expanded metal on every third chimney block during construction.

- Depending on the diameter of the junction pipe the insulation can be cut with the saw provided in the accessory pack.
- Once fitted push the clips into the insert insulation and place into the opening.
- The inspection door is to be fixed to the chimney block with the nails provided. Once secured place the ceramic inspection insert into the opening.
- Finally place the ventilation grill into the opening of first chimney block, and the installation is completed.
- The space between the clay junction pipe and the metal appliance should then be sealed with a ceramic rope or other non-combustible material.

2.4.3 Bends and Chimneys

The Flemings Chimney System offers an option for the construction of a bend in a chimney. The standard Chimney Breast Bend kit is shown in Figure 7. Chimneys should be vertical where possible but where bends are unavoidable the angle of the bend should be no greater than 45 degrees to the vertical for oil-burning appliances and 30 degrees to the vertical for solid fuel appliances.

When a Fleming Chimney System is completely installed it should be allowed to cure for a minimum of four to five days before the appliance is used.

2.4.4 Bend Kit Installation

- The Flemings Bend Kit is delivered to site on a pallet.
- The Bend Kit consists of two purpose made L.W.A. blocks which can be built to provide offset in increments of 228mm. The block sizes are compatible with standard masonry sizes.
- To form the bend lay the first bend block on a bed of mortar on the flue gatherer.
- Insert the ceramic flue bend into the block, rebate up. Ensure that both ends are pointed with fire proof sealant.
- Place the second block on a bed of mortar over the bend.
- Pack the voids with the insulation provided.
- This will provide a 228mm offset.
- To form the chimney breast fill in the voids with standard masonry.

2.4.5 Plastering of Chimneys

Chimneys exposed externally throughout their length must be either clad in brickwork or rendered blockwork. The internally exposed faces of the Fleming Chimney Blocks can be plastered on the exposed faces or boxed in with plasterboard and skim coated.

The chimney breast to all chimney systems must be dry lined or plastered. The plasterboard

sheets used in the dry lining are fixed to the chimney breast using dabs of drywall adhesive at not greater than 600mm centres. A 50mm wide dry wall adhesive ribbon must be applied along all edges of the dry lining, e.g. around openings. Fire stopping at the junction of ceiling and chimney is achieved by using a continuous fillet of dry wall adhesive. Where the chimney faces of a Fleming System are left exposed in an uninhabited attic, it is not necessary to plaster the surfaces.

2.4.6 Inspection of the Installed Chimney

Once a Flemings Chimney System has been installed the following shall be inspected:

- All joints in block work have been checked.
- All fire stops and spacers are properly located and secured in accordance with this Certificate and the manufacturer's installation instructions.
- The fitting of terminal and roof flashing above the corbel should be inspected before scaffolding is removed.

3.1 GENERAL

Flemings Chimney Systems, when installed in accordance with this Certificate, will perform in a safe and satisfactory manner when used internally or externally in domestic housing or commercial/industrial buildings. The chimney systems can be used in conjunction with gas, oil or solid fuel burning appliances, as described in section 4 of this Certificate. The term 'solid fuel' relates to those fuels listed in Appendix A of BS 1846: Part 1: 1994 *Glossary of terms relating to solid fuel burning equipment - Domestic appliances*.

3.2 DESIGN REQUIREMENTS

- 3.2.1** The Flemings Chimney Systems are designed to be suitable for open fire and closed heating appliances that might be installed during the lifetime of the dwelling. The size and formation of fire openings must be in accordance with BS 1251: 1987 *Specification for open fireplace components* and BS 8303: 1986 *Code of Practice, Installation of domestic heating and cooking appliances burning solid mineral fuels*. Appliances must allow access to the chimney for cleaning.
- 3.2.2** The design of the chimney must be in accordance with normal good practice. For example, the chimney must be terminated so as to prevent discharge gases from re-entering the building, or entering any other adjacent building. The structure to which the chimney system is attached must be in accordance with the relevant Code of Practice. Only one appliance or open fire per chimney is to be used.
- 3.2.3** The Fleming Chimney block units comply with the general recommendations for materials for flue block chimneys contained in BS 6461: Part 1: 1984 *Installation of chimneys and flues for domestic appliances burning solid fuel (including wood and peat) - Code of practice for masonry chimneys and flue pipes*.
- 3.2.4** Completed chimneys should be left to cure for 4 to 5 days before the appliance is used.
- ### 3.3 FOUNDATION
- Where a chimney is built up from foundation level, it must be supported on a concrete foundation designed in accordance with normal good practice. This foundation must reach a frost-free depth, i.e. approximately one metre below ground level if the chimney is external or approximately 400 mm below floor level if the chimney is internal.

3.4 CONNECTION TO STRUCTURE

The chimney units should not be bonded into the building structure, but external chimneys must be tied to the structure at not more than three unit intervals and at the point of departure from the roof line, using the specified stainless steel ties/brackets. Consideration must be given to the effects on the adjacent structure of the loads imposed by the chimney fixings. Internal chimneys may be tied to the structure using the specified stainless steel ties/brackets wall ties at three unit intervals; alternatively, the necessary support may be provided during and after construction by the intermediate floors and by the timber trimming at roof level.

3.5 FLOOR DETAIL

Where the chimney system passes through concrete floors, a sliding joint must be made using mineral wool or similar non-combustible material. Bonding between the chimneys and the floor or structure must be avoided. A minimum clearance of 40mm must be maintained between the outer surface of the chimney block and timber structural members such as joists and rafters. After the units have been positioned, the gap must be filled with mineral wool having a minimum density of 25-30 kg/m².

3.6 CAVITY WALLS

When an external chimney is erected the design and installation of the flue connection to the appliance must be in accordance with BS 6461: Part 1: 1984 *Installation of chimneys and flues for domestic appliances burning solid fuel (including wood and peat) - Code of practice for masonry chimneys and flue pipes*. Particular care must be taken to comply with the weather details for the connection flue where it passes through the cavity wall.

3.7 AIR SUPPLY

Heat producing appliances are required to be provided with an adequate supply of air for combustion of fuel and for efficient operation of the chimney or flue. For this reason a Fleming Chimney System must be located where the chimney has adequate air supply (ventilation). The chimney system can be used with Solid Fuel, Oil and Gas burning appliances. The following are the ventilation requirements for the respected fuels.

- (i) Air Supply for Solid Fuel Burning Appliance with output rating not more than 45 kW. The ventilation requirements must comply with Table 1 Section 2 of the TGD to Part J of the Building Regulations 1997 to 2002.

- (ii) Air Supply for Individually Fuelled (Non-Fan Assisted) Gas Burning Appliances with Rated Input up to 45kW and for Gas Burning Cooking Appliances. The performance requirements for air supply should comply with clause 3.4 & 3.5 of the TGD to Part J of the Building Regulations 1997 to 2002.

- (iii) Oil Burning Appliances with a Rated Output up to 45 kW. The ventilation requirements should comply with clause 4.1 of the TGD to Part J of the Building Regulations 1997 to 2002.

4.1 DOMESTIC APPLIANCES

Flemings Chimney Systems are suitable for use with Solid Fuel, Oil and Gas burning appliances. Before installing a chimney system, the following guidance should be given on the respective fuel-burning appliance.

4.1.1 Solid Fuel Burning Appliance

Guidance should be either sought from Flemings Chimney Systems or a chartered heating engineer experienced in the use of solid fuel appliances, to ensure that the correct size of flue is selected in each case.

4.1.2 Oil Burning Appliance

Advice on the correct size of chimney flue should be provided by the appliance manufacturer or registered boiler installer.

4.1.3 Gas Burning Appliance

Guidance for the installation of gas burning appliances is available from An Bord Gais.

4.2 STRENGTH AND STABILITY

The chimney components are sufficiently strong to withstand normal site handling and accidental impacts associated with normal conditions of use. Stability of the externally or internally installed chimney is adequate with the lateral restraint provided by the units and stainless steel ties/wall brackets. In addition further restraint is provided for external chimneys by the stainless steel ties used every meter. For internal chimneys stainless steel ties/brackets are used for additional restraint. Where the chimney stack projects above the roof it will remain stable under the action of normal wind forces provided the stack heights do not exceed the limits given in Table 2. Where the chimney stack is brick-clad, this cladding must be supported on the appropriate corbel supplied by Flemings Chimney Systems.

When the Flemings Chimney Systems are correctly installed in a properly designed chimney, they will not collapse or cause danger to a building's occupants in the event of an accidental chimney fire caused by soot burnout or gaseous explosions of the kind which may occur through malfunctioning of the heating appliance.

4.3 HEIGHT OF CHIMNEYS

The maximum permissible chimney height above the roofline should comply with Table 2 of this Certificate. In addition to Table 2 the height of the Chimney Stack above the roofline for a particular installation must be in accordance with the Building Regulations 1997 to 2002.

4.4 PROXIMITY OF BUILDING TO FIRE AND HEAT

4.4.1 The requirement of Part J3 of the Building Regulations 1997 to 2002 can be met by ensuring that hearths, fireplaces, chimneys and flue pipes are:

- Of sufficient size.
- Constructed of suitable materials (ref Part 2 & 3 of this Certificate).
- Suitably isolated from any adjacent combustible material (ref 4.4.2 of this Certificate).

4.4.2 Isolation from Combustible Material

Arrangements for spacing and packing between the chimney and any structural timber have been assessed as being adequate to prevent excessive drying out of the timber or the occurrence of any fire hazard. The spacing must be maintained throughout the chimney height but the requirement does not apply to skirting boards or floorboards; direct contact between these and the face of the chimney is permissible.

It is generally unnecessary to box in the chimney, except to maintain the specified 40mm clearance between the chimney and any loose combustible material, e.g. in an airing cupboard or insulated roof space.

4.5 DURABILITY

The materials used in Fleming chimneys are durable in terms of their resistance both to natural weathering and flue conditions. Provided the chimney is correctly used, e.g. the chimney size is matched to the type and rating of the heating appliance and the appliance is maintained in good working order and not misused, the chimneys will have a minimum life of 60 years.

4.6 INSPECTION, CLEANING & MAINTENANCE

The Flemings Chimney Systems are designed to allow access for inspection, cleaning and maintenance. The chimney can be swept throughout its length without difficulty or without causing damage to any part of the chimney once proper sweeping equipment is used. On the Flemings Open Fire System cleaning is achieved by passing the brush head from the firebox to the flue through the appliance, therefore no separate access to the chimney is required. The Flemings Central Heating System comes with an inspection door and preformed inspection pipe to allow for easy cleaning and maintenance.

The frequency of chimney sweeping will depend on many factors, i.e. type of fuel and quantity used and method of operation of appliance. The interval of inspection and cleaning will be determined by user experience but under no circumstances should this be less frequent than once a year.

4.7 TESTS AND ASSESSMENTS WERE CARRIED OUT TO DETERMINE THE FOLLOWING:

Tests by Ceram Building Technology were examined to determine:

- Effect of thermal shock at 1000°C.
- Adequacy of thermal insulation.
- Effect of sweeping leakage rate before and after thermal tests.

4.8 OTHER INVESTIGATIONS

- (i) An examination was made of existing data to determine:
 - Relevance of Ceram Building Technology test results to Irish usage.
 - Structural stability.
 - Durability.
- (ii) A computer analysis was carried out to investigate the thermal behaviour of the chimney.
- (iii) Visits were carried out to existing sites in Germany to assess practicability of installation and performance in use.
- (iv) Reports of visits to the factory were examined and an assessment made of the adequacy of quality control procedures. Details were obtained of the quality and composition of the materials used.
- (v) A re-examination was made of the data and investigations on which the previous German certification was based. The conclusions drawn from that data remain valid.
- (vi) Visits to sites in progress in Ireland were carried out to assess the practicability of installation.
- (vii) Regular factory inspections have been carried out to ensure that quality is being maintained.
- (viii) No failure of the product in use has been reported to the IAB.
- (ix) On site smoke test has been carried out.

- 5.1** National Standards Authority of Ireland ("NSAI") following consultation with the Irish Agrément Board ("IAB") has assessed the performance and method of installation of the product/process and the quality of the materials used in its manufacture and certifies the product/process to be fit for the use for which it is certified provided that it is manufactured, installed, used and maintained in accordance with the descriptions and specifications set out in this Certificate and in accordance with the manufacturer's instructions and usual trade practice. This Certificate shall remain valid for five years from date of issue so long as:
- (a) the specification of the product is unchanged.
 - (b) the Building Regulations 1997 to 2002 and any other regulation or standard applicable to the product/process, its use or installation remains unchanged.
 - (c) the product continues to be assessed for the quality of its manufacture and marking by NSAI.
 - (d) no new information becomes available which in the opinion of the NSAI, would preclude the granting of the Certificate.
 - (e) the product or process continues to be manufactured, installed, used and maintained in accordance with the description, specifications and safety recommendations set out in this certificate.
 - (f) the registration and/or surveillance fees due to IAB are paid.
- 5.2** The IAB mark and certification number may only be used on or in relation to product/processes in respect of which a valid Certificate exists. If the Certificate becomes invalid the Certificate holder must not use the IAB mark and certification number and must remove them from the products already marked.
- 5.3** In granting Certification, the NSAI makes no representation as to;
- (a) the absence or presence of patent rights subsisting in the product/process; or
 - (b) the legal right of the Certificate holder to market, install or maintain the product/process; or
 - (c) whether individual products have been manufactured or installed by the Certificate holder in accordance with the descriptions and specifications set out in this Certificate.
- 5.4** This Certificate does not comprise installation instructions and does not replace the manufacturer's directions or any professional or trade advice relating to use and installation which may be appropriate.
- 5.5** Any recommendations contained in this Certificate relating to the safe use of the certified product/process are preconditions to the validity of the Certificate. However the NSAI does not certify that the manufacture or installation of the certified product or process in accordance with the descriptions and specifications set out in this Certificate will satisfy the requirements of the Safety, Health and Welfare at Work Act. 1989, or of any other current or future common law duty of care owed by the manufacturer or by the Certificate holder.
- 5.6** The NSAI is not responsible to any person or body for loss or damage including personal injury arising as a direct or indirect result of the use of this product or process.
- 5.7** Where reference is made in this Certificate to any Act of the Oireachtas, Regulation made thereunder, Statutory Instrument, Code of Practice, National Standards, Manufacturer's instructions, or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this Certification.

This Certificate No. **01/0129** is accordingly granted by the NSAI to **Flemings Fireclays Manufacturing Ltd.** on behalf of The Irish Agrément Board.

Date of Issue: **October 2001**

Signed



Chief Executive, NSAI

Readers may check that the status of this Certificate has not changed by contacting the Irish Agrément Board, NSAI, Glasnevin, Dublin 9, Ireland. Telephone: (01) 807 3800. Fax: (01) 807 3842. www.n sai.ie