IRISH AGRÉMENT BOARD
CERTIFICATE NO. 01/0133

Perla Ltd.,
Cuddy O'Leary,
94 South Mall,
Cork.

Perla Lite Chimney Systems

Revetment de cheminee en beton leger
Schornsteinauskleidung

NSAI Agrément (**Irish Agrément Board)** is designated by Government to issue European Technical Approvals.

NSAI Agrément 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 2007**.

Figure 1:
Twin Fireplace system going through Timber Frame Party Wall

PRODUCT DESCRIPTION:
This Certificate relates to the prefabricated Perla Lite Chimney Systems, incorporating lightweight concrete blocks, clay flue liners and preformed insulation. This Certificate certifies compliance with the requirements of the Building Regulations 1997 to 2007.

The Perla Lite Chimney System consists of lightweight concrete outer chimney blocks, acid resistant clay internal flue liners which are surrounded by a preformed moisture resistant rockwool insulation. Each system is factory assembled in pre-determined lengths from individual blocks units to order, then transported to the site and installed by trained installers. Each assembly is reinforced with steel rods and a series of special connectors/anchors which are tightened together with nuts to a preset torque of 4Nm on both the factory assembled sections and on final installation on site. The chimney system is available in both single and double assemblies with appropriate fireplace units.

The Single Flue Perla Lite Chimney consists of a fireplace unit and gatherer cast in normal dense concrete and chimney blocks typically 445mm x 445mm x 435mm high, in lightweight concrete. The Double Flue Perla Lite Chimney also consists of a fireplace unit and gatherer cast in normal dense concrete and assembled with two different dimensional chimney blocks. The lower "Shamrock" blocks typically 970mm wide x 435mm high x 900mm deep, and "standard" blocks 970mm wide x 435mm high x 445mm deep.

Both Single and Double Chimneys incorporate

- 200mm nominal acid resistant rebated flue liners jointed with a proprietary acid resistant mortar. The

flue liners are surrounded with a high temperature moisture resistant rockwool insulation.
- Glass Reinforced Concrete corbels, Glass Reinforced Plastic covers and prefabricated dense concrete capping units.

USE:
The Perla Lite Chimney Systems are designed to offer fast and efficient erection on site and are suitable for all types of domestic heating appliances. The systems are designed for use with both open fire and closed appliances with an output of up to 45kW and fueled by gas, oil or solid fuel consisting of coal, manufactured solid fuel, wood or peat. The systems are suitable for use in domestic prefabricated buildings such as Timber and Steel frame as well as traditional masonry construction.

Only one fuel appliance should be connected to each flue. Where the Double Perla chimney system is used in party walls in prefabricated steel and timber frame construction, the party walls of the system must be designed to accommodate the Perla chimney system.

It is essential that all Perla Lite Chimney Systems are assembled and installed in accordance with the requirements of this Certificate and the manufacturer's instructions.

MANUFACTURE:
The Perla Lite Chimney Systems are manufactured, distributed and erected under licence by:

Croom Concrete Ltd.,
Off Church Road, Croom, Co. Limerick.
Tel: 061 397479
Fax: 061 397479
Email: sales@croomconcrete.ie

Part One / Certification 1

1.1 ASSESSMENT
In the opinion of NSAI Agrément, the Perla Lite Chimney Systems if used in accordance with this Certificate can meet the requirements of the Building Regulations 1997 to 2007, as indicated in Section 1.2 of this Certificate.

1.2 BUILDING REGULATIONS 1997 to 2007

REQUIREMENT:

Part D – Materials and Workmanship
D3 – The materials used in the Perla Lite Chimney Systems, as certified in this Certificate, are comprised of proper materials fit for their intended use (see Part 4 of this Certificate).

D1 – The Perla Lite Chimney Systems when used in accordance with this Certificate can satisfy the requirements for workmanship.

Part A - Structure
A1 – Loading
The Perla Lite Chimney Systems, when installed in accordance with this Certificate and the manufacturer's instructions, have adequate strength and stability and can satisfy this Regulation provided that they are correctly installed and supported and the maximum height restrictions are observed as referenced in this Certificate (see Parts 2 and 3 of this Certificate).

Part B – Fire Safety
B3 (1) – Internal Fire Spread (Structure)
The Perla Lite Chimney System will retain its stability for a reasonable period in the event of a chimney fire.

B3 (2, 3) – Internal Fire Spread (Structure)
The Perla Lite Chimney Systems used in accordance with this Certificate will inhibit the spread of fire and smoke within the building.

Part C – Site Preparation and Resistance to Moisture
C4 – Resistance to Weather and Ground Moisture
The Perla Lite Chimney Systems are fabricated from approved building materials and when assembled in accordance with this Certificate using traditional flashing and damp proofing materials can satisfy the requirements of this regulation. The fireplace units must be protected from contact with the ground by using traditional damp proofing materials.

Part E – Sound
E1 – Airborne Sound (Walls)
When installed in accordance with this Certificate, the Perla Lite Chimney System can meet or exceed the requirements for airborne sound for walls (see Part 4 of this Certificate).

Part J – Heat Producing Appliances
J1 – Air Supply
The Perla Lite Chimney System meets 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 Perla Lite Chimney System has adequate provision for the discharge of the products of combustion to the outside air, as the flues, flue pipes and chimney of the chimney 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 Section 4.4 of this Certificate.

J3 – Protection of Building
When used in accordance with Part 4 of this Certificate, the Perla Lite Chimney System can meet the requirements of this Regulation.

Part Two / Technical Specification and Control Data 2

2.1 PRODUCT DESCRIPTION

The Perla Lite Chimney Systems are fabricated to order in pre-determined assembled lengths incorporating the requisite fireplace unit in the first section. The second section consists of lightweight concrete blocks with clay-rebated liners and preformed moisture resistant rockwool insulation. The third section is similar to the second but also may include the corbel and is topped off with the capping. Each system is delivered to site and contains all the materials necessary to construct a chimney from the base to the chimney pot.

The lightweight blocks/sections have holes cast in each corner which are used to locate the steel reinforcing rods during assembly. The 12mm diameter steel reinforcing rods which originate in the fireplace unit extend up through the chimney system. Special connectors/anchors are used to join the rods between sections thus giving continuous reinforcing over the full length of the chimney system. When the system is fully assembled on site a pre-determined torque of 4Nm is applied to the reinforcing rods.

Each chimney system is installed on site by trained and approved contractors who operate under the guidance of Perla Ltd.

Externally exposed chimneys must be finished in brickwork, rendered and/or have the special glass reinforced plastic (GRP) cover fitted above the roofline. Traditional roof flashing must be used with all finishes.

2.1.1 Fireplace Units

The Perla Single and Double Fireplace Units are manufactured from normal density concrete (see Table 1 for dimensions and weights).

2.1.2 Lightweight Blocks

The single lightweight block is used for the full length with the single fireplace unit (Figure 2).

For the double chimney two separate lightweight block types are used in the lower assembly. These consist of a “Shamrock” block measuring 970mm x 435m x 900mm (ref. Figure 4) and the “standard” blocks measuring 970mm x 435mm x 445mm (ref. Figure 3).

2.1.3 Clay Flue Liners

The clay flue liners used in both single and double chimneys are rebated, with a nominal internal diameter of 200mm and a nominal working length of 400mm meet the requirements of IS EN 13502:2002 *Chimneys – Requirements and test methods for clay/ceramic flue terminals* and IS EN 1457:1999 *Chimneys – Clay/ceramic flue liners – Requirements and test methods.*

It should be noted that solid fuel burning open fires require a chimney with an internal diameter of not less than 200mm.

Ancillary Items:

- Corbels and cappings
- Glass fibre reinforced plastic cover (for above roof line with specified)
- Reinforcing bars
- Connectors/anchors, nuts and washers
- Masonry stainless steel or galvanised steel ties
- Timber frame stainless steel ties (with provision for restrained vertical movement).

2.2 MANUFACTURE

2.2.1 Fireplace Units

The fireplace units are cast in steel moulds and are made from normal density concrete and are air cured. Threaded anchors are cast into the concrete to receive the steel reinforcing rods.

2.2.2 Perla Lite Flue Blocks

The flue blocks for both chimney types are manufactured from lightweight concrete. Liapor, an expanded clay aggregate and Ordinary Portland Cement are used in a lightweight concrete designed mix to give a pre-determined strength and density. A Liapor concrete mix is also used for infilling the voids around the insulated flue liners in the Shamrock blocks which are used in the lower assembly of a double chimney system.

Special accessory blocks incorporating soot doors and blocks to facilitate side entry stoves and boilers are also manufactured from lightweight concrete for both chimney types.

Table 1: Dimensions and Weights of elements of Perla Lite Chimney Systems

Product	Volume	Weight	Dimensions	Concrete
Single Fireplace	0.205 m^3	490 kg	(W) 880 mm (H) 920 mm (D) 480 mm	Dense Concrete
Twin Fireplace	0.443 m^3	1065 kg	(W) 970 mm (H) 920 mm (D) 960 mm	Dense Concrete
Shamrock Block	0.124 m^3	173 kg	(W) 970 mm (H) 435 mm (D) 900 mm	Lightweight Aggregate + OPC
Standard Blocks*	0.095 m^3	114 kg	(W) 970 mm (H) 435 mm (D) 445 mm	Lightweight Aggregate + OPC
Single Flue Block*	0.045 m^3	46 kg	(W) 445 mm (H) 435 mm (D) 445 mm	Lightweight Aggregate + OPC
Single Corbel	0.0152 m^3	24 kg	(W) 725 mm (H) 75 mm (D) 725 mm	GRC
Twin Corbel	0.0244 m^3	46 kg	(W) 1250 mm (H) 75 mm (D) 725 mm	GRC
Single Capping	0.0471 m^3	53 kg	(W) 890 mm (W) 630 mm (H) 55 mm (H) 90 mm (D) 890 mm (D) 630 mm	Dense Concrete
Twin Capping	0.0645 m^3	110 kg	(W) 1330 mm (W) 1145 mm (H) 55 mm (H) 90 mm (D) 860 mm (D) 600 mm	Dense Concrete

* Special blocks with soot doors and blocks to facilitate side entry stoves and boilers are also available.

Figure 2: Single Flue Block

Figure 3: Twin Flue Block with edge recess

Figure 4: Shamrock Flue Block

2.2.3 Flue Liners
Inner refractory clay flue liners are manufactured to IS EN 1457:1999.

2.2.4 Corbels
The precast corbels used in the Perla Lite Chimney Systems are manufactured from Glass Reinforced Concrete (GRC).

2.2.5 Cappings
The precast cappings used in the Perla Lite Chimney Systems are manufactured from normal dense concrete.

2.2.6 Covers
The special covers used in the Perla Lite Chimney Systems are manufactured from Glass Reinforced Plastic (GRP). When specified these are used above the roof line of the system as a replacement for brick facing or render.

2.2.7 Accessories
Special proprietary connectors/anchors, nuts and washers are used with the 12mm steel rods in the Perla Lite Chimney Systems.

2.3 QUALITY CONTROL
Quality control procedures are operated to check the density, dimensions and crushing strengths of the manufactured Perla Lite Blocks, Corbels and Cappings.

The quality of all imported materials is monitored on an ongoing basis.

2.4 DELIVERY, STORAGE AND MARKING
The fabricated sections of the Perla Lite Chimney are delivered to the site and each section has markings indicating the NSAI Agrément logo and Certificate number. Instructions for storage on site, mechanical handling and the final assembly of the Perla Lite Chimney systems are the responsibility of the manufacturer.

2.5 INSTALLATION
2.5.1 General
1. Ensure adequate scaffolding, ladders and Health & Safety equipment before any work is commenced and advise the site supervisor of any problems.
2. At all times hard hats, hi visibility vests and harnesses are to be used when working at height.
3. Check Perla Chimney components on site before erection. Replace or repair any parts which have been damaged on site, and record the data.
4. Mark out the exact location of the chimney, and agree location with site supervisor.
5. Place DPC on the concrete slab and cover with layer of mortar.
6. Using a crane or other suitable lifting equipment, lift the base section into place, level and plumb. This base section is normally 3.14m high.
7. The timber frame is then erected, including the roof trusses, by the contractor or their agents.
8. Remove the lifting plate by unscrewing the four top nuts. Retighten the nuts on the four threaded bars by using a 19mm socket and torque wrench, ensuring the threaded bars are centred in the metal cups. Cut the four protruding threaded bars down to 10mm above the block, and file the top of the bars.
9. Place fire cement around the top of the flues ensuring a continuous bead of fire cement around the flue. Place a layer of mortar on top of the block, and place safety spacers 30mm deep on top of the mortar.
10. Carefully unscrew two of the threaded bars of section 2 diagonally.
11. Lift section 2 of the Perla Chimney system with a crane or other suitable equipment into place – use of a safety rope attached to the chimney is recommended in windy weather.
12. Carefully connect the two loosened threaded bars of section 2 and connect them to base section bars using connectors provided.
13. Remove the safety straps from the flues.
14. Lower the flues and ensure good bond between upper and lower flues.
15. Remove 30mm safety blocks and lower section 2, connect remaining two bars.
16. Lower section 2 and plumb chimney.
17. Remove the lifting plate on section 2 by unscrewing the four top nuts. Retighten the nuts on the four threaded bars by using a 19mm socket and torque wrench, ensuring the threaded bars are centred in the metal cups.
18. For section 3, repeat as per items 8 to 17, cut the protruding bars flush with the top of the block after the nuts have been tightened using a torque wrench.
19. The contractor or their agents finish the roof, i.e. leated, felted, the chimney flashed as per a conventional chimney and either tiled or slated.
20. The installer places a roofing ladder on the roof.
21. The GRP cover is then cut to the pitch of the roof.
22. The GRP cover is lifted up on the scaffolding using a teleporter or other suitable lifting equipment.
23. The GRP cover is placed down over the chimney and secured using a coarse thread screw with a white plastic washer and cap.
24. A bed of mortar is placed on top of the chimney. The chimney cap is then lifted up on the chimney using a teleporter or other suitable lifting equipment and bedded in place.
25. A flue liner is then inserted as a flue terminal and the top of the chimney is haunched with mortar to throw off rain water.
26. Any mortar that has fallen down is cleaned up and the roof ladder is removed.
27. For the Single Chimney, two stainless steel or galvanised steel U-shaped brackets are fixed around the chimney, one at first floor and the second in the attic space. These brackets must have provision for 20mm of vertical movement to allow for timber shrinkage.
28. For the Double Chimney, two stainless steel or galvanised steel angle brackets are fixed either side of the chimney. These angles must be long enough to span at least two roof joists – this is to allow for adequate fixing of the bracket.
29. All tools are packed up.
30. Before leaving the site, the installer must obtain a signature from the site supervisor.
31. This is the general method of placing chimneys.

The Perla Chimney System is factory assembled to order. Where the Double Perla Chimney used in party walls in prefabricated steel and timber frame construction the party walls of the system must be designed to accommodate the Perla Chimney System.

Installation must be carried out in accordance with this Certificate and the manufacturer's instructions.

Installation of the Perla Lite Chimney does not present any undue difficulty when installed within traditional or system-built dwellings.

Installation achieves an appreciable saving in site time over traditional block or brick masonry chimneys.

Chimneys exposed externally must be either clad in brickwork, rendered or fitted with the proprietary GRP cover and secured to the roof members using stainless steel straps. Where brick cladding is used above the roofline, it is supported on a corbel unit (see Figure 10). The opening in the roof must be suitably trimmed by timber fixed to the roof members. The detailing where the chimney passes through the roof, the junction between the chimney units, the sarking felt and flashing is similar to that for a traditional block/brick chimney except that the sawing (or cutting) of grooves is not permitted. Otherwise the flashing of the chimney at the roof level is the same as for a traditional masonry chimney construction. Prior to the application of the plaster or rendering coats, the flashing may be held in position by bonding it to the chimney units using proprietary adhesive.

The chimney must be terminated so as to prevent discharge gases from entering the building in which it is installed, or any adjacent building.

The height and location of the chimney above the roofline must be in accordance with the Technical Guidance Document to Part A of the Building Regulations 1997 to 2007.

Only one appliance or open fire is to be used per flue.

2.5.2 Foundation

The Perla Chimney Systems are constructed from lightweight concrete blocks and lintels. As these blocks are lighter than normal density blockwork, a conventional concrete foundation is adequate.

2.5.3 Constructional Hearths

A constructional hearth must be provided to all Perla Chimney Systems. The constructional hearth should be constructed in accordance with the TGD to Part J, Section 2.18 and 2.19 of the Building Regulations 1997 to 2007. The installation of the constructional hearth is the responsibility of the main contractor.

2.5.4 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 should be 40mm for structural timbers or 30mm for a concrete ceiling. The gap is then filled with a 100mm strip of rockwool or similar non-rigid, non-combustible material.
- To comply with the Building Regulations 1997 to 2007 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, mantelshelf or architrave are excluded in condition (b).

2.5.5 Party Walls in Steel/Timber Frame Construction

During installation of the plasterboard slabbing, a 50mm wide dry wall adhesive or other proprietary intumescent material is placed into the edge recess (see Figure 3) of the Perla Lite Double Chimney System. The plaster slabs are then fixed into the recess and fitted to the stud partitions in the traditional way (see Figures 7 and 8). All gaps around the chimney must be packed with 100mm high density rockwool.

Before any slabbing commences it is necessary to check that all firestopping has been installed and that no voids have been left unfilled in party walls and all necessary stainless steel strapping has been correctly fixed in place. In the case of timber frame construction, the strap must have provision for 20mm of vertical movement to allow for timber shrinkage (in a two storey high dwelling).

2.5.6 Rendering/Plastering of Chimneys

Chimneys exposed externally throughout their length must be either clad in brickwork or rendered. The internally exposed faces of the Perla Lite 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 on the three exposed faces. 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 Perla Lite System are left exposed in an uninhabited attic, it is not necessary to render the surfaces, however all exposed chimney blockwork must be rendered.

2.5.7 Chimney Stack with Brick or Block Cladding

For chimneys that require a brick or block cladding a corbel and chimney tray are provided with the system. Weep holes are required in all brickwork.

- The GRC corbel is placed on the Perla Lite chimney block as shown in Figure 10. This gives the support for laying the required number of brick or blockwork courses to reach chimney DPC 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.

2.5.8 Inspection of Installed System

Once the Perla Lite Chimney System has been installed the following should be inspected:

- All joints in blockwork 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.

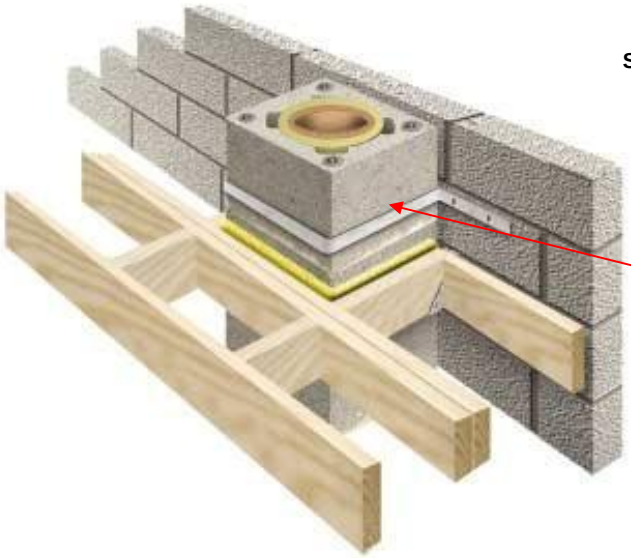

Figure 5:
Single Perla system going through first floor fixed to masonry wall

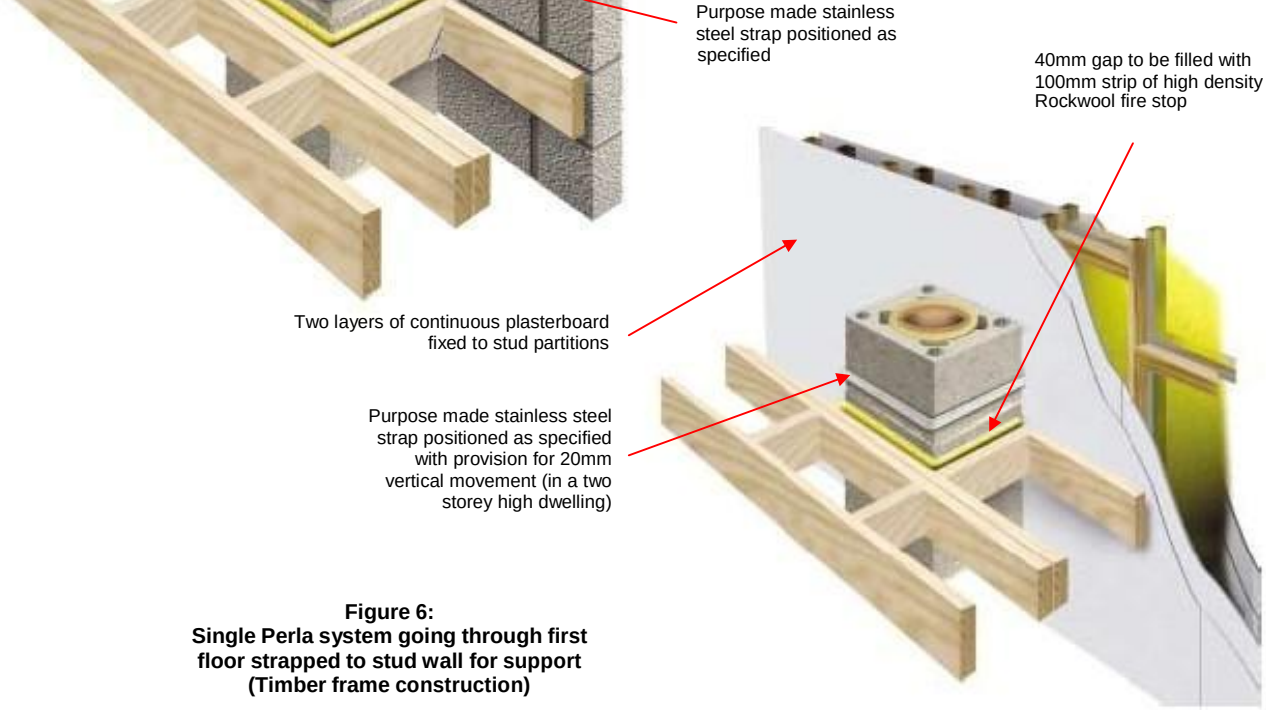

Figure 6:
Single Perla system going through first floor strapped to stud wall for support (Timber frame construction)

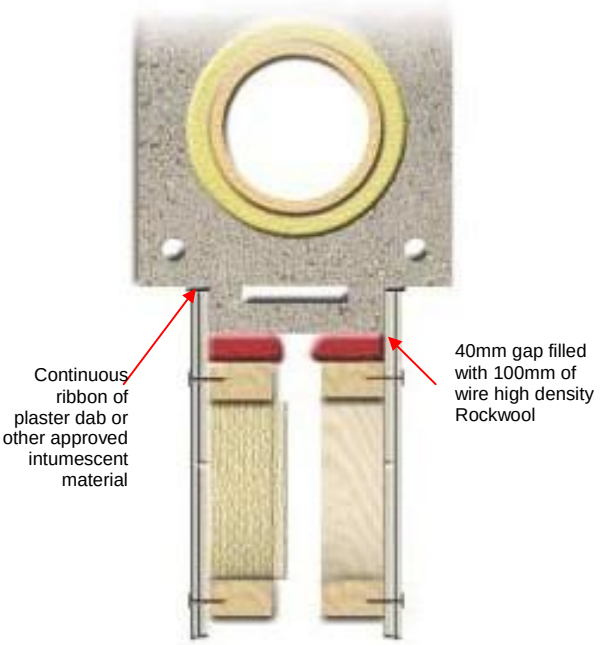

Figure 7:
Fixing detail of plasterboard to Perla Lite twinblock and timber frame party wall

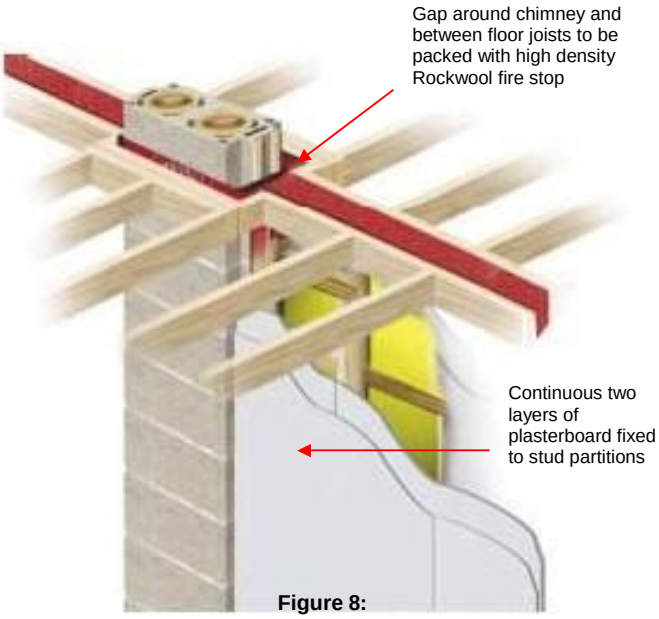

Figure 8:
Fire stopping at party wall going through first floor

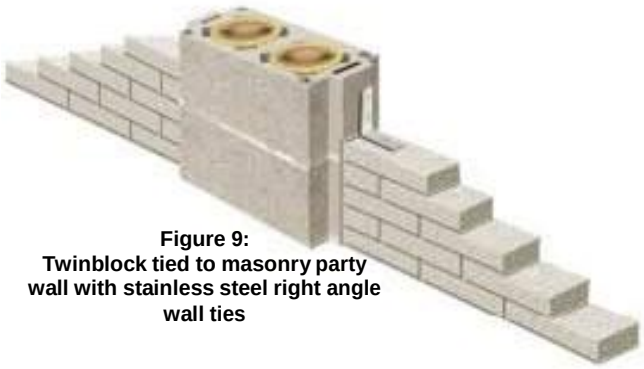

Figure 9:
Twinblock tied to masonry party wall with stainless steel right angle wall ties

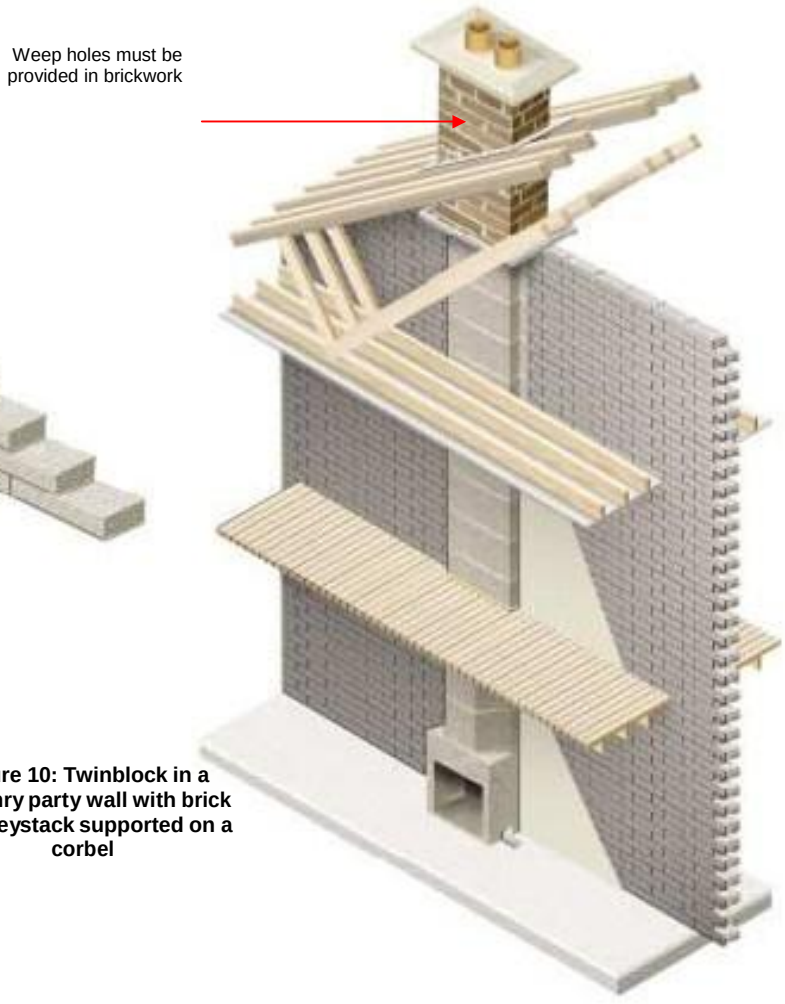

Figure 10: Twinblock in a masonry party wall with brick chimneystack supported on a corbel

3.1 GENERAL

Perla Lite Chimney System, when installed in accordance with this Certificate, will perform in a safe and satisfactory manner when used in domestic housing or commercial/industrial buildings with a heat output of up to 45kW. 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 BA 1846-1:1994 *Glossary of terms relating to solid fuel burning equipment – Domestic appliances.*

Each flue in a Perla Lite Chimney is for a single appliance with an output not exceeding 45kW.

3.2 DESIGN REQUIREMENTS

The Perla Lite Chimney System is 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 8303-1:1994 *Installation of domestic heating and cooking appliances burning solid mineral fuels – Specification for the design of installations*. Appliances must allow access to the chimney for cleaning.

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 Codes of Practice and Standards. **Only one appliance or open fire per chimney must be used.**

The Perla Lite block units comply with the general recommendations for materials for flue block chimneys contained in BS 6461-1:1984 *Installation of chimneys and flues for domestic appliances burning solid fuel (including wood and peat) – Code of practice for masonry chimneys and flue pipes.*

Completed chimneys should be left to cure for 4 to 5 days before the appliance is used. Normal good practice dictates that initial fires in completed chimney systems should be small and then gradually increased to full operating capacity.

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 1m below ground level if the chimney system is installed externally or approximately 400mm below floor level if the chimney system is installed internally in the building.

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 block unit intervals and at the point of departure from the roofline, using the specified stainless steel ties (see Figures 5 and 6). Consideration must be given to the effects on the adjacent structure of the loads imposed by the chimney fixings. Internal chimneys must be tied to the structure using the specified stainless steel wall ties at eight block unit intervals; the necessary support must be provided during and after construction by the intermediate floors and by the timber trimming at roof level. For timber frame constructions the stainless steel wall ties must be provided with vertical slots which will facilitate vertical movement of approximately 20mm in a two storey high dwelling.

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 – 30kg/m^2.

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 6461-1:1984. 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 Perla Lite 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) Solid Fuel Burning Appliances with output rating not more than 45kW

The ventilation requirements must comply with Table 1 Section 2 of TGD to Part J of the Building Regulations 1997 to 2007.

(ii) Oil Burning Appliances with output rating up to 45kW

The ventilation requirements should comply with cl. 4.1 of TGD to Part J of the Building Regulations 1997 to 2007.

4.1 DOMESTIC APPLIANCES

The Perla Lite Chimney Systems incorporating the 200mm nominal diameter clay flue liners are suitable for use with open fires and appliances fuelled with gas, oil and solid fuels. Appliances must be installed in accordance with the manufacturer's instructions. Reference should also be made to BS 1251:1987, BS 6461-1:1984 and BS 8303-1:1994.

4.2 COMMERCIAL AND INDUSTRIAL USE NOT EXCEEDING 45kW OUTPUT

The Perla Lite Chimney Systems are suitable for use with gas, oil and solid fuel appliances. Installations in this category shall be under the design and supervision of a Chartered Heating Engineer.

It should be noted that only 200mm nominal diameter clay flue liners are used in Perla Lite Chimney Systems.

4.3 STRENGTH AND STABILITY

4.3.1 General

The individual components of the Perla Lite Chimney Systems are sufficiently strong to withstand mechanical handling during normal fabrication in the factory, transportation to the site and prescribed site handling.

The manufacturer will fabricate, transport and be responsible for the installation of the Perla Lite Chimney on the site.

4.3.2 Perla Lite Chimney System

Stability of the chimney system is achieved with the 4 No. vertical steel rods inserted full length through the lightweight blocks and attached to the dense concrete fireplace unit. In addition, stainless steel straps are fixed to adjacent walls at the recommended intervals.

4.4 HEIGHT OF CHIMNEYS

All chimney systems must be adequately tied in to the roof structure of the building in order to resist lateral wind loads.

The maximum permissible chimney height above the roofline is generally 1.1m. However, where the basic wind speed does not exceed 44m/s (Zone A, TGD to Part A of the Building Regulations 1997 to 2007; see also BS 6399-2:1997 *Loading for buildings – Code of practice for wind loads*), the height may be increased to 1.4m. Alternative arrangements will required to be based on structural design calculations. Measurement of chimney height above roofline to be taken from the highest exit point from the roof to the top of the chimney capping.

The outlet of the chimney above the roofline for a particular installation must be in accordance with the Building Regulations 1997 to 2007 requirements (TGD to Part J, Diagram 1, Paragraph 2.4).

The basic compressive strength for Perla Lite Chimney blocks can be taken at a nominal value of 5Mpa (5N/mm^2) net cross sectional area.

4.5 PROXIMITY OF COMBUSTIBLE MATERIAL

The recommended arrangements for spacing and packing between the chimney and any structural timber are deemed adequate to prevent excessive drying out of the timber or the occurrence of a fire hazard risk. The spacing must be maintained throughout the chimney height but the requirement does not apply to floorboards, skirting boards, dado rails, picture rails, mantelshelves or architraves.

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

Dry lining must be bonded to the faces of the chimney with plaster dab bonding at not greater than 600mm centres and a 50mm wide dry wall adhesive ribbon must be applied along all edges of individual panels of dry lining and along all continuous cut edges of the dry lining, e.g. around fireplace openings.

The clay flue liners in the Perla Lite Chimney System, when installed in accordance with this Certificate in domestic chimneys, will meet the requirements of the Building Regulations 1997 to 2007 in relation to proximity of combustible materials.

4.6 SOUND

The Certificate holder has carried out extensive laboratory and field tests on the Perla Lite Chimney System. Tests and assessments were conducted in accordance with IS EN ISO 140-4:1999(2004) *Acoustics – Measurement of sound insulation in buildings and of building elements – Field measurements of airborne sound insulation between rooms.* All test results met the requirements laid out in Table 1 of the Technical Guidance Document to Part E of the Building Regulations 1997 to 2007 in relation to airborne sound between rooms (sample test results are laid out in Table 2).

Wall Tested	**Airborne Sound** Individual Values
Bedroom Front to Bedroom Front	49.3 dB
Bedroom Rear to Bedroom Rear	60.7 dB
Kitchen to Kitchen	65.1 dB
Living Room to Living Room	62.8 dB
Overall result	**59.5 dB**

Note: This acoustic test was carried out to obtain the Airborne Sound Transmission value of the walls between a pair of semi-detached houses – the chimney breast travels up to the roof as part of the party wall in the living room and front bedroom.

Table 2: Sample Sound Test Results

4.7 DURABILITY
The materials used in the Perla Lite Chimney System are durable in terms of their resistance both to natural weathering and flue conditions.

Provided the appliance connected to the chimney is maintained properly and not misused, the Perla Lite Chimney will have a minimum life of 50 years.

4.8 INSPECTION AND CLEANING
The Perla Lite Chimney Systems present no difficulties for cleaning.

Normal chimney cleaning with brushes should be carried out preferably at the start of the heating season, to ensure that the flue is not obstructed. However, 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.

If a chimney fire occurs the chimney should be inspected afterwards to ensure its suitability for continued use.

4.9 TESTS AND ASSESSMENTS WERE CARRIED OUT TO DETERMINE THE FOLLOWING:
As part of the assessment tests were carried out by Ceram Building Technology on a Perla Lite Chimney System to determine the temperatures of a timber framed wall in close proximity to the flue block system exhausting gases at 1000^{o}C (soot fire conditions). From this test it was concluded that with a soot fire temperature of 1000^{o}C maintained in the chimney flue for a period of 4 hours, there would be no risk of fire in any combustible materials in close proximity to the chimney system.

For concrete flue blocks, IS EN 1858:2003 *Chimneys – Components – Concrete flue blocks* states that the maximum temperature of adjacent combustible materials shall not exceed 100^{o}C when related to an ambient temperature of 20^{o}C when tested at a temperature of 1000^{o}C over a period of 30 minutes.

Tests by Ceram Building Technology were also carried out to IS EN 1457:1999 on the clay flue liners to determine:
- Thermal properties
- Acid resistance
- Proof load
- Air leakage
- Sweeping resistance
- Bulk density
- Water absorption

4.10 OTHER INVESTIGATIONS
Visits were made to the manufacturing plant and building sites to assess practicability of fabrication and installation procedures.

The adequacy of documented quality control procedures was assessed both in relation to manufactured components in the factory, site installation instructions and also imported materials.

No failure of the product in use has been reported to NSAI Agrément.

Part Five / Conditions of Certification 5

5.1 National Standards Authority of Ireland ("NSAI") following consultation with NSAI Agrément 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 2007 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 NSAI Agrément are paid.

5.2 The NSAI Agrément 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 NSAI Agrément 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 2005, 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.

NSAI Agrément

This Certificate No. **01/0133** is accordingly granted by the NSAI to **Perla Ltd.** on behalf of NSAI Agrément.

Date of Issue: **December 2001**

Signed

Seán Balfe
Director of NSAI Agrément

Readers may check that the status of this Certificate has not changed by contacting NSAI Agrément, NSAI, 1 Swift Square, Northwood Business Park, Santry, Dublin 9, Ireland. Telephone: (01) 807 3800 Fax: (01) 807 3842 www.nsai.ie

Revisions: January 2007; December 2008
Revised dimensions and installation procedure of the chimney system.
Inclusion of sound test results.