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**Agrément
Certificate
No 90/2472**

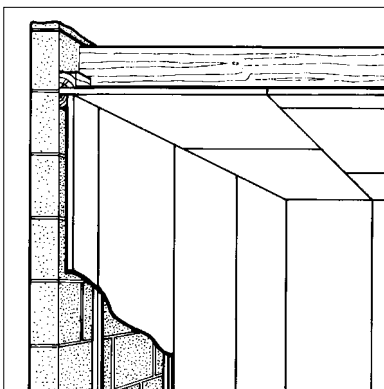
Designated by Government
to issue
European Technical
Approvals

DIAMOND FOIL BACKED GYPSUM WALLBOARD

Revêtement d'isolation
Warmedämmung


Product

- THIS CERTIFICATE RELATES TO DIAMOND FOIL BACKED GYPSUM WALLBOARD, A PLASTERBOARD HAVING A METALLIZED POLYESTER FILM FACTORY BONDED TO IT.
- The product improves the thermal performance of walls and ceilings and will provide a vapour check to dwellings or buildings with similar environmental conditions.
- It may be used on new or existing ceilings, timber stud walls, solid or cavity masonry walls.




Building Regulations

1 The Building Regulations 1985 (as amended) (England and Wales)

 The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of dry lining systems with the Building Regulations. In the opinion of the BBA, Diamond Foil Backed Gypsum Wallboard, if used in accordance with the provisions of this Certificate, will meet or contribute towards meeting the relevant requirements.

Requirement: B2	Internal fire spread (surfaces)
Comment:	Data obtained from tests to BS 476 : Part 7 : 1971 and BS 476 : Part 6 : 1968 indicate that Diamond Foil Backed Gypsum Wallboard will meet the requirement in buildings of every purpose group. See section 10 of this Certificate.
Requirement: F2	Condensation
Comment:	Data obtained by the BBA indicate that Diamond Foil Backed Gypsum Wallboard contributes towards meeting the requirement. See section 8.4 of this Certificate.
Requirement: L1	Conservation of fuel and power
Comment:	Data obtained from tests by the BBA indicate that elements incorporating Diamond Foil Backed Gypsum Wallboard contributes towards meeting the U value requirements. See sections 7.1 and 7.2 of this Certificate.
Requirement: Regulation 7	Materials and workmanship
Comment:	Diamond Foil Backed Gypsum Wallboard is an acceptable material. See section 13 of this Certificate.

2 The Building Standards (Scotland) Regulations 1981 to 1987

 In the opinion of the BBA, Diamond Foil Backed Gypsum Wallboard, if used in accordance with the provisions of this Certificate, will satisfy or contribute towards satisfying the Regulations as listed below.

Regulation: B2	Selection and use of materials
Comment:	Diamond Foil Backed Gypsum Wallboard is an acceptable material. See section 13 of this Certificate.
Regulation: E17	Surfaces of walls and ceilings
Comment:	Data obtained from tests to BS 476 : Part 7 : 1971 and BS 476 : Part 6 : 1968 indicate that the ivory or grey side of Diamond Foil Backed Gypsum Wallboard is considered Class 0 and will satisfy the requirements of the Table to Regulation E17(1). It may therefore be used on the internal surfaces of buildings in every occupancy group (Table to Regulation E17). See sections 10.1 and 10.2 of this Certificate.
Regulation: G10	Control of interstitial condensation
Comment:	Data obtained from tests to BS 874 : 1973(1980) and tests conducted by the BBA indicate that Diamond Foil Backed Gypsum Wallboard will not promote interstitial condensation. See sections 8.1 to 8.3 of this Certificate.
Regulation: J3	Resistance to the transmission of heat and means to conserve energy — Walls, floors and roofs
Comment:	Data obtained by the BBA indicate that elements incorporating Diamond Foil Backed Gypsum Wallboard will contribute to the U value requirements as specified in Table 1. See sections 7.1 and 7.2 of this Certificate.

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3 The Building Regulations (Northern Ireland) 1977 (as amended)



In the opinion of the BBA, Diamond Foil Backed Gypsum Wallboard, if used in accordance with the provisions of this Certificate will satisfy or contribute towards satisfying the various Building Regulations as listed below.

Regulation: B1 Comment:	Fitness of materials Diamond Foil Backed Gypsum Wallboard is an acceptable material. See section 13 of this Certificate.
Regulation: E15 Comment:	Restriction of spread of flame over surfaces of walls and ceilings Data obtained from tests to BS 476 : Part 7 : 1971 and BS 476 : Part 6 : 1968 indicate that the ivory or grey side of Diamond Foil Backed Gypsum Wallboard is considered Class 0 and will satisfy the requirements of the Table to Regulation E15. Therefore it may be used on the internal surfaces of buildings in every purpose group (Table to Regulation E15). See sections 10.1 and 10.2 of this Certificate.
Regulation: F3(1) Comment:	Maximum U values of walls, floors and roofs Data obtained from tests to BS 874 : 1973(1980) indicate that elements incorporating Diamond Foil Backed Gypsum Wallboard will contribute to the U value requirements as specified in Table 1. See sections 7.1 and 7.2 of this Certificate.
Regulation: FF3 Comment:	Conservation of Fuel and Power They will also contribute to the U value requirements for buildings other than dwellings. See sections 7.1 and 7.2 of this Certificate.

Technical Specification

4 Description

4.1 Diamond Foil Backed Gypsum Wallboard is standard Diamond Gypsum plasterboard with a 12 µm metallized polyester film laminate bonded to it. The film is laminated to the grey or ivory face for square-edge boards and on the grey face for tapered-edge boards.

4.2 Quality control tests are carried out on the finished product to determine:

- dimensional accuracy
- geometry
- surface finish
- film/plasterboard adhesion
- water vapour resistance.

Table 1 Nominal standard sizes

Profiles and surface	Thickness (mm)	Width (mm)	Length (mm)
Square edge grey/film	9.5, 12.5	900	1800, 1829 2400, 2438
		1200	2400, 2438
	15	1200	2400
Square edge ivory/film	9.5, 12.5	1200	2400, 2438 2700
		900	1800, 1829
	12.5	900	1800, 1829
		1200	2400, 2438
15	1200	2400	
Tapered edge ivory/film	9.5, 12.5	1200	2400, 2438 2700
		900	1800, 2400
	15	1200	2400

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4.3 The fixing system depends on the substrate but uses one of the manufacturer's specified systems for mechanical fixing. Boards for ceilings are fixed directly to the joists; boards for masonry walls are fixed to a frame of either timber battens or metal firrings (see section 14 of this Certificate).

4.4 Accessories include jointing products conforming with the requirements of Class A or Class B of BS 6214 : 1982 *Specification for jointing materials for plasterboards*.

5 Delivery and site handling

5.1 Diamond Foil Backed Gypsum Wallboard is delivered to site shrink-wrapped on pallets. Production labels giving the brand name, dimensions, edge profile and type are attached to each pallet. The BBA identification mark is displayed along board edges and on the production labels.

5.2 To ensure successful fixing, it is essential that the boards are stored flat on a dry, level surface, completely protected from rain and snow but in a well ventilated area. Stacks of boards should not exceed one metre in height.

5.3 Dry materials, such as adhesives, should be stored in the same way as plaster. Similarly, metal components should be stored in dry conditions.

5.4 Knauf UK technical literature details site handling and storage practices which should be followed.

Design Data

6 General

6.1 Diamond Foil Backed Gypsum Wallboard is satisfactory for use as a vapour check and/or insulating dry lining system for existing and new, solid or cavity masonry walls (masonry includes clay and calcium silicate bricks, concrete blocks, natural and reconstituted stone blocks) of dwellings and buildings of similar occupancy, type and condition.

6.2 The walls of new buildings should be designed and constructed in accordance with the relevant Codes of Practice, eg BS 5628 : Part 3 : 1985 *Code of practice for use of masonry — Materials and components, design and workmanship*.

6.3 The walls must be in a good state of repair with no evidence of rain penetration, damp or frost damage.

6.4 The product may be incorporated in timber-framed construction which should be constructed in accordance with BS 5268 : Part 2 : 1984 *Structural use of timber — Code of practice for permissible stress design, materials and workmanship*.

6.5 The installation of insulated dry lining systems requires careful detailing around doors and windows to achieve a satisfactory surface for finishing. In addition, every attempt should be made to minimise the risk of cold bridging at reveals and where heavy party walls are attached to the external wall.

6.6 With dry lining installations which form a void, services can be incorporated behind the dry lining, making the chasing of the wall unnecessary. Where the services have a greater depth than the void, the wall should be chased provided the structural integrity is not affected. It is recommended that services which penetrate the dry lining, eg light switches, power outlets, are kept to a minimum to limit damage to vapour checks.


6.7 When the product is to be used in existing buildings it should be realised that a small reduction in room size will occur and that permanent fixtures, eg baths, will present difficulties.

6.8 When the taper edge wallboard is used and provided the boards are installed in a neat manner, the jointing and finishing systems specified are capable of providing a satisfactory surface for direct decoration without the need for further plastering.

6.9 The recommendation in the manufacturer's literature should be followed before plastering.

6.10 Diamond Foil Backed Gypsum Wallboard, if filled and taped with the specified materials, will provide a satisfactory vapour check to walls and ceilings (see also section 8 of this Certificate).

7 Thermal insulation

 7.1 When examining the thermal performance of Diamond Foil Backed Gypsum Wallboard for compliance with Building or other Statutory Regulations, the thermal conductivity (λ value) of the product is $0.18 \text{ Wm}^{-1}\text{K}^{-1}$. The result is based on measurements carried out in accordance with the Guarded Hot Plate Method, Method 4.2.1 of BS 874 : 1973(1980) *Methods for determining thermal insulating properties with definitions of thermal insulating terms*.

7.2 The product will contribute to improving the U value (thermal transmittance) of a wall or ceiling when installed with the foil facing an unventilated airspace. The thermal resistances for such airspaces are given in Table A3.8 to Section A3 (1980) of the CIBSE Guide.

7.3 The ultimate thermal performance of the system will depend on the construction of the wall or roof against which it is installed. The dynamic performance of a structure can be determined by the admittance procedure given in section A5 (1979) of the CIBSE Guide.

7.4 The dynamic thermal performance of a building can be expressed as a ratio called the response factor (Equation A3.36 of the Guide). This factor is about 2.5 for a thermally lightweight building and about 6 for a heavyweight building. The use of any form of insulation will affect this factor and it should be considered when designing heating systems for new buildings. Modifications to existing heating systems may also have to be considered in buildings being upgraded by the use of Diamond Foil Backed Gypsum Wallboard. Methods of sizing heating systems are given in section A9 (1979) of the CIBSE Guide.

8 Condensation and hygrothermal characteristics



8.1 Diamond Foil Backed Gypsum Wallboard has a vapour resistance of approximately 78.5 MNsg^{-1} and can therefore offer resistance to water vapour transmission. The product can therefore be considered to provide a vapour check for walls and ceilings, if the joints between boards are filled and taped in accordance with the manufacturer's literature (see section 1.5.3 of this Certificate).

8.2 Calculations show that it is feasible to design dry-lined walls which will not suffer from condensation within the structure. However, when using this type of product as a vapour resistant layer, due consideration must be taken in the overall installation to minimise perforations by services. Joints at wall/ceiling and wall/floor level must be well sealed.

8.3 When used on ceilings the recommendations of BS 5250 : 1975 *Code of basic data for the design of buildings : the control of condensation in dwellings* should be followed to minimise the risk of condensation within the roof structure. Perforations for services must be well sealed.



8.4 The product can assist in limiting the amount of water vapour penetrating into the loft space and therefore will assist in meeting the requirements of Regulation F2. However, the product does not preclude the need to satisfy the provisions of Regulation F2 (see clause 1.11 of Approved Document F2).

9 Infestation

The use of Diamond Foil Backed Gypsum Wallboard does not in itself promote infestation but the creation of voids within the wall structure may provide habitation for insects or vermin in areas already infested. Such infestation may be difficult to eradicate. There is no food value in the materials used.



10.1 The ivory and grey sides of Diamond Foil Backed Gypsum Wallboard were tested and classified for surface spread of flame in accordance with BS 476 : Part 7 : 1971 *Fire tests on building materials and structures — Method for classification of the surface spread of flame of products*, Section 2, in thicknesses of 9.5 mm and 12.5 mm. A Class 1 result was obtained. The ivory and grey sides of the product were also subjected to the fire propagation test specified in BS 476 : Part 6 : 1981 *Method of test for fire propagation for products* in the same thicknesses and achieved an index of performance (I) of not more than 12, and a sub-index (i_1) of not more than 6.

10.2 The position of the product with regard to the Building Regulations 1985 (as amended) (England and Wales), the Building Standards (Scotland) Regulations 1981 to 1987 and the Building Regulations (Northern Ireland) 1977 (as amended) is that it can be used in all situations requiring a Class 0 surface. Details of such situations are contained in the appropriate regulations (Scotland and Northern Ireland) and Approved Document B2/3/4 (England and Wales).

11 Impact resistance

When tested in accordance with BBA test methods, the systems covered by this Certificate performed in a satisfactory manner. No damage was sustained under soft body impacts and hard body impacts resulted in no greater damage than would be expected from plasterboard alone.

12 Wall-mounted fittings

As with standard plasterboard to BS 1230 : Part 1 : 1985 *Gypsum plasterboard — Specification for plasterboard excluding materials submitted to secondary operations*, the recommendations of the manufacturer should be followed. Any object fixed to the wall (other than lightweight items, eg framed pictures), should be fixed through the lining board to the loadbearing structure behind, using recommended proprietary fixings as required.

13 Durability



The durability of the materials is satisfactory. Provided that the product is used in accordance with this Certificate and the manufacturer's instructions, and is fixed to satisfactory stable and durable backgrounds by fully trained operatives, Diamond Foil Backed Gypsum Wallboard should have a life equal to that of the building in which it is installed. Under normal conditions of occupancy it is unlikely to suffer damage, but repairs can be easily carried out.

Installation

14 General

It is recommended that Diamond Foil Backed Gypsum Wallboard is installed by trained dry lining operatives or, where the product is used for plastering, by plasterers.

Procedure

15.1 Diamond Foil Backed Gypsum Wallboard may be used for ceilings and on internal walls, of new or existing buildings.

15.2 Installation should be in accordance with the relevant parts of Knauf UK technical literature and good dry lining practice.

Walls

15.3 Boards should be fixed with the foil face against the supports. They should be tightly butted together with the long bound edges vertical and parallel with the primary supports (timber/metal studs, battens). Boards may be fixed at right-angles to the primary supports, but intermediate supports must be provided at all edges and ends. Primary supports (timber or steel*) should be set out at centres as given in Table 2.

Table 2 Primary support spacing (mm), walls

Board thickness	Timber or steel (mm)
9.5	max 450
12.5	max 600

*The minimum thickness for timber primary supports should be 40 mm, and for end/edge supports 38 mm. The minimum face width for metal firings and channels should be 35 mm and perimeter 25 mm, with thickness of between 0.5 mm and 0.72 mm.

Ceilings

15.4 The product is installed, with the foil face uppermost, in the traditional way, ie boards should be tightly butted together and mechanically fixed, with edges at right-angles to the primary supports (joists, battens, metal channel). End joints should be staggered. Where the product is to be used for vapour check purposes, supports (noggings) must be provided along all edges. In all cases perimeter supports must be provided.

15.5 Primary supports should be set out at the centres given in Table 3.

Table 3 Primary support spacing (mm), ceilings

Board thickness (mm)	Timber	Steel
9.5	max 450	max 450
12.5	max 600	max 450

The minimum face width for steel studs on channels should be 35 mm and perimeter 25 mm, with thickness of between 0.5 mm and 0.72 mm. The minimum thickness for timber primary supports should be 44 mm, end supports 38 mm, and perimeter supports 25 mm.

Mechanical fixings

15.6 Boards may be fixed with galvanized plasterboard nails or wood screws (see Table 4) on timber supports, and with power driven dry-wall screws for steel supports. Fixings should be not less than 10 mm from the bound edges and 13 mm from board ends. All fixings should be driven home so as to slightly indent the surface of the board, but without fracturing the paper or the gypsum core.

Table 4 Dimensions of fixings (mm)

Board thickness (mm)	Nail l length/diameter	Screw length/diameter
9.5	30/2.65	30/4
12.5	40/2.65	35/4

Finishing

15.7 Dry lining jointing compounds complying with the requirements of Class A or Class B of BS 6214 : 1982 *Specification for jointing materials for plasterboard* should be used. Jointing fillers may be applied manually or by proprietary mechanical jointing tools. A 50 mm wide jointing tape should be bedded on the first application of filler centred over the board joint and fixing heads. When dry a second application should be applied up to 200 mm wide and allowed to set. A thin finishing coat up to 300 mm wide is applied, after the second coat has set, and feathered off at each edge.

15.8 Internal angles should be reinforced with folded jointing tape bedded and finished with jointing filler compound. External angles should be reinforced with tape or with expanded metal thin beads bedded and finished with jointing filler compound.

Plastering

15.9 Diamond Board Finish should be applied to a thickness of 5 to 6 mm.

15.10 Diamond Foil Backed Gypsum Wallboard is not suitable in applications involving continuous wetting or high humidity.

Technical Investigations

The following is a summary of the technical investigations carried out on Diamond Foil Backed Gypsum Wallboard.

16 Tests

Tests were carried out to determine:

- dimensional accuracy
- effect of humidity/temperature on board stability
- impact properties of boards
- suitability of fixings
- thermal conductivity water absorption.

17 Other investigations

17.1 The manufacturing process was examined including the methods adopted for quality control and details were obtained of the quality and composition of the materials used.

17.2 Data relating to water vapour permeability and fire performance were examined.

17.3 Independent reports on the behaviour and performance of dry lining systems were examined.

17.4 Independent reports on the characteristics and performance of the product were examined.

Conditions of Certification

18 Conditions

18.1 The quality of materials and the method of manufacture have been examined and found satisfactory by the BBA and must be maintained to this standard during the period of validity of this Certificate. This Certificate will remain valid for an unlimited period provided that:

- (a) the specification of the product is unchanged, and
- (b) the manufacturer continues to have the product checked by the BBA.

18.2 Where reference is made in this Certificate to any Act of Parliament, Regulation made thereunder, Statutory Instrument, Code of Practice, British Standard, manufacturer's instruction 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 Certificate.

18.3 In granting this Certificate, the BBA makes no representation as to the presence or absence of patent rights subsisting in the product and/or as to the legal right of Knauf UK GmbH to market, install or maintain the product.

18.4 It should be noted that any recommendations relating to the safe use of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do not purport in any way to re-state the requirements of the Health and Safety at Work etc Act 1974, or of any other statutory or Common Law duties of care, or of any duty of care which may in the future exist; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any other present or future statutory or Common Law duties of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage incurred in respect of personal injury arising as a direct or indirect result of the use of this product.



In the opinion of the British Board of Agrément, Diamond Foil Backed Gypsum Wallboard is satisfactory if used as set out in the above text. This Certificate No 90/2472 is accordingly awarded to Knauf UK.

On behalf of the British Board of Agrément

Date of issue: 11th May 1990

Director

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British Board of Agrément

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