

MONOLUX[®]

The High Performance Building Board

Non-combustible • Extremely lightweight • Moisture resistant
Easy to work • Good acoustic performance



041-009

Intumex[®]
ASIA PACIFIC

MONOLUX®

is a non-combustible, autoclaved calcium silicate reinforced fire protection board, manufactured with selected organic fibres and fillers. Long prominent as a fire resistant board and used extensively for fire rated HVAC ducts, MONOLUX® is especially designed to meet the customer's requirements. MONOLUX® is lightweight compared to most building boards. The unique Magnani production process produces a monolithic board that is rigid, robust and lightweight.

MONOLUX® is a user friendly product because its system installation is easy and convenient. MONOLUX® panels also have good screw holding qualities -- screws can be installed without pre-drilling. MONOLUX® is moisture tolerant. Although it absorbs water, MONOLUX® regains 100% of its original strength upon drying out. Moisture will not cause leaching or efflorescence and has no permanent effect on the board. MONOLUX® is very stable with good acoustic performance.



Fire performance

MONOLUX® has been developed and thoroughly tested for various fire resistant constructions including:

- Fire resistant and smoke extract ducts for up to four hours stability, integrity and insulation in accordance with BS 476: Part 24: 1987.
- Fire resistant enclosures for general building services for up to four hours integrity and insulation in accordance with BS 476: Part 20: 1987.
- Fire resistant structural steelwork protection offering up to four hours in accordance with BS 476: Part 21: 1987.

Handling and working

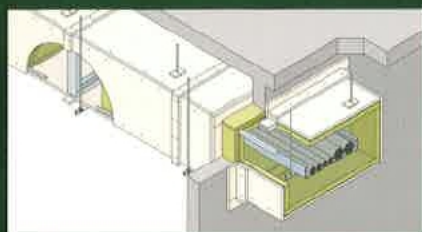
MONOLUX® is formulated with organic fibres. It therefore does not require any special precautions in handling or working. However, dust extraction equipment is recommended to control dust levels particularly when using power saws or sanders in confined spaces.

MONOLUX® is a non loadbearing product. Thicker boards will be heavy and require care when lifting. For further details of applications, properties, cutting, fixing and decoration, contact your nearest supplier.

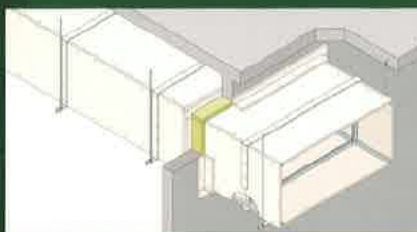
When passing through a compartment wall or floor and where installed without fire damper, all ductwork should be encased in a fire protection system. MONOLUX® is the ideal choice for a wide range of requirements for protecting duct systems.

WHEN MECHANICALLY MACHINING THIS PRODUCT, AIRBORNE DUST MAY BE RELEASED WHICH MAY BE HAZARDOUS FOR HEALTH. DO NOT BREATHE THE DUST. AVOID CONTACT WITH SKIN AND EYES. USE APPROPRIATE DUST EXTRACTION EQUIPMENT AT ALL TIMES. RESPECT REGULATORY OCCUPATIONAL EXPOSURE LIMITS FOR TOTAL INHALABLE AND RESPIRABLE DUST. WEAR APPROPRIATE PERSONAL SAFETY PROTECTION AT ALL TIMES. FOR MORE DETAILED INFORMATION PLEASE CHECK THE MATERIAL SAFETY DATA SHEET APPLICABLE TO THIS PRODUCT, WHICH IS AVAILABLE UPON REQUEST.

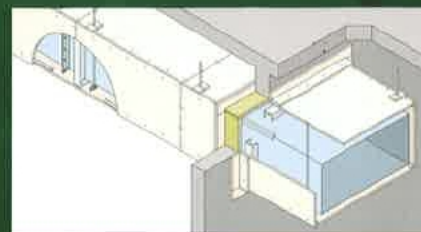
MONOLUX® is applicable to three ducts systems.



E & M Enclosure - page 2



Self supporting duct - page 3 to 4



Steel duct cladding - page 5 to 6

E & M Enclosure

Fire protection for electrical and mechanical services is crucial where the systems must remain functioning until all personnel have escaped in case of fire. The systems may include;

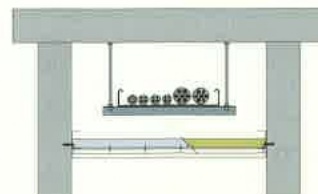
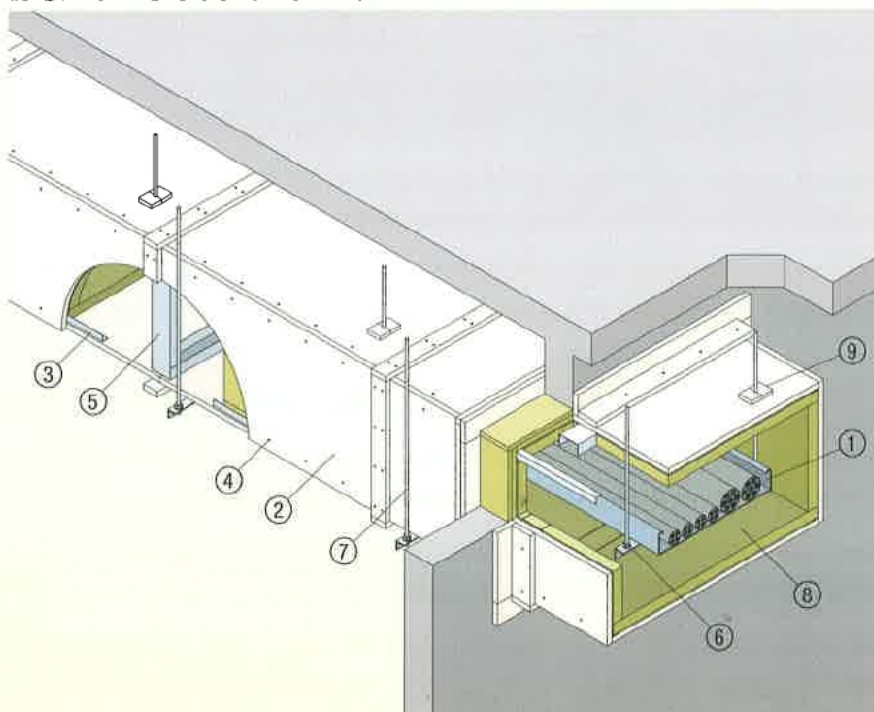
- Electrical operated fire alarms
- Emergency escape route lighting
- Electrically operated extinguishing systems
- Power supply for fire service elevators in high-rise buildings
- Water mains to sprinkler system

MONOLUX® enclosure system for building services are designed to prevent the spread of fire from one compartment to another for periods of up to four hours. Cable ducts constructed from MONOLUX® boards carrying non fire rated cables provide an inexpensive solution to fire protection when compared to alternatives using fire rated cables. To maintain cable function under fire conditions, please consult Intumex Asia Pacific for details.

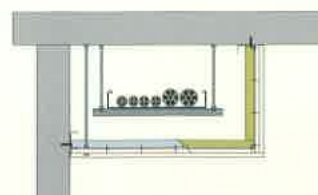
MONOLUX® can be installed in the following configurations, all of which are suitable for ducts exposed to either internal or external fire:

Fire resistance (BS 476: Part 20: 1987)		Board thickness (mm)	Dimensions of duct (mm)	Rock wool (thickness x density)
Stability & Integrity (minimum)	Insulation (minimum)			
120	120	16	Up to 3000 wide x 1500 high	50mm x 100kg/m³
240	240	25	Up to 3000 wide x 1500 high	100mm x 100kg/m³

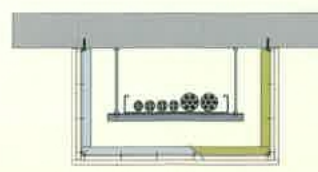
E & M 4 sided enclosure



E & M 1 sided enclosure



E & M 2 sided enclosure



E & M 3 sided enclosure

4 hours fire rating, integrity and insulation in accordance with the criteria of BS 476: Part 20: 1987.

- ① Steel cable ladders or trays, independently supported from the building structure.
- ② MONOLUX® board, thickness dependant upon fire resistance requirements, Please consult Intumex Asia Pacific for details to meet your specific performance requirements.
- ③ Galvanised steel angle, nominal 25mm x 25mm x 0.6mm at board corners. Note that this angle is not always required, thicker boards can be simply screwed or stapled edge to face.
- ④ Corrosion resistant screws at nominal 200mm centres, or steel wire staples at 100mm centres. Length of screws and staple dimension dependant upon the thickness of the MONOLUX® boards and the fire resistance levels. Please consult Intumex Asia Pacific for details.
- ⑤ Galvanised steel channel framing at nominal 1220mm or 610mm centres (dependant on overall duct dimensions) 50mm x 35mm x 0.6mm nominal size.
- ⑥ Hanger support system for cable ladders.

- ⑦ Threaded rods and galvanised steel angles or channels forming support system for MONOLUX® enclosure. Maximum stress levels should not exceed 10N/mm² or 6N/mm² for two and four hour systems respectively.

- ⑧ Rock wool, thickness and density depends on fire resistance performance requirements.

- ⑨ MONOLUX® board pads minimum 100mm x 100mm x cladding thickness to close off gaps around cable tray support hanger ⑥

Note:

- a) The rock wool shall be fixed into the underside of the top boards using screws and mudguard washers (minimum 25mm diameter) minimum penetration of screws into board 20mm. The screws should be in a staggered grid pattern of 300mm in either direction.
- b) An additional row of screws should be included at 50mm from the corners of the duct spaced at 300mm centres down the length of the enclosure.
- c) If the enclosure exceeds 600mm in height, additional screws will be required along the top edge of the rock wool panels to the sides of the ducts.
- d) Where enclosures exceed 1500mm in width, intermediate drop rods are required at the centre of the span to act as stiffeners. Please consult Intumex Asia Pacific for details.

Self Supporting Duct

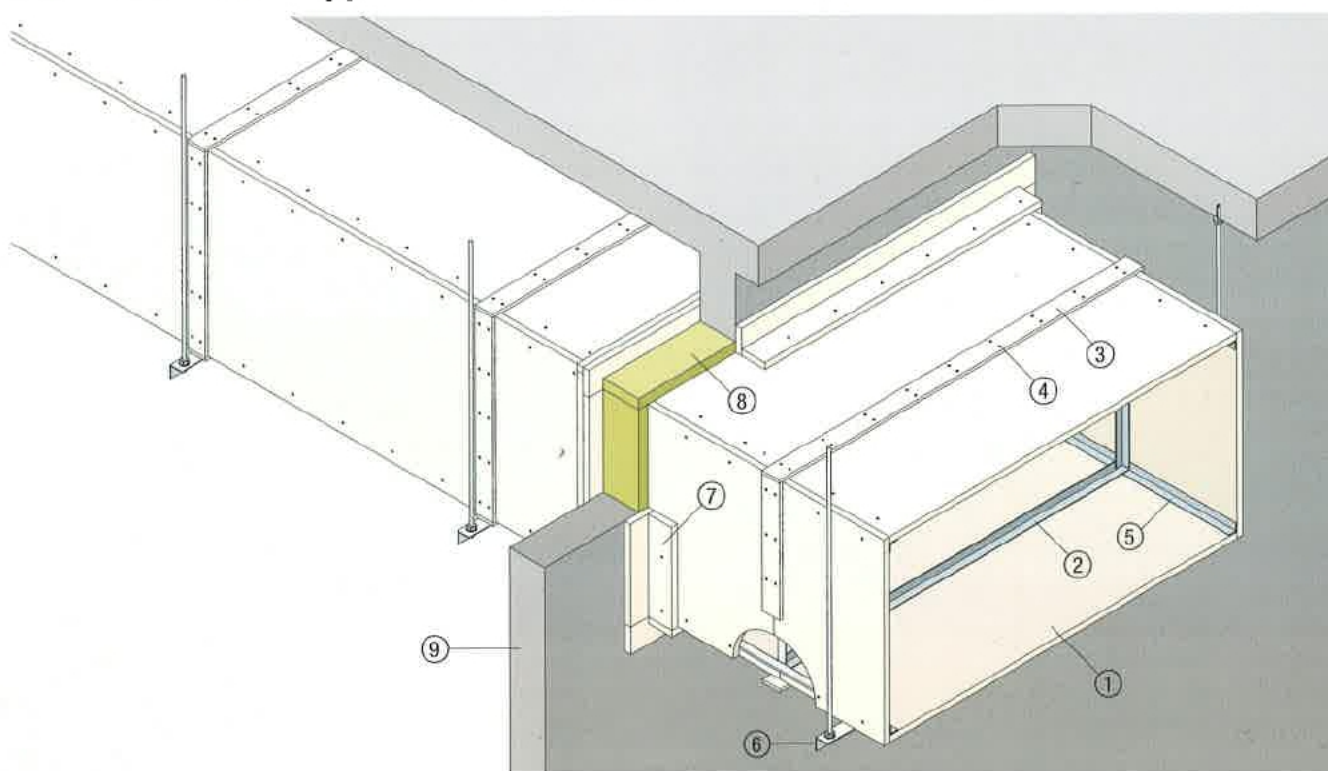
The MONOLUX® self-supporting duct system provides an economical and fire safe method of constructing without a steel lining. Below are details of systems available for MONOLUX® self supporting duct systems.

Fire resistance (BS 476: Part 24: 1987)		Board thickness (mm)	Dimensions of duct (mm)	Rock wool (thickness x density)
Stability & Integrity (minimum)	Insulation (minimum)			
240	30	25	Up to 4000 wide x 1500 high	-
240	240	25	Up to 3000 wide x 1500 high	100mm x 100kg/m³
120	30	19	Up to 4000 wide x 1500 high	-
120	120	19	Up to 3000 wide x 1500 high	50mm x 100kg/m³

Note that all joints in the duct are filled with one of the following sealants:

- a) potassium silicate / MONOLUX® dust mixture
- b) potassium silicate adhesive
- c) Intumex® AN acrylic intumescent sealant

2 & 4 hours self-supported duct enclosure



- ① MONOLUX® 40 boards, thickness in accordance with the table above.
- ② Galvanised steel angles or channel stiffeners, dimensions dependant on fire resistance performance requirements of duct. Please consult Intumex Asia pacific for details.
- ③ MONOLUX® cover fillets, minimum 75mm wide and 19mm thickness for two hours and 25mm for four hours performance. Alternatively use 75mm x 12mm SUPALUX® boards.
- ④ Self drill, self tapping screws at nominal 200mm centres.
- ⑤ Galvanised steel angle at corners, 30mm x 30mm x 0.6mm for two hours, 1.2mm for four hours performance.
- ⑥ Galvanised steel hanger support system, Maximum stress levels should not exceed 10N/mm² or 6N/mm² for two and four hour systems respectively.

- ⑦ MONOLUX® 40 boards forming collar at any penetration through wall or floor, minimum 100mm x 100mm, with 19mm thickness for two hours and 25mm thickness for four hours.

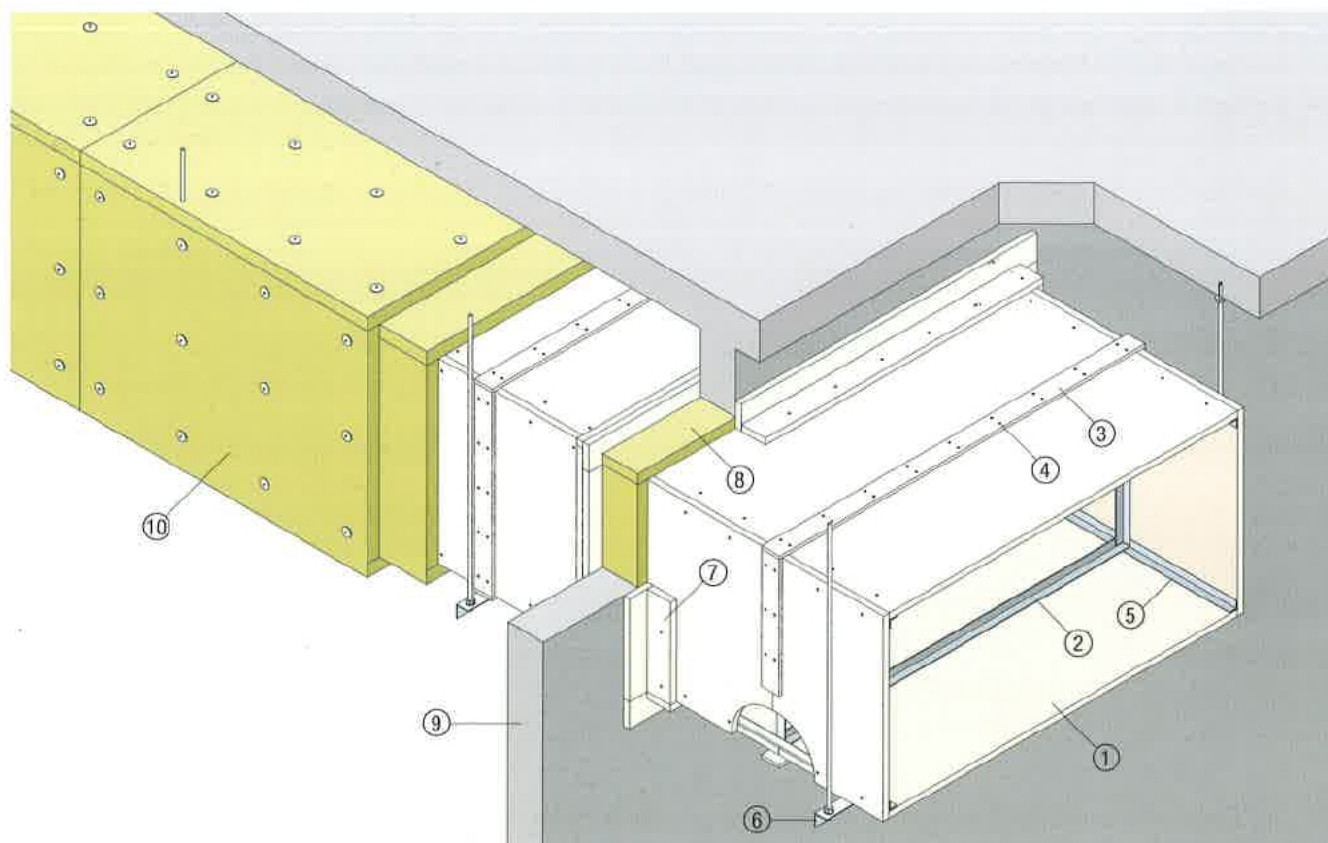
- ⑧ Rock wool seal to maintain insulation performance at penetrations.

- ⑨ Compartmentation, performance of the duct should be at least that of the separating element.

Note : Additional items for consideration where ducts exceed 1220mm width or 1500mm depth.

- The ducts should be installed incorporating addition threaded rods internally to act as stiffeners. These rods should be installed such that the maximum unsupported distance does not exceed 1200mm.

4 hours and 2 hours insulated self-supporting enclosure



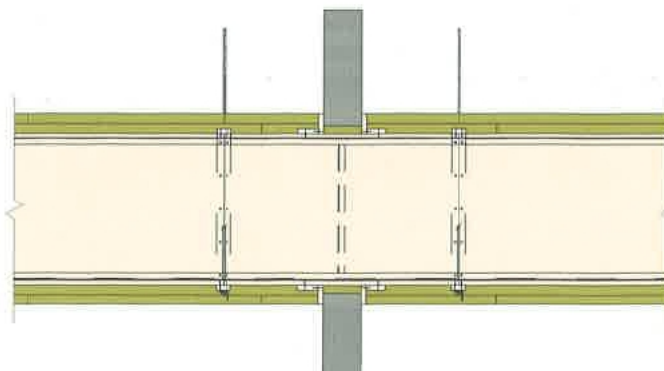
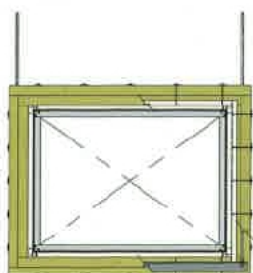
- ① MONOLUX® 40 boards, thickness in accordance with the table above.
- ② Galvanised steel angles or channel stiffeners, dimensions dependant on fire resistance performance requirements of duct. Please consult Intumex Asia Pacific for details.
- ③ MONOLUX® cover fillets, minimum 75mm wide and 19mm thickness for two hours and 25mm for four hours performance. Alternatively use 75mm x 12mm SUPALUX® boards.
- ④ Self drill, self tapping screws at nominal 200mm centres.
- ⑤ Galvanised steel angle at corners, 30mm x 30mm x 0.6mm for two hours, 1.2mm for four hours performance.
- ⑥ Galvanised steel hanger support system, Maximum stress levels should not exceed 10N/mm² or 6N/mm² for two and four hour systems respectively.
- ⑦ MONOLUX® 40 boards forming collar at any penetration through wall or floor, minimum 100mm x 100mm, with 19mm thickness for two hours and 25mm thickness for four hours.

- ⑧ Rock wool seal to maintain insulation performance at penetrations.
- ⑨ Compartmentation, performance of the duct should be at least that of the separating element.
- ⑩ Rock wool, thickness and density minimum as per the above table. Fixing detailed depend on overall dimensions of the duct, please consult Intumex Asia Pacific for details.

Note : Additional items for consideration where ducts exceed 1220mm width or 1500mm depth.

- The ducts should be installed incorporating addition threaded rods internally to act as stiffeners. These rods should be installed such that the maximum unsupported distance does not exceed 1200mm.

Details of self supporting ducts enclosure system



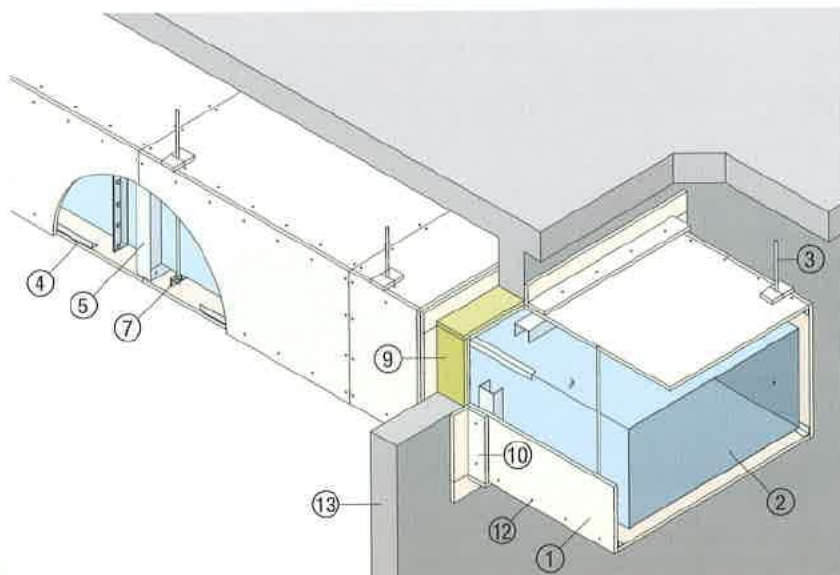
Steel Duct Cladding

The steel ventilation and smoke outlet duct systems protected by MONOLUX® board are designed to provide a fire resistance of up to 4 hours. Below are systems available for MONOLUX® self supporting duct systems.

Fire resistance (BS 476: Part 24: 1987)		Board thickness (mm)	Dimensions of duct (mm)	Rock wool (thickness x density)
Stability & Integrity (minimum)	Insulation (minimum)			
240	-	25	Up to 6000 wide x 1500 high	-
240	240	25	Up to 6000 wide x 1500 high	100mm x 100kg/m ³
120	-	16	Up to 6000 wide x 1500 high	-
120	120	16	Up to 6000 wide x 1500 high	50mm x 100kg/m ³
120	120	19	Up to 6000 wide x 1500 high	50mm x 80kg/m ³
60	60	16	Up to 6000 wide x 1500 high	35mm x 45kg/m ³ or 25mm x 50kg/m ³

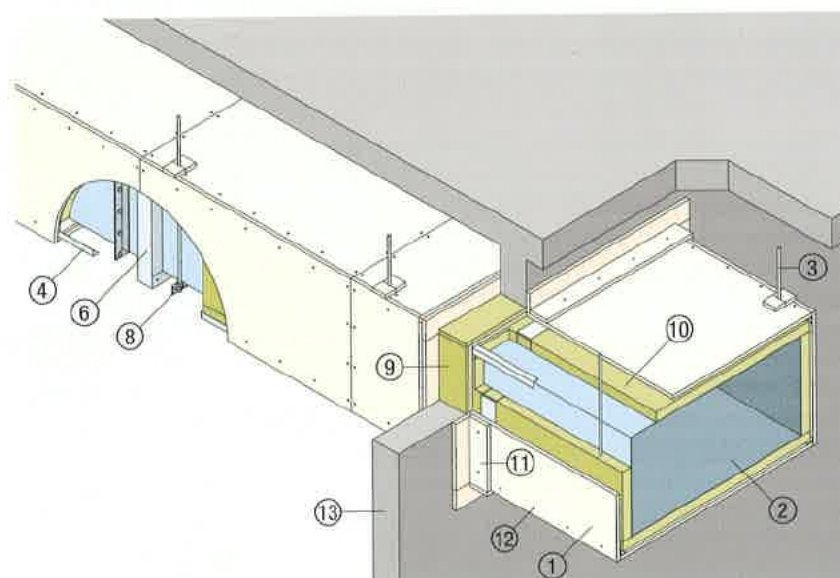
The steel duct construction must be constructed in accordance with the requirement of DW/144 - Specification for sheet metal ductwork or equivalent specification. The steel ducts must be constructed with rolled steel angle-flanged cross joints. Longitudinal seams formed by using the Pittsburgh lock are recommended.

2 & 4 hours Cladding Enclosure



- ① MONOLUX® 40 boards, thickness in accordance with the table above.
- ② Galvanised steel duct.
- ③ Galvanised steel hanger support system, Maximum stress levels should not exceed 10N/mm² or 6N/mm² for two and four hour systems respectively.
- ④ Galvanised steel angle at corner, 50mm x 50mm x 0.6mm.
- ⑤ Steel channel support folded around at 610mm centres, 50mm x 35mm x 0.6mm.
- ⑥ Steel channel support folded around at 610mm centres, 50mm x 35mm x 0.6mm for two hours and 100mm x 50mm x 0.6mm for four hours.
- ⑦ Mild steel angle support at 1220mm centres, 40mm x 40mm x 5mm.
- ⑧ Mild steel angle support at 1220mm centres, 40mm x 40mm x 5mm for two hours and 50mm x 50mm x 5mm thick for four hours.
- ⑨ Rock wool packing to fill penetration seal gap between MONOLUX® duct cladding and compartment wall or floor.
- ⑩ Rock wool, thickness and density in accordance with the table above.
- ⑪ MONOLUX® 40 boards forming collar at any penetration through wall or floor, minimum 100mm x 100mm, with 19mm thickness for two hours and 25mm thickness for four hours.
- ⑫ Self tapping screws at 200mm centres.
- ⑬ Compartment wall or floor.

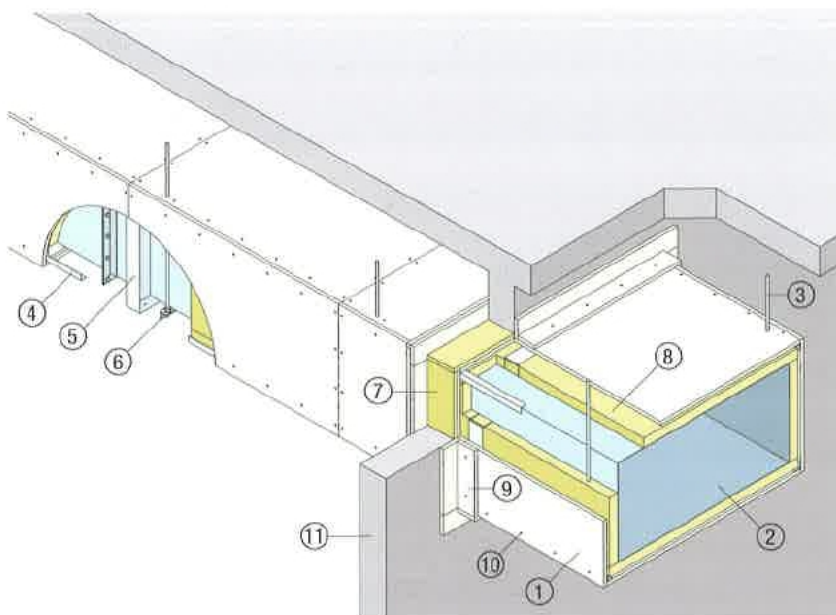
2 & 4 hours Insulated Cladding Enclosure



Note: Additional items for consideration where ducts exceed 2000mm width or 1500mm depth.

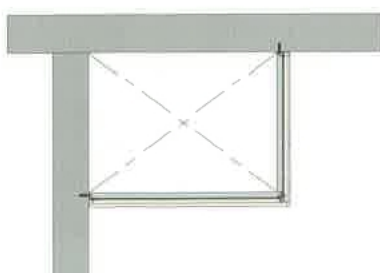
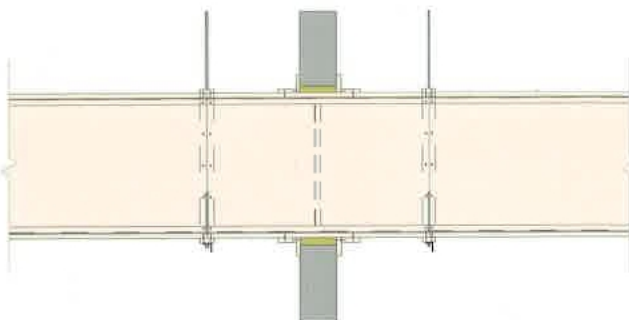
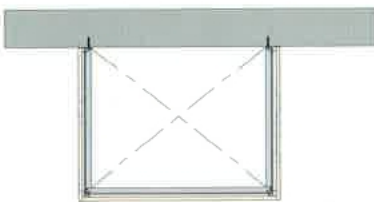
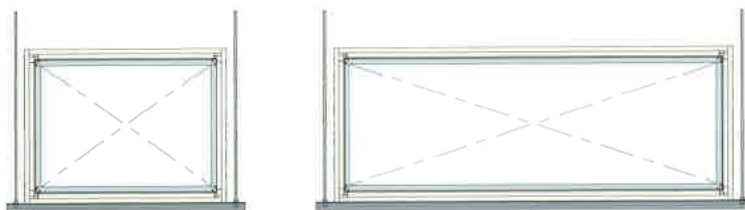
- The ducts should be installed incorporating addition threaded rods internally to act as stiffeners. These rods should be installed such that the maximum unsupported distance does not exceed 1200mm.

1 hour Insulated Cladding Enclosure



- ① MONOLUX® 40 boards, thickness in accordance with the table above.
- ② Galvanised steel duct.
- ③ Galvanised steel hanger support system, Maximum stress levels should not exceed 15N/mm^2 .
- ④ Galvanised steel angle at corner, $50\text{mm} \times 50\text{mm} \times 0.6\text{mm}$.
- ⑤ Steel channel support folded around at 610mm centres, $50\text{mm} \times 35\text{mm} \times 0.6\text{mm}$.
- ⑥ Mild steel angle support at 1220mm centres, $40\text{mm} \times 40\text{mm} \times 5\text{mm}$.
- ⑦ Rock wool packing to fill penetration seal gap between MONOLUX® duct cladding and compartment wall or floor.
- ⑧ Rock wool, 25mm thick $\times 50\text{kg/m}^3$.
- ⑨ MONOLUX® 40 boards forming collar at any penetration through wall or floor, minimum $100\text{mm} \times 100\text{mm} \times 19\text{mm}$ thick.
- ⑩ Self tapping screws at 200mm centres.
- ⑪ Compartment wall or floor.

Detail of steel duct cladding system enclosures



Note: Additional items for consideration where ducts exceed 2000mm width or 1500mm depth.

- The ducts should be installed incorporating addition threaded rods internally to act as stiffeners. These rods should be installed such that the maximum unsupported distance does not exceed 1200mm .

Technical properties

Properties

Density	640 kg/m ³	
Weight (Size: 1220 x 2440mm)	12mm thick	25.0kg approximately
	16mm thick	33.6kg approximately
	19mm thick	39.9kg approximately
	22mm thick	46.2kg approximately
	25mm thick	52.4kg approximately
	32mm thick	67.0kg approximately
Other sizes available	Width (mm)	1220
	Length (mm)	2440, 3050

General Characteristics

Maximum recommended hot face temperatures	250°C
Normal moisture content	6 - 8%
Moisture movement ambient (30% RH, 20°C) to saturated	0.05%
Alkalinity (pH value)	7 - 9
Fire performance to BS 476: Part 4: 1970	Non-combustible
Surface spread of flame (BS 476: Part 7: 1971)	Class 1
Smoke or toxic gas emission	Minimal

Mechanical Characteristics

Young's modulus (E value)	2.7 GPa
Modulus of Rupture	4.8 MPa
Impact strength (19mm board BS 1811: Part 2: 1969)	125mm
Hard body impact resistance as classified in BS 8200	12mm thick 3.0 Nm
Compaction under load:	
1.0% compaction	1.8 MPa
1.5% compaction	3.7 MPa
2.0% compaction	7.0 MPa
Brinell hardness 50kg load 10mm ball, 10 sec	15
Screwholding power (BS 3536: Part 2: 1974)	
13mm penetration-ultimate pull	36 kgf
19mm penetration-ultimate pull	90 kgf

Thermal Characteristics

Thermal conductivity (K) at mean temperature	25°C	0.180 W/m°C
	100°C	0.190 W/m°C
	250°C	0.200 W/m°C
Thermal capacity	100°C	1130 J/kg°C
	200°C	1210 J/kg°C
Coefficient of thermal expansion to 120°C	6 x 10 ⁻⁶ per °C	
Thermal shrinkage 4 hrs at 250°C	Linear	0.25%
	Thickness	0.60%

Manufacturing Tolerances

Length	-0, +5mm
Width	-0, +5mm
Thickness	+0, -0.8mm

Your local supplier