
CERTIFICATE OF APPROVAL
No. ME0155

This is to certify that the referenced products of

PROMAT MIDDLE EAST

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have been assessed against the requirements of the *warringtonfire – mideast certification scheme* and are approved for use within the scope of the test and/or assessment report(s) referenced.

Duraduct LT and Duraduct SMT
Ductwork Systems

Certificate Reference	Valid Until
CERTIFIRE Certificate CF480	6 th June 2011

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Promat UK Ltd – Duraduct LT Ductwork Systems

Ducts without rock wool insulation

The 4-sided Duraduct LT duct system is constructed with a single layer of 6mm-thick Durasteel. The duct consists of a galvanised steel inner duct, minimum 0.8mm thick, over-boarded with 6mm-thick Durasteel and finishing steel external angle trims, 50mm x 50mm x 1mm thick. The Durasteel boards and the trim angles are fastened to the steel duct with steel fixings minimum 4.5mm diameter at 300mm maximum centres longitudinally and 500mm maximum centres across the duct. Proprietary steel flange sections are fitted over the steel duct, Durasteel board and trim angles to form the cross joints and fastened with steel fixings minimum 4.5mm diameter at 150mm nominal centres. Promaseal Acrylic Sealant is applied between the flange section and duct body prior to sliding the flange into position. The flanges of adjacent duct sections are fastened together with an M10 steel bolt at each corner and steel flange clamps at 450mm maximum centres. Promaseal Acrylic Sealant is applied to the meeting faces of the flanges. The maximum length of duct section is 1500mm for Durasteel ducts up to 1200mm wide or high and 1210mm long for Durasteel ducts over 1200mm wide or high. The maximum size of the duct is 6.0m wide x 2.0m high.

Steel angle sections, minimum 40mm x 40mm x 3mm thick, may be used to form the duct cross-joints as an alternative to the proprietary flanged sections. The angles are fastened to the duct with steel fixings minimum 4.5mm diameter at 150mm nominal centres. The angles of adjacent duct sections are fastened together with M6 steel bolts and nuts at the four corners and at 250mm maximum centres.

The hangers consist of threaded steel drop rods and steel angle or channel bearers. The maximum tensile and shear stresses that unprotected steel hangers can bear in the standard fire test are 10N/mm² for fire exposures of up to 120 minutes and 6N/mm² for fire exposures of up to 240 minutes. The maximum loads for drop rods are shown in Table 3. The maximum spacing of the hangers is 1500mm. Where the width of the duct exceeds 1.5m an additional steel drop rod is fitted at each hanger at mid width of the duct. The rod passes through the duct and supports the bearer under the duct. The rod is also fitted with a steel nut and large steel washer so that it supports the upper wall of the duct. In the same way, where the internal width of the duct exceeds 3000mm, two or more additional threaded rods are fitted at each hanger position at centres not exceeding 1500mm across the duct. The penetrations of the rods through the duct are sealed with Promaseal Silicone Sealant or Promaseal Acrylic Sealant.

The drop rods are connected to the floor soffit either directly with an all-steel expanding anchor at least the same size as the rod or via steel channel brackets. Each bracket is 75mm long, made from 127mm x 64mm x 6mm-thick hot-rolled channel and is fastened to the concrete floor with an all-steel expanding anchor. The anchor bolts must penetrate the concrete by at least 50mm for fire ratings up to 120 minutes and at least 65mm for fire ratings up to 240 minutes. The anchors must be of sufficient strength to support the weight of the duct and be fitted in accordance with the manufacturer's instructions. The maximum tensile stress values for the anchor bolts are 14.1N/mm² for fire exposures of up to 120 minutes and 7.8N/mm² for fire exposures of up to 240 minutes.

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Promat UK Ltd – Duraduct LT Ductwork Systems

At a penetration, where the duct passes through a fire compartment wall, a duct joint is positioned in the line of the wall. The gaps between the duct and the reveals of the opening are filled with rock wool, 140kg/m³ density, with collars of the same rock wool, minimum 40mm thick, overlapping the faces of the wall and collars, minimum 200mm wide x 40mm thick, around the duct on both sides of the penetration.

Three, two and one sided ducts

On the 3-sided, 2-sided and 1-sided duct systems the hangers are not required. A longitudinal corner steel angle is fitted to the duct where it butts up to the soffit of the concrete floor or the concrete/masonry wall. The angles are minimum 40mm x 40mm x 3mm thick and are fastened to the duct, through the steel duct and the Durasteel, with steel fixings minimum 4.5mm diameter at 150mm nominal centres. The angles are fastened to the floor or wall with minimum M8 all-steel expanding anchors at 500mm maximum centres. The size and spacing of the steel fixings and anchors must be adjusted depending on the weight of the duct assembly. The maximum tensile and shear stresses for the steel fixings are 10N/mm² for fire exposures of up to 120 minutes and 6N/mm² for fire exposures of up to 240 minutes. The maximum tensile and shear stress values for the anchor bolts are 14.1N/mm² for fire exposures of up to 120 minutes and 7.8N/mm² for fire exposures of up to 240 minutes.

Promaseal Acrylic Sealant is fitted between the angles and the wall or floor. The penetration seal system is the same as for the 4-sided duct. Where the width of the 3, 2 and 1-sided Durasteel LT ducts exceeds 1.5m, a threaded rod is fitted at mid-width at 1.5m maximum centres along the duct, in the same manner as the additional threaded rods for the 4-sided ducts greater than 1.5m wide. The additional rods support the soffit of the duct with a steel nut and washer under the duct. The drop rods are M20 steel studding and where possible should coincide with the flanged or angle cross-joints. Where the drop rods do not coincide with the cross-joints, the size of the steel washer under the Durasteel is at least 100mm square x 3mm thick. In the same way, where the internal width of the duct exceeds 3.0m, two or more additional threaded rods are fitted at centres not exceeding 1.5m across the duct. The penetrations of the rods through the duct are sealed with Promaseal Silicone Sealant or Promaseal Acrylic Sealant.

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Promat UK Ltd – Duraduct LT Ductwork Systems
Ducts with rock wool insulation

When rock wool insulation is fitted around the outside of the duct it is held in position with 2.5mm-diameter steel stud-welded pins and 38mm-diameter spring steel washers. The pins are positioned in a grid 400mm x 400mm maximum. On the top and bottom faces of the duct one row of pins is located nominally 50mm from each longitudinal corner. On the soffit of horizontal ducts the ends of the pins are bent over to ensure that the washers are retained in position. Cover strips of the rock wool are fitted over each duct joint position and at the hanger positions. The cover strips are 130mm wide at the duct joints and 150mm wide at the hanger positions. At the cover strip locations the foil facing (if fitted) is removed from the first layer of rock wool and the cover strips are bonded in position with Conlit glue. Steel pins are used to hold the cover strips in position while the glue sets.

Table 1 Insulation performances for Duraduct LT duct systems

Duct type*	Insulation minutes	Rock wool insulation		Layers of insulation - mm
		Thickness - mm	Density – kg/m ³	
A	30	-	-	-
A	60	30	60	1 x 30
A	120	50	60	1 x 50
A	180	50	140	1 x 50
A	240	80	140	2 x 40
A	240	90	165	1 x 90
A (KE ¹)	120	90	165	1 x 90
A (KE ¹)	60	50	165	1 x 50
B	30	-	-	-
B	60	50	60	1 x 50
B	60	50	165	1 x 50
B	120	90	165	1 x 90
B	120	80	140	2 x 40
B	180	100	140	2 x 50
B	240	120	140	3 x 40

* A – fire outside, B – fire inside. Note 1: - KE = kitchen extract

At the penetration through fire compartment walls a collar of rock wool, at least 300mm wide, is bonded around the duct on both sides of the penetration on top of the general rock wool insulation.

For the 60kg/m³ density insulation systems, the rock wool may be bonded to the Durasteel with Conlit glue instead of using stud-welded steel pins. All board-to-board joints of the insulation are bonded with Conlit glue. Steel wire is also wrapped around the insulation at maximum 300mm centres. This option is limited to 4-sided ducts with a maximum width or height of 1200mm.

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Promat UK Ltd – Duraduct SMT Ductwork Systems

Ducts without rock wool insulation

The 4-sided Duraduct SMT duct system is constructed with a single layer of 9.5mm-thick Durasteel boards supported by a welded framework of steel angles, 50mm x 50mm x 3mm thick, at the corners of the duct and at duct joints. The boards are fastened to the steel framework with M5.5 steel self drill and tap Tek screws at 200mm nominal centres. The flanges of adjacent duct sections are fastened together with M8 steel bolts at each corner and at 250mm maximum centres. Promaseal Acrylic Sealant is applied to the meeting faces of the flanges. The maximum length of duct section is 1500mm. The maximum size of the duct is 6.0m wide x 2.0m high.

The hangers consist of threaded steel drop rods and steel angle or channel bearers. The maximum tensile and shear stresses that unprotected steel hangers can bear in the standard fire test are 10N/mm^2 for fire exposures of up to 120 minutes and 6N/mm^2 for fire exposures of up to 240 minutes. The maximum loads for drop rods are shown in Table 3. The maximum spacing of the hangers is 1500mm. Where the width of the duct exceeds 1.5m an additional steel drop rod is fitted at each hanger at mid width of the duct. The rod passes through the duct and supports the bearer under the duct. The rod is also fitted with a steel nut and large steel washer so that it supports the upper wall of the duct. In the same way, where the internal width of the duct exceeds 3000mm, two or more additional threaded rods are fitted at each hanger position at centres not exceeding 1500mm across the duct. The penetrations of the rods through the duct are sealed with Promaseal Silicone Sealant or Promaseal Acrylic Sealant.

The drop rods are connected to the floor soffit either directly with an all-steel expanding anchor at least the same size as the rod or via steel channel brackets. Each bracket is 75mm long, made from 127mm x 64mm x 6mm-thick hot-rolled channel and is fastened to the concrete floor with an all-steel expanding anchor. The anchor bolts must penetrate the concrete by at least 50mm for fire ratings up to 120 minutes and at least 65mm for fire ratings up to 240 minutes. The anchors must be of sufficient strength to support the weight of the duct and be fitted in accordance with the manufacturer's instructions. The maximum tensile stress values for the anchor bolts are 14.1N/mm^2 for fire exposures of up to 120 minutes and 7.8N/mm^2 for fire exposures of up to 240 minutes.

At a penetration, where the duct passes through a fire compartment wall, a duct joint is positioned in the line of the wall. The gaps between the duct and the reveals of the opening are filled with Durastop Original, 150mm thick.

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Promat UK Ltd – Duraduct SMT Ductwork Systems

Three, two and one sided ducts

On the 3-sided, 2-sided and 1-sided duct systems the hangers are not required. A longitudinal corner steel angle is fitted to the duct where it butts up to the soffit of the concrete floor or the concrete/masonry wall. The angles are minimum 50mm x 50mm x 3mm thick and are fastened to the duct with minimum M5.5 steel self drill and tap Tek screws at 200mm nominal centres. The angles are fastened to the floor or wall with minimum M8 all-steel expanding anchors at 500mm maximum centres. The size and spacing of the screws and anchors is adjusted depending on the weight of the duct assembly. The maximum tensile and shear stresses for the steel screws are 10N/mm² for fire exposures of up to 120 minutes and 6N/mm² for fire exposures of up to 240 minutes. The maximum tensile and shear stress values for the anchor bolts are 14.1N/mm² for fire exposures of up to 120 minutes and 7.8N/mm² for fire exposures of up to 240 minutes.

Promaseal Acrylic Sealant is fitted between the angles and the wall or floor. The penetration seal system is the same as for the 4-sided duct.

Where the width of the 3, 2 and 1-sided Durasteel ducts exceeds 1.5m, a threaded drop rod is fitted at mid-width at 1.5m maximum centres along the duct, in the same manner as the additional threaded drop rods for the 4-sided ducts greater than 1.5m wide. The additional rods support the soffit of the duct with a steel nut and washer under the duct. The drop rods are M20 steel studding and where possible should coincide with the flanged cross-joints. Where the drop rods do not coincide with the cross-joints, the size of the steel washer under the Durasteel is at least 100mm square x 3mm thick. In the same way, where the internal width of the duct exceeds 3.0m, two or more additional threaded rods are fitted at centres not exceeding 1.5m across the duct. The penetrations of the rods through the duct are sealed with Promaseal Silicone Sealant or Promaseal Acrylic Sealant.

Ducts with rock wool insulation

The rock wool insulation fitted around the outside of the duct is held in position with 2.5mm-diameter steel stud-welded pins and 38mm-diameter spring steel washers. The pins are positioned in a grid 400mm x 400mm maximum. On the top and bottom faces of the duct one row of pins is located nominally 50mm from each longitudinal corner. On the soffit of horizontal ducts the ends of the pins are bent over to ensure that the washers are retained in position. Cover strips of the rock wool are fitted over each duct joint position and at the hanger positions. The cover strips are 130mm wide at the duct joints and 150mm wide at the hanger positions. At the cover strip locations the foil facing (if fitted) is removed from the first layer of rock wool and the cover strips are bonded in position with Conlit glue. Steel pins are used to hold the cover strips in position while the glue sets. At the penetration through fire compartment walls, for ducts clad with one layer of 30mm or 50mm thick rock wool, a collar of the same rock wool, at least 300mm wide, is bonded around the duct on both sides of the penetration on top of the general rock wool insulation.

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Promat UK Ltd – Duraduct SMT Ductwork Systems

For the 60kg/m³ density insulation systems, the rock wool may be bonded to the Durasteel with Conlit glue instead of using stud-welded steel pins. All board-to-board joints of the insulation are bonded with Conlit glue. Steel wire is also wrapped around the insulation at maximum 300mm centres. This option is limited to 4-sided ducts with a maximum width or height of 1200mm.

Alternatively, stud-welded pins and washers are fastened to the duct, as above, and layers of wired rock wool insulation are wrapped around the duct. The wire mesh used is galvanised steel 25mm hexagonal cell 'chicken wire' mesh. Each layer of insulation is supported by both the wire mesh and the pins/washers. The insulation is fixed with joints staggered by at least 150mm between layers. Steel straps at 1000mm nominal centres further support the outer layer of insulation. This option is limited to 4-sided ducts. The insulation is closely fitted around the hangers so that the presence of the hangers within the thickness of the insulation does not result in hot spots that would exceed the maximum temperature rise limit of the test standard.

Table 2 Insulation performances for Durasteel duct systems

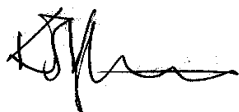
Duct type*	Insulation minutes	Rock wool insulation		Layers of insulation - mm
		Thickness – mm	Density – kg/m ³	
A	30	-	-	-
A	60	30	60	1 x 30
A	120	50	60	1 x 50
A	180	50	140	1 x 50
A	240	80	140	2 x 40
A	240	90	165	1 x 90
A (KE ¹)	120	90	165	1 x 90
A (KE ¹)	60	50	165	1 x 50
B	60	50	60	1 x 50
B	60	50	165	1 x 50
B	120	90	165	1 x 90
B	120	80	140	2 x 40
B	180	100	140	2 x 50
B	240	120	140	3 x 40

* A – fire outside, B – fire inside. Note 1: - KE = kitchen extract

Table 3 Maximum loads for drop rods

Nominal rod diameter mm	Tensile stress area mm ² (BS 4190)	Load			
		kN – 2hr (10N/mm ²)	kg – 2hr	kN – 4hr (6N/mm ²)	kg – 4hr
6	20.1	0.20	20.49	0.12	12.29
8	36.6	0.37	37.31	0.22	22.39
10	58.0	0.58	59.12	0.35	35.47
12	84.3	0.84	85.93	0.51	51.56
16	157.0	1.57	160.04	0.94	96.02
20	245.0	2.45	249.75	1.47	149.85

Signed for and on behalf of Warrington Certification



Sir Ken Knight
Chairman - Management Council

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