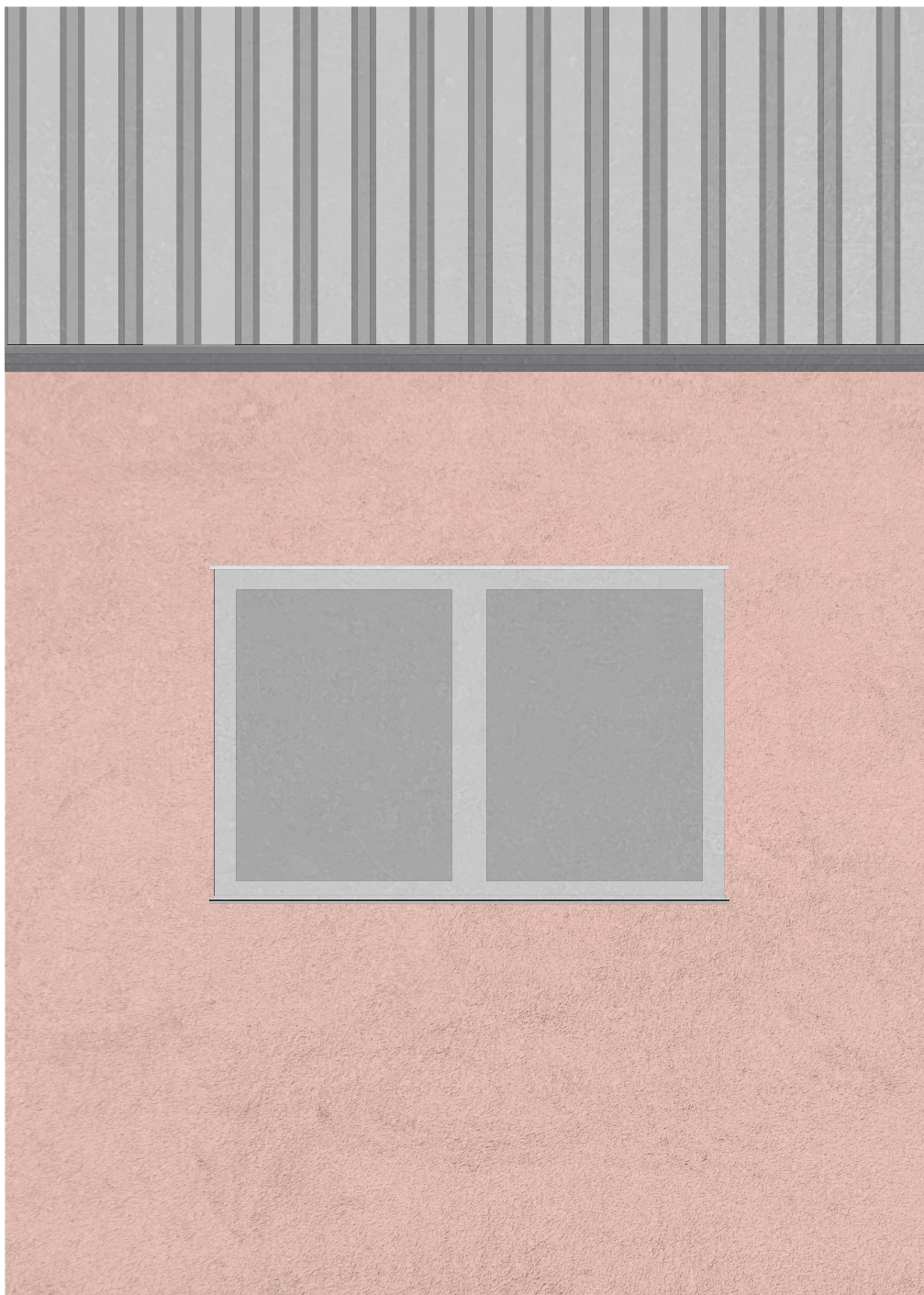


TECHNICAL REPORT



POLITECNICO
MILANO 1863

BUILDING TECHNOLOGY STUDIO - ANDREA TARTAGLIA - SPRING 2022
GROUP 9 - YONNA HOVRELL - EREN YAPRAK - MEHMET EGE

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SYSTEM OVERVIEW

Structural System

The residential building is constructed using a reinforced concrete column and waffle slab system, while the service building is built on heavy steel construction [1]

Electrical System

We use v-tac VT-5811 16A EU type sockets throughout the building. [2]
For lighting, the false ceiling is embedded with Philips CorePro GU10 type mini spotlights [3]

Air Conditioning Systems

We use Kensa commercial grade chainable ground source heat pumps to provide a source for cool and warm air. By using the ground as a source for the heatpump, the system is able to achieve high efficiency even during the coldest weeks of winter. [4]

The heat is distributed using Fujitsu ADUH09LUAS1 model duct type air conditioner embedded into a false ceiling. [5]

Window Systems

Our window frames are aluminium frames by Raynaers of the CS77 model. This model features both inward opening and also top opening of the window. [6]

It is mounted using clip-on masonry clips in order to avoid thermal bridging. [7]

Roof Systems

Our roofs are constructed using sandwich panels with rockwool insulation in order to provide longevity and durability with high comfort. [8]

The structural system supporting the roof is the classical Italian wooden truss roof system adapted to be made from steel and placed onto concrete. [9]

Curtain Wall and Partition Wall CMU systems

Curtain walls and partition walls are constructed using aerated concrete, which is a high performance and lightweight concrete masonry unit that allows us to have higher thermal insulation and acoustical insulation. [10][11]

Acoustical Floating Floor System

We use a floating floor system in order to reduce both air born sound transmittance between floors and the impact sound transmittance [12]

Draining System

For the draining pipes we are using Valsir PP3 Waste system in size 32 mm and 110 mm. The acoustic insulation of these pipes increase resident comfort by reducing transmitted sound. [13]

Anti-root barrier

we used the deeproot root barriers to protect our foundation from plant growth and the resulting physical damage. The barrier redirects the growing roots away from the direction it is placed. [14]

Sun Shading System

We use the sol'art louver system to reduce unwanted thermal gain and glare in the south and east facing façades. By using a system placed outside of the window, we have better thermal results. [15]

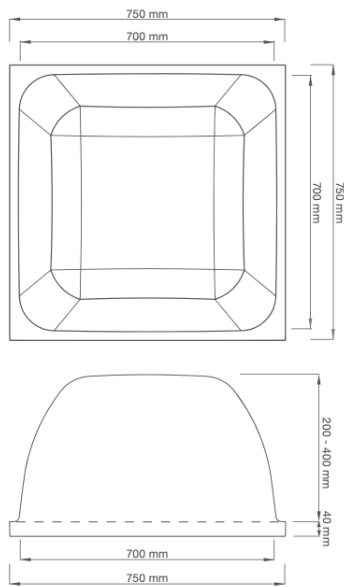
Dimple Mat

Dörken's Delta MS dimple mat allows us to have increased drainage around our foundation by breaking the surface tension of water. [16]

Structural System

The residential building is constructed using a reinforced concrete column and waffle slab system, while the service building is built on heavy steel construction [1]

SKYDOME TECHNICAL DATA



SIZES

Base	750 x 750 mm
Heights	200 - 250 - 300 - 350 - 400 mm

SKYDOME MATERIAL

Acrylonitrile Butadiene Styrene	ABS
---------------------------------	-----

BEAM AND CUBE



These two items are part of the supporting structure of the dome:

- light and easy to handle;
- fits onto standard H20 timber beams;
- resistant and reusable.

Made of abs, easy to clean with water, ready for reuse.

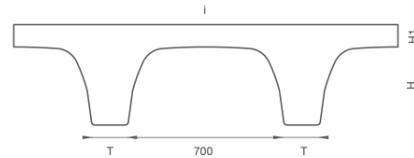
CONCRETE CONSUMPTION

ITEM	Ribbing width (T) mm	On centres (I) mm	Concrete consumption ribbing m ³ /m ²	Concrete consumption of the slab m ³ /m ²		
				Topping slab depth H1 = 50 mm	Topping slab depth H1 = 100 mm	Topping slab depth H1 = 150 mm
SKYDOME H200	120	820	0.080	0.130	0.180	0.230
	160	860	0.091	0.141	0.191	0.241
	200	900	0.100	0.150	0.200	0.250
SKYDOME H250	120	820	0.099	0.149	0.199	0.249
	160	860	0.113	0.163	0.213	0.263
	200	900	0.125	0.175	0.225	0.275
SKYDOME H300	120	820	0.123	0.173	0.223	0.273
	160	860	0.139	0.189	0.239	0.289
	200	900	0.153	0.203	0.253	0.303
SKYDOME H350	120	820	0.151	0.201	0.231	0.301
	160	860	0.169	0.219	0.269	0.319
	200	900	0.185	0.235	0.285	0.335
SKYDOME H400	120	820	0.185	0.235	0.285	0.335
	160	860	0.205	0.255	0.305	0.355
	200	900	0.222	0.272	0.322	0.372

The table to the left allows to calculate the concrete consumption and consequently the self-weight of the floor according to the height of the dome and the width of the ribbing.

EXAMPLE

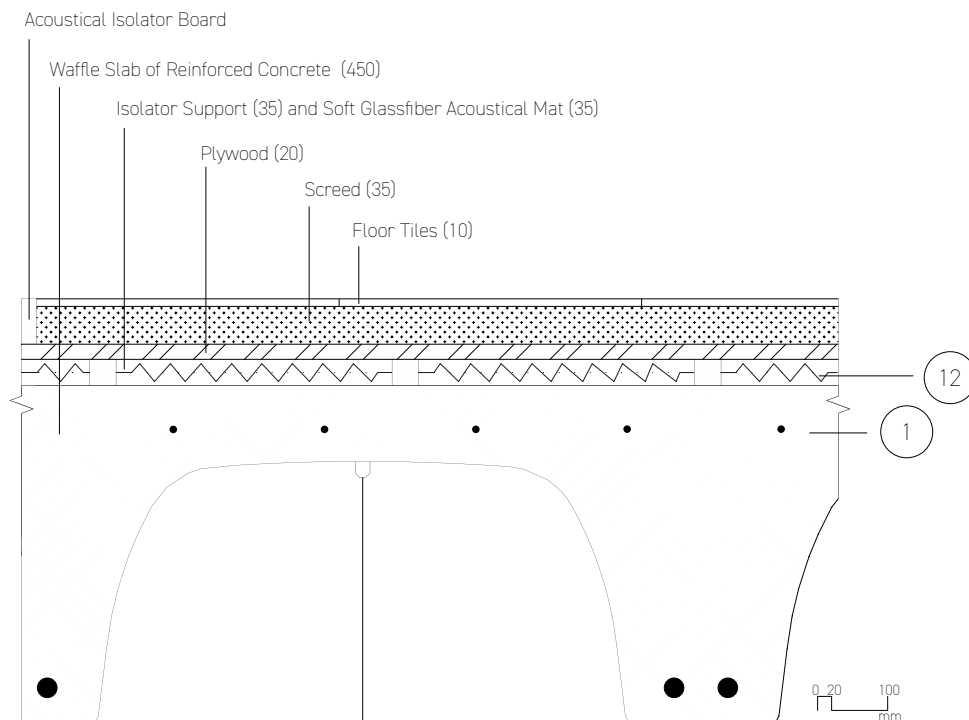
For a slab of 300 + 50 mm (300 mm dome + 50 mm topping slab) with ribbing width of 160 mm, the concrete consumption is 0.189 m³/m² and the self-weight is 472.50 kg/m².



GEOPLAST TECHNICAL ASSISTANCE

Geoplast Technical Unit, with its staff of structural engineers, guarantees the needed support during all the stages in the worksite. After the analysis of the technical details and the possible restrictions of the construction, the technical staff defines the formwork system's configuration and develops the project, specifying the accessories. Prior agreement, when required, assistance in the worksite during the system's installation, the pouring stage and the removal, is provided.

IN PROJECT



For lighting, the false ceiling is embedded with Philips CorePro GU10 type mini



[3]



CorePro LEDspot MV



Corepro LEDspot 4.6-50W GU10 827 36D

CorePro LEDspot è una soluzione ideale per l'illuminazione spot, che eroga una calda luce simile a quella delle lampade alogene. Compatibile con la maggior parte degli apparecchi esistenti con attacchi GU10 e progettata come alternativa per l'aggiornamento diretto (retrofit) delle lampade spot alogene o a incandescenza. La gamma CorePro LEDspot consente notevoli risparmi energetici e riduce al minimo i costi di manutenzione.

Dati del prodotto

Informazioni generali	
Attacco	GU10 [GU10]
Conformità a RoHS EU	SI
Durata nominale (Nom)	15000 h
Ciclo di commutazione on/off	50.000 X
Tipo tecnico	4.6-50W
Riferimento di misurazione del flusso	Narrow Cone
Dati tecnici di illuminazione	
Codice colore	827 [CCT di 2.700 K]
Angolo del fascio (Nom)	36 °
Flusso luminoso (Nom)	355 lm
Intensità luminosa (Nom)	700 cd
Designazione colore	Bianca calda (WW)
Temperatura di colore correlata (Nom)	2700 K
Efficienza luminosa (specificata) (Nom)	77,00 lm/W
Uniformità del colore	<6
Indice di resa dei colori (Nom)	80
LLMF a fine durata vita nominale (Nom)	70 %
Flusso luminoso in cono 90° (specificato)	355 lm

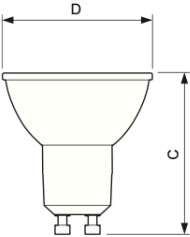
Funzionamento e parte elettrica	
Frequenza di ingresso	Da 50 a 60 Hz
Power (Rated) (Nom)	4,6 W
Corrente lampada (Nom)	39 mA
Wattaggio equivalente	50 W
Tempo di avvio (Nom)	0,5 s
Tempo di riscaldamento al 60% luce (Nom)	0,5 s
Fattore di potenza (Nom)	0,5
Tensione (Nom)	220-240 V
Temperatura	
Temp. massima involucri (Nom)	72 °C
Controlli e regolazione del flusso	
Regolabile	No
Meccanica e corpo	
Forma lampadina	PAR16 [PAR 16pollici o 50mm]
Approvazione e applicazione	
Classe di efficienza energetica	F

CorePro LEDspot MV

Adatto all'illuminazione d'accento	Yes
Consumo energetico kWh/1000 h	5 kWh
Numero di registrazione EPREL	387358
Dati del prodotto	
Codice prodotto completo	871869675251700
Nome prodotto ordine	Corepro LEDspot 4.6-50W GU10 827 36D
EAN/UPC - Prodotto	8718696752517

Codice d'ordine	75251700
Numeratore SAP - Quantità per confezione	1
Numeratore - Confezioni per scatola esterna	10
Materiale SAP	929001215232
Peso netto SAP (Pezzo)	0,045 kg

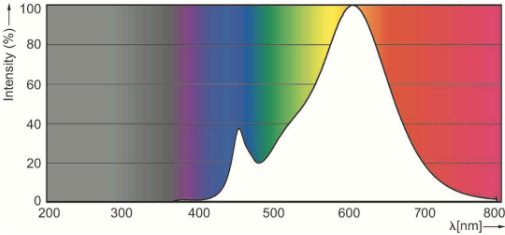
Disegno tecnico



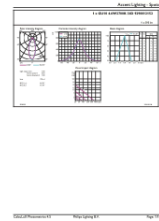
Corepro LEDspot 4.6-50W GU10 827 36D

Product	D	C
Corepro LEDspot 4.6-50W GU10 827 36D	50 mm	54 mm

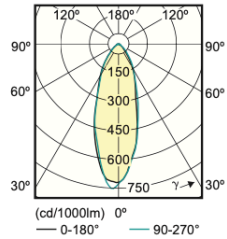
Fotometrie



LEDspotMV GU10 MR16 827

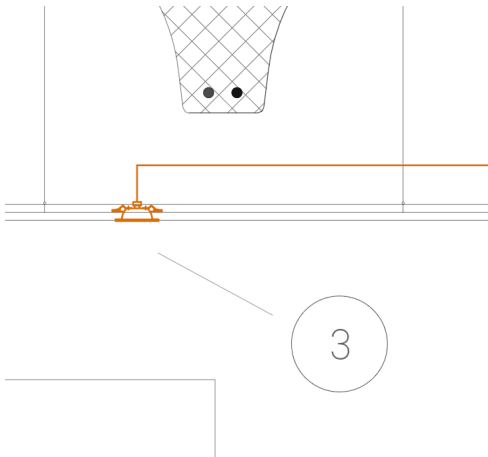


LED Lamps, CorePro LEDspotMV 4.6-50W GU10 PAR16 827 355lm 36D



LED Lamps, CorePro LEDspotMV 4.6-50W GU10 PAR16 827 355lm 36D

IN PROJECT



Air Conditioning Systems

We use Kensa commercial grade chainable ground source heat pumps to provide a source for cool and warm air. By using the ground as a source for the heatpump, the system is able to achieve high efficiency even during the coldest weeks of winter.

Technical (TIS)



TI - Commercial Heat Pumps – 1.2

Page(s)



Commercial Heat Pumps

Features and Benefits

- **Modular design**
- **Low running costs**
- **Low carbon emissions**
- **Heating and external cooling options**
- **UK manufactured**
- **Internal vibration eliminators**



Product Description

The [Kensa Commercial Heat Pump](#) is designed to provide a low cost renewable heat source for a building's heating system and will generate significantly lower carbon emissions and running costs compared with traditional fossil fuels.

Kensa Commercial Heat Pumps are available with an output of 87kW, and are of a modular design meaning by combining them much higher loads can be achieved.

The design allows the majority of maintenance work to be carried out from the front allowing the units to be installed with minimal clearance. By individual isolation any unit may be disconnected and withdrawn for major maintenance or repair operations.

The modular design also enables the system to closely match the required heating load and offers a degree of redundancy in the unlikely event of a problem with one of the units.

Due to the size of the compressors Commercial Heat Pump models are only available in three phase and come fitted with soft starts as standard.

Commercial Heat Pumps can interface easily with a buildings heating distribution system, such as fan coils, underfloor, and air handling units etc.

Commercial Heat Pump models are not supplied with water pumps as these are dependant on the application and site.

Commercial Heat Pump models can provide external cooling as well as heating hence a single system can satisfy the buildings heating and cooling requirements. The cooling is achieved external to the heat pump by a combination of three port diverting valves. Advice can be obtained from Kensa if required.

As a UK manufacturer, Kensa offers a high quality product which is supported by industry leading technical support to ensure the application engineering is performed to the highest standard.

Technical (TIS)



TI - Commercial Heat Pumps – 1.2

Page(s)



Commercial Range Heat Pumps

	Three Phase
Nominal thermal kW rating	87
MCS approved	Not required as outside of scope
Product Code	Q80-MAK
Performance data—rated heating output at B0/W35 BS EN14511	
Power consumption kW	21.3
Coefficient of performance*	3.9
Immersion heater output	Kensa heat pumps do not feature back-up electric immersion heaters**
Brine (primary) based on 0°C in, -3°C out	
Design flow rate l/min	305
Pressure drop kPa at design flow rate	60
Max inlet temperature °C	15
Min temperature °C (Outlet)	-5 (at standard settings)
Heating water (secondary) based on 30°C in, 35°C out	
Design flow rate l/min	252
Pressure drop kPa at design flow rate	35
Max flow temperature °C***	64
Electrical Values @B0/W35	
Rated Voltage	380-420V/ 50 Hz
Power supply rating amps	65
Rated current (max) amps	64
Typical running current @ B0/W35 amps	38
Starting current amps****	118

The heat is distributed using Fujitsu ADUH09LUAS1 model duct type air conditioner embedded into a false ceiling.



AIR CONDITIONER

Duct type



DESIGN & TECHNICAL MANUAL

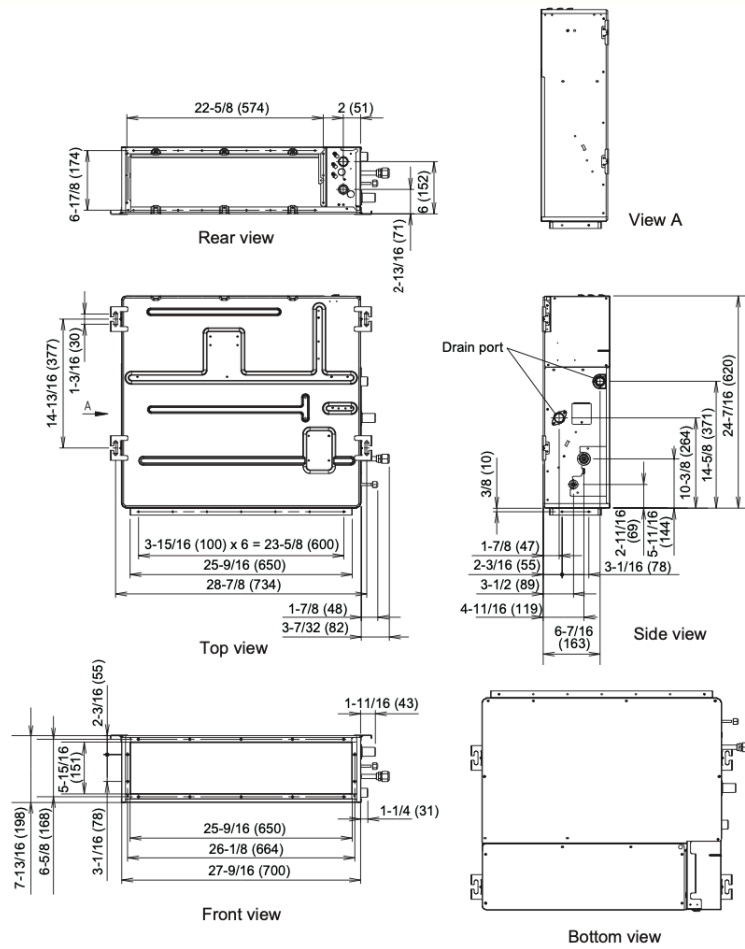
INDOOR		
	ADUH09LUAS1 ADUH12LUAS1	ADUH18LUAS1
OUTDOOR		
	AOUH09LUAS1	AOUH12LUAS1 AOUH18LUAS1

FUJITSU GENERAL LIMITED

2. Dimensions

2-1. Models: ADUH09LUAS1 and ADUH12LUAS1

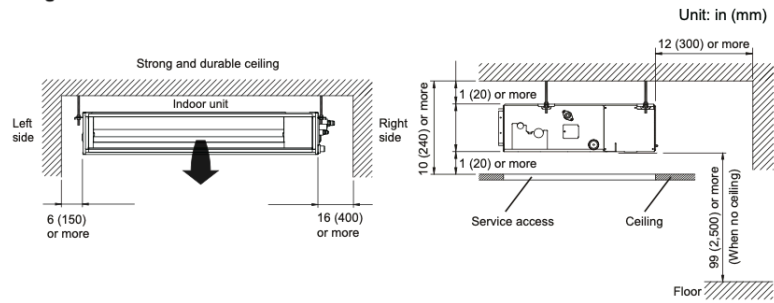
Unit: in (mm)



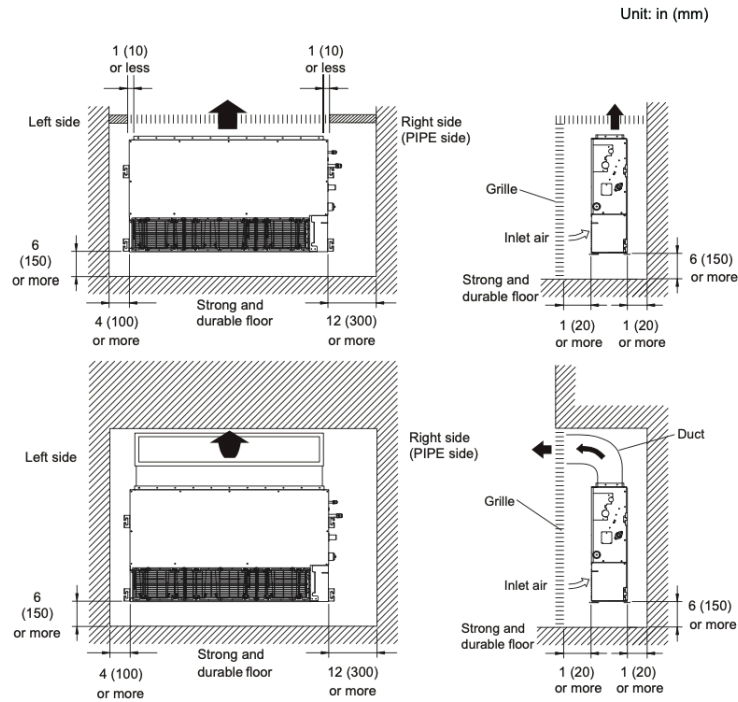
2-3. Installation space requirement

Provide sufficient installation space for product safety.

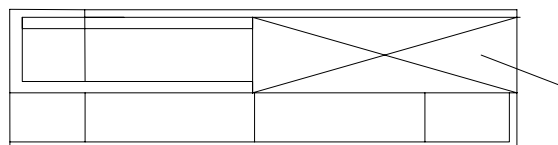
In ceiling-concealed installations:



In wall-concealed installations:



IN PROJECT



Window Systems

Our window frames are aluminium frames by Reynaers of the CS77 model. This model features both inward opening and also top opening of the window.



[6]

CS 77
Optimised safety and comfort

REYNAERS
aluminium



Concept System® 77 is a high insulation window and door system that meets elevated requirements regarding thermal insulation, stability and security. The system's HI+ variant achieves Uf values down to 1.2 W/m²K. The Uf value of a frame/vent section with 115 mm visible width is 1.7 W/m²K.

CS 77 is available in a variety of aesthetic styles to match the current trends whilst offering all types of both inward and outward opening windows and doors. An additional asset is the possibility to combine this system with Ventalis®.









The system's performance regarding acoustics, water- and air tightness, but also for specific applications like Bullet - and Fire Resistance, meets the most severe European standards. Moreover, CS 77 is available in different burglar resistance levels (RC2 & RC3) making it an extremely secure system.



TECHNICAL CHARACTERISTICS

				
Style variants		FUNCTIONAL	RENAISSANCE	HIDDEN VENT
Min. visible width inward opening window	Frame	51 mm	51 mm	76 mm
	Vent	33 mm	33 mm	not visible
Min. visible width outward opening window	Frame	17.5 mm	-	-
	Vent	76 mm	-	-
Min. visible width inward opening flush door	Frame	68 mm	-	-
	Vent	76 mm	-	-
Min. visible width outward opening flush door	Frame	42 mm	-	-
	Vent	102 mm	-	-
Min. visible width T-profile		76 mm	76 mm	126 mm
Overall system depth window	Frame	68 mm	77 mm	68 mm
	Vent	77 mm	86 mm	72.5 mm
Rebate height		25 mm	25 mm	18.5 mm
Glass thickness		up to 53 mm	up to 53 mm	up to 48 mm
Glazing method		dry glazing with EPDM or neutral silicones		
Thermal insulation		32 mm omega and/or hollow chamber -shaped fibreglass reinforced polyamide strips		
High Insulation variant (HI)		Available	Available	Not Available
High Insulation Plus variant (HI+)		Available	Not Available	Not Available

PERFORMANCES

ENERGY											
	Thermal insulation ⁽¹⁾ EN ISO 10077-2	Uf-value down to 1.2 W/m²K depending on the frame/vent combination and the glass thickness.									
COMFORT											
	Acoustic performance ⁽²⁾ EN ISO 140-3; EN ISO 717-1	Rw (C; Ctr) = 36 (-1; -4) dB / 42 (-2; -4) dB, depending on glazing type									
	Air tightness, max. test pressure ⁽³⁾ EN 1026; EN 12207	1 (150 Pa)		2 (300 Pa)		3 (600 Pa)		4 (600 Pa)			
	Water tightness ⁽⁴⁾ EN 1027; EN 12208	1A (0 Pa)	2A (50 Pa)	3A (100 Pa)	4A (150 Pa)	5A (200 Pa)	6A (250 Pa)	7A (300 Pa)	8A (450 Pa)	9A (600 Pa)	E900 (900 Pa)
	Wind load resistance, max. test pressure ⁽⁵⁾ EN 12211; EN 12210	1 (400 Pa)		2 (800 Pa)		3 (1200 Pa)		4 (1600 Pa)		5 (2000 Pa)	Exxx (≥ 2000 Pa)
	Wind load resistance to frame deflection ⁽⁵⁾ EN 12211; EN 12210	A (≤ 1/150)				B (≤ 1/200)			C (≤ 1/300)		
SAFETY											
	Burglar resistance ⁽⁶⁾ EN 1627-1630	RC 1				RC 2			RC 3		
	Fire resistance ⁽⁷⁾ - EN 13501-2, EN 1364-1, EN 1634-1 - NEN 6069	EI 30 EI 60, EI 45 EW 30									
	Bullet resistance ⁽⁸⁾ EN 1522	FB 1	FB 2	FB 3	FB 4	FB 5		FB 6			
				FSG			Kalashnikov				

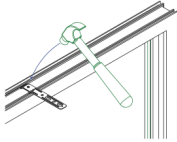
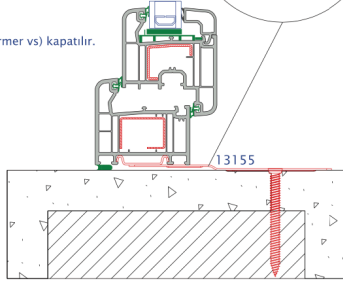
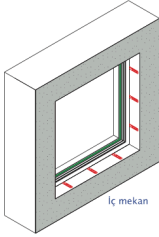
This table shows possible classes and values of performances. The values indicated in red are the ones relevant to this system.

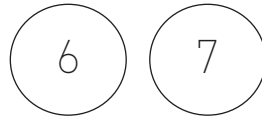
- (1) The Uf-value measures the heat flow. The lower the Uf-value, the better the thermal insulation of the frame.
 (2) The sound reduction index (Rw) measures the capacity of the sound reduction performance of the frame.
 (3) The air tightness test measures the volume of air that would pass through a closed window at a certain air pressure.
 (4) The water tightness testing involves applying a uniform water spray at increasing air pressure until water penetrates the window.
 (5) The wind load resistance is a measure of the profile's structural strength and is tested by applying increasing levels of air pressure to simulate the wind force.
 There are up to five levels of wind resistance (1 to 5) and three deflection classes (A,B,C). The higher the number, the better the performance.
 (6) The burglar resistance is tested by statistical and dynamic loads, as well as by simulated attempts to break in using specified tools.
 (7) The performance is defined by directly exposing the construction to fire in order to determine the stability, thermal insulation and radiation insulation over a certain amount of time.
 (8) The bullet resistance of the window or door is evaluated for different classes of weapons and ammunition: hand guns, (automatic) rifles and shot guns.

It is mounted using clip-on masonry clips in order to avoid thermal bridging.

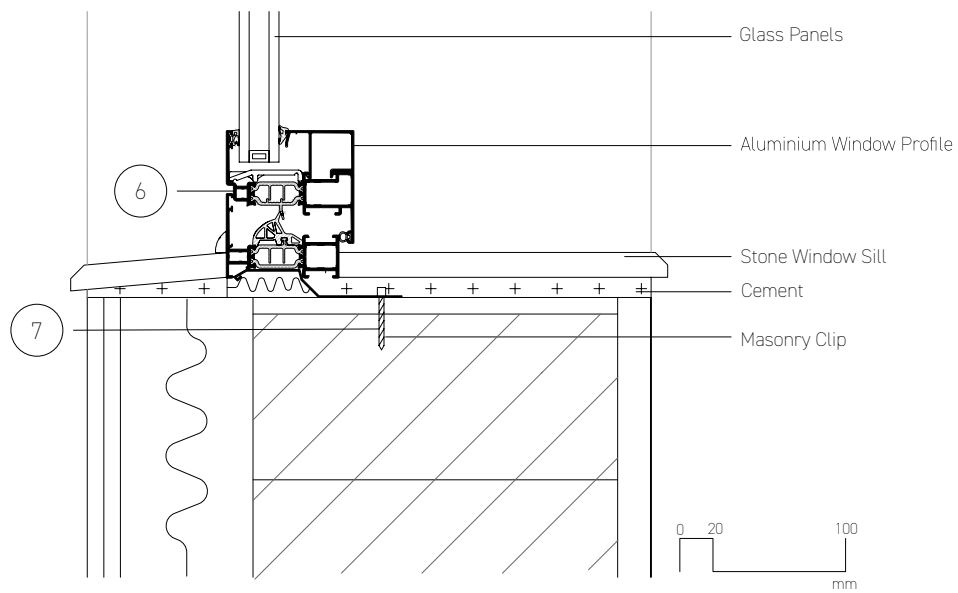
MONTAJ KURALLARI



<p>MONTAJ TEKNİK DOSYA</p>	<p>DOĞRAMANIN SABİTLENMESİ</p>	<p>4.5</p> <p>MD_2013_07</p>
<p>KENET LAMASI İLE MONTAJ</p> <p>Kenet laması kasanın dış tırnaklarına çekiçle çakılarak klipslenir. Kenet lamaları da doğramayı sabitlemek için gerekli vida sayısı kadar kullanılır. Doğramanın tabanına denizlik montaj profili kullanılıyorsa lama bu profile vidalanır.</p> <p>Duvar genişliği uygunsa , kenet lamaları dik olarak tesbit edilir. Duvar genişliğinin dik konuma yeterli olmadığı durumlarda , kenet laması uygun açıda getirilerek tesbit edilir. Kenet lamaları duvarın iç tarafına vidalanır. Daha sonra üzeri uygun malzeme ile (alçı,sıva,mermer vs) kapatılır.</p> <p>Kenet Laması (13155) , kasa profili üzerine dış taraftan çekiy yardımcı ile sabitlenmelidir.</p>   <p>Şekil.20 Kenet lama uygulaması</p>  <p>İç mekan</p> <p>Şekil.21 Kenet lamasının duvara sabitlenmesi</p> <p>Özetle,</p> <ul style="list-style-type: none"> * Kenet laması ile montaj zamandan tasarruf sağlar, * Lama, doğramaya klips şeklinde geçtiğinden doğramada vida delikleri oluşmaz. * Dolayısıyla montaj sırasında açılan deliklerden doğramaya girebilecek su riski yoktur. * Doğrama dışından tesbit ettirildiği için camlı doğrama takmak da mümkündür. 		



IN PROJECT



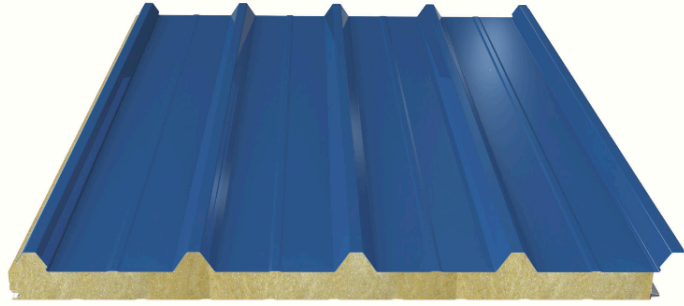
Window Detail (1:5)

Roof Systems

Our roofs are constructed using sandwich panels with rockwool insulation in order to provide longevity and durability with high comfort.



R5T Kepli Çatı Paneli



Ürün Tanımı

Yangın riskinin yüksek olduğu yapılarda ve azami yangın dayanımı istenen binalarda güvenle kullanılırken beş hadveli formuyla geniş açıklıkların güvenle geçilmesini sağlamaktadır. R5T kepli panelin en büyük avantajı panel bağlantı elemanlarının, panel birleşim noktasını örten bir kepprofilisi sayesinde dış etkenlerden korunması ve gerek panel birleşimi yerinde, gerekse bağlantı elemanlarında zaman içinde yaşanan su sızıntısı problemlerinin yaşanmamasıdır. Kepprofilisi kullanılmadan yanal binili olarak montaj edilebileceği gibi isteğe bağlı olarak sonradan kepprofilisi montajı da yapılabilir. Ayrıca, kepprofillerinin isteğe göre farklı renkte yapılması ile görsel olarak da avantaj sağlamaktadır. R5T kepli panel kullanılarak minimum %7 eğimle çatı kaplaması yapılabilmesiyle birlikte kepprofilisinin bağlantı elemanlarının gizlenmesi sayesinde cephe paneli olarak da kullanılabilir. Taşyünü iç dolgu malzemesi sayesinde yüksek akustik performans sunmaktadır.

Üretim Yeri

Balıkesir

Uygulama Alanları

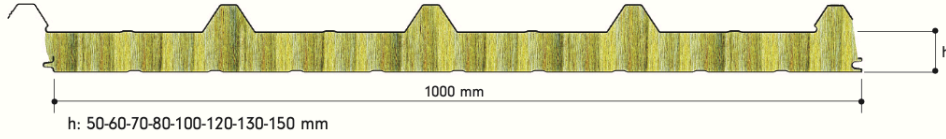
- Sanayi yapıları
 - Askeri yapılar
 - Sosyal yapılar
 - Ziraat yapıları
 - Spor tesisleri
 - Şantiye binaları
 - Silolar
 - Hipermarketler
 - Alışveriş merkezleri
 - Hal binaları
 - İdari binalar
- gibi taşıyıcı sistemi çelik veya prefabrik beton olan yapılarda kullanılır.

Assan Panel'in ürünlerinin özelliklerini değiştirme hakkı saklıdır. Üçüncü şahısların mülkiyet hakları gözetilmelidir. Bütün siparişlerin kabulünde, satış ve nakliye konusundaki mevcut şartlarımız esas alınır. Kullanıcılar, her zaman, ilgili ürünün Assan Panel'e başvurarak temin edilecekleri Yerel Ürün Bilgi Föyü'nün son baskısını dikkate almalıdır.

Performans Değerlendirmesi

En iyi yangın dayanım değerlerine sahiptir.
 Hızlı ve sorunsuz montajı hem zamandan hem de işçilikte tasarruf sağlar.
 Isı yalıtımı yanısıra ses yalıtımında da yüksek performansa sahiptir.
 Renkli yüzeyi sayesinde sıva, boya gibi ilave kaplamalara gerek duyulmaz
 RAL kataloğundan renk seçimi yapılabilir.
 Kullanılacağı yere uygun yüzey boyası (Polyester, PvdF, Plastisol, PVC) seçenekleri vardır.
 Çatı kaplaması olarak minimum % 7 eğimle kullanılabilir.
 Zamanla bozulmaz, çürümez ve küf tutmaz.
 Ses izolasyon performansı yüksektir.
 Min. 0,60 mm kalınlıkta istenilen renkte kep profili ile kullanılabilir.

Ölçüler



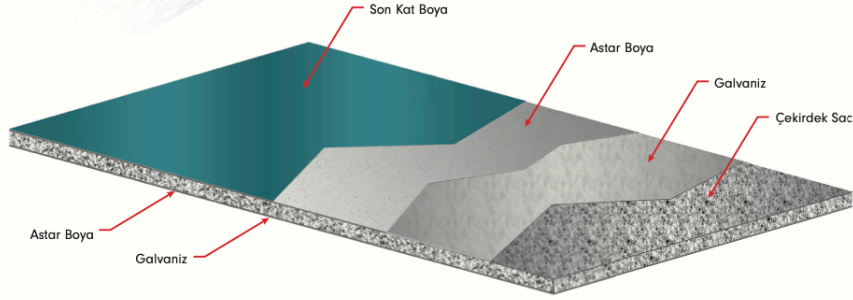
Faydalı En	1000 mm
Minimum boy	3 metre
Maksimum boy	Nakliye Koşullarına Bağlıdır

Taş Yünü



Taşyünü Yoğunluk	100 (± 10) kg/m ³
Taşyünü kalınlık	50-60-70-80-100-120-130-150 mm
Isı İletim Katsayısı	0,043 W/mK
Yanmazlık Sınıfı (EN 13501-1)	A1
Su absorpsiyonu	Hacimce %2
Sıcaklık Dayanımı	600 °C
Ses Yalıtımı Rw [dB] \geq	30
Su Buharı Difüzyonu (EN 12086)	1

Metal Yüzeyler



Boyalı Galvaniz Sacdan Metal Yüzey

Metal Tipi	Boyalı Galvaniz Sac
Üst Metal Kalınlığı	0,55-0,80 mm
Alt Metal Kalınlığı	0,50-0,80 mm
Kalınlık Toleransı (EN 10143)	Nominal
Sac Kalitesi (EN 10327)	DX51 D+Z Boyalı Galvanizli Sac (astar üzeri son kat polyester boya)
Boya Cinsi	Polyester, PvdF, Plastisol, PVC

Yük Taşıma Tablosu

BGS	BGS	Çok Açıklık					
Üst Metal Kalınlığı (mm)	Alt Metal Kalınlığı (mm)	Taş yünü Kalınlığı (mm)	150 cm	200 cm	250 cm	300 cm	350 cm
0,5	0,5	50	498	261	160	108	76
0,5	0,5	60	556	301	191	132	96
0,5	0,5	70	614	343	223	157	116
0,5	0,5	80	672	386	255	183	138
0,5	0,5	100	789	470	320	235	180
0,5	0,5	120	906	556	386	288	224
0,5	0,5	130	965	599	419	315	246
0,5	0,5	150	1082	684	486	369	290

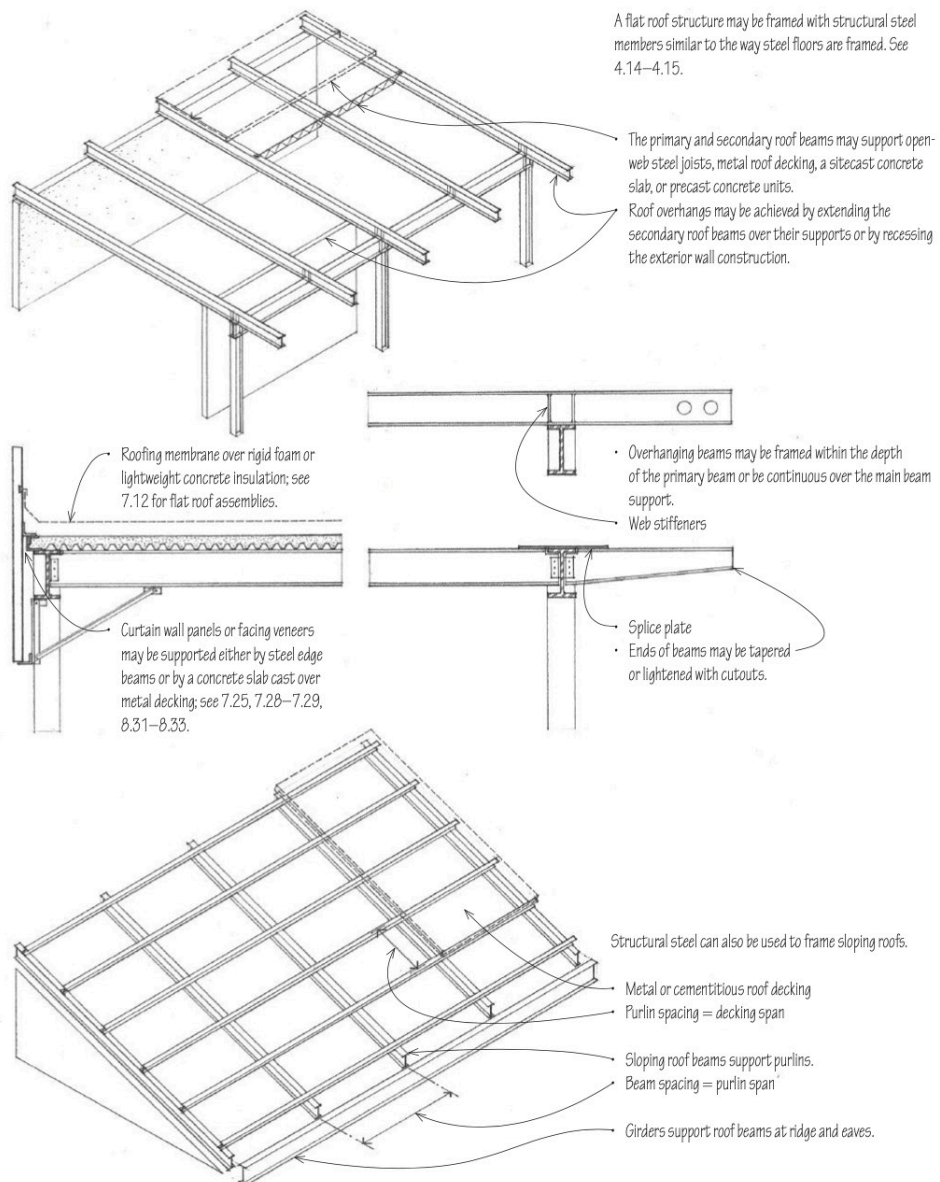
• Yük Değerleri kg/m² • Limit değeri L/200 • BGS: Boyalı Galvaniz Sac

Taşıyın İsl Geçirgenlik Değerleri

Panel Kalınlığı	U İsl Geçirgenlik (W/m ² K)	R İsl Geçirgenlik (m ² K/W)	R İsl Geçirgenlik (ft ² °F h/Btu)
50 mm	0,585	1,708	9,698
60 mm	0,497	2,011	11,418
70 mm	0,440	2,274	12,913
80 mm	0,382	2,617	14,861
100 mm	0,310	3,223	18,299
120 mm	0,261	3,831	21,756
130 mm	0,243	4,115	23,366
150 mm	0,224	4,464	25,347

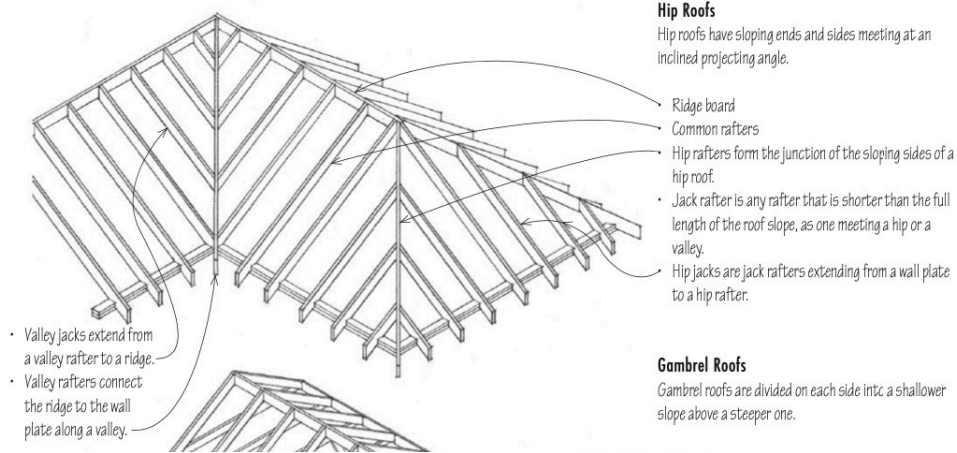
The structural system supporting the roof is the classical Italian wooden truss roof system adapted to be made from steel and placed onto concrete.

6.06 STRUCTURAL STEEL ROOF FRAMING



CSI MasterFormat 05 12 00: Structural Steel Framing

RAFTER FRAMING 6.17

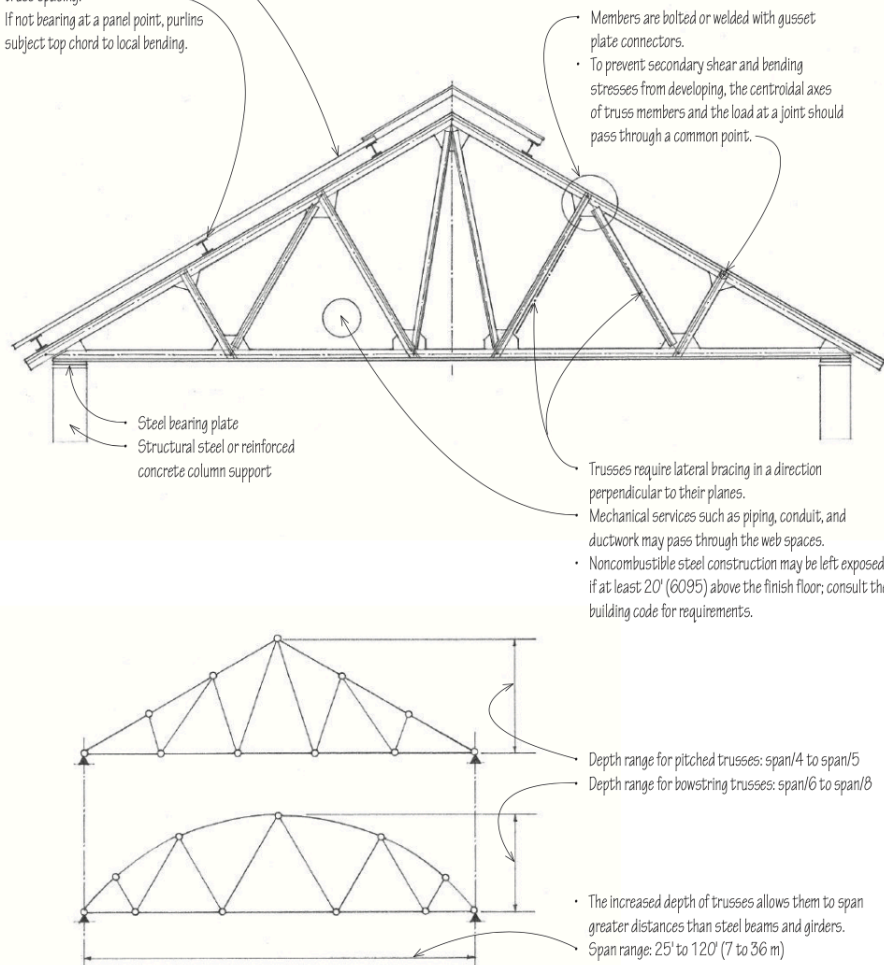


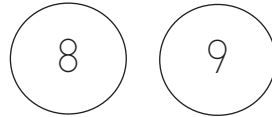
6.08 STEEL TRUSSES

- See 2.16 for more information on trusses.

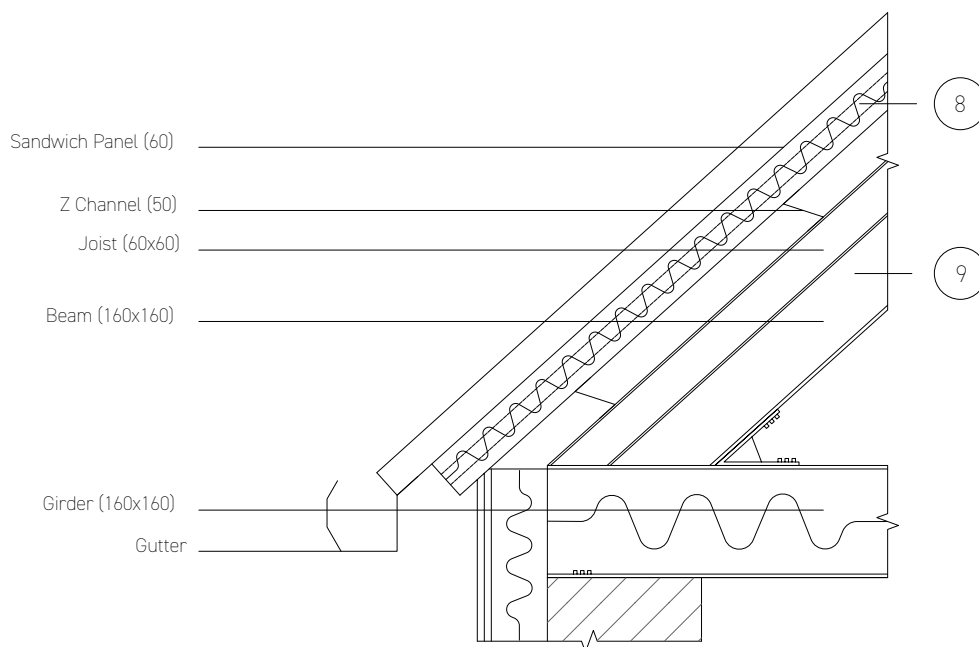
- Metal or cementitious roof decking or panels span purlin spaces.
- Channel or W-shape purlins span the truss spacing.
- If not bearing at a panel point, purlins subject top chord to local bending.

Steel trusses are generally fabricated by welding or bolting structural angles and tees together to form the triangulated framework. Because of the slenderness of these truss members, connections usually require the use of steel gusset plates. Heavier steel trusses may utilize wide-flange shapes and structural tubing.





IN PROJECT



Sandwich Panel Roof (1:10)

0 20 100
mm

Curtain Wall and Partition Wall CMU systems


Curtain walls and partition walls are constructed using aerated concrete, which is a high performance and lightweight concrete masonry unit that allows us to have higher thermal insulation and acoustical insulation.



DECLARATION OF PERFORMANCE		31000265	Page 1/2
1.	Unique identification code of the product-type:	Ytong 3,6 Standard Block	
2.	Type-, batch- or serial number or other marking for the identification of the construction product in accordance with Article 11 paragraph 4:	NL044054640006393 NL074054640006393	
3.	Intended use or uses defined by the manufacturer of the construction product in accordance with the applicable technical specification:	Factory made autoclaved aerated concrete blocks, category I, for uses in load bearing and non-load bearing mortar c.q. thin layer mortar masonry constructions.	
4.	Name, registered trade name or trade mark and contact address of the manufacturer in accordance with Article 11, paragraph 5:	Xella Nederland bv Mildijk 141 4214 DR, Vuren Nederland	
5.	Name and contact address of the authorised representative, who is in charge for the tasks referred to in Article 12, paragraph 2:	Xella Technologie- und Forschungsgesellschaft GmbH Hohes Steinfeld 1 D-14797 Kloster – Lehnin Duitsland	
6.	System or systems of assessment and verification of constancy of performance of the construction product in accordance with Annex V:	System 2+ on the basis of Category I in accordance with EN 771-4 (2011)	
7.	In case of the declaration of performance concerning a construction product covered by a harmonised standard:	IKOB-BKB, Ringveste 1, 3992 DD, Houten, Nederland, nr 0957 has performed the initial inspection of the manufacturing and factory production control and continuously surveys the factory production control as part of the CE-tours in accordance with System 2+ and issued the following: Certificates of conformity, Declarations of conformity	

DECLARATION OF PERFORMANCE		Ytong 3,6 Standard Block	Page 2/2
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8.	Declared performance	Ytong 3,6 Standard Block	
	Dimensions length	440 mm	
	Dimensions width	100 mm	
	Dimensions height	215 mm	
	Shape	Right angled	
	Tolerances (length x width x height) in mm	± 3 mm, ± 2 mm, ± 2 mm	
	Category	TLMA	EN 771-4, Table 2
	Mean compressive strength of the unit	≥ 3,6 N/mm ² ⊥ bed face, whole unit	EN 772-1
	Bond strength Thin-layer mortar General purpose mortar	≥ 0,30 N/mm ² ≥ 0,15 N/mm ²	EN 998-2 Art. 5.4.2b Annex C
	Gross dry density	475 kg/ m ³	EN 772-13
	Reaction to fire	Class A1	EN 13501-1
	Water absorption	10 minutes < 190 g/(m ² · s ^{0,5}) 30 minutes < 160 g/(m ² · s ^{0,5}) 90 minutes < 130 g/(m ² · s ^{0,5})	EN 772-11
	Water vapour permeability	5 / 10	EN 1745 Tab A.10
	Thermal conductivity λ _{10dry} (P=50%)	≤ 0,11 W/(mK)	EN 1745 Tab A.10
	Moisture movement	≤ 0,2 mm/m	EN 680
	Durability against freeze-thaw	For use above and below ground level	
	Dangerous substances	No performance determined (NPD)	

9.	The performance of the product referring to paragraph 1 and 2 correspond to the declared performance at paragraph 8. This declaration of performance was issued under the sole responsibility of the manufacturer specified in paragraph 4. Signed on behalf of the manufacturer:	Ruud Hermans, CTO Xella Nederland bv Vuren 01.10.2014 	
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ULTRALITE

Low Density Lightweight Aggregate Blocks

Ultralite blocks are designed to offer the builder a low-weight, loadbearing block with enhanced thermal properties suitable for a wide range of applications.

Ultralite blocks are manufactured to BS EN 771-3 and are ISO 9001 Quality Assured, ISO 14001 Environmentally Certified and hold BES 6001 'Excellent' Responsible Sourcing.

TECHNICAL PROPERTIES

Property	Value
Face Size (BS EN 771-3):	440mm x 215mm
Dimensional Tolerance (BS EN 772-16):	Category D1
Gross Dry Density (BS EN 772-13):	950 - 1050 kg/m ³
Mean Compressive Strength (BS EN 772-1):	3.6 & 7.3 N/mm ²
Manufacturing Category (BS EN 771-3):	Category II
Thermal Conductivity (BS EN 1745):	0.32 W/mK [inner leaf] 0.34 W/mK [outer leaf]
Moisture Movement (BS EN 772-14):	< 0.6 mm/m
Fire Resistance (BS EN 13501-1):	Class A1 reaction to fire
Configuration (BS EN 1996-1-1):	Solid - Group 1
Available Texture, Finish:	Standard



APPLICATIONS

- Manufactured to BS EN 771-3.
- Inner & outer leaf of external cavity walls. Not suitable for unfinished external applications.
- Internal partition walls.
- Acoustic separating party walls to Part E of the Building Regulations.
- Standard texture finish provides an excellent surface for mortars, renders and plasters.
- Low weight, robust, accepts most standard fixings.

PHYSICAL PROPERTIES

Block Size mm	'R' Value m ² /W	Walled Weight kg/m ² See Note 1	Sound Reduction R _w , dB See Note 2	Block Weight kg See Note 3	Fire Resistance Hours See Note 4
90	0.36	86	42	9.8	3
100	0.40	96	43	10.7	4
140	0.56	134	46	14.6	4

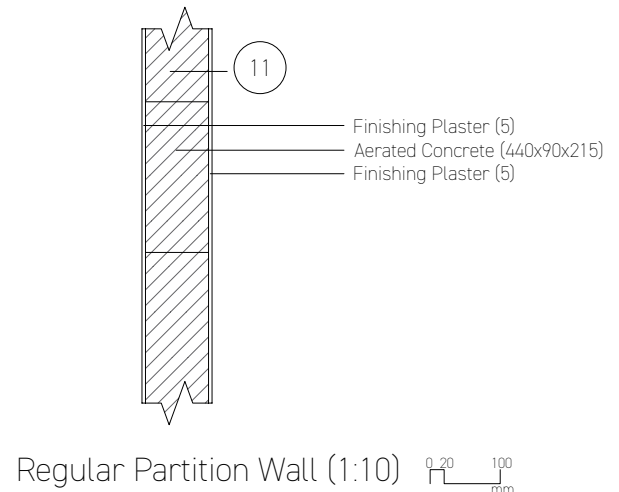
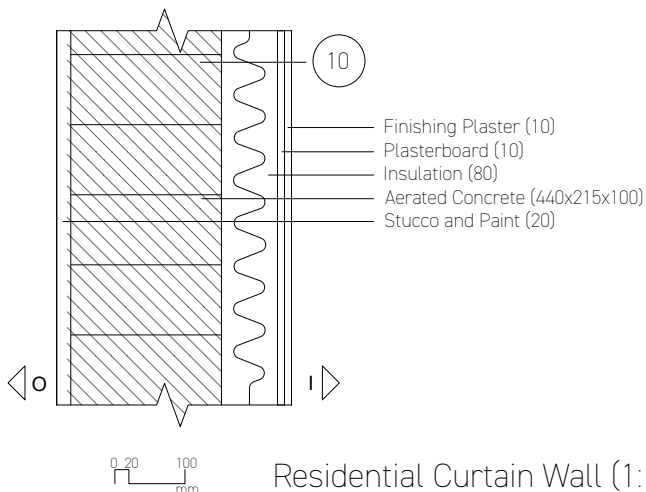
PACK DETAILS

Block Size mm	Blocks per pack	m ² per pack
90	80	8.0
100	72/90	7.2/9.0
140	48/60	4.8/6.0

1. Walled weight is for a single-leaf wall, plastered both sides.
2. Sound reduction R_w values are based on wall assuming a plastered finish both sides.
3. The block weights quoted above are approximate and include the typical additional weight from the moisture content.
4. Fire resistance periods to BS EN 1996-1-2 for a single-leaf, non-loadbearing plastered wall.

Pack details may vary slightly between manufacturing locations. Always check details with your nearest sales office.

IN PROJECT

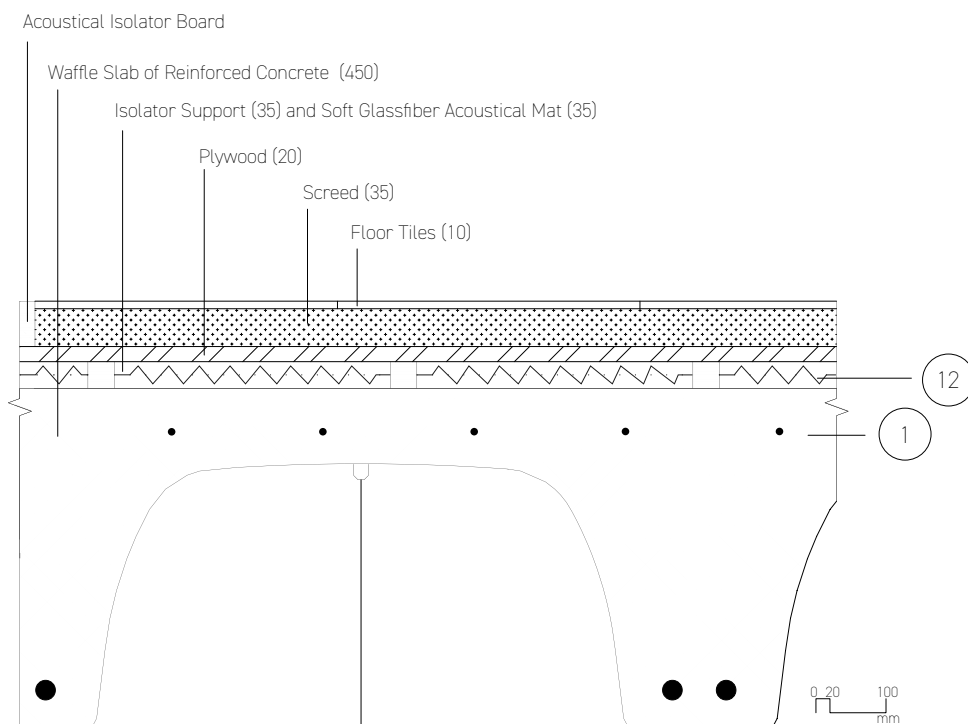


Acoustical Floating Floor System

We use a floating floor system in order to reduce both air born sound transmittance between floors and the impact sound transmittance



IN PROJECT



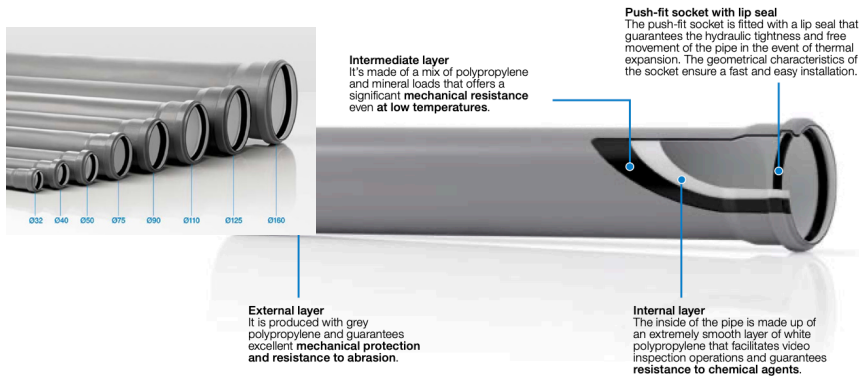
Draining System

For the draining pipes we are using Valsir PP3 Waste system in size 32 mm and 110 mm. The acoustic insulation of these pipes increase resident comfort by reducing transmitted sound.

LIGHT WEIGHT, SIMPLICITY AND RELIABILITY

The advantages of using PP3® waste system

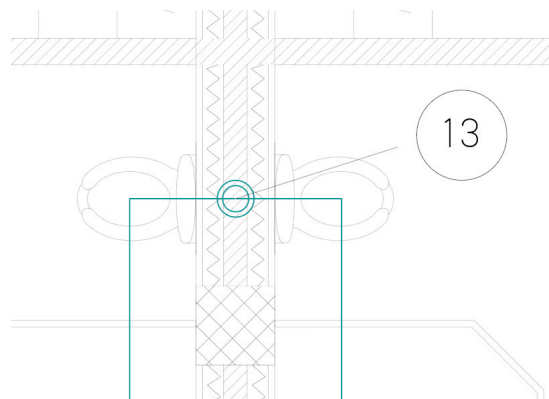
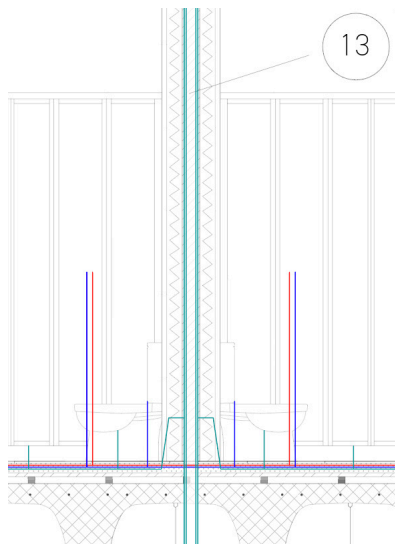
- **Light weight and ease of installation** on site without special tools, thanks to the push-fit connection. Furthermore, the push-fit socket does not require the use of harmful glues or solvents.
- Excellent sound insulating performances: 17 dB(A) with a flow rate of 2 l/s in compliance with EN 14366 (certificate P-BA 92/2014).
- **Smooth internal surface, white in colour** to facilitate video inspection.
- High impact resistance at extremely harsh temperatures **below 0°C**.
- **High chemical resistance** to the substances dissolved in civil and industrial waste waters.
- Wide range of **diameters from DN 32 mm to DN 160 mm** characterised by triple layer pipes and single layer fittings.
- Wide range of transition fittings for connection to other waste systems such as cast iron, PE, PP, PVC.
- The product, its recyclability and the production processes used are based on the **Green Building principles**, respecting the environment and the conservation of resources.



The Valsir PP3® waste system can transport waste liquids at temperatures as high as 95°C, it has a high resistance to the most common chemical agents and is characterised by an extremely smooth internal surface that prevents the accumulation of deposits inside the waste network.

Furthermore, polypropylene is a material that is not attacked by microorganisms and guarantees the absence of internal deposits and the build-up of bacterial flora. This system is also free of problems relating to stray currents.

IN PROJECT



Anti-root barrier

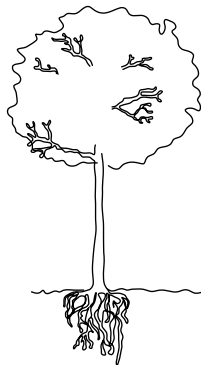
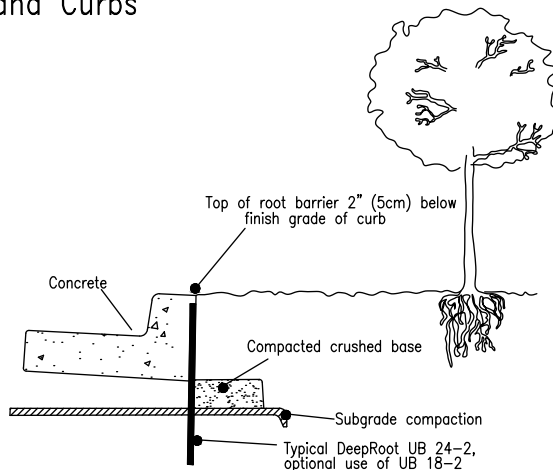
we used the deeproot root barriers to protect our foundation from plant growth and the resulting physical damage. The barrier redirects the growing roots away from the direction it is placed.

Linear Application of DeepRoot Tree Root Barriers at Time of Installing Concrete Sidewalks and Curbs

TYPICAL SECTION OF CURB AND GUTTER WITH DEEPROOT TREE ROOT BARRIER INSET INTO CONCRETE. BARRIER INSTALLED IN A TRENCH IN SUBGRADE WHICH IS THEN COMPACTED. BARRIER IS SET SO THAT TOP EDGE WILL BE 2" (5CM) BELOW FINISH GRADE OF CURB, AND SET FLUSH WITH EDGE OF CURB. BARRIER RIBS FACE TOWARD TREE ROOTS.

INSTALLATION SEQUENCE:

1. Prepare base and subgrade
2. Trench to appropriate depth for installation of root barrier so that top of barrier is 2" (5cm) below finish grade of top of curb.
3. Place root barrier in trench, vertical ribs must face toward tree roots.
4. Backfill and compact to requirements.
5. Place form material against barrier (It may be nailed from the outside of the form)

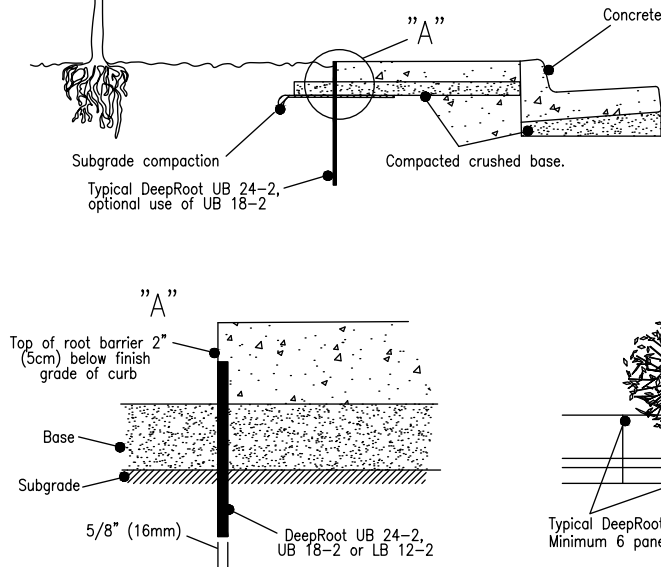


TYPICAL SECTION OF CURB, GUTTER AND SIDEWALK WITH DEEPROOT TREE ROOT BARRIER INSET INTO CONCRETE

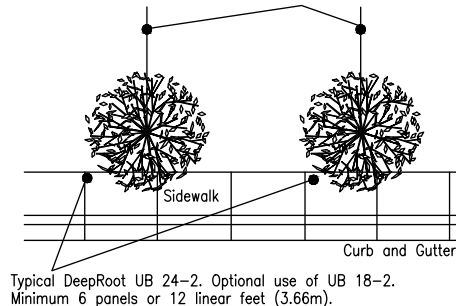
BARRIER INSTALLED IN A TRENCH IN SUBGRADE WHICH IS THEN COMPACTED. BARRIER IS SET SO THAT TOP EDGE WILL BE 2" (5CM) ABOVE COMPACTED BASE (or halfway between base and finish grade of SW). BARRIER RIBS FACE TOWARD TREE ROOTS.

INSTALLATION SEQUENCE:

1. Prepare base and subgrade
2. Trench to appropriate depth for installation of root barrier so that top of barrier is 2" (5cm) below finish grade of top of sidewalk (or halfway between top of compacted base and finish grade of SW)
3. Place root barrier in trench, vertical ribs must face toward tree roots.
4. Backfill and compact to requirements.
5. Place form material against barrier (It may be nailed from the outside of the form)



IMPORTANT NOTE: Tree location must align with "as-built" center of barrier.



IN PROJECT

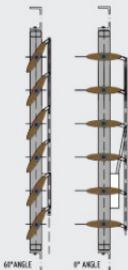
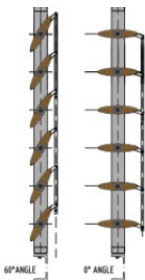


Sun Shading System

We use the sol'art louver system to reduce unwanted thermal gain and glare in the south and east facing façades. By using a system placed outside of the window, we have better thermal results. [15]

SOL'ART OPERABLE LOUVRE - MANUAL

Our manually operable Louvre systems are easily controlled by hand adjusting the angle of the blades. This is done with ease thanks to our high-quality pivots that move only when and how desired.



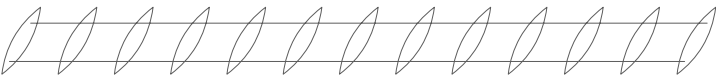
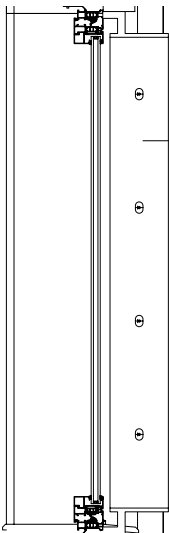
SOL'ART OPERABLE LOUVRE - MOTORISED

SOL'ART Motorised Louvre Systems allow the blades to be adjusted automatically, either via: A simple flick of a switch, or The push of a button on remote control.
The blades can also be fully automated via integration into a building façade management system to maintain light and shade levels based on predetermined programs.



PROFILES			
PRODUCT CODES	LB09119	LB15035	LB30060
COVERAGE	91mm	150mm	300mm
HORIZONTAL SPAN	1200mm	1800mm	3000mm
VERTICAL SPAN	1800mm	2700mm	3800mm
INNOVATIVE COLOURS	Available	Available	Not Available
PREMIUM COLOURS	Not Available	Not Available	Available

IN PROJECT



Dimple Mat

Dörken's Delta MS dimple mat allows us to have increased drainage around or foundation by breaking the surface tension of water.

DELTA®

HIGH PERFORMANCE AIR & MOISTURE BARRIERS

DÖRKEN

TECHNICAL DATA SHEET

DELTA®-MS

Foundation Dampproofing and Wall Waterproofing.

MATERIAL

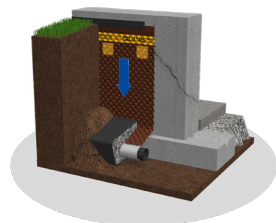
DELTA®-MS is manufactured with an exclusive co-extrusion process, utilizing 60% recycled high density polyethylene (HDPE) from municipal recycling programs in the middle, and two thin layers of a special virgin HDPE on the outside. The encapsulation of the recycled HDPE ensures that DELTA®-MS is protected against degradation caused by oxidation and environmental influences, like acidic soils or alkalinity (concrete). DELTA®-MS, equipped with highly effective additive packages, provides high compressive strength, impact resistance, and chemical and environmental stress crack resistance.

PROPERTIES

DELTA®-MS is a dimpled membrane, impermeable to water and water vapor. The dimple pattern creates an air-gap between the membrane and the foundation wall. This allows any incidental water getting past the dimpled membrane to flow freely to the perimeter footing drain. The air-gap provides a safe separation and full capillary break between the foundation wall and any ground moisture. DELTA®-MS bridges large cracks and imperfections in foundation walls. It can also be utilized as an effective protection layer over spray or sheet applied waterproofing systems. DELTA®-MS is available in many sizes to cover any foundation with a minimum of overlaps and seams. The high compressive strength of the membrane ensures sustainable protection of foundation walls up to 12 ft below grade.

APPLICATION

DELTA®-MS is installed by unrolling the membrane against the foundation wall. DELTA® Accessories allow for quick and effective fastening of the membrane. The top edge of the product is sealed and protected against intrusion of soil particles and surface water with sealant and specifically designed profiles and fasteners.



Technical Data

Product name	DELTA®-MS	
Color	chocolate brown	
Material	Recycled high-density polyethylene, encapsulated between two layers of special virgin HDPE	
Dimple height	5/16" (8 mm)	ASTM D6364-06
Compressive strength	approx. 5,200 psf (250 kN/m²)	ASTM D6364-06
Flow rate / unit width @ hydr. grad. 1: 100 kPa	10.6 gal/min/ft (132 l/min/m)	ASTM D4716-08
Flow rate / unit width @ hydr. grad. 0.1: 100 kPa	3 gal/min/ft (37.5 l/min/m)	ASTM D4716-08
Air-gap volume between dimples	approx. 0.13 gal/ft² (5.3 l/m²)	ASTM D4716-08
Water penetration resistance	> 120 psi (815 kPa) Watertight	AATCC 127-1995
Water vapor transmission	< 22 ng/(Pa s m²)	ASTM E96, Meth. A
Vapor permeance	< 0.3 perms (grains/hv/ft² in Hg)	ASTM E96, Meth. A
Temperature range	-22°F to +176°F (-30°C to +80°C)	ASTM D5261-92
Chemical properties	Excellent chemical resistance, resistant to root penetration, rot-proof	
Toxicity	non-toxic, non-polluting	
Roll length	65' 7" (20 m)	
Roll width / weight	3' 6" (1.07 m) 28 lbs (12.7 kg) 5' (1.52 m) 41 lbs (18.6 kg) 6' (1.83 m) 47 lbs (21.3 kg) 6' 7" (2.00 m) 51 lbs (23.1 kg) 7' (2.13 m) 55 lbs (24.9 kg) 8' (2.45 m) 63 lbs (28.6 kg) 9' 10" (3.00 m) 77 lbs (34.9 kg)	
Service life expectancy	> 25 years (at pH between 4 and 9, and temperature below 77°F / 25°C). Do not expose to UV light for more than 30 days.	

DELTA® products support sustainable and energy-efficient building practices, including efforts toward achieving LEED® certification (LEED® for New Construction & Major Renovations, LEED® for Core and Shell, LEED® for Existing Buildings and LEED® for Homes).

For technical support, call our technical support team at 1-888-4DELTA4 (1-888-433-5824) extension 326, or visit www.dorken.com.

ICC-ESR # 2303 Dampproofing & Wall Waterproofing Membrane
CCMC # 12788 Drainage Layer
CCMC # 12658 Dampproofing

Dörken Systems Inc. - 4655 Delta Way - Beamsville - ON - L3J 0T6 - Canada
Tel.: +1 (905) 563 3255 - Fax: +1 (905) 563 5582 - info@dorken.com - www.dorken.com
A DÖRKENGROUP company



03/20/2022.7

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