

Technical Data Sheet	<b>NAG-PC170-100</b>
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## Product Information

The NAG-PC170-100 is a versatile pavement-light Suitable for Roofs – internal floors, pavements to the public highway. Loadings achieved, 20kN/m <sup>2</sup> and 75kN ultimate. pavement-light are designed to accept pedestrian foot traffic and are capable of withstanding Accidental vehicular loading, NOT deliberate vehicular loading, e.g. Parking.	The NAG-PC170-100 may be cast in-situ or precast and the bearings may be of any structural material such as brick or steel and the edges may be sealed using a variety of materials such as polysulphide-mastic, hot-poured bitumen, hydrophilic-waterbar.	The NAG-PC170-100 is 100 mm thick with 117 mm circular glass-shells cast at 170 mm centres. The minimum bearing recommended is 100 mm and the light may be cast with an asphalt tuck if required. The NAG-PC170-100 is also suitable for use as a smoke-vent.
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## Safe Span Tables

The NAG-PC170-100 pavement-light is capable of supporting loads in excess of 100 kN and spanning wide openings. The maximum span that may be achieved is dependant on the load and below is a table that lists the maximum one-way and two-way spans for three of the most common load-cases.

*All New Age Glass pavement-lights are checked by a Structural Engineer in accordance with BS1992-1-1: N.A. and PD 6687. The load-conditions shown have been tabulated in accordance to the categories listed under Table NA.2: of the NA to BS EN 1991-1-1:2002: Actions on structures. Contact New Age Glass if a special load-case is required.*

*Where these structures are used within concourses and public spaces, they are likely to be subject to inadvertent or deliberate synchronised movement by people causing dynamic excitation. The design provisions should take account of the nature and intended use of the structure, the potential number of people and their possible behaviour. Structural design should be carried out with the help of specialist advice and specialist guidance documents. (NA. 2.1.4)*

Load Condition 1		Commercial and multiple occupancy	
All usage within self-contained dwelling units including student-accommodation, blocks of flats, dormitories, hotels, motels, hospitals, public-toilets, snooker-rooms, balconies., flat-roofs and walkways. Not suitable for where people may congregate.			
UDL kN/m <sup>2</sup>	Point kN	Maximum Two-Way Span	Maximum One-Way Span
<b>3</b>	<b>2</b>	2890 mm	2380 mm

Load Condition 2		Communal Areas	
Areas where people may congregate including restaurants, reading-rooms, classrooms, fixed seating areas, corridors, museums, dance floors, concert halls and public areas subject to crowding.			
UDL kN/m <sup>2</sup>	Point kN	Maximum Two-Way Span	Maximum One-Way Span
<b>5</b>	<b>3.6</b>	2720 mm	2210 mm

Load Condition 3		Highway Use	
Pavement-lights situated close to a road or access where heavy vehicles could park on the pavement-light. Maximum point-load 100kN.			
UDL kN/m <sup>2</sup>	Point kN	Maximum Two-Way Span	Maximum One-Way Span
<b>20</b>	<b>75</b>	1360 mm	850 mm

### Frequently asked questions

#### Are we able to drive over a pavement-light or smoke-vent?

Only the S and SG smoke-outlets are suitable for use where there is traffic movement. The glass-lenses become damaged if constantly driven over. The glass-panels will support a heavy load such as a fire-engine but there may be damage to the glass-lenses.

#### What is Safe-Span?

The Safe-Span is the span of the glass-lenses and should not be confused with the Structural-Opening which is the span between the face of the bearings. The concrete-margin or kerb may be any dimension to suit the site conditions.

#### What does one-way and two-way spanning mean?

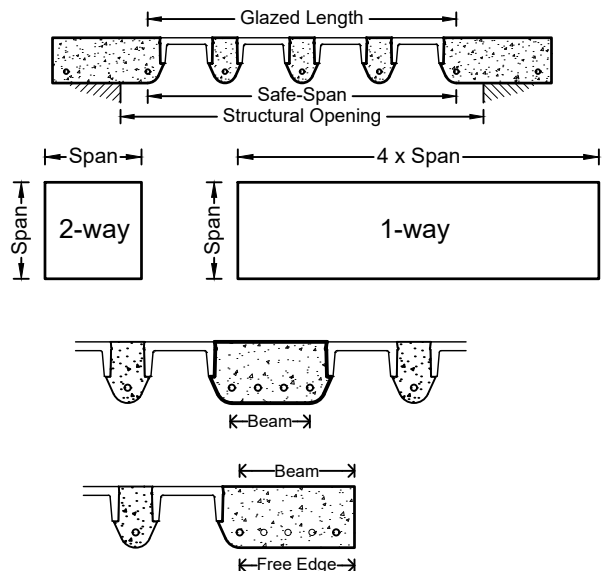
Two-way span is where the panel has the length and breadth of the glazed section of the panel in ratios up to 1:2. When the length exceeds this ratio, the panel is considered to be spanning one-way. The Safe-Load Tables show the Safe-Span for a square panel and a panel with a ratio of 1:4.

#### What if the required span exceeds the Safe-Span?

If the Safe-Span is exceeded, a beam is introduced to split the panel. The simplest method is the remove a row of the lenses and to introduce additional steel to support the pavement-light.

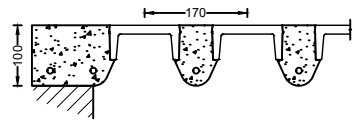
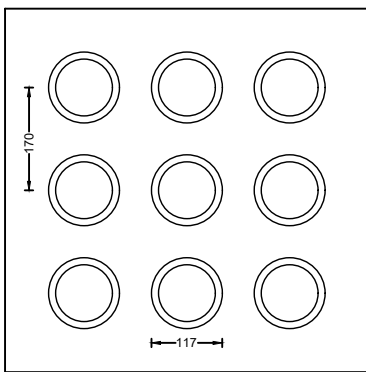
#### What if the panel has a free-edge such as a balcony?

Edge-beams may be used where there are no bearings and the panel has a free edge. The edge-beam would be within the depth of the pavement-light.

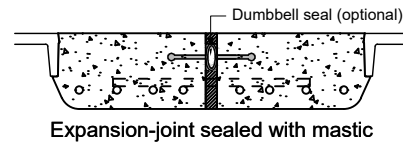
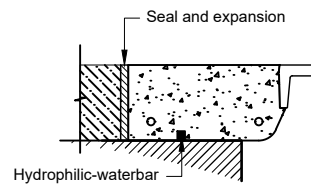
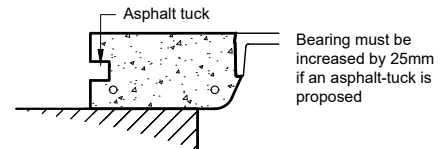


Properties		
Fire Rating	1-hour fire protection to grillage only. Glass unspecified.	Concrete cover to steel-bars allows for 1-hr fire-protection. Glass-shells do not have a fire-rating
Thermal Transmittance	5.74 W/sq.m.K	Value for a m <sup>2</sup> of the glazed-area of the pavement-light and includes the concrete grillage and Glass-shells but no allowance made for the concrete-margin or kerb.
Self-weight	1.7 kN/sq.m (175.2 kg/sq.m )	Value for a m <sup>2</sup> of the glazed-area of the pavement-light and includes the concrete grillage and Glass-shells but no allowance made for the concrete-margin or kerb.
Light Transmittance	29.52 %	See calculation below

## Structural Details



Bottom Steel: Type II deformed. 10 or 12 mm dia. Stainless-steel available.  
 Concrete: C40 with 10 mm aggregate 60-minute fire protection  
 Top finish: 40 mm topping by others  
 Glass shells: 117 mm diameter, 57 mm deep.. Clear or sanded finish  
 Glass - fire protection unspecified.



117-mm shells: 170-mm centres: 100-mm thick. U-value 2.8. Fire 60 min.

Important. A 10 mm (minimum) gap must be provided around every panel. This is to allow for expansion.

## Calculations

Dimensions		NAG-PC170-100		
Depth of panel	t	100	mm	
Lens Centres	c	170	mm	
Number of units per sq.m	n	34.6	no.	
Shell diameter	lg	117	mm	
Area of glass	Ag	13689	mm <sup>2</sup>	n * lg * lg
Thickness of shell	tg	20	mm	Measured
Volume of concrete	Vc	0.00180	cu.m	Measured
Ratio of glass to concrete	r	0.474		

Light Transmittance				
Glass Light Transmittance	Ltr.g	68.0		
Area of glass	A	434048	mm	5 mm for lip
Resultant light transmittance	L.tr	29.52	%	A * Ltr.g

Self Weight					
Mass of glass	mg	1.00	kg	Measured	
Mass of concrete	mc	4.06	kg	Vc * 2260 E-9	
Mass per unit	mu	5.06	kg	mg + mc	
Self-weight	sw	175.21	kg/m <sup>2</sup>	n * mu	

Thermal Resistance									
Unit u-values		Glass Shells						Rib	
		d	λ	R			d	λ	R
	rsi			0.100		rsi			0.100
Glass	tg	20	0.800	0.025	Concrete	tc	100	2.30	0.043
	rse			0.040		rse			0.040
Total resistance				Rg	0.165	Rr		0.183	
Unit u-value				ug	6.061	ur		5.450	W/m <sup>2</sup> .K
Resultant U-Values									
Glass	Ug	2.871		ug * Ag					
Rib	Ur	2.869		ur * Ac					
Total u-value	U	5.739		W/m <sup>2</sup> .K					