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# LED Lighting Systems

Accessories | step, aisle & wall lighting

GRADUS



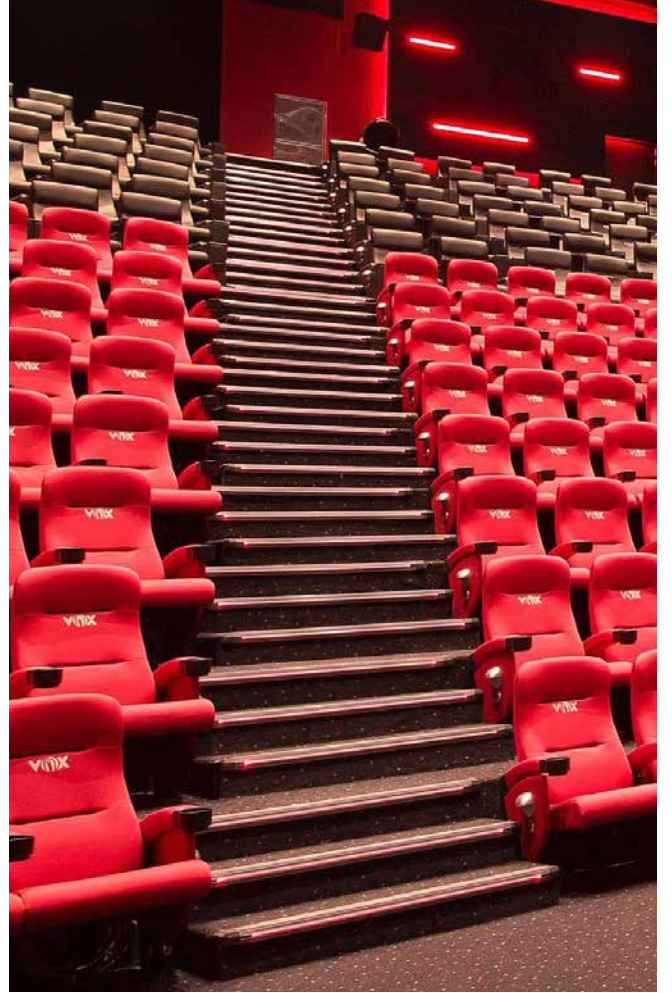
# Contents

<b>Corporate</b> .....	4
<b>Client Details</b> .....	5
<b>Where Gradus lighting can be used</b> .....	6
<b>Illustration of a step system</b> .....	9
<b>Illuminated Stair Edgings</b>	
Continuity™ 12v DC LED Lighting System .....	12
Interlok Advance™ 12v DC LED Lighting System .....	13
Step Lighting Effects .....	14 - 15
Stair Edging Profiles .....	17
- PVC-u .....	18 - 19
- Aluminium .....	20 - 23
Insert colour availability for stair edging profiles .....	24
How to select the correct insert .....	25
<b>Floor Trim Lighting Systems</b>	
Aisle & Floor Trim Lighting .....	28 - 30
<b>Lighting Systems</b>	
Continuity™ LED Linear Lighting System .....	32 - 33
Wall Lighting 12v or 24v DC LED System .....	34 - 35
LED Step Row Indicator .....	36 - 37
Decortape .....	38
<b>Power Supply Units</b> .....	39 - 40
<b>Technical Services / Specification Guidelines</b>	
Technical Services .....	42
Specification Guidelines .....	43 - 44
<b>Case Study</b> .....	46 - 47
<b>Index</b> .....	48











# Corporate



## LED Lighting Systems

Gradus offers a range of LED low voltage, decorative and safety lighting products including:

- step lighting
- aisle lighting
- row identification
- wall lighting
- seat lighting
- bespoke options



## Sistemas De Iluminacion LED

Gradus ofrece una gama de productos para iluminación decorativa y de seguridad con sistema LED de bajo voltaje que incluye:

- iluminación de bordes de escaleras
- iluminación de pasillo y suelos
- identificación de fila
- iluminación de la pared
- iluminación de asiento
- opciones hechas a medida



## Système de Balisage Lumineux

Gradus propose une large gamme de produits de balisage décorative et sécuritaire, à base de leds à basse tension

- nez de marche
- balisage au sol
- identification de rang
- balisage mural
- éclairage de fauteuils



## LED 照明系统

葛雷德斯提供的产品含有一系列的低电压LED, 装饰和安全的照明产品, 包括:

- 楼梯照明灯
- 走廊照明灯
- 行列照明灯
- 墙面照明灯
- 座位照明灯
- 定制选项



## LED Beleuchtungssysteme

Gradus bietet eine Reihe von LED Niedervolt-, Dekorations- und Sicherheitsbeleuchtungsprodukten an. Darunter auch folgende Produkte:

- treppenbeleuchtungen
- gangbeleuchtungen
- sitzreihen-kennzeichnung
- wandbeleuchtungen
- sitzbeleuchtungen
- massgeschneiderte optionen bzw. lösungen



# Client Details



## Cinema Groups

Cineworld  
Vue Entertainment  
Odeon  
Showcase  
City Screen  
Reel Cinemas  
Empire  
Omniplex Cinema Group  
WTW Cinemas  
The Light Cinemas  
Village Cinemas  
Pathé  
The Space Cinema  
Zon Lusomundo  
Cinestar  
New Lineo Cinemas  
JT Bioscopen  
Auditorium Reel Cinemas  
Grand Cinemas  
Cathay Cineplexes  
Kinopolis  
Cinemark  
Studio Movie Grill  
Flix Brewhouse  
Allen Theatres  
Nordic Cinema Group

## Education

The University of Manchester  
University of Reading  
Newcastle University  
Durham University  
University College London  
University of Salford  
Queen Mary, University of London  
University of Bath  
Anglia Ruskin University  
Bangor University  
American University of Sharjah  
Hong Kong Baptist University  
The Hong Kong Institute of Education  
French International School of London  
Cardiff University  
University of Birmingham  
University of Cambridge  
University of Oxford  
University of Southampton  
Sheffield Hallam University  
University of Sheffield

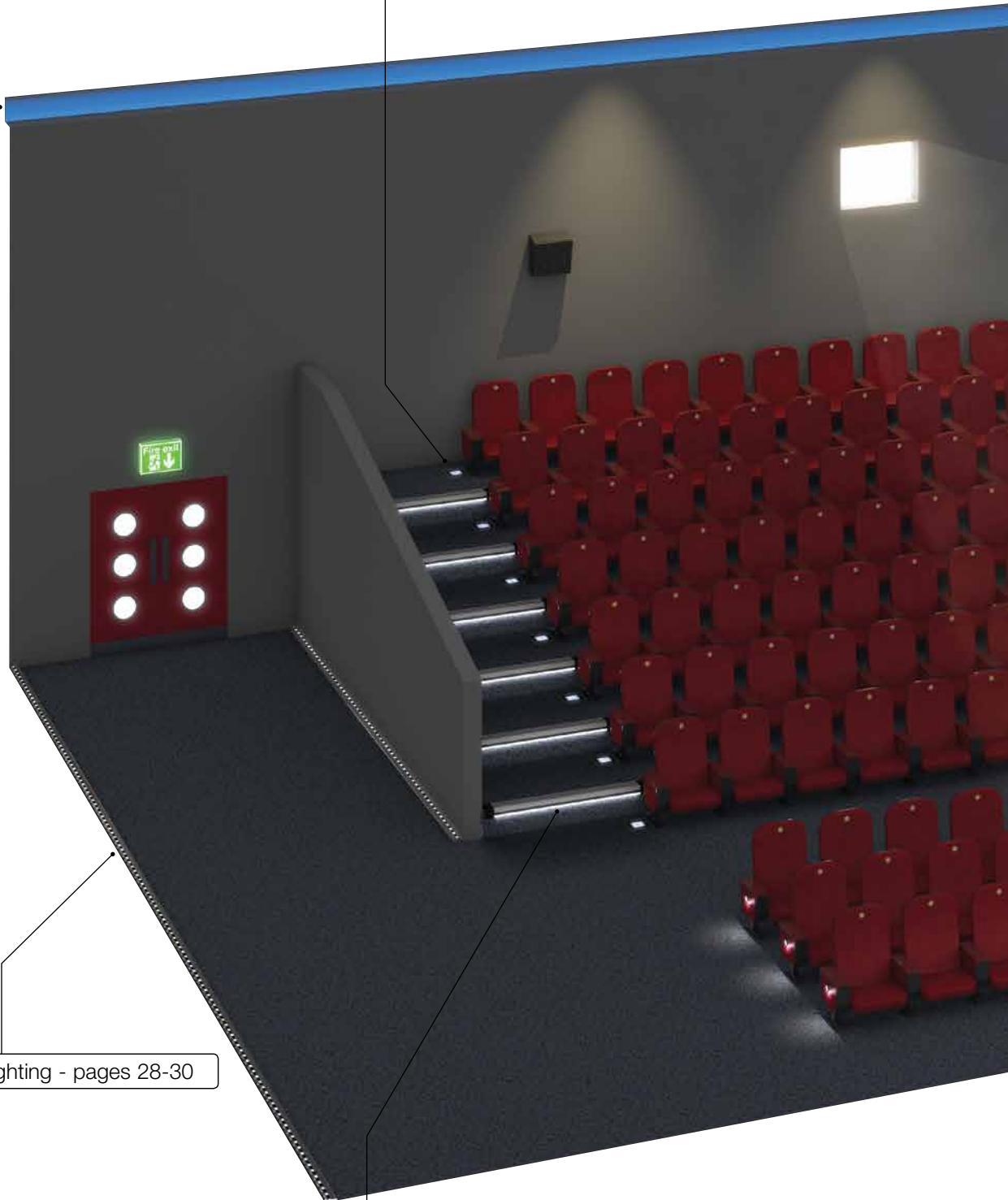
## Leisure

Stringfellows  
Madame JoJo's  
Gracie's Sports Grille & Pizza  
The Regency Club  
Hippodrome, Colchester  
Strawberry Moons  
Broadway Boulevard  
Carnival Cruise Lines  
P&O Cruises  
Royal Caribbean International  
Princess Cruises  
Grimaldi Lines  
Dubai Marina  
Marina Bay Sands Casino  
Fusionopolis, Singapore  
Headingley Experience

# A typical auditorium layout showing where Gradus lighting can be used

Decortape - page 38

LED Step Row Indicator - pages 36-37



Aisle & Floor Trim Lighting - pages 28-30

Continuity Step Lighting - page 12





Continuity LED Linear Lighting System - pages 32-33

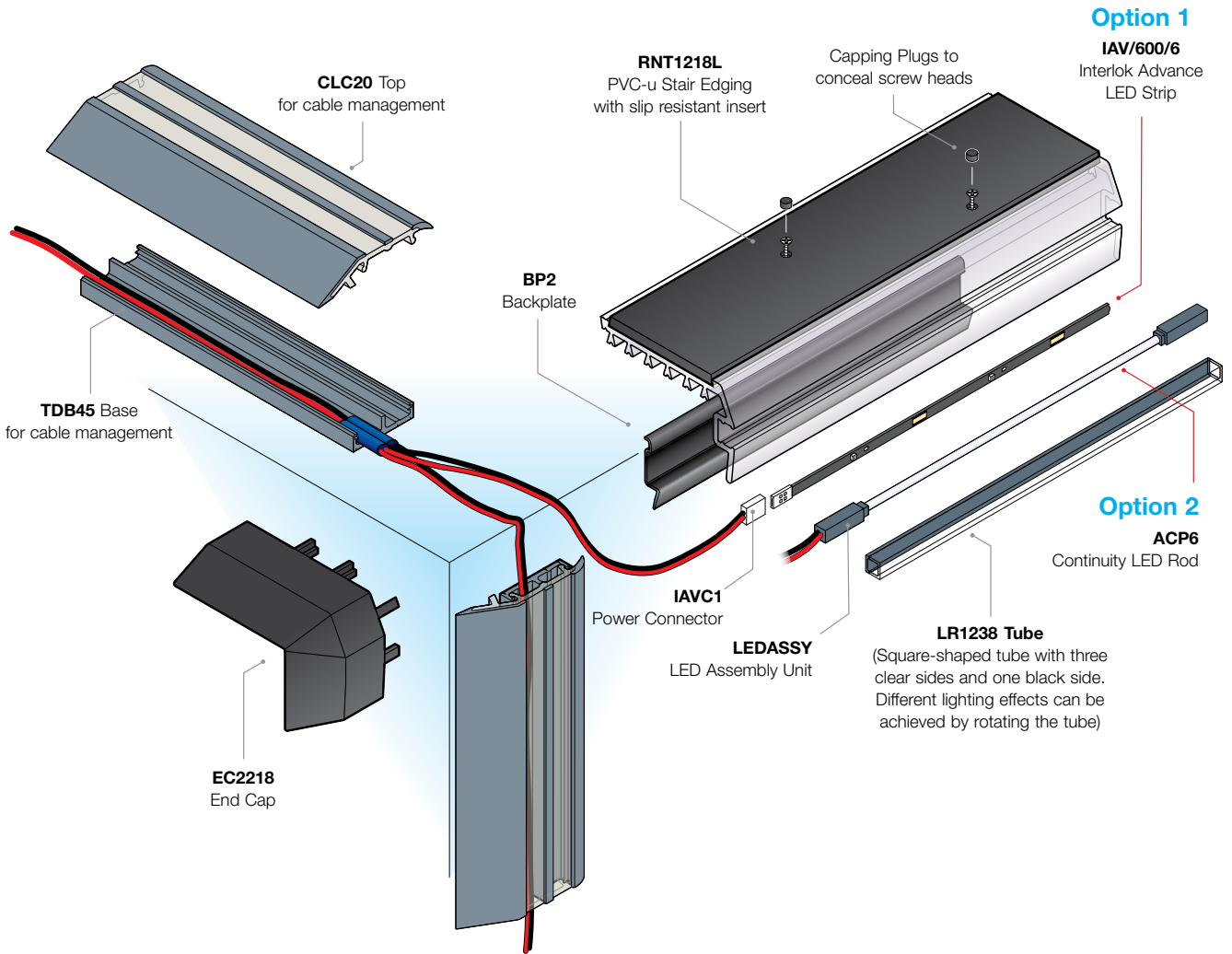
Interlok Advance Step Lighting - page 13

Wall Lighting LED System - pages 34-35

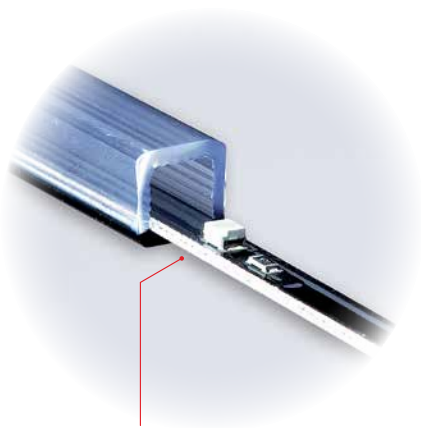




# Illustration of a Step System

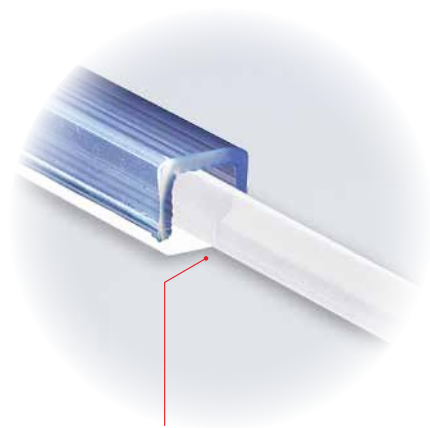


## Interlok Advance™



**Option 1**  
**IAV/600/6**  
Interlok Advance LED Strip  
inserted into LR1238 Tube

## Continuity™



**Option 2**  
**ACP6**  
Continuity LED Rod  
inserted into LR1238 Tube





# Illuminated Stair Edgings

A range of safety and decorative lighting profiles for stairs that have been designed specifically to suit interior environments such as auditoria, where light is required for safety to protect the public from slips, trips and falls.

# Continuity™ 12v DC LED Lighting System



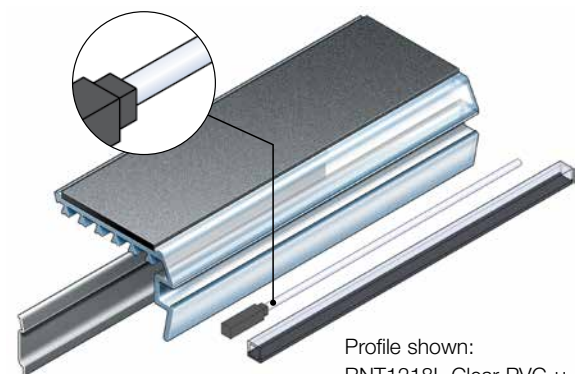
## Description

**Continuity™** is an LED lighting system that provides a continuous linear lighting effect for a streamlined modern finish.

- Continuous lighting effect
- LED housed in polycarbonate assembly unit. Light is projected through the fibre optic rod
- Sealed LED system provides resistance to moisture ingress e.g. soft drink spillage (IP44)
- LED lifetime of up to 50,000 hours
- Power consumption of 0.3 watts per LED
- Dimming options available see page 40
- For power supply units see page 40

LED choice	
	Blue
	Green
	Amber
	Red
	White
	Warm White

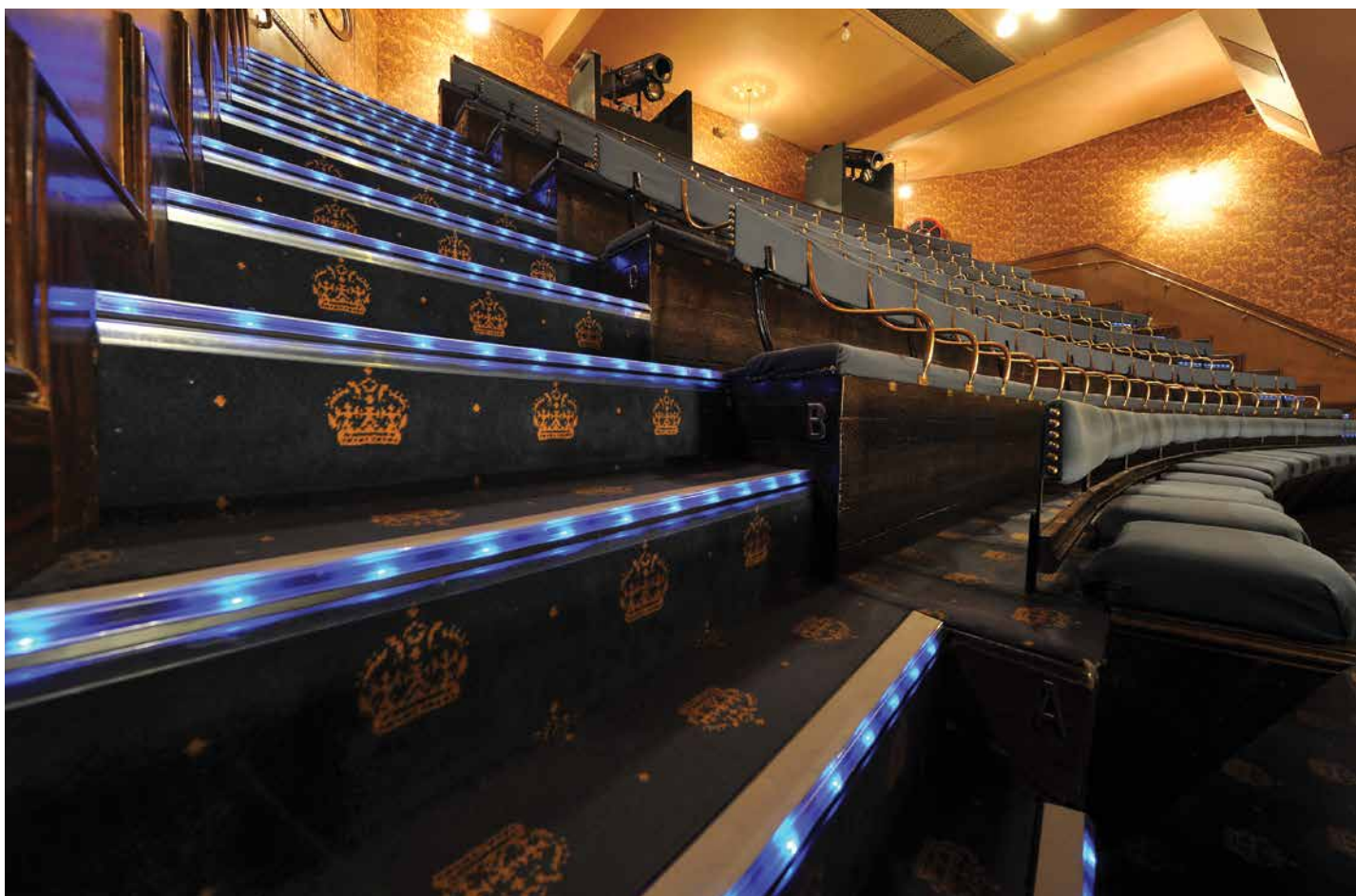
## Typical Example



Profile Shown: ATD121L



# Interlok Advance™ 12v DC LED Lighting System



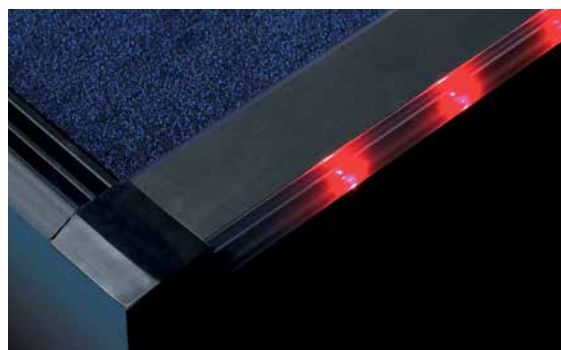
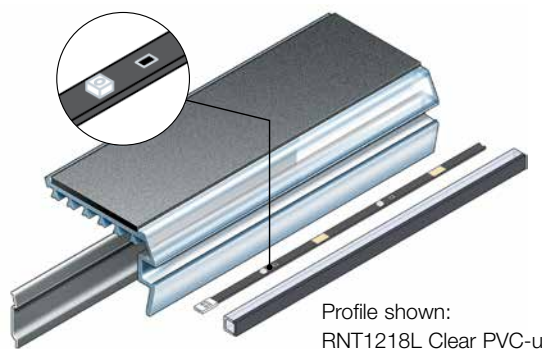
## Description

**Interlok Advance™** is an LED lighting system that offers a pin point lighting effect.

- Pin point light effect
- LEDs are surface mounted onto strips (600mm strips)
- Strips can be cut to desired length without causing any reduction in brightness
- LED lifetime of up to 50,000 hours
- Power consumption of 1.8 watts per strip
- LEDs are spaced at either 50mm or 100mm intervals
- Dimming options available see page 40
- For power supply units see page 40

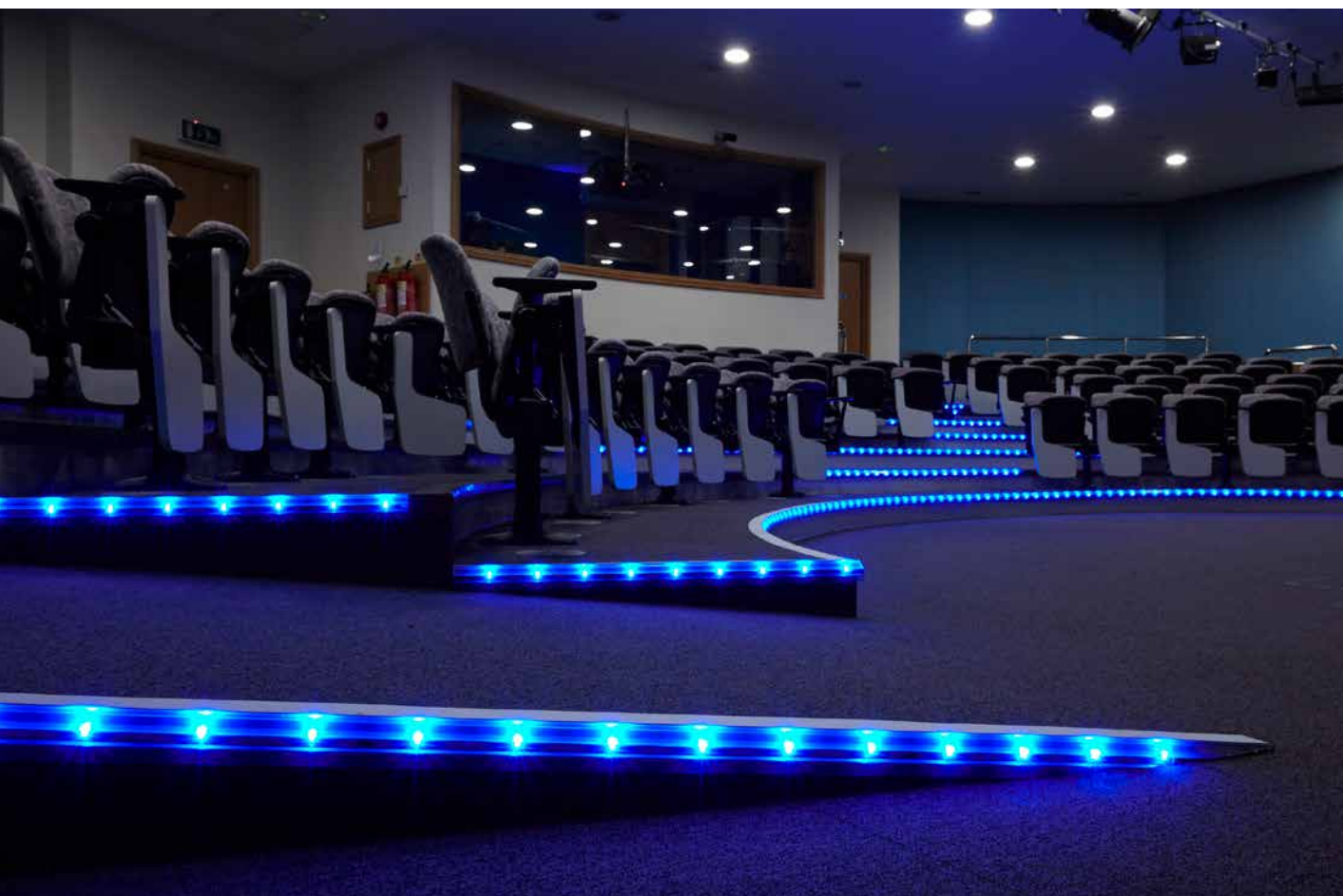
LED choice	
	Blue
	Green
	Amber
	Red
	White
	Warm White

## Typical Example



Profile Shown: RXT1218L

# Step Lighting Effects



## Description

Gradus lighting offers a range of aluminium and PVC-u stair edging profiles, with a choice of slip resistant inserts, which incorporate LED lighting systems that are designed to provide a wide choice of lighting effects.

## PVC-u

- By altering the position of the Interlok Advance LED strips or by rotating the PVC LR1238 tube (PVC tube with three clear sides and one black side as seen in diagrams opposite) within the profile, a variety of different lighting effects can be achieved (see opposite)
- Clear profile allows light to project through the profile
- Illuminated stair edging is visible when ascending and descending the staircase

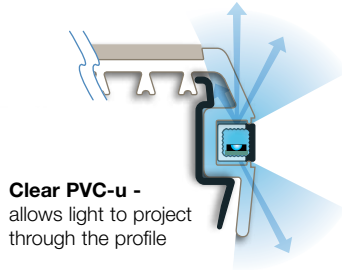
## Aluminium

- Light is projected directly from the tube
- The angle at which the illumination is visible depends on the profile design



## PVC Profiles

### Up & Down

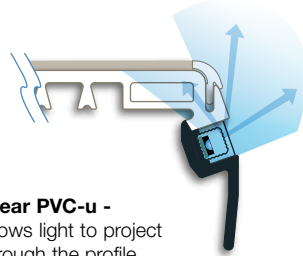


**Clear PVC-u** - allows light to project through the profile

Step lighting effect available in the following profiles:

**RNT1218L - pg19, RNT718L - pg19**

### Up & Angled

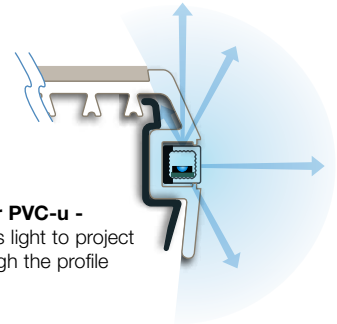


**Clear PVC-u** - allows light to project through the profile

Step lighting effect available in the following profile:

**RXT1218L - pg18**

### Up, Forward & Down



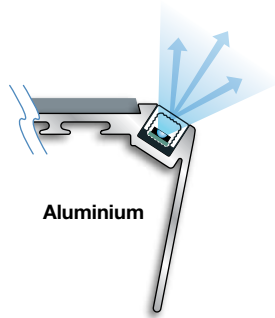
**Clear PVC-u** - allows light to project through the profile

Step lighting effect available in the following profiles:

**RNT1218L - pg19, RNT718L - pg19**

## Aluminium Profiles

### Angled Up

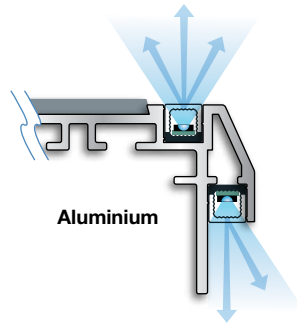


**Aluminium**

Step lighting effect available in the following profiles:

**ATNG71L - pg22, ELAF5150 - Pg23, ELAF230 - pg23**

### Up & Down

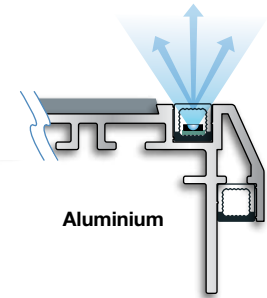


**Aluminium**

Step lighting effect available in the following profiles:

**ATD121L - pg21, ATD71L - Pg20**

### Up

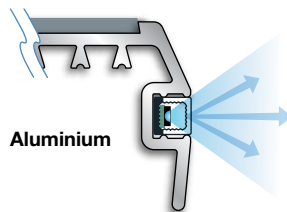


**Aluminium**

Step lighting effect available in the following profiles:

**ATD121L - pg21, ATF71L - pg20, ATD71L - Pg20**

### Forward

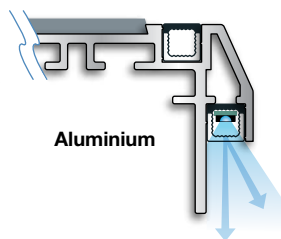


**Aluminium**

Step lighting effect available in the following profiles:

**AT718L - pg21, AS1106L - pg22, ATF71L - pg20**

### Down

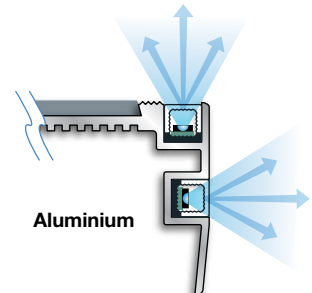


**Aluminium**

Step lighting effect available in the following profiles:

**ATD121L - pg21, ATD71L - Pg20**

### Up & Forward



**Aluminium**

Step lighting effect available in the following profile:

**ATF71L - pg20**







# Stair Edging Profiles

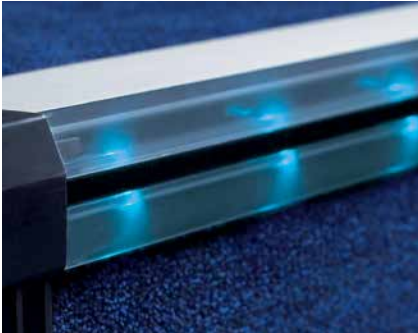
## PVC-u Profiles

Gradus illuminated PVC-u stair edgings feature clear PVC-u channels that allow light to project through the profiles. This ensures that the step edge is clearly visible when both ascending and descending the staircase, offering additional safety plus an enhanced design feature.

Available in two gauges (7mm and 12mm) to accommodate different floorcoverings, the profiles combine hardwearing PVC-u channels with a choice of slip-resistant pvc inserts.

The profiles can incorporate either the Continuity or Interlok Advance LED lighting systems. The square tube (LR1238) that houses the lighting system has three clear sides and one solid black side. By rotating the tube, the light can be projected in the desired direction. This gives the option of multiple lighting effects simply by rotating the position of the tube (see page 15).

End caps are available for all profiles to provide neat finishing and to conceal cables.



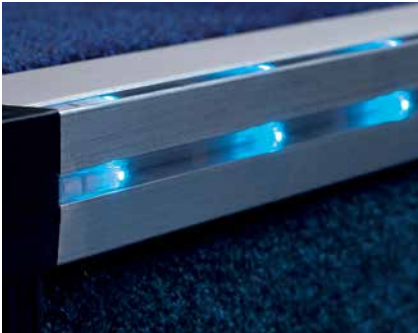
## Aluminium Profiles

Gradus illuminated aluminium stair edging profiles combine hardwearing mill finish aluminium channels with a choice of slip-resistant pvc inserts. Black or gold anodised finish is available as an option for all aluminium profiles. ELAF5150 is black anodised as standard (see page 23).

Available in a variety of gauges from ramp back through to 12mm, profiles incorporate a PVC-u tube that fits securely into the channel and houses either the Continuity or Interlok Advance LED lighting systems.

Profiles offer either single or double lighting options that can be used to create a range of lighting effects including forward illumination, top and down illumination, top and forward illumination and angled illumination.

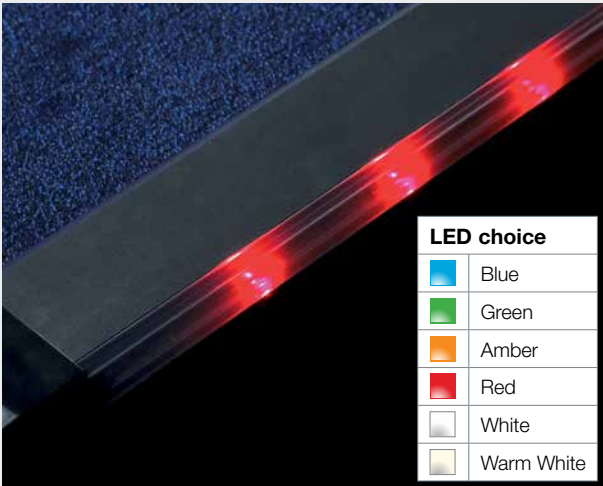
End caps are available for all profiles to provide neat finishing and to conceal cables.



## Step Lighting Effects

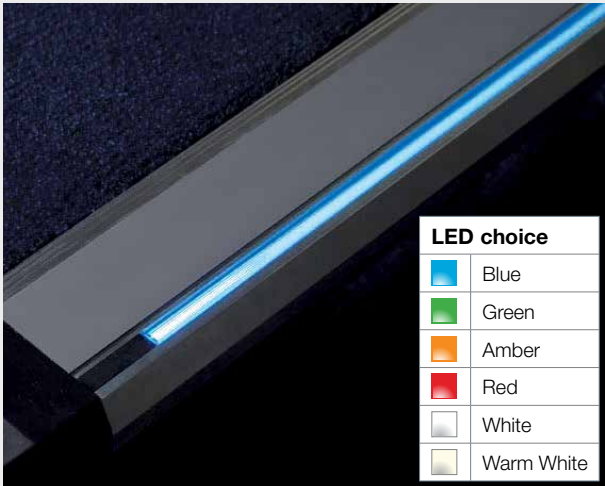
### Interlok Advance™

- Interlok Advance is an LED lighting system that offers a pinpoint lighting effect
- The Interlok Advance effect is created using circuit board strips with LEDs spaced at 50mm or 100mm intervals



### Continuity™

- Continuity is an LED lighting system that offers a continuous linear lighting effect for a streamlined, modern finish.
- The Continuity lighting effect is created using a fibre optic rod that is end-illuminated with high intensity LEDs



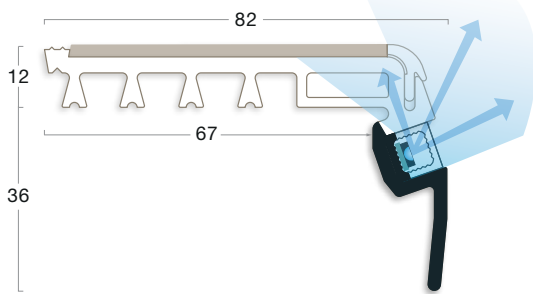
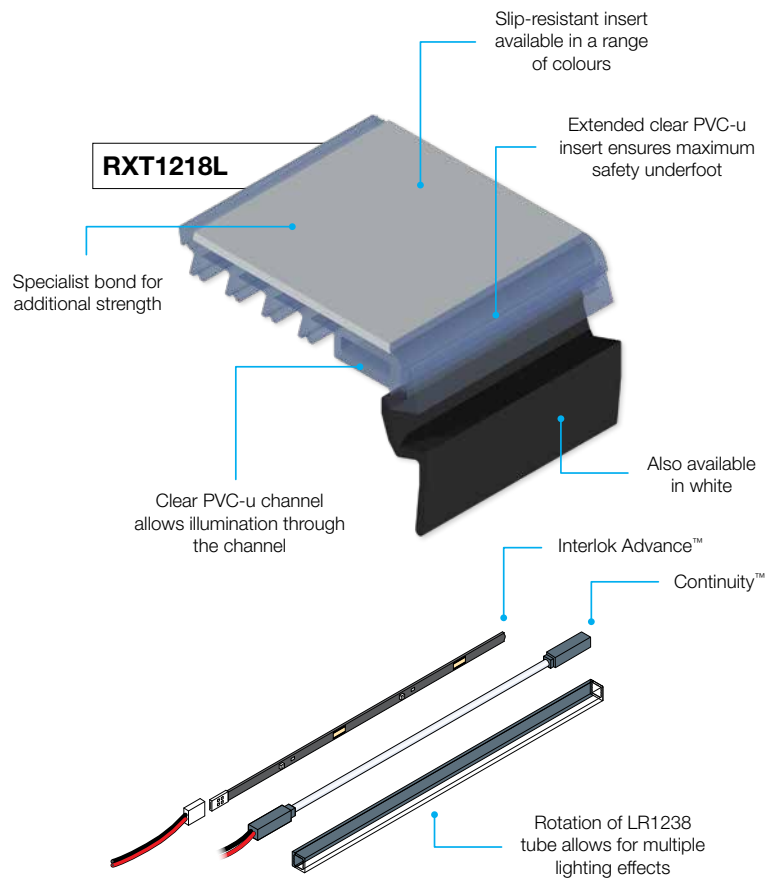
# PVC-u Stair Edging Profiles

RXT1218L

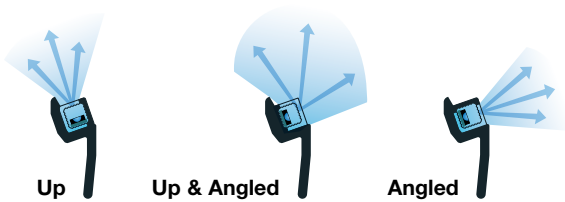
## Description

The RXT1218L stair edging profile offers the ultimate solution to help reduce the risk of slips, trips and falls on stairs in most applications.

This profile also gives the option of multiple lighting effects, simply by rotating the position of the LR1238 tube.



### MULTIPLE LIGHTING EFFECTS



### DESCRIPTION:

- Clear/Black PVC-u Channel
- Up & angled illumination
- For use with carpet

### LENGTH:

- 2.44m / 2.75m / 3.2m

### INSERT AVAILABILITY:

- Interior

### LED COLOUR AVAILABILITY

### CONTINUITY™ & INTERLOK ADVANCE™

- Blue
- Green
- Amber
- Red
- Warm White
- White

### CONTINUITY™

### INTERLOK ADVANCE™

LED <b>LEDASSY / BLANK</b>	FIBRE OPTIC ROD <b>ACP6</b>	LED <b>IAV/600/6</b>	CONNECTOR <b>IAVC1</b>
TUBE <b>LR1238</b>	END CAP <b>EC3218</b>	TUBE <b>LR1238</b>	END CAP <b>EC3218</b>

For insert selection see pages 24-25. Products subject to minor design alterations without notice.



RNT1218L		CONTINUITY™		
		<p>LED LEDASSY / BLANK</p>	<p>FIBRE OPTIC ROD ACP6</p>	
<p><b>Profile can be curved subject to approval of template</b></p>		<p>TUBE LR1238</p>	<p>END CAP EC2218</p>	<p>BACKING PLATE BP2</p>
INTERLOK ADVANCE™				
<p><b>DESCRIPTION:</b></p> <ul style="list-style-type: none"> <li>• Clear PVC-u Channel</li> <li>• Illumination on front gives all round visibility</li> <li>• For use with carpet</li> </ul> <p><b>LENGTH:</b></p> <ul style="list-style-type: none"> <li>• 2.44m / 2.75m / 3.2m</li> </ul> <p><b>INSERT AVAILABILITY:</b></p> <ul style="list-style-type: none"> <li>• Xtra-grip</li> <li>• Xtra-grip Plus</li> <li>• Interior</li> </ul>		<p><b>LED COLOUR AVAILABILITY</b></p> <p><b>CONTINUITY™ &amp; INTERLOK ADVANCE™</b></p> <ul style="list-style-type: none"> <li> Blue</li> <li> Green</li> <li> Amber</li> <li> Red</li> <li> Warm White</li> <li> White</li> </ul>	<p>LED IAV/600/6</p>	<p>CONNECTOR IAVC1</p>
		<p>TUBE LR1238</p>	<p>END CAP EC2218</p>	<p>BACKING PLATE BP2</p>

RNT718L		CONTINUITY™		
		<p>LED LEDASSY / BLANK</p>	<p>FIBRE OPTIC ROD ACP6</p>	
<p><b>Profile can be curved subject to approval of template</b></p>		<p>TUBE LR1238</p>	<p>END CAP ECT718L</p>	<p>BACKING PLATE BP3</p>
INTERLOK ADVANCE™				
<p><b>DESCRIPTION:</b></p> <ul style="list-style-type: none"> <li>• Clear PVC-u Channel</li> <li>• Illumination on front gives all round visibility</li> <li>• For use with carpet</li> </ul> <p><b>LENGTH:</b></p> <ul style="list-style-type: none"> <li>• 2.44m / 2.75m / 3.2m</li> </ul> <p><b>INSERT AVAILABILITY:</b></p> <ul style="list-style-type: none"> <li>• Xtra-grip</li> <li>• Xtra-grip Plus</li> <li>• Interior</li> </ul>		<p><b>LED COLOUR AVAILABILITY</b></p> <p><b>CONTINUITY™ &amp; INTERLOK ADVANCE™</b></p> <ul style="list-style-type: none"> <li> Blue</li> <li> Green</li> <li> Amber</li> <li> Red</li> <li> Warm White</li> <li> White</li> </ul>	<p>LED IAV/600/6</p>	<p>CONNECTOR IAVC1</p>
		<p>TUBE LR1238</p>	<p>END CAP ECT718L</p>	<p>BACKING PLATE BP3</p>

For power supply units see page 40.

# Aluminium Stair Edging Profiles

ATF71L		CONTINUITY™		
<p>Profile can be curved subject to approval of template</p>		<p>LED LEDASSY / BLANK</p>	<p>FIBRE OPTIC ROD ACP6</p>	
<p><b>DESCRIPTION:</b></p> <ul style="list-style-type: none"> <li>Aluminium channel (also available in black or gold anodised)</li> <li>Illumination on tread and riser</li> <li>For use with carpet</li> </ul> <p><b>LENGTH:</b></p> <ul style="list-style-type: none"> <li>2.44m / 2.75m / 3.2m</li> </ul> <p><b>INSERT AVAILABILITY:</b></p> <ul style="list-style-type: none"> <li>Xtra-grip</li> <li>Xtra-grip Plus</li> <li>Interior</li> </ul>		<p><b>LED COLOUR AVAILABILITY</b></p> <p><b>CONTINUITY™ &amp; INTERLOK ADVANCE™</b></p> <ul style="list-style-type: none"> <li><span style="color: blue;">■</span> Blue</li> <li><span style="color: green;">■</span> Green</li> <li><span style="color: orange;">■</span> Amber</li> <li><span style="color: red;">■</span> Red</li> <li><span style="color: grey;">■</span> Warm White</li> <li><span style="color: white;">■</span> White</li> </ul>	<p>TUBE LR1238</p>	<p>END CAP ECF71L</p>
		INTERLOK ADVANCE™		
		<p>LED IAV/600/6</p>	<p>CONNECTOR IAVC1</p>	
		<p>TUBE LR1238</p>	<p>END CAP ECF71L</p>	
ATD71L		CONTINUITY™		
<p>Profile can be curved subject to approval of template</p>		<p>LED LEDASSY / BLANK</p>	<p>FIBRE OPTIC ROD ACP6</p>	
<p><b>DESCRIPTION:</b></p> <ul style="list-style-type: none"> <li>Aluminium channel (also available in black or gold anodised)</li> <li>Illumination on tread and/or riser</li> <li>For use with carpet</li> </ul> <p><b>LENGTH:</b></p> <ul style="list-style-type: none"> <li>2.44m / 2.75m / 3.2m</li> </ul> <p><b>INSERT AVAILABILITY:</b></p> <ul style="list-style-type: none"> <li>Xtra-grip</li> <li>Xtra-grip Plus</li> <li>Interior</li> </ul>		<p><b>LED COLOUR AVAILABILITY</b></p> <p><b>CONTINUITY™ &amp; INTERLOK ADVANCE™</b></p> <ul style="list-style-type: none"> <li><span style="color: blue;">■</span> Blue</li> <li><span style="color: green;">■</span> Green</li> <li><span style="color: orange;">■</span> Amber</li> <li><span style="color: red;">■</span> Red</li> <li><span style="color: grey;">■</span> Warm White</li> <li><span style="color: white;">■</span> White</li> </ul>	<p>TUBE LR1238</p>	<p>END CAP ECF71L</p>
		INTERLOK ADVANCE™		
		<p>LED IAV/600/6</p>	<p>CONNECTOR IAVC1</p>	
		<p>TUBE LR1238</p>	<p>END CAP ECF71L</p>	

For insert selection see pages 24-25. Products subject to minor design alterations without notice.

ATD121L		CONTINUITY™	
		<p>LED LEDASSY / BLANK</p>	<p>FIBRE OPTIC ROD ACP6</p>
<p>TUBE LR1238</p>		<p>END CAP ECTD121L</p>	
<b>INTERLOK ADVANCE™</b>			
<p><b>DESCRIPTION:</b></p> <ul style="list-style-type: none"> <li>Aluminium channel (also available in black or gold anodised)</li> <li>Illumination on tread and/or riser</li> <li>For use with carpet</li> </ul> <p><b>LENGTH:</b></p> <ul style="list-style-type: none"> <li>2.44m / 2.75m / 3.2m</li> </ul> <p><b>INSERT AVAILABILITY:</b></p> <ul style="list-style-type: none"> <li>Xtra-grip</li> <li>Xtra-grip Plus</li> <li>Interior</li> </ul>		<p><b>LED COLOUR AVAILABILITY</b></p> <ul style="list-style-type: none"> <li>Blue</li> <li>Green</li> <li>Amber</li> <li>Red</li> <li>Warm White</li> <li>White</li> </ul> <p><b>CONTINUITY™ &amp; INTERLOK ADVANCE™</b></p>	
		<p>LED IAV/600/6</p>	<p>CONNECTOR IAVC1</p>
		<p>TUBE LR1238</p>	<p>END CAP ECTD121L</p>

AT718L		CONTINUITY™	
		<p>LED LEDASSY / BLANK</p>	<p>FIBRE OPTIC ROD ACP6</p>
<p> Profile can be curved subject to approval of template</p>		<p>TUBE LR1238</p>	<p>END CAP ECT718L</p>
<b>INTERLOK ADVANCE™</b>			
<p><b>DESCRIPTION:</b></p> <ul style="list-style-type: none"> <li>Aluminium channel (also available in black or gold anodised)</li> <li>Step front illumination</li> <li>For use with carpet</li> </ul> <p><b>LENGTH:</b></p> <ul style="list-style-type: none"> <li>2.44m / 2.75m / 3.2m</li> </ul> <p><b>INSERT AVAILABILITY:</b></p> <ul style="list-style-type: none"> <li>Xtra-grip</li> <li>Xtra-grip Plus</li> <li>Interior</li> </ul>		<p><b>LED COLOUR AVAILABILITY</b></p> <ul style="list-style-type: none"> <li>Blue</li> <li>Green</li> <li>Amber</li> <li>Red</li> <li>Warm White</li> <li>White</li> </ul> <p><b>CONTINUITY™ &amp; INTERLOK ADVANCE™</b></p>	
		<p>LED IAV/600/6</p>	<p>CONNECTOR IAVC1</p>
		<p>TUBE LR1238</p>	<p>END CAP ECT718L</p>

For power supply units see page 40.



# Aluminium Stair Edging Profiles

ATNG71L		CONTINUITY™	
		<p>LED LEDASSY / BLANK</p>	<p>FIBRE OPTIC ROD ACP6</p>
<p>TUBE LR1238</p>		<p>END CAP ECNG71L</p>	
<b>INTERLOK ADVANCE™</b>			
<p><b>DESCRIPTION:</b></p> <ul style="list-style-type: none"> <li>Aluminium channel (also available in black or gold anodised)</li> <li>Angled illumination</li> <li>For use with carpet</li> </ul> <p><b>LENGTH:</b></p> <ul style="list-style-type: none"> <li>2.44m / 2.75m / 3.2m</li> </ul> <p><b>INSERT AVAILABILITY:</b></p> <ul style="list-style-type: none"> <li>Xtra-grip</li> <li>Xtra-grip Plus</li> <li>Interior</li> </ul>		<p><b>LED COLOUR AVAILABILITY</b></p> <p><b>CONTINUITY™ &amp; INTERLOK ADVANCE™</b></p> <ul style="list-style-type: none"> <li><span style="color: blue;">■</span> Blue</li> <li><span style="color: green;">■</span> Green</li> <li><span style="color: orange;">■</span> Amber</li> <li><span style="color: red;">■</span> Red</li> <li><span style="color: grey;">■</span> Warm White</li> <li><span style="color: white;">■</span> White</li> </ul>	
<p>LED IAV/600/6</p>		<p>CONNECTOR IAVC1</p>	
<p>TUBE LR1238</p>		<p>END CAP ECNG71L</p>	
AS1106L		CONTINUITY™	
<p><i>Profile can be curved subject to approval of template</i></p>		<p>LED LEDASSY / BLANK</p>	<p>FIBRE OPTIC ROD ACP6</p>
<p>TUBE LR1238</p>		<p>END CAP EC1106L</p>	
<b>INTERLOK ADVANCE™</b>			
<p><b>DESCRIPTION:</b></p> <ul style="list-style-type: none"> <li>Aluminium channel (also available in black or gold anodised)</li> <li>Step front illumination</li> <li>For use with resilient flooring or where no surface floorcoverings are used</li> </ul> <p><b>LENGTH:</b></p> <ul style="list-style-type: none"> <li>2.44m / 2.75m / 3.2m</li> </ul> <p><b>INSERT AVAILABILITY:</b></p> <ul style="list-style-type: none"> <li>Xtra-grip</li> <li>Xtra-grip Plus</li> <li>Interior</li> </ul>		<p><b>LED COLOUR AVAILABILITY</b></p> <p><b>CONTINUITY™ &amp; INTERLOK ADVANCE™</b></p> <ul style="list-style-type: none"> <li><span style="color: blue;">■</span> Blue</li> <li><span style="color: green;">■</span> Green</li> <li><span style="color: orange;">■</span> Amber</li> <li><span style="color: red;">■</span> Red</li> <li><span style="color: grey;">■</span> Warm White</li> <li><span style="color: white;">■</span> White</li> </ul>	
<p>LED IAV/600/6</p>		<p>CONNECTOR IAVC1</p>	
<p>TUBE LR1238</p>		<p>END CAP EC1106L</p>	












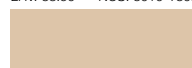
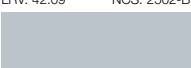
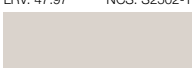
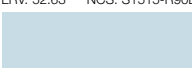



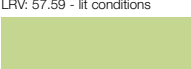


For insert selection see pages 24-25. Products subject to minor design alterations without notice.

ELAF230		CONTINUITY™			
		<p>LED <b>LEDSLLEEVE</b></p>	<p>FIBRE OPTIC ROD <b>ACP6</b></p>		
		<p>COVER <b>IC10CL</b></p>	<p>END CAP <b>ECELAF</b></p>	<p>CARRIER <b>CRH5</b></p>	
<p><b>DESCRIPTION:</b></p> <ul style="list-style-type: none"> <li>Black powder coated aluminium channel</li> <li>Angled illumination</li> <li>For use with carpet</li> </ul> <p><b>LENGTH:</b></p> <ul style="list-style-type: none"> <li>2.44m / 2.75m / 3.2m</li> </ul> <p><b>INSERT AVAILABILITY:</b></p> <ul style="list-style-type: none"> <li>Interior (ELINS30 insert sold separately)</li> <li>Xtra-grip (ELINSXG30 insert sold separately)</li> </ul>		<p><b>LED COLOUR AVAILABILITY</b></p> <p><b>CONTINUITY™ &amp; INTERLOK ADVANCE™</b></p> <ul style="list-style-type: none"> <li> Blue</li> <li> Green</li> <li> Amber</li> <li> Red</li> <li> Warm White</li> <li> White</li> </ul>	<p><b>INTERLOK ADVANCE™</b></p>		
		<p>LED <b>IAV/600/6</b></p>	<p>CONNECTOR <b>IAVC1</b></p>		
		<p>COVER <b>IC10CL</b></p>	<p>END CAP <b>ECELAF</b></p>	<p>BACKING PLATE <b>IS9</b></p>	
ELAF5150		CONTINUITY™			
<p> Can be supplied preassembled</p>		<p>LED <b>LEDASSY / BLANK</b></p>	<p>FIBRE OPTIC ROD <b>ACP6</b></p>	<p>TUBE <b>LR1238</b></p>	
		<p>Incorporates step row indicator</p> <p>END CAP <b>EC5150RHI</b></p>		<p>END CAP <b>EC5150RH</b></p>	
<p><b>DESCRIPTION:</b></p> <ul style="list-style-type: none"> <li>Black anodised aluminium channel</li> <li>Angled illumination</li> <li>For use with thin gauge carpet</li> <li>End cap can be selected to incorporate a step row indicator</li> <li>Can be supplied preassembled for ease of installation</li> </ul> <p><b>LENGTH:</b></p> <ul style="list-style-type: none"> <li>2.44m / 2.75m / 3.2m</li> </ul> <p><b>INSERT AVAILABILITY:</b></p> <ul style="list-style-type: none"> <li>Interior (ELINS50 insert sold separately)</li> <li>Xtra-grip (ELINSXG50 insert sold separately)</li> </ul>		<p><b>LED COLOUR AVAILABILITY</b></p> <p><b>CONTINUITY™ &amp; INTERLOK ADVANCE™</b></p> <ul style="list-style-type: none"> <li> Blue</li> <li> Green</li> <li> Amber</li> <li> Red</li> <li> Warm White</li> <li> White</li> </ul>	<p><b>INTERLOK ADVANCE™</b></p>		
		<p>LED <b>IAV/600/6</b></p>	<p>CONNECTOR <b>IAVC1</b></p>		
		<p>END CAP <b>EC5150RHI</b></p>	<p>END CAP <b>EC5150RH</b></p>		











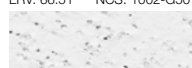
For power supply units see page 40.

# Insert Colours

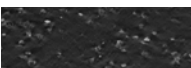


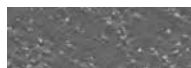







## Interior Standard Finish

<b>Jet*</b> LRV: 4.56 NCS: 8502-B 	<b>Ink</b> LRV: 4.96 NCS: 8010-R70B 	<b>Burgundy</b> LRV: 5.70 NCS: 6030-R10B 	<b>Coffee*</b> LRV: 6.05 NCS: 8010-Y50R 	<b>Midnight</b> LRV: 6.56 NCS: 6030-R80B 	<b>Evergreen</b> LRV: 6.69 NCS: 7020-B70G 
<b>Ocean</b> LRV: 8.00 NCS: 6020-R90B 	<b>Poppy</b> LRV: 10.39 NCS: 2070-R 	<b>Lead*</b> LRV: 12.77 NCS: 7005-R50B 	<b>Steel*</b> LRV: 26.99 NCS: 4500-N 	<b>Cloud</b> LRV: 28.57 NCS: 4010-R70B 	<b>Linen</b> LRV: 38.59 NCS: 3010-Y30R 
<b>Glacier</b> LRV: 42.09 NCS: 2502-B 	<b>Clay†</b> LRV: 47.97 NCS: S2502-Y 	<b>Sky†</b> LRV: 52.63 NCS: S1515-R90B 	<b>Canvas</b> LRV: 53.27 NCS: 2005-Y30R 	<b>Jade†</b> LRV: 53.98 NCS: S2005-G 	<b>Buttercup</b> LRV: 55.54 NCS: 1070-Y 
<b>Photoluminescent</b> LRV: 57.59 - lit conditions 	<b>Wisp†</b> LRV: 58.17 NCS: S2000-N 	<b>Snowdrift*</b> LRV: 83.77 NCS: 0500-N 	†RXT1218L profile only *ELINS30 colour availability		

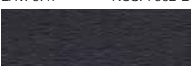



## NEW Xtra-grip™

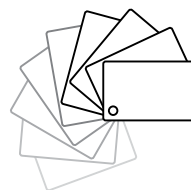
<b>Onyx</b> LRV: 4.52 NCS: 8502-B 	<b>Neptune</b> LRV: 5.03 NCS: 8010-R70B 	<b>Umber</b> LRV: 5.71 NCS: 8005-Y50R 	<b>Graphite</b> LRV: 12.56 NCS: 6502-B 	<b>Quarry</b> LRV: 24.71 NCS: 4500-N 	<b>Concrete</b> LRV: 37.44 NCS: 2502-B 
<b>Ochre</b> LRV: 49.97 NCS: 1060-Y 	<b>Surf</b> LRV: 43.58 NCS: 1515-R90B 	<b>Pumice</b> LRV: 46.83 NCS: 2005-Y30R 	<b>Bamboo</b> LRV: 45.84 NCS: 2005-B80G 	<b>Frost</b> LRV: 66.51 NCS: 1002-G50Y 	*ELINSXG30 & ELINSXG50 colour availability

## NEW Xtra-grip Plus™

<b>Asphalt</b> LRV: 4.52 NCS: 8502-B 	<b>Shark</b> LRV: 5.03 NCS: 8010-R70B 	<b>Bark</b> LRV: 5.71 NCS: 8005-Y50R 	<b>Mercury</b> LRV: 12.56 NCS: 6502-B 	<b>Smoke</b> LRV: 24.71 NCS: 4500-N 	<b>Dusk</b> LRV: 37.44 NCS: 2502-B 
<b>Citrine</b> LRV: 49.97 NCS: 1060-Y 	<b>Air</b> LRV: 43.58 NCS: 1515-R90B 	<b>Sandstone</b> LRV: 46.83 NCS: 2005-Y30R 	<b>Prairie</b> LRV: 45.84 NCS: 2005-B80G 	<b>Calcite</b> LRV: 66.51 NCS: 1002-G50Y 	

## Interior Grained Finish

<b>Black</b> LRV: 6.47 NCS: 7502-B 	<b>Brown</b> LRV: 12.13 NCS: 6010-Y70R 	<b>Granite</b> LRV: 13.44 NCS: 6502-R 	<b>Dove</b> LRV: 23.40 NCS: 5000-N 
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## For samples

For enquiries in the UK & Eire

Tel: 01625 428922

For enquiries outside the UK & Eire

contact Gradus International

Tel: +44 (0)1625 613780

Visit: [www.gradus.com](http://www.gradus.com)

### NCS Colour References



Gradus is a member of NCS (Natural Colour System) and utilises the NCS reference codes shown above each colour. For further information visit [www.ncscolour.co.uk](http://www.ncscolour.co.uk)

©Property of and used under licence from the Scandinavian Colour Institute AB, SCI-Sweden se, Stockholm 2004. \*See [www.ncscolour.co.uk](http://www.ncscolour.co.uk) for NCS-standard samples\*.

### Light Reflectance Value (LRV)

All colours have been measured for light reflectance/visual contrast (LRV using CIE Y value).

For details on LRV's visit [www.gradus.com](http://www.gradus.com) or call technical support on 01625 428922

Please note: Due to the limitations of the printing process, colours within this leaflet should not be relied upon for colour matching.

An accurate colour match can only be achieved by requesting the relevant product sample(s).



# How to select the correct insert

## Gradus Inserts:

- Provide slip-resistance at the step edge to reduce the risk of slips, trips and falls on stairs
- Are designed and tested to ensure optimum performance throughout the life of the product
- Are measured for Light Reflectance Values (LRVs) to provide a visual contrast to ensure the step edge is clearly visible

Pendulum Test Value (PTV)	Slip Potential
0 - 24	High Slip Potential
25 - 35	Moderate Slip Potential
36+	Low Slip Potential

BS 8300-2:2018 - a PTV of at least 36 is required irrespective of wet or dry conditions

**Wear Classification\*** - Xtra-grip, Xtra-grip Plus and Interior inserts achieve wear classifications of:

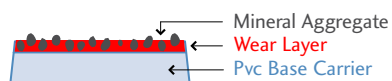
Group T – Class 34 – Commercial Very Heavy

Group T – Class 43 – Light Industrial Heavy

\* Interior (standard & grained) tested to BS EN 660-2:1999 and assessed against the requirements of BS EN 649:1997.

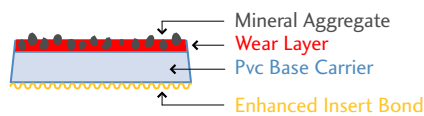
Xtra-grip and Xtra-grip Plus tested to BS EN 13845:2005 – 50,000 cycles.

## Xtra-grip™



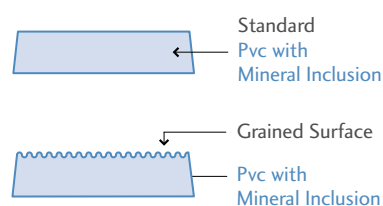
- Suitable for interior steps that may become wet
- Pvc insert incorporating a slip-resistant aggregate
- Low slip risk in both wet & dry conditions
- PTV rating of >36 in wet and dry conditions

## Xtra-grip Plus™



- As Xtra-grip, with the addition of an enhanced insert bond system for areas subject to more frequent cleaning e.g. catering and food preparation areas
- PTV rating of >36 in wet and dry conditions

## Interior (standard or grained)



- Suitable for interior dry conditions where there is no risk that the stairs will be contaminated by moisture
- Pvc material with slip-resistant properties
- PTV rating of >36 in wet and dry conditions

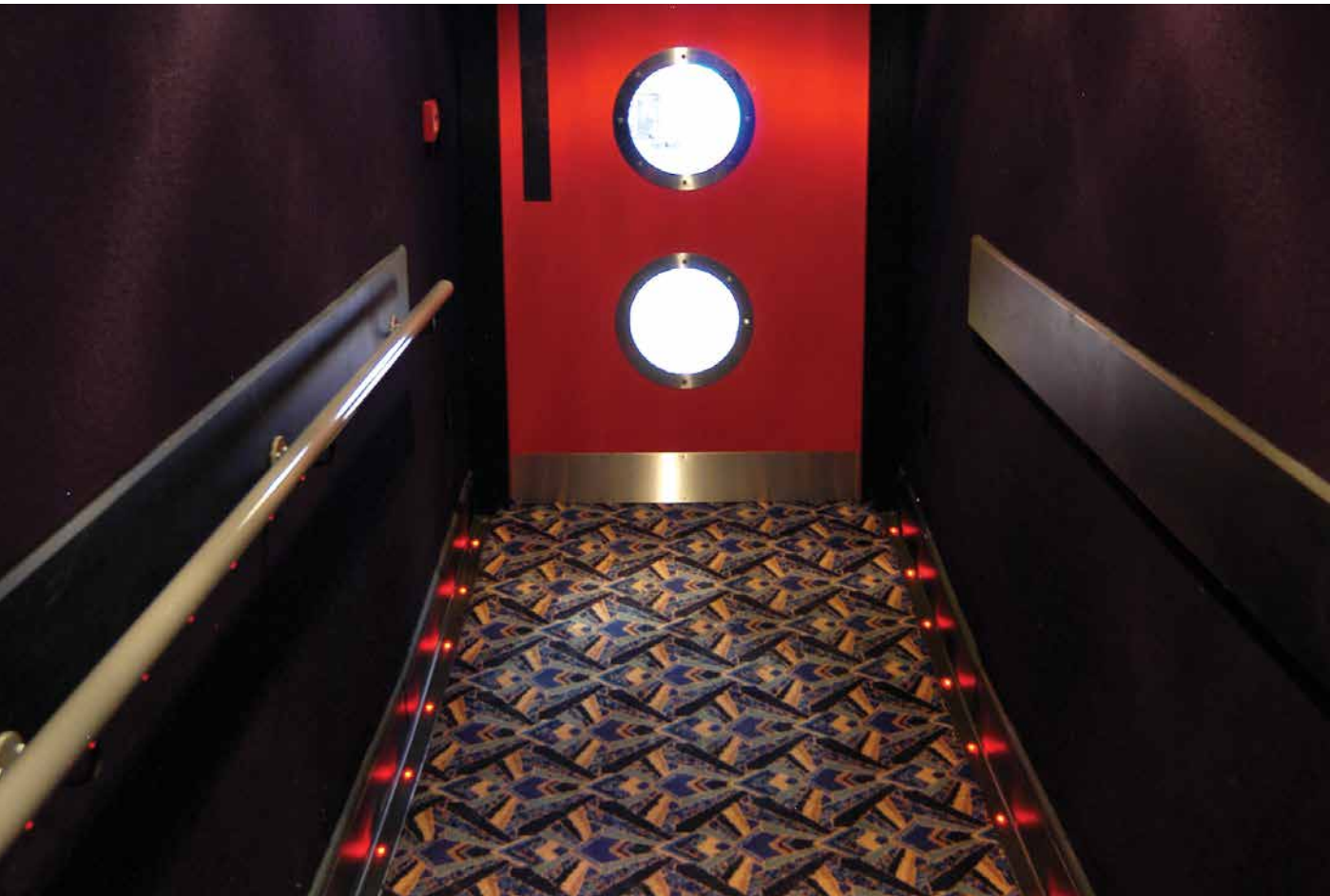


# Floor Trim Lighting Systems

A comprehensive range of PVC-u and aluminium aisle and floor trims that are designed for use as cable management systems to work with illuminated stair edging profiles, or to illuminate floors, walkways, aisles and exit/entrance routes.



# Aisle & Floor Trim Lighting



## Description

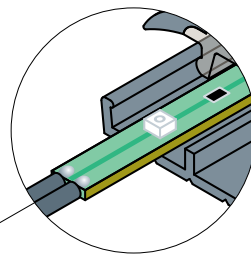
Gradus offers a comprehensive range of PVC-u and aluminium aisle and floor trims that are designed for use as cable management systems to work with illuminated stair edging profiles or to illuminate floors, walkways, aisles and exit/entrance routes.

Profiles can feature Interlok Advance, Continuity or Loom Lighting. See Pages 12 & 13 for details of Continuity and Interlok Advance.

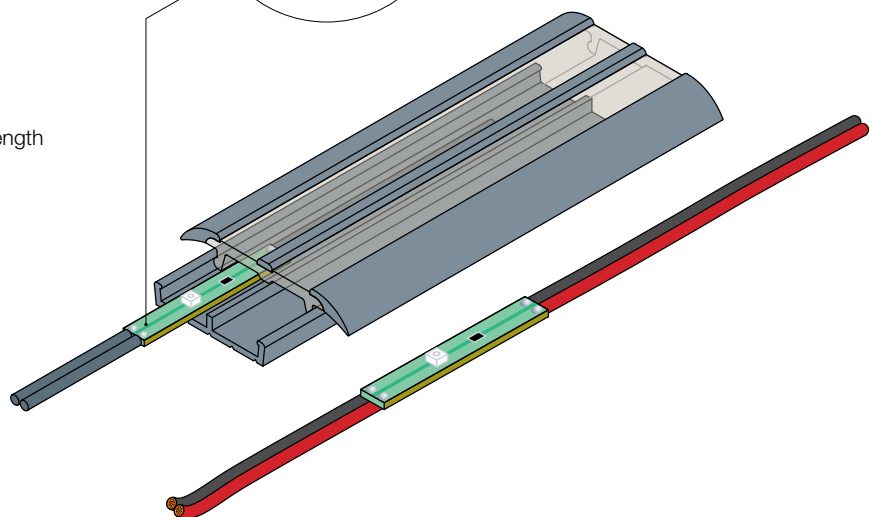
## Loom information

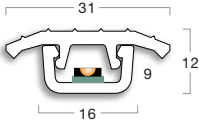






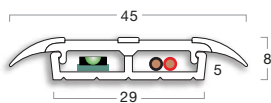






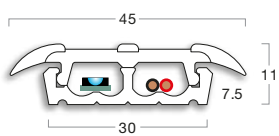






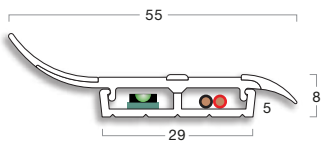






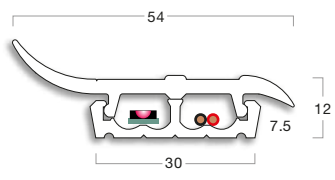






- LEDs are spaced at 300mm intervals
- Easy to install and can be cut to required length
- Can be supplied in 1 to 50 metre coils
- LED lifetime of up to 50,000 hours
- Power consumption of 0.9 watts per metre

## Typical Example





Floor Loom shown with CLS13/LBS45

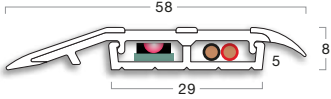
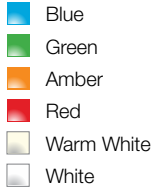
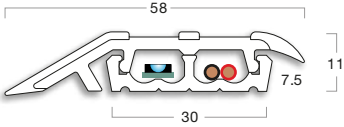
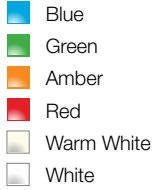
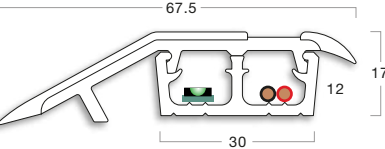
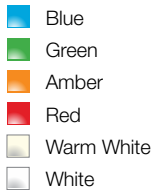
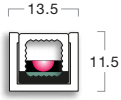
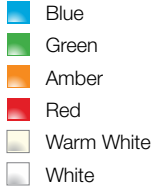


CODE / PROFILE	DESCRIPTION	DETAILS	LENGTH	PROFILE COLOUR	LIGHTING SYSTEM	LED COLOUR AVAILABILITY
<b>CL05/LB10</b> 	PVC-u floor trim	Carpet to Carpet	2.5m	Smoked/Black Clear Translucent	Loom, Interlok Advance or Decortape	 Blue  Green  Amber  Red  Warm White  White
<b>CLS13/LBS45</b> 	PVC-u floor trim/cable management system	Carpet to Carpet	2.5m	Smoked/Black Clear Translucent	Loom, Interlok Advance or Decortape	 Blue  Green  Amber  Red  Warm White  White
<b>CLC13/TDB45</b> 	PVC-u floor trim/cable management system	Carpet to Carpet	2.5m	Smoked/Black Clear Translucent	Loom, Interlok Advance or Decortape	 Blue  Green  Amber  Red  Warm White  White
<b>CLS16/LBS45</b> 	PVC-u floor trim/cable management system	Carpet to Wall	2.5m	Smoked/Black Clear Translucent	Loom, Interlok Advance or Decortape	 Blue  Green  Amber  Red  Warm White  White
<b>CLC16/TDB45</b> 	PVC-u floor trim/cable management system	Carpet to Wall	2.5m	Smoked/Black Clear Translucent	Loom, Interlok Advance or Decortape	 Blue  Green  Amber  Red  Warm White  White



For power supply units see page 40. Illustrations not to size. Products subject to minor design alterations without notice.

Key	
Cable	
Lighting Loom or Interlok Advance	

# Aisle & Floor Trim Lighting

CODE / PROFILE	DESCRIPTION	DETAILS	LENGTH	PROFILE COLOUR	LIGHTING SYSTEM	LED COLOUR AVAILABILITY
<b>CLS20/LBS45</b>  	PVC-u floor trim/cable management system	Vinyl to Carpet	2.5m	Smoked/Black  Clear Translucent	Loom, Interlok Advance or Decortape	
<b>CLC20/TDB45</b>  	PVC-u floor trim/cable management system	Vinyl to Carpet	2.5m	Smoked/Black  Clear Translucent	Loom, Interlok Advance or Decortape	
<b>CLC11/TB45D</b>  	PVC-u floor trim/cable management system	Vinyl to Carpet	2.5m	Smoked/Black  Clear Translucent	Loom, Interlok Advance, Decortape, or Continuity	
<b>DLA45</b>  	Aluminium U section	Suitable for floor, wall or ceiling mounting	3.1m	Aluminium - Mill finish  Can also be supplied anodised on request	Interlok Advance or Continuity	

For power supply units see page 40. Illustrations not to size. Products subject to minor design alterations without notice.

Key	
Cable	
Lighting Loom or Interlok Advance	



# Lighting Systems

Systems that can be used to visually enhance any leisure application whilst providing guidance to the public & creating a safe environment. Bespoke products and adaptations of existing products can be produced to create specific light effects for customised applications.

# Continuity™ - Linear Lighting System

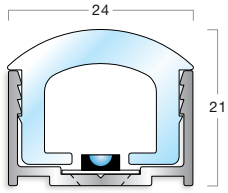










## Description

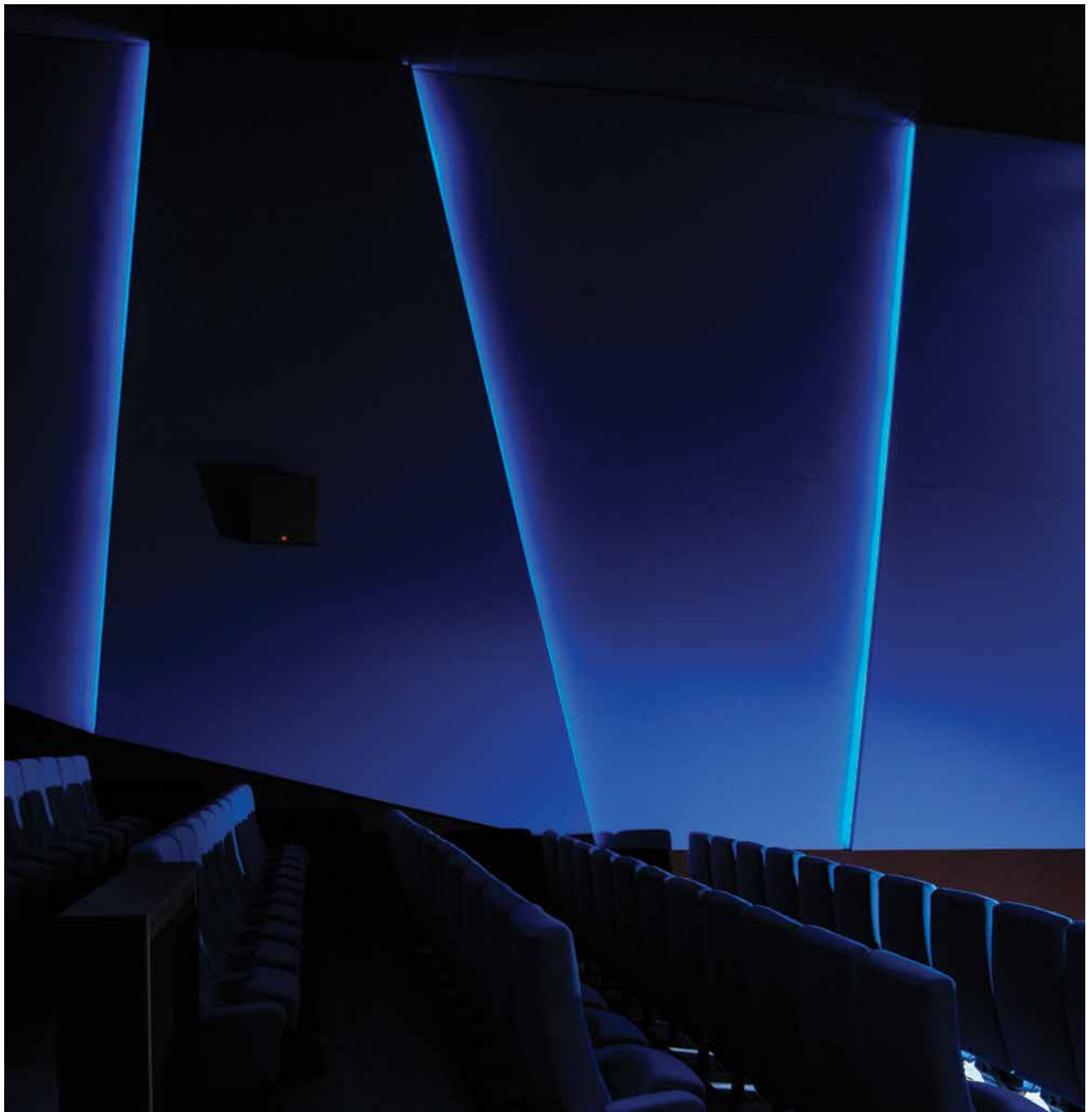
Continuity™ LED linear lighting offers an excellent alternative to neon lighting for interior applications.

- Extra low voltage alternative to neon lighting
- Low Power consumption – 4.8 - 15.00 watts/metre dependant on standard or high brightness
- Lifecycle – effective up to 50,000 hours
- Flexibility allows designers to create bespoke designs
- Easily installed on site – shock and vibration proof
- Flexible up to a minimum radius of 300mm
- Low heat output means it is safe in use
- LED strip can be cut at short intervals
- Static colours and RGB available
- PVC-u cover available as Clear (CL) or Opaque (FR)
- Can be factory curved subject to template and approval. Limitations apply.



PROFILE	ENVIRONMENT	SIZE	LED COLOUR AVAILABILITY
<b>DC2012/DLA2415</b>  	Interior	LED 5m DC2012 PVC Cover 2m DLA2415 Aluminium Carrier 2m	<ul style="list-style-type: none"> <li> Blue</li> <li> Green</li> <li> Amber</li> <li> Red</li> <li> Warm White</li> <li> White</li> <li> RGBW Colour Change</li> <li> RGB Colour Change</li> </ul>

Illustrations not to size. Products subject to minor design alterations without notice.





# Wall Lighting 12v or 24v DC LED System



## Description

Gradus LED wall lighting has been designed to provide soft illumination way finding for auditoria access during showings or performances without distracting from the primary function of the installation.

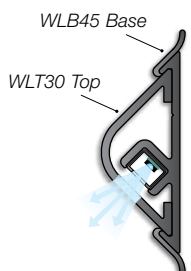
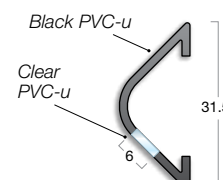
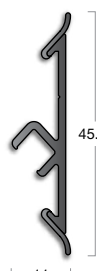
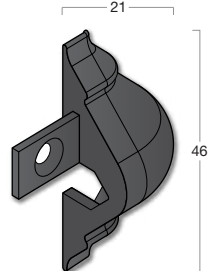
Gradus LED wall light provides 2.2 lux at 1.9m distance when mounted 300mm above floor.

## Colorimetric Details

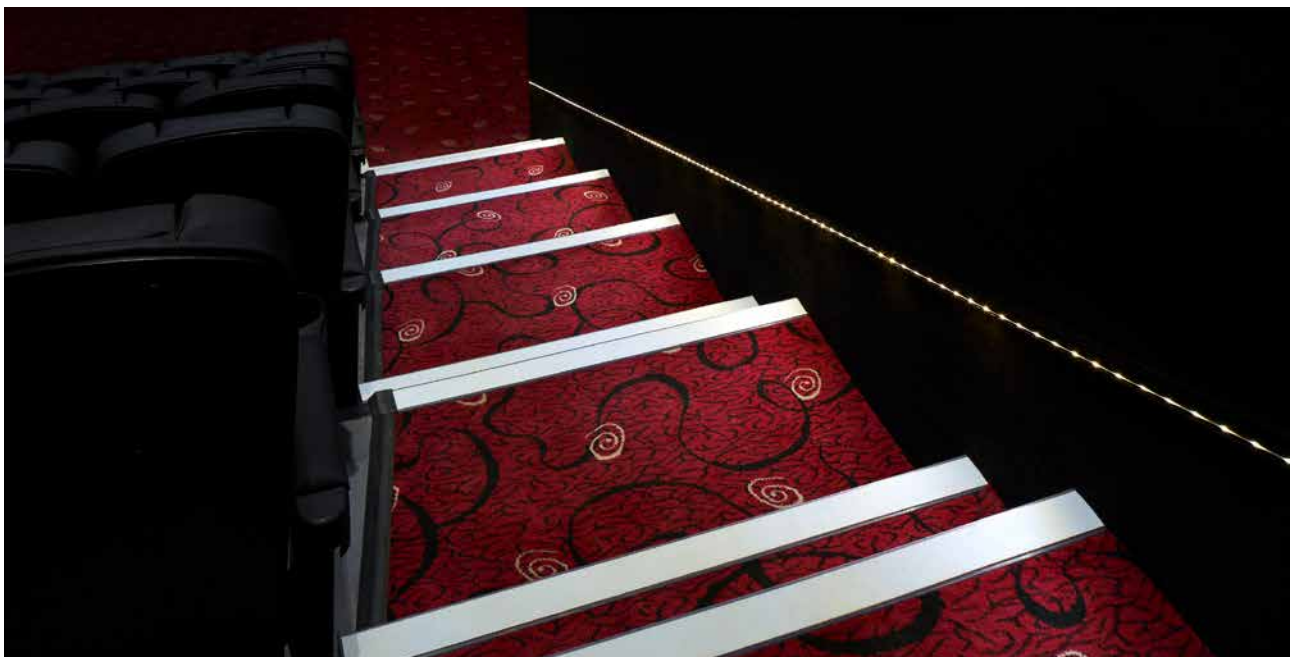
CCT	3075K
CRI (Ra)	90

## Specification

Environment	Interior
Description	PVC-u base / PVC-u cover
Details	Incorporates a clear window for light to shine downwards
Length	2.5m
Profile Colour	Black
Accessories	End cap - ECWLB45 (right or left handed)
Lighting System	Interlok Advance™ 50mm spaced 12v or 24v DC
LED Colour	<ul style="list-style-type: none"> <li><span style="color: blue;">■</span> Blue</li> <li><span style="color: green;">■</span> Green</li> <li><span style="color: orange;">■</span> Amber</li> <li><span style="color: red;">■</span> Red</li> <li><span style="color: yellow;">■</span> Warm White</li> <li><span style="color: white;">■</span> White</li> </ul>

PROFILE	TOP	BASE	END CAP
 <p>WLB45 Base WLT30 Top</p> <p><b>WLT30/WLB45</b></p>	 <p>Black PVC-u Clear PVC-u</p> <p>31.5 6</p> <p><b>WLT30 TOP</b></p>	 <p>45.5 11</p> <p><b>WLB45 BASE</b></p>	 <p>21 46</p> <p><b>ECWLB45</b> (right or left handed)</p>

Illustrations not to size. Products subject to minor design alterations without notice.



# LED Step Row Indicator

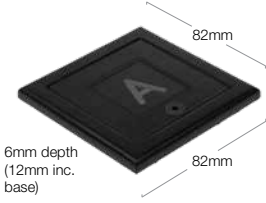









## Description


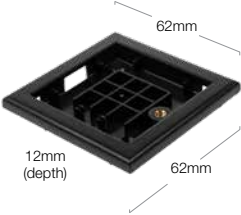
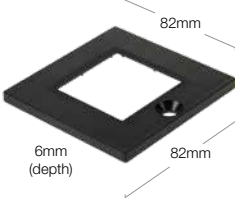
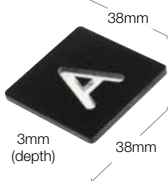
Gradus step row indicators are used to identify seating rows in auditoria, such as cinema, theatres and lecture theatres in darkened conditions.

- The step row indicator is supplied in four parts - base, frame with window, indicator tile and LED
- The step row indicator features a 12mm base suitable for installing with carpets that have a compressed thickness of 12mm. It can be installed into the surrounding floorcoverings on either the step tread or the riser
- The profile can incorporate alphabetical or numerical formats, or can be produced in graphical format for directional signage or to denote particular areas eg. wheelchair access points
- Extra low voltage (12v DC) for safe installation and use
- Low power consumption - 25mA per indicator - so it is cost effective to operate

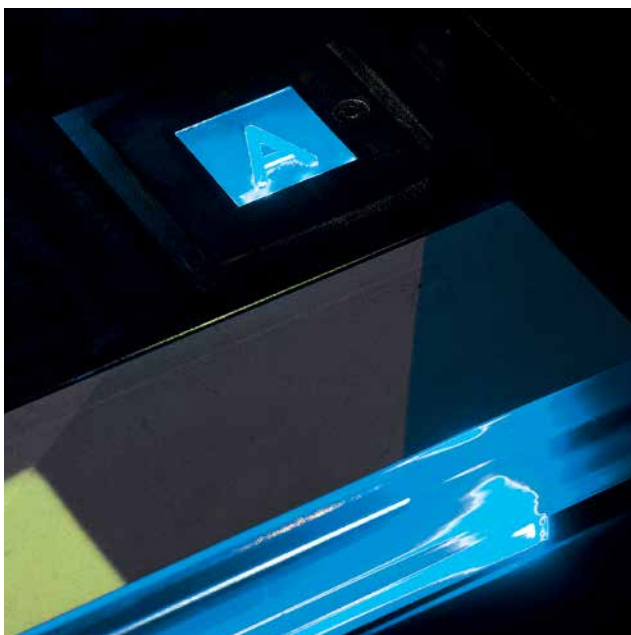


PROFILE	VOLTAGE	DESCRIPTION	DETAILS	DIMENSIONS	PROFILE COLOUR	LED COLOUR
	12v DC	System supplied in 3 parts: PVC-u frame PVC-u base Tile Gauge: 12mm	Alphabetical, numerical or graphical format including disabled access	82mm (width) x 82mm (height) x 12mm (depth)	 Black	<ul style="list-style-type: none"> <li> Blue</li> <li> Green</li> <li> Amber</li> <li> Red</li> <li> Warm White</li> <li> White</li> </ul>

Images are not to scale in mm. Products subject to minor design alterations without notice.

LED	BASE	FRAME	TILE
 <p><b>IAV/3</b></p>			

For power supply units see page 40.











# Decortape



## Description

Decortape is a flexible LED lighting tape that allows bespoke design lighting in most commercial applications.

- Adhesive taped back means Decortape can be mounted to any surface
- Available with splash proof coating, making this product suitable for use in wet areas
- Flexibility allows designers to create bespoke designs
- Provides a crisp light instantly on start-up

PROFILE	ENVIRONMENT	VOLTAGE	SIZE	ACCESSORIES	LED COLOUR AVAILABILITY
	Interior	12v DC or 24v DC	10mm (width) x 5m (length)	LED Driver	<ul style="list-style-type: none"> <li> Blue</li> <li> Green</li> <li> Amber</li> <li> Red</li> <li> Warm White</li> <li> White</li> <li> RGBW Colour Change</li> <li> RGB Colour Change</li> </ul>

For power supply units see page 40.

# Power Supply Units

A range of direct current power supply units to provide a safe and efficient power source to low level lighting systems.



# Power Supply Units



## Description

Gradus power supply units are designed to transform power from the mains to a 12v/24v DC system, thereby providing a safe and efficient power source to a low level lighting system.

- Interlock Advance and Continuity LEDs operate on extra low voltages and, therefore, when used correctly, do not represent a safety hazard
- Always ensure that Gradus systems are connected to a Gradus power source or other approved unit. They must never under any circumstance be connected directly to the mains supply



Visit [www.gradus.com](http://www.gradus.com) for power supply diagram.

## PSU Loadings

Code	Input Voltage	Output Voltage	Current	IAV Strips 0.15A / metre	Continuity LED 0.025A / unit	Aisle Loom 0.075A / metre	Row Indicator 0.025A / metre	Seat Light 0.05A / metre	Decorflex 0.33A / metre
PSU30/12v	200-240v AC	12v DC	2.5A	9.6m / 16 units	100 units	33m	100 units	50 units	n/a
PSU30/24v	200-240v AC	24v DC	1.25A	n/a	n/a	n/a	n/a	n/a	3.5m
PSU70/12v	200-240v AC	12v DC	6.25A	24m / 40 units	250 units	80M	250 units	175 units	n/a
PSU75/24v	200-240v AC	24v DC	3.125A	n/a	n/a	n/a	n/a	n/a	9m
PSU150/12v	90-295v AC	12v DC	12.5A	48m / 80 units	500 units	160m	500 units	250 units	n/a
PSU150/24v	90-295v AC	24v DC	6.25A	n/a	n/a	n/a	n/a	n/a	18m
PSU240/12v	90-264v AC	12v DC	20A	78m / 130 units	800 units	260m	800 units	400 units	n/a
PSU240/24v	90-264v AC	24v DC	10A	n/a	n/a	n/a	n/a	n/a	30m
PSU320/12v	90-305v AC	12v DC	26.6A	105m / 175 units	1060 units	350m	1060 units	530 units	n/a
PSU320/24v	90-305v AC	24v DC	13.3A	n/a	n/a	n/a	n/a	n/a	40m
PSU/DIMMER	12-36v DC	12-36v DC	12A	PWM Dimmer for use with loadings of up to 12A, in conjunction with either a 1-10v dimming controller or 8-230v $\sphericalangle$ push switch & PSU					
PSU/DALIDIMMER	12-24v DC	12-24v DC	12A	PWM Dimmer for use with loadings of up to 12A, in conjunction with DALI dimming systems & PSU					
PSU/DALIDMX/DIM	10.5-24v DC	10.5-24v DC	8A	PWM Dimmer for use with loading of up to 8A, in conjunction with DMX, DALI & DSI dimming systems & PSU					

Where there is a mixed load the total current must be found and the correct power supply used, e.g; 20M of IAV strips, 50M of aisle loom and 60 row indicators = (34 \* 0.15 for 20M of IAV strips you would need 34 units) + (50 \* 0.075 for the aisle loom) + (60 \* 0.025 for the row indicators) = 5.1 + 3.75 + 1.5 = 10.35A, therefore the PSU150/12v would be a suitable power supply. **For LED strips the maximum single continuous run is 10M. For Aisle loom the maximum single continuous run is 20M. For Continuity lighting 10M is the maximum single continuous run.** Dimming LEDs due to volt drop can be compensated for by wiring the circuit in a ring, or splitting the load over 2 circuits.

# Technical Services / Specification Guidelines

This section contains details on the Technical Services offered by Gradus and information on the most relevant Building Regulations and British Standards and how they impact upon Gradus LED lighting specification.

# Technical Services



- Gradus offers a complete supply and fit package, ensuring a convenient and reliable service throughout the specification, survey and installation process.
- Specially trained specification consultants can provide face to face advice when specifying lighting, ensuring that the products selected are matched to the specific requirements of the environment.
- A complete estimating service is available on a supply only basis or for both supply and installation. Gradus also have on-line project collaboration capabilities.
- Site surveys are carried out and Gradus liaises with other trades to ensure complete peace of mind for the customer.
- Gradus Contracts manages the entire process to tailor the order to specific customer requirements.
- Trained and experienced technicians carry out the installations in line with Gradus quality system, in accordance with current standards and guidance stated in BS 8300-2:2018.
- Electrical installations carried out and tested in accordance with BS7671 wiring regulations.
- To take advantage of the supply and fit service, contact Gradus' specification consultants who will undertake an evaluation of the requirements from which a detailed quote can be prepared. Details of specification consultants are available from Gradus Technical Support on +44 (0) 1625 428922.

*Applicable to UK & Eire only.*



# Specification Guidelines

## The Building Regulations and British Standards specifying the right Gradus product

The Building Regulations and British Standards are designed to ensure the optimum specification of products through a combination of legislative requirements and guidance. The following extracts have been taken from The Building Regulations 2010 and British Standard BS 8300-2:2018, BS 9266:2013, BS 5395-1:2010 and show how Gradus products can be used to help satisfy these requirements, and help achieve an inclusive environment in line with the Equality Act 2010. For further details on this or any other aspect of The Building Regulations and British Standards contact Gradus Technical Services on 01625 428922. Guidance varies internationally, please refer to the relevant countries' building standards (or equivalent) before specification. [Extracts shown below represent examples of good practice.](#)

### BS 8300-2:2018

This standard provides guidance or good practice in the design of domestic and non-domestic buildings and their approaches so that they are convenient to use by disabled people. Gradus advice and recommendations are [shown in blue text](#).

#### Guidance on Stair Edgings

##### 10 Vertical movement

##### 10.1 Steps and stairs

##### 10.1.4 Identification and slip resistance of nosings

*Each step nosing should incorporate a durable, permanently contrasting continuous material for the full width of the stair on both the tread and the riser to help people who are blind or partially sighted appreciate the extent of the stair and identify individual treads ❶. The contrasting material should extend 50 mm to 65 mm in width from the front edge of the tread and 30mm to 55mm from the top of the riser, and should contrast visually with the remainder of the tread and riser ❷.*

*NOTE 1 Particular care is needed to ensure that there is adequate contrast between nosings and landings ❶.*

*NOTE 2 Nosing that wraps around the riser might assist people who are blind or partially sighted ❸.*

*NOTE 3 A proprietary nosing can provide a durable solution that satisfies both visual contrast and slip resistance criteria (see BRE IP 15/03).*

*The whole tread or the nosing should incorporate a slip-resistant material.*

*NOTE 4 Guidance on slip resistance of surfaces is given in Annex C.*

*Surface material tread and risers should be free from patterning.*

*NOTE 5 It is beneficial that surface material at landings and floors contrasts with surface material of stairs, subject to maintaining visual contrast at top and bottom nosings.*

❶ All Gradus stair edging colours have been measured to provide Light Reflectance Values (LRVs)\* in order to provide the specifier with information to ensure that suitable contrast is achieved with the surrounding stair material. PVC-u Hardnose stair edgings can provide an ideal solution as channel and insert colours can be matched to contrast with the tread and riser.

\* These values have been determined using the CIE Y value, in accordance with BS 8493:2008+A1:2010.

❷ The profile dimensions stated are guidance only and other factors should be taken into consideration when specifying stair edgings such as step dimension and type and frequency of traffic. However, a large proportion of Gradus stair edgings fall between the dimensions stated, including the XT range.

❸ The XT range of stair edgings features a slip-resistant PVC insert that extends around the leading edge of the profile to ensure that foot contact is always made with the slip-resistant element of the stair edging, providing the ideal solution for reducing the risk of slips, trips and falls on stairs in line with BRE recommendations.

##### 10 Vertical movement

##### 10.1 Steps and stairs

##### 10.1.7 Surface materials

*The surface materials used for internal steps and stairs should be chosen to be easy to maintain and as slip-resistant as possible, especially if surfaces are likely to become wet due to location or use, or if spillage occurs.*

*NOTE 1 Advice and further references on slip resistance of surfaces are given in Annex C.*

*A choice of slip-resistant insert materials is available for all Gradus stair edgings. Xtra-grip and Xtra-grip Plus inserts have been specifically designed to reduce the risk of slip in internal wet areas or where spillages are likely to occur.*

### 10.1.6 Lighting

Each flight and landing of a stepped access route should be well illuminated, providing a clear distinction between each step and riser. The illuminance at tread level should be at least 100 lux.

Lighting that will cause glare (such as poorly located wall lights, spotlights, floodlights or low-level light sources) should be avoided.

Gradus provides a range of step and aisle lighting systems that in dark conditions, where light levels are below 100 lux on the step, will illuminate the edge of the step and provide a means of identifying the changes in level.

## Annex C Slip potential characteristics of treads, ramp surfaces and floor finishes

### C.2 Slip resistance

The following indices are used to indicate the slipperiness of surfaces:

a) pendulum test values (PTVs) obtained using a pendulum tester in line with BS 7976-2;

b) surface micro roughness (Rz) measurements using a stylus instrument in accordance with BS 1134.

Detailed information on assessing slip resistance, together with a table illustrating common surface materials and their dry and wet slip resistance values (SRV), also known as pendulum test values (PTV), can be found in BS 5395-1:2010, Clause 7.

NOTE Depending on the precise nature of the wearing surface, seemingly similar products made from the same material can be totally different in terms of their slip potential characteristics.

### C.4 Step nosings

Where slip resistance is required for nosings and treads, the slip resistance needs to be equivalent to that expected for level surfaces. A PTV greater than 36 is considered to be suitable, as pushing and turning are unlikely on stairs. On existing nosings, the slip resistance of step nosings are generally expressed by their Rz roughness value as PTV is difficult to measure. In such cases a roughness Rz value of 20 µm is considered to be suitable.

All Gradus stair edging inserts are tested for slip-resistance using the pendulum tester – all inserts have a low slip potential (inserts measured in dry conditions - PTV of >36; inserts measured in wet conditions – PTV of >36). All inserts are also tested for wear, surface roughness, chemical resistance and bacterial/fungal resistance (see page 143 for further details).

## The Building Regulations 2010 - Approved Document M

Approved documents are intended to provide guidance and much of the guidance in Approved Document M is based on BS 8300-2:2018. The main points relating to stair and stepped access in Approved Document M are shown below, with supporting recommendations by Gradus shown in blue text.

### Stepped Access

- 1.27 People with impaired sight risk tripping or losing their balance if there is no warning that steps provide a change in level.  
Use of a stair edging with LED lighting will make the steps highly visible when the ambient light levels are reduced.
- 1.29 Materials for treads should not present a slip hazard when the surface is wet.  
Gradus illuminated stair edgings are available with a range of slip-resistant inserts for interior use, both in dry conditions and where there is a risk of the steps becoming wet.
- 1.30 People should easily be able to appreciate where to place their feet by highlighting nosings and avoiding open risers.  
Use of a stair edging that contrasts with the surrounding tread/riser materials will help to clearly define the step edge in lit conditions. LED lighting will highlight the edge of the step when the general lighting is dimmed or off.  
If light levels in an area are low, people entering the area from a well lit area will find it very difficult to see steps that are not fitted with step lighting.  
Stair edging inserts should vary by 30 points in Light Reflectance Value (LRV) from the tread and riser materials, but less light will be reflected in low ambient light conditions, therefore the use of illuminated stair edgings will ensure the step remains visible when overhead lighting is dimmed or off.

Source: Building Regulations - Access to and use of buildings - Approved Document M - 2004 Edition incorporating 2010 and 2013.  
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## The colour, light and contrast manual

Keith Bright and Geoffrey Cook

Powered way-guidance systems include electroluminescent strips and tracks formed using miniature incandescent light-sources or LED's. Studies of powered way-guidance systems have shown that although they do not provide high illuminance in themselves, the contrast they provide with the surrounding area, and the fact they tend to delineate a route to be taken rather than a general area, mean they are generally preferred by all users, including those with poor vision. They also enhance the speed at which people escape from a space (Wright et al., 2001a).

There is also evidence to suggest that low-mounted way-guidance systems are often more effective than overhead emergency lighting in situations where smoke encroaches into the escape route (Cook et al., 1999b).







# Case Study

## Accessories

### Project: The Met, Bury



Leisure



“ The LED lighting system has helped to create a safe and inclusive environment for all building users. Gradus were able to offer a full project management service based on our specification needs and we’re very pleased with the result. ”

Fran Healy  
Project Manager for The Met Refurbishment

The Met is a Grade II listed independent arts and entertainment venue which has recently undergone a significant refurbishment.

As part of the refurbishment, Gradus’ ATD71L stair edgings incorporating blue LED Interlok Advance lighting were installed in the main theatre. This creates a pinpoint lighting effect across each step, helping to enhance the safety of the building by providing a clear edge when ascending and descending the staircase in darkened conditions.

The ATD71L illuminated stair edging comprises a hardwearing, aluminium channel with a 6mm gauge, and incorporates two PVC-u tubes that house the LED lighting and clip securely into the channel.

Step edge lighting is a very important feature for any theatre space. Low light levels, coupled with busy footfall, means there is an increased risk of slip and trip accidents on staircases. As a result, our LED lighting has helped provide The Met theatre with a solution that not only enhances the buildings safety, but is also in keeping with the theatres new, contemporary aesthetic.

#### Products Specified:

- ATD71L illuminated stair edging with blue Interlok Advance





# Product Index

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<b>Illuminated Stair Edgings</b> . . . . .	<b>11</b>	<b>Floor Trim Lighting Systems</b> . . . . .	<b>27</b>
AS1106L . . . . .	22	CL05/LB10 . . . . .	29
AT718L . . . . .	21	CLC11/TB45D . . . . .	30
ATD121L . . . . .	21	CLC13/TDB45 . . . . .	29
ATD71L . . . . .	20	CLC16/TDB45 . . . . .	29
ATF71L . . . . .	20	CLC20/TDB45 . . . . .	30
ATNG71L . . . . .	22	CLS13/LBS45 . . . . .	29
Continuity 12v DC LED Lighting System . . . . .	12	CLS16/LBS45 . . . . .	29
ELAF230 . . . . .	23	CLS20/LBS45 . . . . .	30
ELAF5150 . . . . .	23	DLA45 . . . . .	30
How to select the correct insert . . . . .	25		
Insert Colour Availability . . . . .	24	<b>Lighting Systems</b> . . . . .	<b>31</b>
Interlok Advance 12v DC LED Lighting System . . . . .	13	Continuity LED Linear Lighting System . . . . .	32-33
RNT1218L . . . . .	19	Decortape . . . . .	38
RNT718L . . . . .	19	LED Step Row Indicator . . . . .	36-37
RXT1218L . . . . .	18	Wall Lighting 12v or 24v DC LED System . . . . .	34-35
Step Lighting Effects . . . . .	14-15		
		<b>Power Supply Units</b> . . . . .	<b>39-40</b>
		<b>Technical Services / Specification Guidelines</b> . . . . .	<b>41</b>
		Specification Guidelines . . . . .	43-44
		Technical Services . . . . .	42
		<b>Case Study</b> . . . . .	<b>46-47</b>



# Other products in the Gradus range

[www.gradus.com](http://www.gradus.com)  
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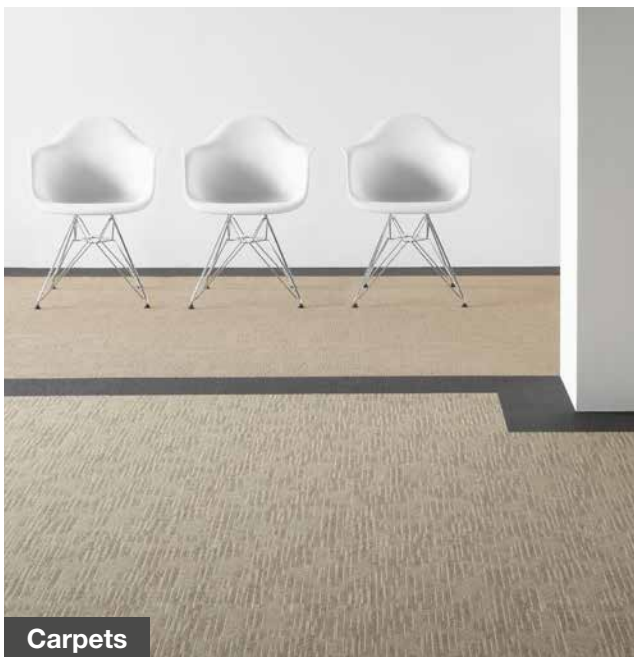
Wall Protection



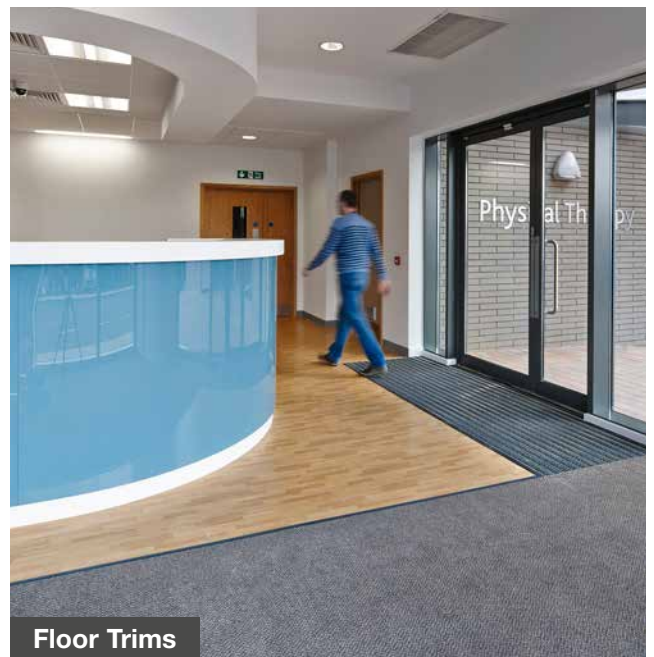
Stair Edgings



Barrier Matting



Carpets



Floor Trims

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