

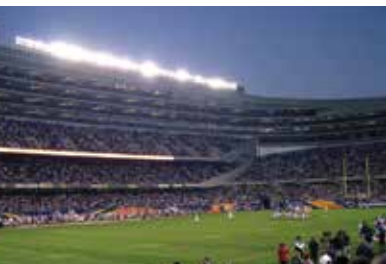


# IDH

**Cables Limited**

MADE IN IRELAND SINCE 1934

QUALITY  
APPROVED  
CABLES



IDH CABLES LIMITED

# GUARDIAN™

MECHANICALLY PROTECTED CABLES



The original BS-8436, IS-273 multifunctional, easy to install, “connect-and-protect” cable system

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## OVERVIEW

IDH Guardian™ is a new fixed cable concept that has been specifically developed against the ever-changing requirements and pressures placed upon the Electrical Services Engineer within the building service installation industry. IDH Guardian™ is manufactured under IDH's Quality System, which is certified by BASEC and LPCB, and is constructed with the latest Low Smoke Halogen Free technology. This new cable's performance standards include significant impact resistance and nail penetration capabilities which have been independently verified by the internationally recognised cables division of ERA Technology.

IDH Guardian™ is a very user friendly, easy to install lightweight cabling system. It is a robust yet pliable multi-purpose cable, which includes a full sized circuit protective conductor for electrical circuit protection. Amongst its many benefits, Guardian™ offers greatly reduced electrical interference through the use of an aluminium screen, which also gives the cable a good level of impact resistance.

The speed and ease of installation of Guardian™ is significantly improved when compared to traditional cabling systems, e.g. small armoured cables and cables within a conduit. Installation times can be reduced by as much as 40% compared to alternate systems and result in lower scrap rates and permits installation in tandem with data cables where EMI is a concern.

### RANGE OF AVAILABILITY

Guardian™ is available in 2, 3 and 4 cores, 1.0mm<sup>2</sup> to 6.0mm<sup>2</sup>, each having a circuit protective conductor (CPC) of equal cross sectional area to its respective phase conductor. Guardian™ is offered in white and black as standard, other colours available on request and can be supplied on 100m or 500m reels.

Changes in building design and construction practices has seen the use of thin partition walls. The latest wiring regulations in the UK 17th Edition of IEE Wiring Regulations clause 5226.5 and the Irish Wiring Regulations ET 101:2009 4th Edition clause 5226.3 and 5226.6 recognised these changes and now allow the use of metal screen cables such as Guardian™ where cables cannot be buried 50mm or more within such walls.

**IDH Guardian™ is a BASEC approved product.**

**Guardian™ sets new cable performance standards including improved impact resistance and nail penetration capabilities.**

**These capabilities have been independently verified by the internationally recognised cables division of ERA Technology.**



Canary Wharf, London



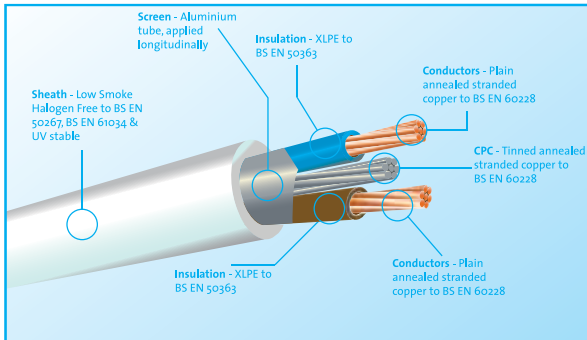
Millennium Dome, London



Burj Al Arab, Dubai

## CABLE CONSTRUCTION & STANDARDS

Guardian™ is manufactured under IDH's Quality Management BS EN ISO 9001–2008 System which is certified by BASEC and LPCB. Guardian™ Cables are BASEC approved to I.S. 273 – BS 8436.



<b>VOLTAGE GRADE:</b>	600/1000volts
<b>CORE COLOURS:</b>	2 core – Brown & Blue 3 core – Brown, Black & Grey 4 core – Blue, Brown, Black & Grey
<b>APPROVALS:</b>	BS EN 60332-1, IEC 60332-1
<b>PERFORMANCE STANDARDS</b>	
<b>SMOKE EMISSIONS:</b>	IEC 61034-2
<b>ACID GAS EMISSIONS:</b>	BS EN 50267-1-2
<b>FLAME RETARDANT:</b>	BS EN 60332-1, IEC 60332-1

## APPLICATIONS

IDH Guardian™ is suitable for a wide range of applications. These include:

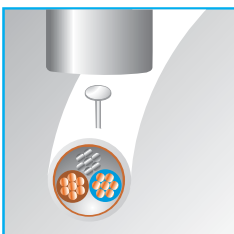
- Lighting and ring main small power wiring
- Outside lighting
- Perimeter and concourse lighting circuits
- Stadium floodlighting
- Air-conditioning
- Ventilation circuits and controls
- Computerised checkouts
- Call systems
- Data networks
- Landlords' services
- Motor fans
- Compressor supplies
- Signage supplies
- Sub-mains

## APPROVALS

IDH Guardian™ is approved by BASEC – British Approval Service for Cables

### Earthing capabilities of the screen under nail penetration test condition – The Nail Test

A sample of Guardian, 1m long, is connected to a 230V circuit, the cable screen earthing is left purely to its contact with the CPC and is not earthed directly. The circuit impedance is adjusted to achieve the prospective fault current required to operate at 40 amp type B MCB in 1 second.



A 40mm panel pin is driven into the live core. The fault current and the voltage is recorded. If the nail remains live after 1 second the cable will have failed the test. If failure occurs, the prospective fault current is reduced by 10% and the test repeated until the nail is shown not to be live after 1 second. The cable only passes if six consecutive samples pass the test and there are no failures at a given fault current.

The results have shown the screen on Guardian can withstand a fault current with over 200A, which is the fault current required to operate a 40 A Type B circuit breaker instantaneously.



The test used is the impact test called in the recognized BS 6387 standard, 'Performance requirements for cables required to maintain circuit integrity under fire conditions'. The requirement in this standard is that a fire performance cable should withstand a 500g weight dropped from 0.25 metres on to a chisel edged former resting on the cable. The cable then has to withstand 3.5kv for one minute, and the conductor is also continually checked after each test. A cable only passes when 10 consecutive samples pass the test.

Guardian passed these conditions and eventually reached the level of 1.0kg weight dropped from a height of 0.8m, at ambient temperature, thus exceeding the requirements of fire performance cables.

## CABLE CONSTRUCTION & STANDARDS

Guardian™ can help to save up to 40% on installation times when compared to traditional cables systems such as steel wire armored and steel conduit.

Ease and speed of installation including simple termination techniques

Reduced installation times when compared to traditional cabling systems

Pliable yet robust

Offers impact resistance, retains its shape when bent and dressed

### Technical Solutions

There are times when it is not possible or extremely difficult to use trunking or conduit as a means of offering cable protection as called up in BS7671, 'Requirements to Electrical Installations' – IEE Wiring Regulations – 17th Edition, e.g. low ceiling voids

Guardian by nature of its design can withstand a short circuit fault current – e.g. if a nail or screw accidentally penetrates the cable and a live phase conductor. It will successfully operate and 40A Type B current breaker, to BS EN 60898, instantaneously

Lightweight, up to 60% less weight and 20% less space required than traditional small armoured cables

Easy to handle and install, lighter cable tray could be used for multiple layers of cables.

Aluminium screen – EMI Shielded

Reduced electrical interference and compatible with EMC requirements. Can be laid in cable trays next to data cables

Can be installed with many surfaces and within different bulking structures

Flexible in the applications it can be used for

Full sized CPC

Compliance with BS7671 earthing requirements

Compatible with expanded Polystyrene thermal insulation

PVC-sheathed cables must be in a conduit when adjacent to Polystyrene

Under new wiring regulations Guardian screen cables can be installed in all locations in thin partition walls

There are restrictions on the location of PVC house wiring cables when used in thin partition walls

## TECHNICAL DATA

<b>MAXIMUM CONTINUOUS CONDUCTOR OPERATING TEMP:</b>	90°C
<b>MINIMUM INSTALLATION TEMPERATURE:</b>	-10°C
<b>MINIMUM BENDING RADIUS:</b>	6D, where D is the Nominal Cable Diameter

## PHYSICAL DATA

Area mm <sup>2</sup>	Conductor No. of Strands /mm	CPC No. of Strands /mm	Nominal Insulation Thickness mm	Nominal Cable Diameter mm			Approx. Weight of Cable kg/km		
				2 Core	3 Core	4 Core	2 Core	3 Core	4 Core
1.5	7 / 0.53	7 / 0.53	0.7	9.6	10.2	11.0	105	140	160
2.5	7 / 0.67	7 / 0.67	0.8	10.7	11.0	13.2	137	184	258
4.0	7 / 0.85	7 / 0.85	0.8	11.0	13.2	13.8	209	267	320
6.0	7 / 1.04	7 / 1.04	0.8	13.2	14.2	15.7	260	330	433

## ELECTRICAL DATA

Area mm <sup>2</sup>	Maximum DC Resistance ohm/km@20°C	Nominal AC Resistance ohm/km@90°C at 50Hz	Inductive Reactance ohm/km@Hz	Maximum Continuous Conductor Operating Temperature °C	Short Circuit Rating in kA for 1 second*
1.5	12.1	15.3	0.100	90	0.21
2.5	7.41	9.43	0.097	90	0.35
4.0	4.61	5.86	0.092	90	0.57
6.0	3.08	3.93	0.088	90	0.85

\*Based on a K value of 143, taken from BS7671 Table 43A. For short circuit durations of other than 1 second, divide the tabulated rating by  $\sqrt{t}$  where t is the duration in seconds. This calculation is valid for values of t between 0.2 and 5 seconds.

## TEMPERATURE CORRECTING FACTORS

Correction for ambient temperature

Ambient Temperature °C	25	35	40	45	50	55	60	65	70	75	80	85
Fuse to BS88 or BS1361 or circuit breakers to BS3871 or BS60898	1.02	0.96	0.91	0.87	0.82	0.76	0.71	0.65	0.58	0.50	0.41	0.29
Semi-enclosed fuse to BS3036	1.02	0.98	0.95	0.93	0.91	0.89	0.87	0.85	0.79	0.69	0.56	0.39

## Correction for grouping

No. of cables	2	3	4	5	6	8	10	12
Clipped direct	0.80	0.70	0.65	0.60	0.57	0.52	0.48	0.45
On cable tray	0.86	0.81	0.77	0.75	0.74	0.73	0.71	0.70

## CURRENT RATINGS

Ambient temperature at 30°C, conductor operating temperature 90°C as BS7671 *Clipped direct - ref method C*

Area mm <sup>2</sup>	Two core cable, single phase AC or DC		Three or four core cable, three phase AC	
	Current Rating amp	Volt drop mV/amp/meter	Current Rating amp	Volt drop mV per amp per metre
1.5	24	31	22	27
2.5	33	19	30	16
4.0	45	12	40	10
6.0	58	7.9	52	6.8

## On cable tray - ref method E

Area mm <sup>2</sup>	Two core cable, single phase AC or DC		Three or four core cable, three phase AC	
	Current Rating amp	Volt drop mV/amp/meter	Current Rating amp	Volt drop mV per amp per metre
1.5	26	31	23	27
2.5	36	19	32	16
4.0	49	12	42	10
6.0	63	7.9	54	6.8

The above current ratings are based on a 'single circuit' in accordance with IEE Wiring Regulations BS7671, Table 4E2A. Where a conductor operates at a temperature exceeding 70°C it shall be ascertained that the equipment connected to the conductors is suitable for the conductor operating temperature, (BS7671, reg 512-02). The above tabulated current ratings should be multiplied by the rating factor (0.8) when conductor operating temperature has not to exceed a recommended terminal temperature of 70°C.



## INSTALLATION GUIDELINES

### TERMINATION

Guardian™ can be simply terminated by scoring the outer sheath and with slightly bending at the score point the sheath and bonded aluminium screen will separate and pull away. The insulated cores can then be stripped. IDH recommends using standard low smoke halogen free or brass glands of a relevant IP rating for the applications. For totally dry conditions ordinary grommets can be used as an entry into fittings, complying with IEE regulations BS7671, 523-21.

### FITTING AND FIXINGS

Guardian can be fixed by using standard cable fixing systems. It is recommended that installation of Guardian be in accordance to BS7671.

## PROJECTS

Guardian has been used in a number of prestigious projects in the United Kingdom and Ireland. These include:

**Savoy Hotel, London** – *Hotel refurbishment*

**Lansdowne House offices, Dublin** – *Third and fourth floor refurbishment. Applications: Final circuits, lighting and general utilities*

**Hull Royal Hospital, Kingston-Upon-Hull** – *Applications: General power circuits in clinics. Required screen cable to be used within the Special Strokes Unit and Gamma Camera Suite*

**Galway Clinic, Cancer Care Unit, Galway** – *For use in the highly sensitive radiological department*

**Marks & Spencer, various locations in the UK** – *General circuit data sensitive drop down to check-outs etc*

**Castle Hill Hospital, East Yorkshire** – *Applications: General power circuits*

**Benetton Retail Outlets, Brent Cross & Birmingham**

**Leisure And Indoor Sports Centres** – *Applications: General utilities. Purple cable to signify Low Smoke Halogen Free sheaths*

## OTHER IDH PRODUCTS



**KILFLAM™**  
FIRE RESISTANT CABLES

KILFLAM HIGH PERFORMANCE FIRE RESISTANT CABLES

Single core conduit wire and multi-core cables available in Standard and Enhanced grades.



**FUMEGUARD™**  
LOW SMOKE HALOGEN FREE CABLES

FUMEGUARD LOW SMOKE HALOGEN FREE CABLES

Low and medium voltage cables



**PVC CABLES™**  
INSULATED PVC CABLES

PVC CABLES

Standard, heat resisting and low temperature types



*Soldier Field Stadium in Chicago, the Savoy Hotel London, the Dubai Metro and the Galway Clinic in Ireland – just some of the projects that have chosen IDH Cables.*

**All our cables are manufactured with materials which are compliant with RoHS and WEEE directives.**

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**RoHS**