

# دوكاب Ducab

## الكابلات FlamBICC FlamBICC Cables



حلول متقدمة للكابلات من خلال التقنية والابداع  
Advanced Cable Solutions Through Technology and Innovation

**BICC**

# CONTENTS

Page

Introduction ..... 1

Customer Service..... 2

BS codes of practice BS 8519 ..... 5

Fire Performance Cable Selection Guide ..... 7

FlamBICC Introduction ..... 8

FlamBICC 1.....10

FlamBICC 2.....12

FlamBICC 3.....14

FlamBICC 4.....16

FlamBICC 6.....21

Areas of application for Fire Resistant Cables.....24

## INTRODUCTION

Established in 1979, Ducab is the leading cable manufacturing company in the region and is equally owned by the Governments of Dubai and Abu Dhabi. Ducab has 3 manufacturing sites and 6 independent manufacturing facilities that support its continuous growth, one in Jebel Ali and two in Abu Dhabi Industrial City. Ducab-HV, inaugurated in November 2011, is a joint venture between Ducab, ADWEA and DEWA offering High Voltage cable systems up to 400 kV. Ducab-HV will sell cable systems in the voltage range 66kV (66,000 Volts) to 400 kV (400,000 Volts) covering the highest voltage currently used in the GCC.

To meet the growing demand of customers around the region and the world, Ducab continues to expand its world-class facilities across the Middle East, North Africa, Europe, Australia and India. Ducab prides itself on setting and maintaining the highest quality standards of power cables. Experienced and highly skilled employees operate state-of-the-art equipment, and conduct extensive testing at every phase of production.

When it comes to advanced cable solutions, Ducab continues its status as the superbrand across the world in 40 countries. Ducab product range covers High Voltage cables up to 400 kV, Ducab Powerplus Medium Voltage cables up to 33 kV, Low Voltage power cables, Control & Auxiliary, Wiring and Lead-Sheathed cables, Ducab Smokemaster - Low Smoke Zero Halogen (LSZH) Cables, THHN/THWN cables, Instrumentation and Pilot cables, Cable components and cable accessories, Installation of cables, as well as Copper rod manufactured in Ducab's own Copper rod plant.

This catalogue provides working information on FlamBICC (Fire Resistant Cables) . Separate catalogues are available for the remaining range of Ducab Cables.

## ORDERING ADVICE

Due to the wide range of cables in the catalogue, it is advisable, when ordering, to provide as much information as possible. Please use the following table as a guide:

1. Cable standard / specification number.
2. Voltage designation.
3. Number of cores.
4. Conductor size.
5. Fire test requirements
6. Colour of outer sheath/ Core colours.
7. Length of cables required and individual drum lengths.\*
8. Any other special requirement, any additional requirement, drum weight limitation, etc.

\* Cables are normally supplied in lengths of 100 metres, 500 metres and 1000 metres depending on conductor size. Other lengths can be supplied if required.

## TECHNICAL ADVISORY SERVICE

For any specialist advice and assistance on the entire Ducab product range contact the Technical Department, Dubai Cable Company (Private) Limited, P. O. Box 11529, Dubai, U. A. E., Tel: 971 4 815 8888, Fax: 971 4 815 8111.

## CUSTOMER SERVICE

Ducab is the premier cable manufacturer in the United Arab Emirates and, since 1979, has been meeting the requirements of customers throughout the GCC, Middle East and Asian markets. Ducab cables are preferred for the following reasons:

### PRODUCT QUALITY



Ducab is committed to supplying its customers with the highest quality of product and of service. Ducab's cables have been type approved by recognized certifying bodies such as BASEC UK (British Approval Service for Cables), Lloyd's Register of the UK, KEMA Netherland, LPCB UK ( Loss Prevention Certification Board), ESMA (Emirates Authority for standardization and Metrology). They fully conform to BS, IEC other international and national specifications.

In addition, Ducab was presented with the Dubai Quality Award 1994, for the best local industrial company of the year. Ducab won Dubai Quality Gold Category award twice, in 1998 and in 2004. The Gold Award rewards the most distinguished companies which are judged to be world class and Ducab is the only manufacturing company in the region to win such acclaim.

Ducab has won the Sheikh Mohammed Bin Rashid Al Maktoum (MRM) Business Excellence Award in manufacturing category in 2009. Recognizing quality products and services, Ducab has also won the Superbrand award for 4 years consecutively from 2009.

### RELIABILITY

Specifying the right cable for a particular application is the first step. The key to reliability however, is in the manufacturing process. The cable must be free from material and manufacturing defects, and weaknesses that will be revealed in service.

Ducab constantly monitors its manufacturing processes and operates stringent quality assurance procedures to give long term reliability. This is of vital significance where cables are to be installed in locations where future access would be difficult and this is where Ducab's reputation and resources give peace of mind.

### PERFORMANCE

Optimum cable performance can be provided only by a company such as Ducab, with access to the latest developments in materials technology. In addition, Ducab's knowledge of application requirements throughout the Middle and Far East is an assurance of high performance.

Our experienced Technical Staff can provide guidance on cable selection and installation and can ensure that you get the right cable for the job.

## HEALTH & SAFETY MANAGEMENT SYSTEM CERTIFIED TO OHSAS 18001



Ducab is able to maintain a close watch on world developments in cable technology and regulations and therefore ensure that its products are designed and constructed to be hazard-free under the prescribed conditions of use.



Ducab uses only tried and tested materials and processes in full compliance with all relevant British and International Standards. Our cables are therefore manufactured for safe use without risk to health on the understanding that users will exercise the same degree of care in their selection and application.

Safety is an important issue for Ducab, and the strictest standards are adhered to throughout the company. Ducab is proud of its safety record and has been awarded RoSPA (Royal Society for the Prevention of Accidents) Gold Awards for safety from 1991 to 1999. From 2000 onward, Ducab was awarded the prestigious President's Award for Health and Safety which is a recognition of Ducab winning 10 consecutive annual Gold awards and acknowledges Ducab's total commitment to health and safety. In 2002, Ducab was declared the joint winner of the Manufacturing Industry Sector Award from RoSPA.

Ducab is the first organisation in the Middle East to receive accreditation to OHSAS 18001 by BASEC (British Approvals Service for Cables). Certification to OHSAS 18001 provides a recognisable Occupational Health and Safety Management standard against which an organisation's management systems can be assessed and certified. Based on the structure of OHSAS 18001, the standard requires continual improvement in health and safety related activities.

## QUALITY MANAGEMENT SYSTEM CERTIFIED TO ISO 9001



Ducab's Quality Management System conforms to the ISO 9001 International Quality System Standard and is certified by BASEC (British Approvals Service for Cables), a specialist certifying body for cables who are an internationally recognised quality authority accredited in the UK and throughout the world.

Certification to the ISO 9001 International standard demonstrates that Ducab has drawn up written procedures to ensure full compliance with all requirements of the standard and that these procedures are followed by every department in the company, thus ensuring that goods leaving Ducab's factory are of the highest quality and meet each customer's requirements in every respect.

Ducab is particularly proud to have achieved certification to the stringent ISO 9001 standard as it is an independent conformation that the company designs, manufactures and tests cables consistently to accepted standards. ISO 9001 is widely used throughout Europe, and is therefore a reassurance to Ducab's customers that the products and service supplied by the company are equal to the best in the world.

## ENVIRONMENTAL MANAGEMENT SYSTEM CERTIFIED TO ISO 14001



Ducab's Environmental Management System conforms to the ISO 14001 International Environmental Management Standard and is certified by BASEC who are an internationally recognised certifying authority accredited in the UK and throughout Europe.

Certification to the ISO 14001 International standard shows that Ducab has a well defined structure and established working practices aimed at limiting its impact on the environment. Measurement and monitoring of effects, issuing work instructions, training of personnel and taking corrective actions are all essential elements to limiting the impact on the environment. Ducab has set improvement targets to reduce the significant environmental impacts associated with its activities.

Ducab is proud to be the first cable manufacturer in the region to achieve certification to ISO 14001 and this certification along with its quality, business success and safety record demonstrates that Ducab is a world class organisation and can hold its head up to any business community throughout the world.

### BASEC CERTIFICATION

Ducab is also proud to hold a Process capability certification issued by BASEC (British Approvals Service for Cables) for several cables in its product range.

### DUCAB SHAREEK

Ducab's customer satisfaction programme is designed to ensure that customers receive a consistently high level of service from Ducab's dedicated staff.



## APPROVAL CERTIFICATES



## Complete Fire Safety Solutions

### BS CODES OF PRACTICE BS 8519

**BS 8519 provides recommendations for the selection and installation of fire resistant power and control system cables for life safety and fire fighting applications.**

BS 8519 is full revision of BS 7346-6, the code of practice for smoke and heat control systems (which is now withdrawn) and provides a more comprehensive coverage of fire engineering systems. It highlights various factors to be considered by engineers while designing systems and selecting cables to meet appropriate life safety and fire fighting objectives.

In the standard BS 8519, cables are classified suitable for LS (Life Safety) and FF (Fire Fighting) system. It separates cables in three categories.

**Category 1: 30 minutes fire survival**

**Category 2: 60 minutes fire survival**

**Category 3: 120 minutes fire survival**

In general Life Safety system cables are required to have fire survival time of 30 minutes for single stage evacuation and 60 minutes in case of phased evacuation. The cables for these systems would include fire protection systems, smoke ventilator system etc.

All Fire Fighting systems are required to function for 120 minutes. Cables for these systems would aid fire fighters in carrying their role and shall include SHEVS (Smoke & Heat Exhaust Ventilation System), smoke curtains, sprinkler system and fire-fighting lift.

#### **BS 8519 covers information on:**

- Fire survival times
- Power Supplies
- Dual circuits/diverse routes
- Fire protective enclosures
- Automatic change over devices
- Motor control panels
- Cable selection
- Fire protective enclosures for cables
- Effects of fire temperature on cable size
- Use of circuit protective conductors (CPCs)
- Cable Installation Practice
- Cable support systems
- Inverters
- Multizoned smoke ventilation systems
- Junction boxes
- Areas of special fire risk



As can be noted, BS 8519 contains mainly six different categories of cables, three each for power and control cables depending upon escape / survival times of 30, 60 or 120 minutes . The table below will simplify the task of cable selection from DUCAB range of products.

## CATEGORIES OF CABLE AS SPECIFIED IN BS 8519

			Applicable fire test	Applicable product
Life Safety (LS)	LS 30 mins	Category 1 Power	BS 8491 30 min	FlamBICC 6
		Category 1 Control	BS EN 50200 PH30 & 30 mins annex E	FlamBICC 4, FlamBICC 2
	LS 60 mins	Category 2 Power	BS 8491 60 min	FlamBICC 6
		Category 2 Control	BS EN 50200 PH60 & 120 mins to BS 8434-2	FlamBICC 4
Fire Fighting (FF)	FF 120 mins	Category 3 Power	BS 8491 120 mins	FlamBICC 6
		Category 3 Control	BS EN 50200 Ph120 & BS 8591 annex B	FlamBICC 4





## Fire Performance Cable Selection Guide

		FlamBICC 2	FlamBICC 1	FlamBICC 3	FlamBICC 4	FlamBICC 6
<b>Codes of Practice</b>						
Emergency Lighting	BS 5266 Emergency Lighting cable	√			√	√
	BS5266 Enhanced Emergency Lighting cable				√	√
	BS 5266 Emergency Lighting cable system	√	√	√	√	√
	BS 5266 Enhanced Emergency Lighting cable system	√	√	√	√	√
Fire Alarm	BS 5839 Standard Grade	√			√	√
	BS 5839 Enhanced Grade				√	√
Smoke, Heat & Exhaust Ventilation System (SHEVS)	BS 8519					√
Power and Control	BS 8519 Catagory 1 Control	√			√	√
	BS 8519 Catagory 2 Control				√	√
	BS 8519 Catagory 3 Control				√	√
	BS 8519 Catagory 1 Power					√
	BS 8519 Catagory 2 Power					√
	BS 8519 Catagory 3 Power					√
General	BS 9999					√
<b>Manufacturing Standards</b>						
	BS 7629	√				
	BS 7846				√	√
<b>Fire Resistance Tests</b>						
	BS 6387 C W & Z	√	√	√	√	√
	BS EN 50200 PH30	√			√	√
	BS EN 50200 PH60	√			√	√
	BS EN 50200 PH120	√			√	√
	BS 8434-2				√	√
	BS 7846 F2				√	√
	BS 7846 F30, F60, F120					√
	BS 8491					√
	IEC 60331	√	√	√	√	√
<b>Fire Reaction Tests</b>						
Low Smoke Zero Halogen (LSZH)	BS EN 50267, (IEC 60754) BS EN 50268, (IEC 61034)		√	√	√	√



## INTRODUCTION

Ducab FlamBICC cables are special fire resistant cables designed to survive and operate during fire conditions. In order to suit different application requirements Ducab offers FlamBICC cables in the following range,

**FlamBICC 1:** These are single core Fire Resistant cables with XL-LSZH insulation to meet C-W-Z test as per BS 6387 for small sizes and IEC 60331 for large sizes.

**FlamBICC 2:** These are screened cables designed as per BS 7629 and are mainly used in fire detection, voice alarm, emergency lighting etc.

**FlamBICC 3:** These are single and multicore Fire Resistant cables with insulation and sheath to meet C-W-Z test as per BS 6387 for small sizes and IEC 60331 for large sizes.

**FlamBICC 4:** These are multi-core armoured cables designed as per BS 7846 with steel wire armour construction to meet category F2 fire test (C-W-Z test as per BS 6387)

**FlamBICC 6:** These are multi-core armoured cables designed as per BS 7846 with steel wire armour construction to meet category F120 fire test as per BS 8491. During F120 fire test direct mechanical impact and water jet is provided on the cable during fire test.

The selection of FlamBICC cables needs to be done in accordance with BS 5839 Part 1 and BS 8519 which lay down the selection and installation criterion for fire resistant cables.

For detailed product description and characteristics, reference can be made to the respective FlamBICC product data in this catalog. As a responsible organisation, all the FlamBICC range products from Ducab are designed with Low Smoke and Zero Halogen (LSZH / LSHF / LSOH) feature. Thus in the event of fire, the FlamBICC cable shall not emit heavy smoke or toxic halogen gases. The low smoke generation gives better visibility in a fire situation aiding the rescue operation and enabling the EXIT path to be seen clearly for escape. As there is no halogen or acidic gas emission during burning of the cable, the sensitive equipment in the surrounding areas are not affected adversely.



BS 6387 fire testing in progress at Ducab



IEC 60332-3 fire test

Fire Test after 6 minutes



PVC Cable



Ducab Smokemaster cable

Ducab range of FlamBICC cable is a highly sophisticated product for use in special application. There are various areas of application for Fire Resistant cables, which include:

- Areas where people will remain in occupation for short time eg. schools, shopping malls, mass transit systems like metro stations etc.
- Services where circuit integrity is very important under fire conditions eg. special equipment in hospital
- Essential safety circuit eg. fire detection, fire alarm, voice alarm etc.
- Power supply to equipment used in fire-fighting eg. sprinkler pumps
- In large buildings where fire strategy involves evacuation of occupants in phased manner.

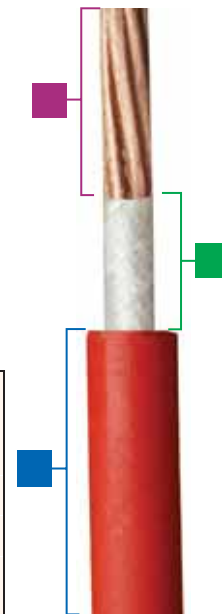


## FLAMBICC 1

These are single core fire resistant cables with approval from Loss Prevention Certification Board (LPCB), UK for use in emergency safety circuits to maintain circuit integrity under fire conditions.

### CONSTRUCTION

- Copper conductor: Plain annealed stranded class 2 conductor to BS EN 60228
- Primary Insulation: Mica Glass tape
- Secondary Insulation: Extruded XL-LSZH compound



### CHARACTERISTICS

General:	Ducab FlamBICC 1 cables are designed for laying in conduit or in cable trunking where fire resistance is of paramount importance.
Approvals:	LPCB approved
Voltage grade:	600 / 1000 V
Fire resistance:	C-W-Z test as per BS 6387 for small sizes and IEC 60331-21 for large sizes which cannot fit in a conduit. Cables comply IEC 60331-21 fire test at increased temperature of 950°C which is higher than that specified by the standard.
Acid gas emission:	Less than 0.5% when tested to IEC 60754 & BS EN 50267
Low smoke emission:	As per IEC 61034 & BS EN 50268
Cable Operating temperature:	Maximum 90°C
Short circuit temperature	Maximum 250°C
Bending radius:	6 x Cable diameter

### CORE IDENTIFICATIONS

Green/Yellow		Black	
Blue		Gray	
Red		White	
Brown			





## TECHNICAL DATA

Technical data for Ducab Fire Resistant Single Core Cables with stranded copper conductors

600 / 1000 V

Nominal conductor area	Approximate overall diameter	Approximate cable weight	Maximum conductor resistance at 20°C	Current rating (1Ø AC)	Current rating (3Ø AC)	Voltage drop (1Ø AC)	Voltage drop (3Ø AC)
mm <sup>2</sup>	mm	kg/km	Ohm/km	Amp	Amp	mV/A/m	mV/A/m
1.5	5.5	45	12.1	23	20	31	27
2.5	5.9	60	7.41	31	28	19	16
4	6.4	75	4.61	42	37	12	10
6	7	95	3.08	54	48	7.86	6.81
10	7.9	140	1.83	75	66	4.67	4.05
16	8.8	200	1.15	100	88	2.94	2.55
25	10.7	300	0.727	133	117	1.86	1.61
35	11.8	395	0.524	164	144	1.35	1.17
50	13.1	520	0.387	198	175	1	0.87
70	15	725	0.268	253	222	0.70	0.61
95	16.7	975	0.193	306	269	0.52	0.45
120	18.4	1210	0.153	354	312	0.42	0.37
150	20.5	1485	0.124	393	342	0.36	0.31
185	22.6	1850	0.0991	449	384	0.30	0.26
240	25.2	2400	0.0754	528	450	0.25	0.22
300	28.1	2990	0.0601	603	514	0.22	0.19
400	31	3765	0.047	683	584	0.20	0.17
500	34.6	4900	0.0366	783	666	0.18	0.16
630	39.4	6180	0.0283	900	764	0.17	0.15

Current rating based on installation "enclosed in conduit on a wall or in trunking" in line with BS 7671 (IEE Wiring Regulations)

**Laying condition:** 30°C ambient temperature & 90°C operating temperature. For other ambient temperatures appropriate rating factors should be applied.

## TEMPERATURE RATING FACTORS

Ambient Temperature in °C	25	30	35	40	45	50	55	60
Rating factor	1.02	1	0.96	0.91	0.87	0.82	0.76	0.71

## CORRECTION FACTORS FOR GROUPING

No of Tables in a group	2	3	4	5	6	7	8	9
Rating factor	0.8	0.7	0.65	0.6	0.57	0.54	0.52	0.5



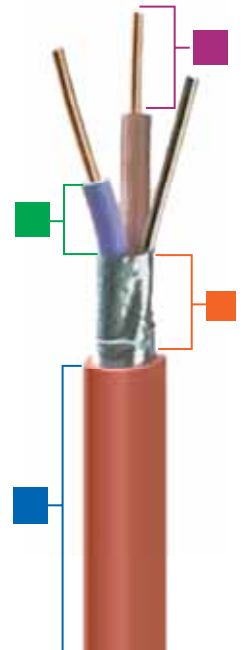


## FLAMBICC 2

These are pliable Fire Resistant screened cables having low emission of smoke and corrosive gases when affected by fire which are designed to meet fire resistance test of BSEN 50200 : 2000 Class PH30.

## CONSTRUCTION

- **Conductor:** Plain annealed copper conductor complying with BS EN 60228, class 1 or class 2
- **Insulation:** Special insulation to meet fire resistance characteristics
- **Screen:** Laminated Aluminium tape screen in contact with full size tinned annealed copper circuit protective conductor
- **Sheath:** Robust LSZH (LSHF / LSOH) sheath



## CHARACTERISTICS

General:	Ducab FlamBICC 2 are screened cables designed as per BS 7629 for applications requiring 'standard' fire resistance.
Approval:	LPCB Approval to BS 7629-1, BS 5839-1 and BS EN 50200 Class PH30
Voltage grade:	300 / 500 V
Fire resistance:	Class PH30 of BS EN 50200. Meets requirement of 'standard' fire resistant cable as per BS 5839-1.
Acid gas emission:	Less than 0.5% when tested to IEC 60754 & BS EN 50267
Low smoke emission:	As per IEC 61034 & BS EN 50268
Cable Operating temperature:	Maximum 90°C
Short circuit temperature	Maximum 250°C
Colours	White or Red sheath are standard, other colours available on request.
Packaging	100 meter reels: Other packaging and lengths available on request
Key Applications	The use of cables with 'standard' fire resistance is recommended for general use for fire detection, voice alarm, addressable system and emergency lighting
Salient features	Highly durable, easy to terminate



















We can offer the cables with new as well as old core colour code as mentioned in next page.

## TECHNICAL DATA

300 / 500 V

No. of Cores	Conductor Area (mm <sup>2</sup> )	No. of Wires	Nom Diameter of Conductor / wire (mm)	Nom Insulation Thickness (mm)	Nom O.D. (mm)	Min Bending Radius (mm)	Approx Cable Weight (kg/km)	Max Conductor Resistance 20° C (ohm/km)	Max Conductor Resistance 70° C (ohm/km)	Approx Capacitance (Adjacent Cores) (pF/km)	Approx Capacitance (Core to Screen) (pF/km)
2	1	1	1.13	0.6	8.05	50	79.8	18.1	21.7	85	170
2	1.5	1	1.37	0.7	8.4	60	98.3	12.1	14.5	95	180
2	2.5	7	0.67	0.8	10.05	70	146.4	7.41	8.8	100	190
2	4	7	0.85	0.8	11.4	80	213.5	4.61	5.5	100	190
3	1	1	1.13	0.6	8.55	60	93.6	18.1	21.7	85	170
3	1.5	1	1.37	0.7	9.15	70	121	12.1	14.5	95	180
3	2.5	7	0.67	0.8	11.15	80	178.8	7.41	8.8	100	190
4	1	1	1.13	0.6	9.2	60	120.1	18.1	21.7	85	170
4	1.5	1	1.37	0.7	10.2	70	148.2	12.1	14.5	95	180
4	2.5	7	0.67	0.8	11.65	80	210.7	7.41	8.8	100	190

## CORE IDENTIFICATIONS

CORE IDENTIFICATIONS NEW				CORE IDENTIFICATIONS OLD					
2 CORE				2 CORE					
	Brown	Blue			Red	Black			
3 CORE				3 CORE					
	Brown	Black	Grey		Red	Yellow	Blue		
4 CORE					4 CORE				
	Blue	Brown	Black	Grey		Red	Yellow	Blue	Black

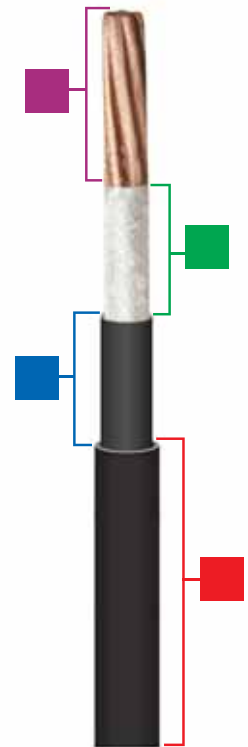
## DUCAB FLAMBICC 3

Ducab FlamBICC 3 cables are single and multicore Fire Resistant cables with insulation and sheath to meet C-W-Z test as per BS 6387 for small sizes and IEC 60331 for large sizes

The single core cables are approved by Loss Prevention Certification Board (LPCB), UK for use in emergency safety circuits to maintain circuit integrity under fire conditions.

## CONSTRUCTION



- **Copper Conductor:** Plain annealed stranded class 2 conductor to BS EN 60228
- **Primary Insulation:** Mica Glass tape
- **Secondary Insulation:** Extruded XLPE/XL-LSZH compound
- **Outer Sheath:** LSOH compound



## CHARACTERISTICS

General:	Ducab FlamBICC 3 cables are designed for laying in conduit or on trays where fire resistance is of paramount importance.
Approvals:	LPCB approved for single core cables
Voltage grade:	600 / 1000 V
Fire resistance:	C-W-Z test as per BS 6387 for small sizes and IEC 60331-21 for large sizes which cannot fit in a conduit. Cables comply IEC 60331-21 fire test at increased temperature of 950°C which is higher than that specified by the standard.
Acid gas emission:	Less than 0.5% when tested to IEC 60754 & BS EN 50267
Low smoke emission:	As per IEC 61034 & BS EN 50268
Cable Operating temperature:	Maximum 90°C
Short circuit temperature	Maximum 250°C
Bending radius:	6 x Cable diameter

## CORE IDENTIFICATIONS

<p><b>STANDARD:</b></p>  <p>Black (Other colours as per request)</p>	<p><b>SHEATH COLOUR:</b></p>  <p>Black (Other colours as per request)</p>
---	--



## TECHNICAL DATA

Technical data for DUCAB fire resistant Single Core Sheathed Cables with stranded copper conductors

600/1000 V

Nominal conductor area	Approximate overall diameter	Approximate cable weight	Maximum conductor resistance at 20°C	Current rating (1ø AC) Clipped direct	Current rating (3ø AC) In air	Voltage drop (1ø AC)	Voltage drop (3ø AC) In trefoil
mm <sup>2</sup>	mm	kg/km	Ohm/km	Amp	Amp	mV/A/m	mV/A/m
1.5	5.5	45	12.1	25	--	31	27
2.5	5.9	60	7.41	34	--	19	16
4	6.4	75	4.61	46	--	12	10
6	7.0	95	3.08	59	--	7.9	6.8
10	7.9	140	1.83	81	--	4.7	4
16	8.8	200	1.15	109	--	2.9	2.5
25	10.7	300	0.727	143	135	1.85	1.6
35	11.8	395	0.524	176	169	1.35	1.15
50	13.1	520	0.387	228	207	1	0.87
70	15.0	725	0.268	293	268	0.71	0.61
95	16.7	975	0.193	355	328	0.52	0.45
120	18.4	1210	0.153	413	383	0.43	0.37
150	20.5	1485	0.124	476	444	0.36	0.31
185	22.6	1850	0.0991	545	510	0.3	0.26
240	25.2	2400	0.0754	644	607	0.25	0.22
300	28.1	2990	0.0601	743	703	0.22	0.195
400	31.0	3765	0.047	868	823	0.2	0.175
500	34.6	4900	0.0366	990	946	0.185	0.16
630	39.4	6180	0.0283	1130	1088	0.175	0.15

Current rating based on installation "enclosed in conduit on a wall or in trunking" in line with BS 7671 (IEE Wiring Regulations)

### Laying condition:

30°C ambient temperature & 90°C operating temperature.

For other ambient temperatures appropriate rating factors should be applied.

## TEMPERATURE RATING FACTORS

Ambient Temperature in °C	25	30	35	40	45	50	55	60
Rating factor	1.02	1.00	0.96	0.91	0.87	0.82	0.76	0.71

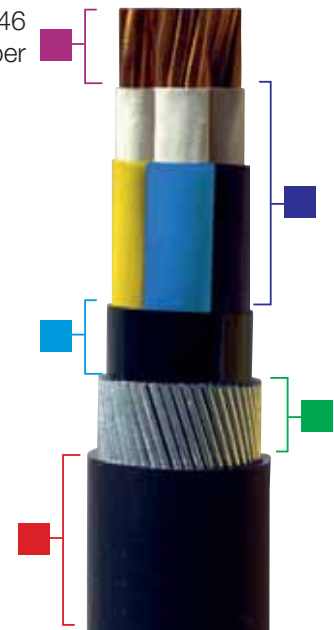


## DUCAB FLAMBICC 4

Ducab FlamBICC 4 cables are multi-core armoured cables designed as per BS 7846 with steel wire armour construction to meet category F2 fire test (C-W-Z test as per BS 6387).

### CONSTRUCTION

- **Conductor:** Plain annealed Copper, stranded class 2 conductor to BS EN 60228
- **Dual Insulation:** Special grade of Mica Glass tape + XLPE
- **Bedding:** LSZH
- **Armour:** Galvanised steel wire armoured
- **Outer Sheath:** Robust LSZH sheath with Black colour as standard, other colours upon request



### CHARACTERISTICS

General:	Ducab FlamBICC 4 are armoured cables designed as per BS 7846 to meet C-W-Z fire test as per BS 6387.
Approvals:	LPCB and BASEC approved for 2, 3 and 4 core cable designs
Voltage grade:	600 / 1000 V
Fire resistance:	C-W-Z test as per BS 6387
Flame propagation:	BS EN / IEC 60332-1 and BS EN / IEC 60332-3 Categories A, B & C
Acid gas emission:	Less than 0.5% when tested to IEC 60754 & BS EN 50267
Low smoke emission:	As per IEC 61034 & BS EN 50268
Cable operating temperature:	Maximum 90°C
Short circuit temperature	Maximum 250°C
Bending radius:	6 x Cable diameter for circular and 8 x Cable diameter for sector shaped cables

### CORE IDENTIFICATIONS

STANDARD				ALTERNATIVE*			
Red	Black			Brown	Blue		
Red	Yellow	Blue		Brown	Black	Grey	
Red	Yellow	Blue	Black	Blue	Brown	Black	Grey



## 2 Core Cables

Fire resistant cables. Two Core Armoured Cables 600/1000 V Grade with stranded copper conductors (BS 7846)

Nominal conductor area	Approximate Diameter			Approximate cable weight	Maximum conductor resistance at 20°C	Maximum armour resistance at 20°C	Current rating on perforated cable trays / free air	Voltage drop (1φ AC)
	Under armour	Over armour	Overall diameter					
mm <sup>2</sup>	mm	mm	mm	kg/km	Ohm/km	Ohm/km	Amp	mV/A/m
<b>600/1000 V Copper power and control cables</b>								
1.5*	8.7	10.5	12.4	315	12.1	10.2	29	31
2.5*	9.9	11.7	13.8	385	7.41	8.8	39	19
4*	11.1	12.9	15.0	460	4.61	7.9	52	12
6*	12.1	13.9	16.0	535	3.08	7.0	66	7.9
10*	13.9	15.7	18.0	690	1.83	6.0	90	4.7
16*	15.7	18.2	20.5	920	1.15	3.7	115	2.9
25*	19.7	22.2	24.7	1270	0.727	3.7	152	1.9
35*	21.9	25.1	27.8	1720	0.524	2.6	188	1.35
50	19.5	22.6	25.4	1810	0.387	2.3	228	1
70	22.1	25.2	28.2	2305	0.268	2.0	291	0.69
95	24.5	28.4	31.6	3105	0.193	1.4	354	0.52
120	29.1	33.0	36.4	3820	0.153	1.3	410	0.42
150	31.1	35.0	38.6	4475	0.124	1.2	472	0.35
185	33.4	38.3	42.2	5675	0.0991	0.82	539	0.29
240	38.0	42.9	47.0	7090	0.0754	0.73	636	0.24
300	43.0	47.8	52.2	8570	0.0601	0.67	732	0.21

\* Circular conductors, all others are sector shaped

• Installation conditions for above rating:

• Ambient Air Temperature 30°C

• Conductor operating temperature 90°C



## 3 Core Cables

Fire resistant cables. Three Core Armoured Cables 600/1000 V Grade with stranded copper conductors (BS 7846)

Nominal conductor area	Approximate Diameter			Approximate cable weight	Maximum conductor resistance at 20°C	Maximum armour resistance at 20°C	Current rating on perforated cable trays / free air	Voltage drop (3φ AC)
	Under armour	Over armour	Overall diameter					
mm <sup>2</sup>	mm	mm	mm	kg/km	Ohm/km	Ohm/km	Amp	mV/A/m
<b>600/1000 V Copper power and control cables</b>								
1.5*	9.2	11.0	12.9	345	12.1	9.5	25	27
2.5*	10.5	12.3	14.4	425	7.41	8.2	33	16
4*	11.8	13.6	15.7	515	4.61	7.5	44	10
6*	12.9	14.7	16.8	610	3.08	6.7	56	6.8
10*	14.8	17.3	19.6	910	1.83	4.0	78	4.0
16*	16.8	19.3	21.8	1110	1.15	3.5	99	2.5
25*	21.1	24.3	27.0	1720	0.727	2.5	131	1.65
35*	23.5	26.7	29.6	2105	0.524	2.3	162	1.15
50	24.9	28.0	30.8	2480	0.387	2.0	197	0.87
70	26.9	30.0	33.0	3145	0.268	1.8	251	0.60
95	30.6	34.5	37.9	4310	0.193	1.3	304	0.45
120	33.9	37.8	41.4	5170	0.153	1.2	353	0.37
150	37.8	42.7	46.5	6555	0.124	0.78	406	0.30
185	42.2	47.1	51.0	7915	0.0991	0.71	463	0.26
240	46.4	51.3	55.6	9815	0.0754	0.63	546	0.21
300	52.8	57.6	62.1	12030	0.0601	0.58	628	0.185
400	58.0	62.8	67.7	14740	0.0470	0.52	728	0.165

\* Circular conductors, all others are sector shaped

- Installation conditions for above rating:
- Ambient Air Temperature 30°C
- Conductor operating temperature 90°C



## 4 Core Cables

Fire resistant cables. Four Core Armoured Cables 600/1000 V Grade with stranded copper conductors (BS 7846)

Nominal conductor area	Approximate Diameter			Approximate cable weight	Maximum conductor resistance at 20°C	Maximum armour resistance at 20°C	Current rating on perforated cable trays / free air	Voltage drop (3φ AC)
	Under armour	Over armour	Overall diameter					
mm <sup>2</sup>	mm	mm	mm	kg/km	Ohm/km	Ohm/km	Amp	mV/A/m
<b>600/1000 V Copper power and control cables</b>								
1.5*	10.1	11.9	13.8	390	12.1	8.8	25	27
2.5*	11.5	13.3	15.4	480	7.41	7.7	33	16
4*	13.0	14.8	16.9	590	4.61	6.8	44	10
6*	14.2	16.7	19.0	825	3.08	4.3	56	6.8
10*	16.4	18.9	21.2	1065	1.83	3.7	78	4.0
16*	18.6	21.1	23.6	1335	1.15	3.1	99	2.5
25*	23.4	26.6	29.3	2070	0.727	2.3	131	1.65
35*	26.1	29.3	32.2	2550	0.524	2.0	162	1.15
50	26.5	29.6	32.6	3015	0.387	1.8	197	0.87
70	30.7	34.6	38.0	4240	0.268	1.2	251	0.60
95	34.5	38.4	42.0	5420	0.193	1.1	304	0.45
120	38.1	43.0	46.8	6935	0.153	0.76	353	0.37
150	42.8	47.7	51.6	8270	0.124	0.68	406	0.30
185	47.2	52.1	56.4	10000	0.0991	0.61	463	0.26
240	52.5	57.3	61.8	12485	0.0754	0.54	546	0.21
300	58.2	63.0	67.9	15175	0.0601	0.49	628	0.185
400	66.5	72.6	78.0	19800	0.0470	0.35	728	0.165

\* Circular conductors, all others are sector shaped

- Installation conditions for above rating:
- Ambient Air Temperature 30°C
- Conductor operating temperature 90°C

## Multicore Cables

Fire resistant cables. Armoured Auxiliary Cables 600/1000 V Grade with stranded copper conductors (BS 7846)

Number of cores	Nominal conductor area	Approximate Diameter			Approximate cable weight	Maximum conductor resistance at 20°C	Maximum armour resistance at 20°C	Current rating on perforated cable trays / free air (Multi circuit operation)	Current rating on perforated cable trays / free air (Single circuit operation)	Voltage drop (3φ AC)
		Under armour	Over armour	Overall diameter						
	mm <sup>2</sup>	mm	mm	mm	kg/km	Ohm/km	Ohm/km	Amp	Amp	mV/A/m
<b>600/1000 V Copper power and control cables</b>										
7	1.5	12.0	13.7	15.9	485	12.1	7.5	19	29	27
12		15.8	18.3	20.6	820	12.1	4.0	16	29	27
19		18.6	21.1	23.6	1060	12.1	3.5	14	29	27
27		22.4	25.6	28.3	1525	12.1	2.3	12	29	27
37		25.2	28.4	31.1	1840	12.1	2.0	11	29	27
48		29.0	32.2	35.1	2240	12.1	1.8	10	29	27
7	2.5	13.8	15.5	17.7	610	7.41	6.3	25	39	16
12		18.3	20.8	23.3	1040	7.41	3.5	21	39	16
19		21.6	24.8	27.5	1525	7.41	2.3	18	39	16
27		26.1	29.3	32.2	1980	7.41	1.9	17	39	16
37		29.4	32.6	35.5	2425	7.41	1.7	15	39	16
48		33.9	37.9	41.1	3260	7.41	1.2	14	39	16
7	4	15.6	18.0	20.3	885	4.61	4.0	33	52	10
12		20.8	24.0	26.5	1450	4.61	2.3	28	52	10
19		24.6	27.8	30.5	1940	4.61	2.0	24	52	10
27		29.8	33.0	36.0	2560	4.61	1.7	22	52	10
37		33.6	37.6	40.8	3445	4.61	1.2	19	52	10
48		38.8	42.8	46.2	4240	4.61	1.0	17	52	10

\* Multi circuit means all conductors are loaded equally and operating in close vicinity

- Installation conditions for above rating:
- Ambient Air Temperature 30°C
- Conductor operating temperature 90°C

## DUCAB FLAMBICC 6

**Ducab FlamBICC 6** (BS8519 Category 3 Power Cables) are special fire resistant cables designed to survive and operate during highly onerous fire conditions. These are designed as per BS 7846 standard and are LPCB approved for F120 fire test as per BS 8491 standard. These cables have received the BASEC approval too.

As described in BS 8519, fire resistant cables are classified for Life Safety and Fire Fighting system with different fire survival time of 30 minutes, 60 minutes or 120 minutes. The FlamBICC 6 cables meet 120 minutes fire survival test. During the F120 fire survival test as per BS 8491 the same cable sample is subjected to fire + mechanical shock with direct impact on the cable + water jet hitting the cable which is applied through a nozzle. All Fire Fighting systems are required to function for 120 minutes.

### CONSTRUCTION

- Conductor: Plain annealed Copper, stranded class 2 conductor to BS EN 60228
- Dual Insulation: Special grade of Mica Glass tape + extruded XLPE
- Bedding: LSZH along with glass fiber tape/s at appropriate layers
- Armour: Galvanised steel wire armoured
- Outer sheath: Robust LSZH sheath with Black colour as standard, other colours upon request



### CHARACTERISTICS

General:	Ducab FlamBICC 6 are armoured cables designed as per BS 7846 to meet F120 fire test as per BS 8491.
Approvals:	LPCB and BASEC approved for 3 and 4 core cable designs
Voltage grade:	600 / 1000 V
Fire resistance:	F120 as per BS 8491
Flame propagation:	BS EN / IEC 60332-1 and BS EN / IEC 60332-3 Categories A, B & C
Acid gas emission:	Less than 0.5% when tested to IEC 60754 & BS EN 50267
Low smoke emission:	As per IEC 61034 & BS EN 50268
Cable Operating temperature:	Maximum 90°C
Short circuit temperature	Maximum 250°C
Bending radius:	6 x Cable diameter for circular and 8 x Cable diameter for sector shaped cables

### CORE IDENTIFICATIONS

STANDARD				ALTERNATIVE*			
Red	Yellow	Blue		Brown	Black	Grey	
Red	Yellow	Blue	Black	Blue	Brown	Black	Grey

## TECHNICAL - DATA of Three Cores Cable

Fire resistant cables. Three Core Armoured Cable 600/1000 V Grade with stranded copper conductors (BS 7846)

Nominal conductor area	Approximate Diameter			Approximate cable weight	Maximum conductor resistance at 20° C	Maximum armour resistance at 20° C	Current rating on perforated cable trays/free air	Voltage drop (3φ AC)
	Under armour	Over armour	Overall diameter					
mm <sup>2</sup>	mm	mm	mm	Kg/Km	Ohm/Km	Ohm/Km	Amp	mV/A/m
<b>600/1000 V Copper power and control cables</b>								
6*	16	17.8	21.8	940	3.08	6.7	56	6.8
10*	16	18.5	21.5	1100	1.83	4	78	4
16*	18.6	21.5	23.6	1300	1.15	3.5	99	2.6
25*	22	25.2	27.9	1850	0.727	2.5	131	1.6
35*	24.4	27.6	30.5	2260	0.524	2.3	162	1.2
50	25.9	29	31.8	2680	0.387	2	197	0.87
70	27.8	30.9	33.9	3385	0.268	1.8	251	0.61
95	31.6	35.5	38.9	4560	0.193	1.3	304	0.45
120	34.8	38.7	42.3	5450	0.153	1.2	353	0.36
150	38.8	43.7	47.4	6910	0.124	0.78	406	0.3
185	43.1	48	51.9	8285	0.0991	0.71	463	0.25
240	47.4	52.3	56.6	10210	0.0754	0.63	546	0.21
300	53.9	58.8	63.3	12390	0.0601	0.58	628	0.19
400	59.2	64.1	68.9	15155	0.047	0.52	728	0.17

\* Circular conductors, all others are sector shaped  
 installation condition for above rating:  
 Ambient Air Temperature 30°C  
 Conductor operating temperature 90°C





## TECHNICAL - DATA of Four Cores Cable

Fire resistant cables. Three Core Armoured Cable 600/1000 V Grade with stranded copper conductors (BS 7846)

Nominal conductor area	Approximate Diameter			Approximate cable weight	Maximum conductor resistance at 20° C	Maximum armour resistance at 20° C	Current rating on perforated cable trays/free air	Voltage drop (3Φ AC)
	Under armour	Over armour	Overall diameter					
mm <sup>2</sup>	mm	mm	mm	Kg/Km	Ohm/Km	Ohm/Km	Amp	mV/A/m
<b>600/1000 V Copper power and control cables</b>								
6*	15.4	17.9	21.9	1000	3.08	7.7	56	6.8
10*	17.6	20.1	22.4	1230	1.83	6.8	78	3.7
16*	19.8	22.3	24.8	1580	1.15	4.3	99	2.6
25*	24.4	27.6	30.3	2385	0.727	3.7	131	1.6
35*	27	30.2	33.1	2930	0.524	3.1	162	1.2
50	27.5	30.6	33.6	3230	0.387	2.3	197	0.87
70	31.7	35.6	39	4520	0.268	2	251	0.61
95	35.4	39.3	42.9	5700	0.193	1.8	304	0.45
120	39	43.9	47.6	7260	0.153	1.2	353	0.36
150	43.7	48.6	52.5	8610	0.124	1.1	406	0.3
185	48.2	53.1	57.4	10370	0.0991	0.76	463	0.25
240	53.5	58.4	62.9	12960	0.0754	0.68	546	0.21
300	59.4	64.3	69.1	15690	0.0601	0.61	628	0.19
400	67.8	73.9	79.3	20300	0.047	0.54	728	0.17

- \* Circular conductors, all others are sector shaped
- installation condition for above rating:
- Ambient Air Temperature 30°C
- Conductor operating temperature 90°C

## INSTALLATION GUIDELINE

### FOR FLAMBICC 4 AND FLAMBICC 6 CABLES

#### Cables Installed in Air

It is anticipated that many of the “in air” installations will be in buildings, and the ratings are therefore given in accordance with IEE Wiring Regulations for Electrical Installations, BS 7671.

It should be noted that all ratings for cables run in free air have been based on the assumption that they are shielded from the direct rays of the sun without restriction of ventilation. The rating for cables subjected to direct sunlight should be reduced to take account of this factor and further guidance on this subject is available on request.

In order to maintain circuit integrity under fire conditions, it should be ensured that accessories used with FlamBICC cables are also fire rated.

#### Rating factor for ambient air temperatures

Air Temperature	25°C	30°C	35°C	40°C	45°C	50°C	55°C
Rating Factors	1.02	1.0	0.96	0.91	0.87	0.82	0.76

# Areas of application for Fire Resistant Cables:

Hospitals



Hotels



High Rise Buildings



Malls



Metros & Underground Tunnels



Airports



# دوكاب Ducab

## Ducab Offices and Joint Ventures

### Ducab - Jebel Ali Factory

P.O. Box 11529, Jebel Ali, Dubai  
Tel: +971 4 815 8888, Fax: +971 4 815 8111  
Email: ducab@ducab.com

### Ducab Mussafah 2 Factory

P.O. Box 9171, Abu Dhabi, UAE  
Tel: +971 2 550 0774, Fax: +971 2 550 0979  
Email: ducab@ducab.com

### Ducab - Oman

P.O. Box 3542,  
112 RUWI, Muscat, Oman  
Tel: +968 245 651 78,  
Fax: +968 245 643 02  
Email: ducabomn@omantel.net.om

### Dubai Cable Co (P) Ltd. (DUCAB) - KSA

403, Al-Za'abi Tower,  
Prince Mohammad Bin Fahad Road, 1st Street  
P.O. Box: 60662, Dammam-31555, KSA  
Tel: +966 3 835 5305, Fax: +966 3 835 5307  
Mobile: +966 50 825 5581  
Email: mohammad.sayeed@ducab.com

### Ducab - Qatar

P.O. Box 23209, Doha, Qatar  
Tel: +974 4016 4070,  
Fax: +974 4016 4072  
Mobile: +974 3351 6218  
Email: dqsales@ducab.com

### Ducab - Australia

Level 3, Suite 4, 695 Burke Road  
Camberwell, 3124, Victoria, Australia  
Tel: +61 (0) 413 658 856  
Email: ausoffice@ducab.com

### Ducab Mussafah 1 Factory

P.O. Box 9171, Abu Dhabi, UAE  
Tel: +971 2 502 7777, Fax: +971 2 502 7755  
Email: ducab@ducab.com

### Ducab HV

P O Box 683, Dubai, UAE  
Tel: +971 4 815 8600, Fax: +971 4 815 8666  
Email: ducab@ducab.com

### DUCAB - UK LTD

Office 22, Leatherline House Business Centre,  
71 Narrow Lane, Leicester LE2 8NA  
United Kingdom  
Tel: +44 116 244 2588, Fax: +44 7919 095500  
Email: ducabuk@ducab.com

### Ducab Joint Venture – Bahrain

BICC MET W.L.L,  
P.O. Box 11413, Manama,  
Kingdom of Bahrain  
Tel: +973 177 497 61,  
Fax: +973 177 280 27  
Email: biccmet@batelco.com.bh

### Ducab Joint Venture - Qatar

JBK DUCAB W.L.L (JV)  
P.O. Box 14039, Doha, Qatar  
Tel: +974 4442 1924  
Fax: +974 4441 9003  
Email: mail@jbkducab.com.qa



دوكاب - ص.ب: 11529 دبي الإمارات العربية المتحدة، هاتف: 815 8111 (4-971)، فاكس: 815 8111 (4-971)  
Ducab, P.O.Box 11529, Dubai, United Arab Emirates, Tel: (971-4) 8158888, Fax: (971-4) 8158111  
e-mail: ducab@ducab.com, website: www.ducab.com, Toll Free: 800-Ducab (800-38222)