

# Ducab-FR

## Fire Resistant Cables



781a/01, 781b/01, 782a/01, 782b/01



**BICC**

دو کاب  
**Ducab**

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## Areas of application for fire resistant cables include:

1. Areas where people will remain in occupation for short time e.g. schools, shopping malls, cinemas etc.
2. Mass transit system e.g. metro, airport terminals etc.
3. High-rise buildings
4. Places where evacuation of people cannot be done immediately in case of fire e.g. large hospitals
5. Services where circuit integrity is of paramount importance under fire conditions
6. Essential safety circuits e.g. fire detection, alarm and evacuation
7. Power supply to equipment used in fire fighting e.g. sprinkler pumps, smoke extractors and fire shutters etc.



High Rise Buildings



Metro and Underground Tunnels



Airports



Hospitals

## Cable Features

### Fire Resistant Cable Construction

- ① Copper conductor
- ② Dual insulation - Mica glass - XLPE
- ③ LSF Bedding (Low Smoke & Fume. Also known as Low Smoke Zero Halogen - LSZH)

### Core identification

#### - Standard

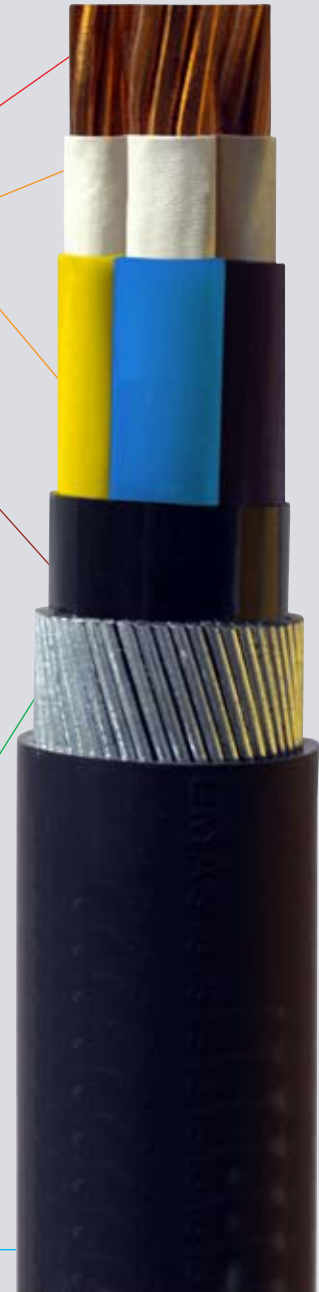


#### - Alternative\*



\*Available on special orders.

- ④ Galvanised steel wire armoured
- ⑤ LSF outer sheath



## INSTALLATION GUIDELINES

### 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 **Ducab-FR** 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

**DucabConnect** offers complete cable components and accessories selection for **Ducab-FR** cables.

# Technical Data



## Introduction

Ducab, established in 1979, is the leading manufacturer of electric cables in the Middle East. It is today equally owned by the Government of Abu Dhabi and Government of Dubai. Ducab's aim is to provide electric cables of the highest quality and provide customer service that is unequalled worldwide.

Ducab's product range also covers Ducab Smokemaster low smoke and fume cables, Ducab Powerplus MV cables upto 33 kV, LV cables, Instrumentation and Pilot cables, Control and Auxiliary cables, Wiring cables, Lead sheathed cables for the oil, gas, and petrochemical sector. Ducab also offers a complete range of cable components and accessories.

Ducab is committed to providing the customer with total quality. Ducab's quality management system conforms to ISO 9001 : 2000 standards and certified by BASEC. Also, Ducab is the first cable manufacturer in the region to achieve certification to ISO 14001, the international environmental management standard by BASEC.

## Ducab-FR cables:

**Ducab-FR** cables are fire resistant armoured cables intended for applications requiring circuit integrity during a fire. Since these cables are used in critical applications, the approval process and certification are vital to ensure necessary performance.

**Ducab-FR** cables comply with BS 7846 category F1 and F2 and are LPCB (Loss Prevention Certification Board) approved to the full British Standard. Ducab has taken the view that using LPCB to approve only the basic fire tests such as CWZ and F2 classifications is not sufficient. By seeking full BS7846 approval from LPCB Ducab has proved that it is committed to go beyond these tests and deliver a superior product with approved materials and manufacturing processes, as well as regular independent assessment and product testing. This ongoing commitment to quality is one of the reasons why our customers have complete faith in Ducab products.

In addition to maintaining circuit integrity under fire conditions, **Ducab-FR** cables generate very low smoke and are Halogen free in accordance with BS7846, thus helping to save human life and provide protection for the sensitive equipment.

**Ducab-FR** cables also have type approval for the complete range by Lloyd's Register, UK.

## Key fire performance requirements

### BS 7846 **Ducab-FR** cable is designed to meet:

**1. Flammability:**

IEC 60332-1 and IEC 60332-3 categories A, B & C.

**2. Resistance to fire:**

C-W-Z of BS: 6387, IEC: 60331 and F-2 of BS: 7846

**3. Smoke Emission:**

IEC 61034 - 1 & 2

**4. Acid Gas Content:**

IEC 60754 - 1 & 2, BSEN 50267- 1 & 2

## Special Features

- a. Maintains Circuit Integrity for 3 hours under fire condition.
- b. Zero halogen, low smoke and resistance to flame propagation.



## Fire resistant cables. Two Core Armoured Cables 600/1000 V Grade with stranded copper conductors

Nominal conductor area mm <sup>2</sup>	Approximate Diameter			Approximate cable weight kg/km	Maximum conductor resistance at 20°C Ohm/km	Maximum armour resistance at 20°C Ohm/km	Current rating on perforated cable trays / free air Amp	Voltage drop (1φ AC) mV/A/m
	Under armour mm	Over armour mm	Overall dia mm					

600/1000 V Copper power and control cables

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

## Fire resistant cables. Three Core Armoured Cables 600/1000 V Grade with stranded copper conductors

Nominal conductor area mm <sup>2</sup>	Approximate Diameter			Approximate cable weight kg/km	Maximum conductor resistance at 20°C Ohm/km	Maximum armour resistance at 20°C Ohm/km	Current rating on perforated cable trays / free air Amp	Voltage drop (3φ AC) mV/A/m
	Under armour mm	Over armour mm	Overall dia mm					

600/1000 V Copper power and control cables

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



## Fire resistant cables. Four Core Armoured Cables 600/1000 V Grade with stranded copper conductors

Nominal conductor area mm <sup>2</sup>	Approximate Diameter			Approximate cable weight kg/km	Maximum conductor resistance at 20°C Ohm/km	Maximum armour resistance at 20°C Ohm/km	Current rating on perforated cable trays / free air Amp	Voltage drop (3φ AC) mV/A/m
	Under armour mm	Over armour mm	Overall dia mm					

600/1000 V Copper power and control cables

Nominal conductor area mm <sup>2</sup>	Under armour mm	Over armour mm	Overall dia mm	Approximate cable weight kg/km	Maximum conductor resistance at 20°C Ohm/km	Maximum armour resistance at 20°C Ohm/km	Current rating on perforated cable trays / free air Amp	Voltage drop (3φ AC) mV/A/m
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



781a/01, 781b/01, 782a/01, 782b/01

## Fire resistant cables. Armoured Auxiliary Cables 600/1000 V Grade with stranded copper conductors

Number of cores	Nominal conductor area mm <sup>2</sup>	Approximate Diameter			Approximate cable weight kg/km	Maximum conductor resistance at 20°C Ohm/km	Maximum armour resistance at 20°C Ohm/km	Current rating on perforated cable trays / free air (Multi circuit operation) Amp	Current rating on perforated cable trays / free air (Single circuit operation) Amp	Voltage drop (3φ AC) mV/A/m
		Under armour mm	Over armour mm	Overall dia mm						

## 600/1000 V Copper auxiliary control cables

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

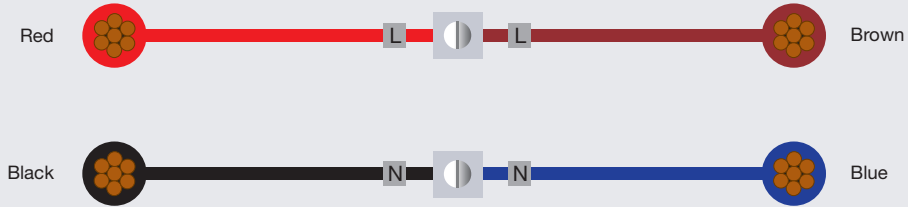
Installation conditions for above rating: • Ambient Air Temperature 30°C • Conductor operating temperature 90°C

Precautions to be observed for extensions or alterations with existing & new color scheme.

Existing Color Code

New Harmonised Color Code

## Single Phase



## Three Phase

