

OIL AND GAS CABLES



WILSON CABLES PRIVATE LIMITED

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WILSON CABLES

Our Company

Wilson Cables enjoys a track record of more than 40 years in power cables, building wires manufacture in Singapore and have successfully introduced Flame Retardant Power Cables and Instrumentation Cables range since 1993.

Flame Retardant Power Cables and Instrumentation Cables manufactured in our Singapore facility are sold under the brand name of **“WILSON CABLES”**. State of the art braiding and pairing machineries used by a well trained workforce that understands the demands of the Petrochemical and Oil & Gas Industry support this operation.

Recognition has come out of hard work and perseverance and **WILSON CABLES** is proud to have been the chosen brand for major Petrochemical and Oil & Gas customers in Singapore and the ASEAN market all these years.

A highly dedicated team of professionals and staff have built up this credibility over the years. Appropriate level of knowledge, customer commitment, quality output economic pricing and prompt delivery have endeared us to the Petrochemical and Oil & Gas industry as a reliable supplier of **WILSON CABLES**.



WILSON CABLES have successfully built up the export market. Projects in China, Hong Kong, Brunei, Malaysia, Thailand, Indonesia, Myanmar, Vietnam, Middle East Countries, Sri Lanka and Maldives use **WILSON CABLES** manufactured in Singapore. We have shown great resilience in handling stringent export requirements and intense competition in catering to this demand.

Confidence grows on performance. **“ WILSON CABLES ”** with the distinctive TÜV SÜD PSB Pte Ltd Product Listing Scheme Certificates and performance ethics is poised for greater achievements. To the enthusiastic team at **WILSON CABLES PRIVATE LIMITED**, it is a passion to succeed amidst intense competition.

The range of **WILSON CABLES** cover:

Cables For Power Supply And General Purposes

- PVC Insulated Cables 450/750 V to SS 358-3 or BS EN 50525-2-31 or IEC 60227-3
- LSOH Insulated Cables or FRT-3S 450/750 V or 600/1000 V BSEN 50525-3-41
- PVC Insulated Unarmoured / Armoured PVC Sheathed Power Cables 600/1000 V to IEC 60502-1
- XLPE Insulated Unarmoured / Armoured PVC Sheathed Power Cables 600/1000 V to IEC 60502-1 / BS 5467
- XLPE Insulated Unarmoured / Armoured LSOH Sheathed Power Cables 600/1000 V to IEC 60502-1 / BS 6724
- Variable Speed Drive Unarmoured / Armoured Cables 600/1000 V to IEC 60502-1
- PVC Insulated Flexible Cords 300/500 V to BS EN 50525-2-11 / SS 358-5 / IEC 60227-5
- PVC Insulated Flexible Cables 450/750 V to BS EN 50525-2-31 (70 °C), 600/1000 V to BS 6231 (105 °C)
- PVC Insulated PVC Sheathed Flexible Cables 600/1000 V to IEC 60502-1
- Wilson Flex Multi-Core PVC Insulated Unscreened / Screened Flexible Cables 300/500 V to BS EN 50525-2-11
- XLPE/PE Insulated Unarmoured / Armoured Instrumentation Cables 300/500 V to BS EN 50288-7
- PVC Insulated Unarmoured / Armoured Instrumentation Cables 300/500 V to BS EN 50288-7
- LSOH Insulated Unarmoured / Armoured Instrumentation Cables 300/500 V to BS EN 50288-7

Fire Resistant Cables

Flame Retardant LSOH Sheathed Fire Resistant Cables complying to the following standards where applicable:

- | | |
|--------------------------|--|
| a. IEC 60331-21 | - Fire Alone Test |
| b. IEC 60331-1/2 | - Fire with Shock Test |
| c. BS 6387 / SS 299-1 | - Fire Resistance Characteristics Tests Cat. C, W, Z |
| d. IEC 60332-1-2 | - Flame Retardant Test |
| e. IEC 60332-3-22 Cat. A | - Flame Retardant Tests Cat. A |
| f. IEC 60754-1 | - Halogen Content Test |
| g. IEC 60754-2 | - Corrosivity Test |
| h. IEC 61034-1&2 | - Smoke Density Test |
| i. ASTM D 2863 | - Oxygen Index Test |
- FR-3S, 450/750 V or 600/1000 V to BSEN 50525-3-41
 - FR-3S Twin Twisted, 450/750 V to BS 7211/ BSEN 50525-3-41
 - FR-100, 300/500 V to BS 6387 / SS 299-1
 - FR-200 & FR-200A, 600/1000 V to IEC 60502-1 And BS 7846 or BS 6724
 - FRIC-300 & FRIC-300A, 300/500 V to BS EN 50288-7
 - FRIM-300 & FRIM-300A, 300/500 V to BS EN 50288-7

Shipboard Cables

There are three types of Shipboard Power and Instrumentation Cables:

Flame Retardant PVC Sheathed Shipboard Power And Instrumentation Cables

- MC-210, MC-210Q & MC-210C, 600/1000 V to IEC 60092-353
- MIC-210, MIC-210Q & MIC-210C, 150/250 V to IEC 60092-376
- MIP-210, MIP-210Q & MIP-210C, 150/250 V to IEC 60092-376
- MIM-210, MIM-210Q & MIM-210C, 150/250 V to IEC 60092-376

Flame Retardant LSOH Sheathed Shipboard Power And Instrumentation Cables

- MC-200, MC-200Q & MC-200C, 600/1000 V to IEC 60092-353
- MIC-200, MIC-200Q & MIC-200C, 150/250 V to IEC 60092-376
- MIP-200, MIP-200Q & MIP-200C, 150/250 V to IEC 60092-376
- MIM-200, MIM-200Q & MIM-200C, 150/250 V to IEC 60092-376

Flame Retardant LSOH Sheathed Fire Resistant Shipboard Power And Instrumentation Cables

- FR-200-M, FR-200Q-M & FR-200C-M, 600/1000 V to IEC 60092-353
- FRIC-200-M, FRIC-200Q-M & FRIC-200C-M, 150/250 V to IEC 60092-376
- FRIP-200-M, FRIP-200Q-M & FRIP-200C-M, 150/250 V to IEC 60092-376
- FRIM-200-M, FRIM-200Q-M & FRIM-200C-M, 150/250 V to IEC 60092-376

Cables For Oil And Gas Industry

Flame Retardant Reduced Toxicity (FRRT) Cables to IEC 60332-3-22 Cat. A And IEC 60754-1 (HCL < 17%)

- FRT-3S, 600/1000 V to BSEN50525-3-41
- FRT-211Q, FRT-211C, FRT-200Q, FRT-200C, 600/1000 V to IEC 60502-1
- FRT-211, FRT-200, FRT-211A, FRT-200A, 600/1000 V to IEC 60502-1
- FRT-411, FRT-411A, 600/1000 V to IEC 60502-1
- Copper Tape Screened Cable, 600/1000 V to IEC 60502-1
- IC-111, IP-111, IM-111, IC-111A, IP-111A, IM-111A, IC-111Q, IP-111Q & IM-111Q, 300/500 V to BS EN 50288-7
- IC-411, IP-411, IM-411, IC-411A, IP-411A, IM-411A, IC-411Q, IP-411Q & IM-411Q, 300/500 V to BS EN 50288-7
- IC-211, IP-211, IM-211, IC-211A, IP-211A, IM-211A, IC-211Q, IP-211Q & IM-211Q, 300/500 V to BS EN 50288-7

Flame Retardant LSOH Sheathed Cables to IEC 60332-3-22 Cat. A, IEC 60754-1&2 And IEC 61034-1&2

- FRT-200Q, FRT-200C, 600/1000 V to IEC 60502-1
- FRT-200, FRT-200A, 600/1000 V to IEC 60502-1
- Copper Tape Screened Cable, 600/1000 V to IEC 60502-1
- IC-200, IP-200, IM-200, IC-200A, IP-200A, IM-200A, IC-200Q, IP-200Q & IM-200Q, 300/500 V to BS EN 50288-7
- IC-300, IP-300, IM-300, IC-300A, IP-300A, IM-300A, IC-300Q, IP-300Q & IM-300Q, 300/500 V to BS EN 50288-7

The list that keeps pace with Customers' need and our adaptability to the dynamic needs of the market.

We welcome you to visit our website at <http://www.wilson-cables.com>

All your requirements can be sent to Marketing Department.

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By Fax : +65 68617871

By Email : exports@wilson-cables.com.sg / sales.sg@wilson-cables.com.sg

By Visiting us : at 142 Gul Circle, Jurong Industrial Estate, Singapore 629602

WILSON CABLES is your reliable source of quality cables. We are here to serve all your cable needs.

Test Methods

1. Fire Alone Test : IEC 60331-21



WILSON CABLES provides Fire Resistant Cables meeting IEC 60331-21 requirement.

Fire Alone Test : IEC 60331-21

The Fire Resistant Cable is subjected to the flame at least 750 °C continuously for a period of 90 minutes or the specified application time. Test voltage equal to the cable designated voltage is applied to the cable continuously during the entire testing. After which the flame shall be extinguished but the cable sample shall remain energised for a further 15 minutes. During the test procedure the cable shall maintain circuit integrity.

3. Flame Retardant Test : IEC 60332-3-22 Cat. A IEC 60332-3-23 Cat. B IEC 60332-3-24 Cat. C



WILSON CABLES can provide Flame Retardant (Reduced Flame Propagation (RFP) and Self-Extinguished) type of cables meeting Flame Retardant test requirement to IEC 60332-3 Cat. A, B & C.

Flame Retardant Test (Bunch) : IEC 60332-3 Cat. A, B, C A bunch of cables are installed vertically on the test ladder. A burner, as specified in the test standard, is used as ignition source. The flame is continuously applied for the test duration in the below table. Flame is cut off after the test duration. After flame extinction, length of charred portion is measured and should not exceed 2.5 meters from the bottom edge of the burner.

Cat.	Total Volume of Non-Metallic Material	Burning Time
A	7 Litre / m	40 min
B	3.5 Litre / m	40 min
C	1.5 Litre / m	20 min

4. Halogen Content & Corrosivity Test : IEC 60754-1 & IEC 60754-2



WILSON CABLES provide LSOH type of cables with Low Smoke Halogen Free material, which comply with IEC 60754-1 & IEC 60754-2 (if applicable) requirements.

Halogen Content Test : IEC 60754-1

Determine the amount of halogen acid gas, which is evolved during the combustion of compounds based on halogenated polymers and compounds containing halogenated additives taken from cable constructions. The amount of halogen acid shall not exceed 0.5%.

Corrosivity Test : IEC 60754-2

Determine the degree of pH value and conductivity of the gases, which is evolved during the combustion of compounds taken from cable components. The weighted pH value should not be less than 4.3 and the weighted value of conductivity should not exceed 10 µS/mm.

5. Smoke Density Test : IEC 61034-1 & IEC 61034-2

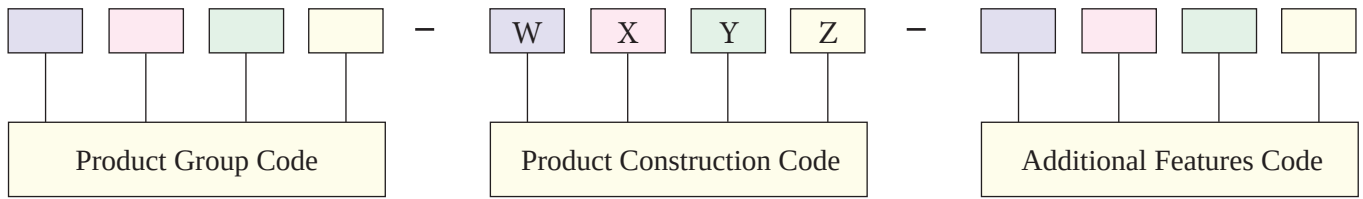


WILSON CABLES LSOH type of cables with Low Smoke Halogen Free materials release very little smoke emission during a fire, which are complying with IEC 61034-1 and IEC 61034-2 requirements, it provide one more layer of safety protection to the personnel.

Smoke Density Test : IEC 61034-1 & IEC 61034-2

Burn the cable sample(s) in a test cube of 27 m³ volume, measure the light transmittance of the smoke to determine the measurement of the smoke density. The minimum value of 60% is adopted. Generally the smoke density shall be followed the requirement specified in the cable specification.

Product Group Code, Product Construction Code & Additional Features Code



Product Group Code

Product Group Code	Description
FRT	Flame Retardant Power & Control Cables
IC	Multi Pair Instrumentation Cables with Collective Screen
IP	Multi Pair Instrumentation Cables with Individual Pair Screen and Collective Screen
IM	Multi-Core Instrumentation Cables with Collective Screen
VSD	Variable Speed Drive Cable with Copper Tape Screen

Product Construction Code

Product Construction Code	Abbreviation	Description
W = First Digit (Insulation Material)	1	PE = Polyethylene
	2	XLPE = Crosslink Polyethylene
	3	LSOH = Low Smoke Zero Halogen
	4	PVC = Polyvinyl Chloride
X = Second Digit (Sheath Material)	0	LSOH = Low Smoke Zero Halogen
	1	PVC = Polyvinyl Chloride
	NIL	Non-Sheathed
Y = Third Digit (Product's Family)	0	Product with Basic Specification as per Standard / Brochure
	1	Product with Basic Specification as per Standard / Brochure Advantages of Sheath Complying with Flame Retardant IEC 60332-3-22 CAT A, Oxygen Index > 30% & HCL Content < 17%
	NIL	Non-Sheathed Product Without Other Family
Z = Forth Digit (Construction)	A	Single Wire Armour
	C	Plain Copper Wire Braid
	T	Tinned Copper Wire Braid
	Q	Galvanized Round Steel Wire Braid
	S	Single Core Non-Sheathed Cable

Additional Features Code

Additional Features Code	Description
C	Chemical Resistant
D	According to Customer's Requirements
H	Heat Resistant 105°C
L	Low Temperature (<-15°C)
M	To Shipboard Cable's Specification & Flame Retardant Test (IEC 60332-3-22 Cat. A)
O	Oil Resistant to IEC 60811-2-1
R	Flame Retardant Test (Bunch) to IEC 60332-3 Cat. A, B & C
T	Anti – Termite
U	UV Resistant
V	Vermin Proof

Flame Retardant Non-Armoured Power / Control Cables

FRT-211 (CU/XLPE/PVC) & **FRT-200** (CU/XLPE/LSOH)



APPLICATION

This cable is preferably used for supplying main power. It can also be used for industrial installation such as in cable trench, cable duct, switchgear and in power stations. This cable is ideal for ground emplacement if a higher electrical or mechanical protection is required.

TECHNICAL DATA

Standard IEC 60502-1
Max. Rated Voltage 600/1000V
Test Voltage 3.5 KV ac / 5 min
Max. Temperature 90 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
ASTM D 2863 Min. 30%
IEC 60754-1 (<17%) (For FRT-211)
IEC 60754-1 & 2 (For FRT-200)
IEC 61034-1 & 2 (For FRT-200)

CONSTRUCTION

1. Conductor Annealed Stranded Non Compacted / Compacted Circular or Shaped Copper
2. Insulation XLPE
3. Sheath FRT-211 (Flame Retardant Reduced Toxicity PVC)
FRT-200 (Flame Retardant LSOH)
4. Colour Black

CORE IDENTIFICATION

- 1C - Natural
2C - Brown & Blue
3C - Brown, Black & Grey
4C - Brown, Black, Grey & Blue
2C+E - Brown & Blue + Green/Yellow
3C+E - Brown, Black, Grey + Green/Yellow
4C+E - Brown, Black, Grey, Blue + Green/Yellow
5C & above - Number printed on the cores

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
1 X 50 cm	13.3	555	3 X 16 rm	18.2	714	4 X 400 sm	75.0	16767
1 X 70 cm	15.1	771	3 X 25 sm	19.5	971	5 X 1.5 rm	12.1	211
1 X 95 cm	17.1	1049	3 X 35 sm	21.5	1288	5 X 2.5 rm	13.3	277
1 X 120 cm	19.0	1294	3 X 50 sm	24.0	1683	5 X 4 rm	14.7	378
1 X 150 cm	21.2	1586	3 X 70 sm	27.5	2377	5 X 6 rm	16.3	505
1 X 185 cm	23.3	1966	3 X 95 sm	31.0	3195	5 X 10 rm	19.0	746
1 X 240 rm	27.3	2577	3 X 120 sm	35.0	4002	5 X 16 rm	21.8	1081
1 X 300 rm	30.1	3207	3 X 150 sm	38.5	4886	5 X 25 cm	25.6	1565
1 X 400 rm	33.7	4071	3 X 185 sm	43.5	6111	5 X 35 cm	28.8	2085
1 X 500 rm	37.4	5096	3 X 240 sm	49.5	7868	5 X 50 cm	32.3	2760
1 X 630 rm	42.3	6531	3 X 300 sm	55.0	9796	5 X 70 cm	37.8	3906
1 X 800 rm	47.1	8283	3 X 400 sm	62.0	12530	7 X 1.5 rm	13.2	267
1 X 1000 rm	52.3	10345	4 X 1.5 rm	11.1	190	10 X 1.5 rm	16.4	367
2 X 1.5 rm	9.80	150	4 X 2.5 rm	12.2	245	12 X 1.5 rm	17.0	414
2 X 2.5 rm	10.7	183	4 X 4 rm	13.5	324	19 X 1.5 rm	19.6	584
2 X 4 rm	11.8	229	4 X 6 rm	15.8	422	27 X 1.5 rm	23.1	785
2 X 6 rm	13.0	286	4 X 10 rm	17.3	616	37 X 1.5 rm	25.7	1021
2 X 10 rm	14.8	395	4 X 16 rm	19.9	889	7 X 2.5 rm	14.6	358
2 X 16 rm	17.2	545	4 X 25 sm	22.0	1259	10 X 2.5 rm	18.1	493
2 X 25 sm	16.2	686	4 X 35 sm	24.0	1689	12 X 2.5 rm	18.7	562
2 X 35 sm	18.0	901	4 X 50 sm	27.0	2208	19 X 2.5 rm	21.7	810
2 X 50 sm	21.0	1174	4 X 70 sm	32.0	3122	27 X 2.5 rm	25.7	1103
2 X 70 sm	23.8	1632	4 X 95 sm	36.0	4225	37 X 2.5 rm	28.7	1440
3 X 1.5 rm	10.3	169	4 X 120 sm	41.0	5292	7 X 4 rm	16.3	487
3 X 2.5 rm	11.3	212	4 X 150 sm	45.0	6457	10 X 4 rm	19.8	675
3 X 4 rm	12.5	275	4 X 185 sm	50.0	8108	12 X 4 rm	20.4	776
3 X 6 rm	13.7	352	4 X 240 sm	60.0	10571	19 X 4 rm	23.9	1140
3 X 10 rm	16.0	503	4 X 300 sm	65.0	13068	27 X 4 rm	28.5	1566

rm: Stranded Circular Non-Compacted, cm: Stranded Circular Compacted, sm: Stranded Shaped

Flame Retardant Non-Armoured Power / Control Cables

FRT-411 (CU/PVC/PVC)



APPLICATION

This cable is preferably used for supplying main power. It can also be used for industrial installation such as in cable trench, cable duct, switchgear and in power stations. This cable is ideal for ground emplacement if a higher electrical or mechanical protection is required.

TECHNICAL DATA

Standard IEC 60502-1
Max. Rated Voltage 600/1000V
Test Voltage 3.5 KV ac / 5 min
Max. Temperature 70 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1 (<17%)
ASTM D 2863 Min. 30

CONSTRUCTION

1. Conductor Annealed Stranded Non-Compacted / Compacted Circular or Shaped Copper
2. Insulation PVC
3. Sheath Flame Retardant Reduced Toxicity PVC
4. Colour Black

CORE IDENTIFICATION

- 1C – Natural
2C – Brown & Blue
3C – Brown, Black & Grey
4C – Brown, Black, Grey & Blue
2C+E – Brown & Blue + Green/Yellow
3C+E – Brown, Black, Grey + Green/Yellow
4C+E – Brown, Black, Grey, Blue + Green/Yellow
5C & above – Number printed on the cores

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
2 X 1.5 rm	10.5	165	3 X 240 sm	50.1	8270	5 X 10 rm	20.6	828
2 X 2.5 rm	11.4	198	3 X 300 sm	55.6	10298	5 X 16 rm	23.2	1170
2 X 4 rm	13.3	267	3 X 400 sm	63.0	13007	5 X 25 cm	26.7	1692
2 X 6 rm	14.4	326	4 X 1.5 rm	11.8	214	5 X 35 cm	30.4	2240
2 X 10 rm	16.1	438	4 X 2.5 rm	13.9	270	5 X 50 cm	34.3	2982
2 X 16 rm	18.6	591	4 X 4 rm	15.2	383	5 X 70 cm	39.0	4127
2 X 25 rm	18.4	745	4 X 6 rm	16.6	485	7 X 1.5 rm	13.6	305
2 X 35 rm	20.1	961	4 X 10 rm	18.7	684	10 X 1.5 rm	16.9	420
2 X 50 rm	22.7	1271	4 X 16 rm	21.9	963	12 X 1.5 rm	17.4	477
2 X 70 rm	25.2	1730	4 X 25 sm	22.8	1364	19 X 1.5 rm	20.1	679
3 X 1.5 rm	11.0	188	4 X 35 sm	25.4	1791	27 X 1.5 rm	23.9	918
3 X 2.5 rm	12.9	233	4 X 50 sm	29.2	2378	37 X 1.5 rm	26.7	1199
3 X 4 rm	14.0	323	4 X 70 sm	33.0	3280	7 X 2.5 rm	14.9	399
3 X 6 rm	15.2	403	4 X 95 sm	38.3	4491	10 X 2.5 rm	18.5	551
3 X 10 rm	17.1	558	4 X 120 sm	41.8	5515	12 X 2.5 rm	19.1	630
3 X 16 rm	19.5	774	4 X 150 sm	46.3	6770	19 X 2.5 rm	22.2	914
3 X 25 sm	20.4	1052	4 X 185 sm	51.3	8427	27 X 2.5 rm	26.5	1248
3 X 35 sm	22.4	1368	4 X 240 sm	58.0	10984	37 X 2.5 rm	29.6	1635
3 X 50 sm	25.5	1814	4 X 300 sm	64.6	13668	7 X 4 rm	17.7	579
3 X 70 sm	28.7	2495	4 X 400 sm	72.2	17403	10 X 4 rm	22.4	805
3 X 95 sm	33.3	3401	5 X 1.5 rm	12.7	239	12 X 4 rm	23.1	928
3 X 120 sm	36.3	4172	5 X 2.5 rm	14.0	307	19 X 4 rm	27.0	1369
3 X 150 sm	40.0	5106	5 X 4 rm	16.6	448	27 X 4 rm	32.6	1904
3 X 185 sm	44.6	6368	5 X 6 rm	18.1	580			

rm: Stranded Circular Non-Compacted, cm: Stranded Circular Compacted, sm: Stranded Shaped

Flame Retardant Armoured Power / Control Cables

FRT-211A / FRT-210A (CU/XLPE/PVC/SWA/PVC)



APPLICATION

This cable is preferably used for supplying main power. It can also be used for industrial installation such as in cable trench, cable duct, switchgear and in power stations. This cable is ideal for ground emplacement if a higher electrical or mechanical protections and required.

TECHNICAL DATA

Standard	IEC 60502-1
Max. Rated Voltage	600/1000V
Test Voltage	3.5 KV / 5 min
Max. Temperature	90 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat. A
IEC 60754-1 (< 17%) (For FRT-211A)
ASTM D 2863 Min. 30%

CONSTRUCTION

1. Conductor Annealed Stranded Non-Compacted / Compacted Circular or Shaped Copper
2. Insulation XLPE
3. Bedding Flame Retardant PVC (For FRT-210A)
Flame Retardant Reduced Toxicity PVC (For FRT-211A)
4. Armour Aluminium Round Wires (For Single Core Cables)
Galvanized Round Steel Wires (For Multi Core Cables)
5. Sheath Flame Retardant PVC (For FRT-210A)
Flame Retardant Reduced Toxicity PVC (For FRT-211A)
6. Colour Black

CORE IDENTIFICATION

- 1C – Natural
2C – Brown & Blue
3C – Brown, Black & Grey
4C – Brown, Black, Grey & Blue
2C+E – Brown & Blue + Green/Yellow
3C+E – Brown, Black, Grey + Green/Yellow
4C+E – Brown, Black, Grey, Blue + Green/Yellow
5C & above – Number printed on the cores

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
1 X 50 cm	19.5	750	3 X 16 rm	23.5	1250	4 X 400 sm	84.0	21944
1 X 70 cm	21.0	1080	3 X 25 sm	26.2	1659	5 X 1.5 rm	16.3	510
1 X 95 cm	23.0	1400	3 X 35 sm	28.2	2052	5 X 2.5 rm	17.7	605
1 X 120 cm	25.5	1680	3 X 50 sm	31.0	2557	5 X 4 rm	19.9	850
1 X 150 cm	27.0	1990	3 X 70 sm	36.4	3657	5 X 6 rm	21.5	1010
1 X 185 cm	29.0	2400	3 X 95 sm	39.6	4648	5 X 10 rm	25.2	1460
1 X 240 rm	33.5	3050	3 X 120 sm	43.6	5613	5 X 16 rm	27.6	1850
1 X 300 rm	36.0	3720	3 X 150 sm	49.0	7114	5 X 25 cm	32.4	2600
1 X 400 rm	41.0	4830	3 X 185 sm	53.5	8578	5 X 35 cm	35.2	3230
1 X 500 rm	45.0	5850	3 X 240 sm	60.5	10853	5 X 50 cm	41.0	4590
1 X 630 rm	49.5	7380	3 X 300 sm	65.0	12842	5 X 70 cm	45.0	5850
1 X 800 rm	56.0	9550	3 X 400 sm	69.5	15840	7 X 1.5 rm	17.3	590
1 X 1000 rm	61.5	11750	4 X 1.5 rm	15.0	430	10 X 1.5 rm	21.0	820
2 X 1.5 rm	13.8	350	4 X 2.5 rm	16.2	510	12 X 1.5 rm	21.4	910
2 X 2.5 rm	14.8	410	4 X 4 rm	18.0	625	19 X 1.5 rm	24.2	1150
2 X 4 rm	16.1	490	4 X 6 rm	19.5	720	27 X 1.5 rm	27.9	1600
2 X 6 rm	17.4	580	4 X 10 rm	22.0	1020	37 X 1.5 rm	31.0	1950
2 X 10 rm	20.0	720	4 X 16 rm	25.5	1630	7 X 2.5 rm	19.4	800
2 X 16 rm	22.0	1040	4 X 25 sm	28.6	2042	10 X 2.5 rm	21.7	1000
2 X 25 sm	22.7	1279	4 X 35 sm	31.7	2603	12 X 2.5 rm	22.9	1100
2 X 35 sm	24.7	1569	4 X 50 sm	34.7	3219	19 X 2.5 rm	27.2	1580
2 X 50 sm	27.2	1955	4 X 70 sm	39.6	4606	27 X 2.5 rm	30.7	1990
2 X 70 sm	30.4	2542	4 X 95 sm	44.6	5895	37 X 2.5 rm	34.4	2470
3 X 1.5 rm	14.2	390	4 X 120 sm	49.6	7614	7 X 4 rm	21.1	990
3 X 2.5 rm	15.4	450	4 X 150 sm	53.8	9014	10 X 4 rm	24.5	1380
3 X 4 rm	16.8	550	4 X 185 sm	58.8	10959	12 X 4 rm	25.9	1530
3 X 6 rm	18.0	660	4 X 240 sm	66.0	13965	19 X 4 rm	30.0	2010
3 X 10 rm	21.0	850	4 X 300 sm	70.0	16664	27 X 4 rm	34.2	2590

rm: Stranded Circular Non-Compacted, cm: Stranded Circular Compacted, sm: Stranded Shaped

Flame Retardant Armoured Power / Control Cables

FRT-200A (CU/XLPE/LSOH/SWA/LSOH)



APPLICATION

This cable is preferably used for supplying main power. It can also be used for industrial installation such as in cable trench, cable duct, switchgear and in power stations. This cable is ideal for ground emplacement if a higher electrical or mechanical protection is required.

TECHNICAL DATA

Standard	IEC 60502-1
Rated Voltage	600/1000V
Test Voltage	3.5 KV / 5 min
Max. Temperature	90 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat. A
IEC 60754-1 & 2
IEC 61034-1 & 2
ASTM D 2863 Min. 30%

CONSTRUCTION

1. Conductor Annealed Stranded Non-Compacted / Compacted Circular or Shaped Copper
2. Insulation XLPE
3. Bedding Extruded LSOH
4. Armour Aluminium Round Wires (For Single Core Cables)
Galvanized Round Steel Wires (For Multi Core Cables)
5. Sheath Flame Retardant LSOH
6. Colour Black

CORE IDENTIFICATION

- 1C – Natural
2C – Brown & Blue
3C – Brown, Black & Grey
4C – Brown, Black, Grey & Blue
2C+E – Brown & Blue + Green/Yellow
3C+E – Brown, Black, Grey + Green/Yellow
4C+E – Brown, Black, Grey, Blue + Green/Yellow
5C & above – Number printed on the cores

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
1 X 50 cm	19.5	750	3 X 25 sm	26.2	1700	5 X 1.5 rm	16.3	520
1 X 70 cm	21.0	1080	3 X 35 sm	28.2	2050	5 X 2.5 rm	17.7	620
1 X 95 cm	23.0	1400	3 X 50 sm	31.0	2560	5 X 4 rm	19.9	870
1 X 120 cm	25.5	1690	3 X 70 sm	36.4	3680	5 X 6 rm	21.5	1030
1 X 150 cm	27.0	2000	3 X 95 sm	39.6	4630	5 X 10 rm	25.2	1490
1 X 185 cm	29.0	2420	3 X 120 sm	43.6	5590	5 X 16 rm	27.6	1880
1 X 240 rm	33.5	3060	3 X 150 sm	49.0	7130	5 X 25 cm	32.4	2630
1 X 300 rm	36.0	3730	3 X 185 sm	53.5	8600	5 X 35 cm	35.2	3270
1 X 400 rm	41.0	4850	3 X 240 sm	60.5	10800	5 X 50 cm	41.0	4620
1 X 500 rm	45.0	5870	3 X 300 sm	65.0	12800	5 X 70 cm	45.0	5880
1 X 630 rm	49.5	7400	3 X 400 sm	69.5	15840	7 X 1.5 rm	17.3	600
1 X 800 rm	56.0	9550	4 X 1.5 rm	15.0	440	10 X 1.5 rm	21.0	840
1 X 1000 rm	61.5	11750	4 X 2.5 rm	16.2	520	12 X 1.5 rm	21.4	930
2 X 1.5 rm	13.8	360	4 X 4 rm	18.0	640	19 X 1.5 rm	24.2	1180
2 X 2.5 rm	14.8	420	4 X 6 rm	19.5	740	27 X 1.5 rm	27.9	1630
2 X 4 rm	16.1	500	4 X 10 rm	22.0	1040	37 X 1.5 rm	31.0	1980
2 X 6 rm	17.4	590	4 X 16 rm	25.5	1650	7 X 2.5 rm	19.4	820
2 X 10 rm	20.0	740	4 X 25 sm	28.6	2060	10 X 2.5 rm	21.7	1020
2 X 16 rm	22.0	1110	4 X 35 sm	31.7	2590	12 X 2.5 rm	22.9	1120
2 X 25 sm	22.7	1310	4 X 50 sm	34.7	3260	19 X 2.5 rm	27.2	1610
2 X 35 sm	24.7	1560	4 X 70 sm	39.6	4600	27 X 2.5 rm	30.7	2020
2 X 50 sm	27.2	1920	4 X 95 sm	44.6	5890	37 X 2.5 rm	34.4	2510
2 X 70 sm	30.4	2460	4 X 120 sm	49.6	7650	7 X 4 rm	21.1	1010
3 X 1.5 rm	14.0	400	4 X 150 sm	53.8	9000	10 X 4 rm	24.5	1400
3 X 2.5 rm	15.4	460	4 X 185 sm	58.8	10960	12 X 4 rm	25.9	1560
3 X 4 rm	16.0	560	4 X 240 sm	66.0	13810	19 X 4 rm	30.0	2040
3 X 6 rm	18.0	670	4 X 300 sm	70.0	16600	27 X 4 rm	34.2	2630
3 X 10 rm	21.0	870	4 X 400 sm	84.0	21800			
3 X 16 rm	23.5	1270						

rm: Stranded Circular Non-Compacted, cm: Stranded Circular Compacted, sm: Stranded Shaped

Flame Retardant Armoured Power / Control Cables

FRT-411A / FRT-410A (CU/PVC/PVC/SWA/PVC)



APPLICATION

This cable is preferably used for supplying main power. It can also be used for industrial installation such as in cable trench, cable duct, switchgear and in power stations. This cable is ideal for ground emplacement if a higher electrical or mechanical protection is required.

TECHNICAL DATA

Standard	IEC 60502-1
Rated Voltage	600/1000V
Test Voltage	3.5 KV / 5 min
Max. Temperature	70 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1 (<17%) (For FRT-411A)
ASTM D 2863 Min. 30%

CONSTRUCTION

1. Conductor Annealed Stranded Non-Compacted / Compacted Circular or Shaped Copper
2. Insulation PVC
3. Bedding Flame Retardant PVC (For FRT-410A)
Flame Retardant Reduced Toxicity PVC (For FRT-411A)
4. Armour Galvanized Round Steel Wires
5. Sheath Flame Retardant PVC (For FRT-410A)
Flame Retardant Reduced Toxicity PVC (For FRT-411A)
6. Colour Black

CORE IDENTIFICATION

- 1C – Natural
2C – Brown & Blue
3C – Brown, Black & Grey
4C – Brown, Black, Grey & Blue
2C+E – Brown & Blue + Green/Yellow
3C+E – Brown, Black, Grey + Green/Yellow
4C+E – Brown, Black, Grey, Blue + Green/Yellow
5C & above – Number printed on the cores

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
2 X 1.5 rm	14.2	387	3 X 240 sm	57.2	11093	5 X 10 rm	25.7	1549
2 X 2.5 rm	15.1	440	3 X 300 sm	62.9	13458	5 X 16 rm	28.5	2022
2 X 4 rm	17.0	547	3 X 400 sm	74.0	17483	5 X 25 cm	32.0	2720
2 X 6 rm	18.8	737	4 X 1.5 rm	15.6	477	5 X 35 cm	36.3	3594
2 X 10 rm	20.7	895	4 X 2.5 rm	16.6	554	5 X 50 cm	41.7	4705
2 X 16 rm	22.8	1115	4 X 4 rm	19.6	819	5 X 70 cm	45.7	5909
2 X 25 rm	22.5	1392	4 X 6 rm	21.0	968	7 X 1.5 rm	17.5	613
2 X 35 rm	24.3	1666	4 X 10 rm	23.3	1228	10 X 1.5 rm	21.5	915
2 X 50 rm	28.0	2124	4 X 16 rm	26.5	1746	12 X 1.5 rm	22.0	983
2 X 70 rm	31.3	2863	4 X 25 sm	27.4	2184	19 X 1.5 rm	25.4	1411
3 X 1.5 rm	14.7	427	4 X 35 sm	30.1	2706	27 X 1.5 rm	29.2	1787
3 X 2.5 rm	15.7	492	4 X 50 sm	33.9	3675	37 X 1.5 rm	32.2	2185
3 X 4 rm	18.4	727	4 X 70 sm	38.1	4763	7 X 2.5 rm	19.5	837
3 X 6 rm	19.7	844	4 X 95 sm	44.4	6533	10 X 2.5 rm	23.1	1094
3 X 10 rm	21.7	1047	4 X 120 sm	48.3	7841	12 X 2.5 rm	23.7	1185
3 X 16 rm	23.9	1343	4 X 150 sm	52.6	9291	19 X 2.5 rm	27.5	1722
3 X 25 sm	24.6	1777	4 X 185 sm	59.0	11371	27 X 2.5 rm	32.0	2229
3 X 35 sm	26.3	2152	4 X 240 sm	66.0	14290	37 X 2.5 rm	35.3	2765
3 X 50 sm	30.2	2746	4 X 300 sm	71.8	17316	7 X 4 rm	22.3	1102
3 X 70 sm	34.7	3825	4 X 400 sm	82.8	22596	10 X 4 rm	27.7	1612
3 X 95 sm	39.0	4904	5 X 1.5 rm	16.5	530	12 X 4 rm	28.4	1770
3 X 120 sm	41.4	5771	5 X 2.5 rm	17.6	625	19 X 4 rm	32.5	2369
3 X 150 sm	46.6	7334	5 X 4 rm	20.9	933	27 X 4 rm	39.5	3440
3 X 185 sm	51.3	8842	5 X 6 rm	22.5	1095			

rm: Stranded Circular Non-Compacted, cm: Stranded Circular Compacted, sm: Stranded Shaped

Flame Retardant Braided Power / Control Cables

FRT-211C / FRT-210C (CU/XLPE/PVC/CWB/PVC) & **FRT-211Q / FRT-210Q** (CU/XLPE/PVC/SWB/PVC)



APPLICATION

This cable is suitable for use in fixed installations for power supply in offshore platform and Oil & Gas industry where flame retardant and low halogen properties are required.

TECHNICAL DATA

Standard	IEC 60502-1
Max. Rated Voltage	600/1000V
Test Voltage	3.5 KV / 5 min
Max. Temperature	90 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat. A
IEC 60754-1 (< 17%) (For FRT-211C/Q)
ASTM D 2863 Min. 30%

CONSTRUCTION

1. Conductor Annealed Stranded Non-Compacted / Compacted Circular or Shaped Copper
2. Insulation XLPE
3. Bedding Flame Retardant PVC (For FRT-210C/Q)
Flame Retardant Reduced Toxicity PVC (For FRT-211C/Q)
4. Wire Braid Q = Galvanized Steel Wires With or Without Earth Lead
C = Annealed Copper Wires (For Single Core Cables)
5. Sheath Flame Retardant PVC (For FRT-210C/Q)
Flame Retardant Reduced Toxicity PVC (For FRT-211C/Q)
6. Colour Black

CORE IDENTIFICATION

- 1C - Natural
2C – Brown & Blue
3C – Brown, Black & Grey
4C – Brown, Black, Grey & Blue
2C+E – Brown & Blue + Green/Yellow
3C+E – Brown, Black, Grey + Green/Yellow
4C+E – Brown, Black, Grey, Blue + Green/Yellow
5C & above – Number printed on the cores

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
1 X 10 rm	12.1	260	3 X 6 rm	16.8	510	5 X 50 cm	36.5	3200
1 X 16 rm	13.2	360	3 X 10 rm	19.2	710	5 X 70 cm	42.0	4350
1 X 25 rm	14.5	490	3 X 16 rm	21.4	900	5 X 1.5 rm	14.5	350
1 X 35 rm	15.8	610	3 X 25 sm	22.7	1220	6 X 1.5 rm	16.0	400
1 X 50 cm	17.2	765	3 X 35 sm	23.9	1570	7 X 1.5 rm	16.0	420
1 X 70 cm	19.1	1030	3 X 50 sm	26.7	2000	8 X 1.5 rm	17.8	480
1 X 95 cm	21.3	1325	3 X 70 sm	30.5	2730	10 X 1.5 rm	19.5	550
1 X 120 cm	22.8	1620	3 X 95 sm	35.2	3820	12 X 1.5 rm	20.0	610
1 X 150 cm	24.8	1940	3 X 120 sm	39.8	4680	16 X 1.5 rm	21.5	720
1 X 185 cm	27.2	2400	3 X 150 sm	42.1	5460	19 X 1.5 rm	22.8	820
1 X 240 rm	31.6	3040	4 X 1.5 rm	14.1	300	24 X 1.5 rm	25.0	970
1 X 300 rm	33.0	3760	4 X 2.5 rm	15.3	370	37 X 1.5 rm	29.4	1330
2 X 1.5 rm	12.8	240	4 X 4 rm	16.5	460	5 X 2.5 rm	16.0	410
2 X 2.5 rm	13.8	290	4 X 6 rm	18.5	600	6 X 2.5 rm	17.1	460
2 X 4 rm	14.9	370	4 X 10 rm	20.5	840	7 X 2.5 rm	17.1	490
2 X 6 rm	16.0	440	4 X 16 rm	23.2	1130	8 X 2.5 rm	19.2	560
2 X 10 rm	18.0	590	4 X 25 sm	24.2	1540	10 X 2.5 rm	21.1	670
2 X 16 rm	20.2	790	4 X 35 sm	26.9	1980	12 X 2.5 rm	21.7	750
2 X 25 sm	19.4	990	4 X 50 sm	29.9	2600	16 X 2.5 rm	23.2	910
2 X 35 sm	21.4	1120	4 X 70 sm	34.4	3540	19 X 2.5 rm	24.9	1040
2 X 50 sm	24.5	1430	4 X 95 sm	38.6	4750	24 X 2.5 rm	28.2	1240
2 X 70 sm	27.4	1940	5 X 6 rm	19.6	690	37 X 2.5 rm	32.4	1750
2 X 95 sm	29.2	2580	5 X 10 rm	22.4	940	5 X 4 rm	17.7	550
3 X 1.5 rm	13.3	260	5 X 16 rm	25.2	1280	6 X 4 rm	19.2	630
3 X 2.5 rm	14.4	320	5 X 25 cm	28.4	1840	7 X 4 rm	19.2	660
3 X 4 rm	15.5	400	5 X 35 cm	31.9	2400			

rm: Stranded Circular Non-Compacted, cm: Stranded Circular Compacted, sm: Stranded Shaped

Note: Higher Sizes On Request

Flame Retardant Braided Power / Control Cables

FRT-200C (CU/XLPE/LSOH/CWB/LSOH) & **FRT-200Q** (CU/XLPE/LSOH/SWB/LSOH)



APPLICATION

This cable is suitable for use in fixed installations for power supply in offshore platform and Oil & Gas industry where flame retardant and low halogen properties are required.

TECHNICAL DATA

Standard	IEC 60502-1
Max. Rated Voltage	600/1000V
Test Voltage	3.5 KV / 5 min
Max. Temperature	90 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat. A
IEC 60754-1 & 2
IEC 61034-1 & 2
ASTM D 2863 Min. 30%

CONSTRUCTION

1. Conductor Annealed Stranded Non-Compacted / Compacted Circular or Shaped Copper
2. Insulation XLPE
3. Bedding Extruded LSOH
4. Wire Braid Q = Galvanized Steel Wires With or Without Earth Lead
C = Annealed Copper Wires
(For Single Core Cables)
5. Sheath Flame Retardant LSOH
6. Colour Black

CORE IDENTIFICATION

- 1C - Natural
2C – Brown & Blue
3C – Brown, Black & Grey
4C – Brown, Black, Grey & Blue
2C+E – Brown & Blue + Green/Yellow
3C+E – Brown, Black, Grey + Green/Yellow
4C+E – Brown, Black, Grey, Blue + Green/Yellow
5C & above – Number printed on the cores

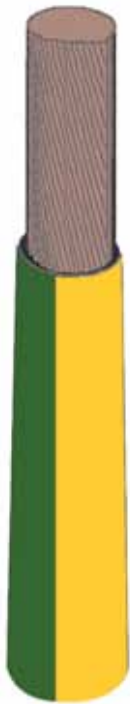
No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
1 X 10 rm	12.1	260	3 X 6 rm	16.8	520	5 X 50 cm	36.5	3250
1 X 16 rm	13.2	360	3 X 10 rm	19.2	710	5 X 70 cm	42.0	4400
1 X 25 rm	14.5	490	3 X 16 rm	21.4	910	5 X 1.5 rm	14.5	350
1 X 35 rm	15.8	610	3 X 25 sm	22.7	1250	6 X 1.5 rm	16.0	400
1 X 50 cm	17.2	765	3 X 35 sm	23.9	1600	7 X 1.5 rm	16.0	430
1 X 70 cm	19.1	1030	3 X 50 sm	26.7	2040	8 X 1.5 rm	17.8	480
1 X 95 cm	21.3	1325	3 X 70 sm	30.5	2810	10 X 1.5 rm	19.5	550
1 X 120 cm	22.8	1620	3 X 95 sm	35.2	3940	12 X 1.5 rm	20.0	630
1 X 150 cm	24.8	1940	3 X 120 sm	39.8	4790	16 X 1.5 rm	21.5	740
1 X 185 cm	27.2	2400	3 X 150 sm	42.1	5640	19 X 1.5 rm	22.8	850
1 X 240 rm	31.6	3040	4 X 1.5 rm	14.1	310	24 X 1.5 rm	25.0	1000
1 X 300 rm	33.0	3760	4 X 2.5 rm	15.3	370	37 X 1.5 rm	29.4	1410
2 X 1.5 rm	12.8	240	4 X 4 rm	16.5	480	5 X 2.5 rm	16.0	440
2 X 2.5 rm	13.8	290	4 X 6 rm	18.5	610	6 X 2.5 rm	17.1	510
2 X 4 rm	14.9	370	4 X 10 rm	20.5	840	7 X 2.5 rm	17.1	540
2 X 6 rm	16.0	440	4 X 16 rm	23.2	1140	8 X 2.5 rm	19.2	600
2 X 10 rm	18.0	590	4 X 25 sm	24.2	1580	10 X 2.5 rm	21.1	700
2 X 16 rm	20.2	790	4 X 35 sm	26.9	2030	12 X 2.5 rm	21.7	790
2 X 25 sm	19.4	930	4 X 50 sm	29.9	2610	16 X 2.5 rm	23.2	990
2 X 35 sm	21.4	1160	4 X 70 sm	34.4	3660	19 X 2.5 rm	24.9	1080
2 X 50 sm	24.5	1470	4 X 95 sm	38.6	4870	24 X 2.5 rm	28.2	1320
2 X 70 sm	27.4	1980	5 X 6 rm	19.6	715	37 X 2.5 rm	32.4	1850
2 X 95 sm	29.2	2640	5 X 10 rm	22.4	960	5 X 4 rm	17.7	580
3 X 1.5 rm	13.3	260	5 X 16 rm	25.2	1300	6 X 4 rm	19.2	680
3 X 2.5 rm	14.4	330	5 X 25 cm	28.4	1870	7 X 4 rm	19.2	690
3 X 4 rm	15.5	410	5 X 35 cm	31.9	2440			

rm: Stranded Circular Non-Compacted, cm: Stranded Circular Compacted, sm: Stranded Shaped

Note: Higher Sizes On Request

Flame Retardant Single Core Non-Sheathed Power Cables

FRT-3S (CU/LSOH)



APPLICATION

This cable is suitable for installation in conduit, in trunking, on trays or fixed protected installation in light fitting and inside switching and control equipment, where flame retardant and low smoke halogen free properties are required. It can carry voltage up to 1000 V a.c. or upto 750 V to earth d.c.

TECHNICAL DATA

Standard	BS EN 50525-3-41
Rated Voltage	450/750 V or (600/1000 V *)
Test Voltage	2.5 KV / 15 min or (or 3.5 / 5 min*)
Max. Temperature	90 °C

CONSTRUCTION

1. Conductor Annealed Stranded
Non-Compacted or Circular
Compacted Copper
2. Insulation Flame Retardant LSOH
3. Insulation Colour Brown, Grey, Blue, Black,
Green/Yellow, White, Red,
Yellow, Orange

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1 & IEC 60754-2
IEC 61034-1 & IEC 61034-2
ASTM D 2863 Min. 30%
Rated Voltage 600/1000 V (On Request)
High Voltage Test – 3.5 KV / 5 min (On Request)

Note : * = On request

No. of Cores	Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No.	mm ²	mm	Kg / Km
1	1.5 rm	3.1	23
	2.5 rm	3.7	34
	4 rm	4.3	50
	6 rm	4.8	70
	10 rm	6.2	120
	16 rm	7.2	180
	25 cm	8.5	270
	35 cm	9.8	370
	50 cm	11.3	500
	70 cm	12.9	700
	95 cm	15.2	970
	120 cm	16.6	1205
	150 cm	18.3	1480
	185 cm	20.6	1860
	240 rm	24.9	2450
	300 rm	27.7	3070
	400 rm	31.1	3900
	500 rm	34.6	4900
	630 rm	38.6	6250

rm: Stranded Circular Non-Compacted, cm: Stranded Circular Compacted

Introduction of Instrumentation Cables

WILSON CABLES provides ranges of single pair, multi-pair and multi-core **Unarmoured and Armoured Instrumentation Cables** with the specified features which are suitable for interconnection of electrical instruments and control equipment in process plants for indoor or underground use.

These cables are not for direct connection to a low impedance source, e.g. the public mains electricity supply.

WILSON CABLES also provides **Low Smoke Halogen Free Instrumentation Cables** with excellent electrical and mechanical properties and enhanced flame retardant characteristics. During a fire, these cables will not release aggressive halogenous substances and the smoke emission is greatly reduced. These properties reduce the danger to personnel and equipment and enable more effective fire fighting.

In addition, **WILSON CABLES** also caters to specific requirement on special request, e.g. cables with anti-termite or UV or oil resistant characteristics.

Usage of Instrumentation Cables

Product Code		Usage of Instrumentation Cables
Indoor Application	Direct Burial	
IC – 411 IC – 111 IC – 211 IC – 200 IC – 300	IC – 411A / IC – 411Q IC – 111A / IC – 111Q IC – 211A / IC – 211Q IC – 200A / IC – 200Q IC – 300A / IC – 300Q	• To oppose static and cross talk noises ensuring precise and Flawless signals to be transmitted. • Where signal transmitted are in excess of 100 mV in Instrumentation and control applications. • For interconnections between sensors, monitors and Instruments where 100% screen effectiveness is needed.
IP – 411 IP – 111 IP – 211 IP – 200 IP - 300	IP –411A / IP –411Q IP –111A / IP –111Q IP –211A / IP –211Q IP –200A / IP –200Q IP –300A / IP -300Q	• Where noise rejection is essential. • Provide optimal protection from crosstalk & common mode interference. • Additional electrostatic noise protection with an overall collective screen.
IM – 411 IM – 111 IM – 211 IM – 200 IM - 300	IM –411A /IM –411Q IM –111A /IM –111Q IM –211A /IM –211Q IM –200A /IM –200Q IM –300A /IM -300Q	• Use in process industries, such as steel, paper, pharmaceutical, petrochemical, mining, etc. • Providing control connections for d.c. or a.c. networks with an option of a fixed potential, with respect to earth. • Use in valve and motor control units, auxiliary station controls, circuit breaker indications and operations, etc.

Flame Retardant Non-Armoured Instrumentation Cables

IC-411 / IC-410 (CU/PVC/OS/PVC)



APPLICATION

This cable is specially designed to provide optimum properties of flexibility and intrinsic safety required for process instrumentation. It is used in electronic equipment, instrument panel, power station and petrochemical plant.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	70 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A (For IC-411)
IEC 60754-1 (<17%) (For IC-411)
ASTM D 2863 Min. 30% (For IC-411)

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	PVC
3. Collective Screen	Aluminium Mylar Foil With Drain Wire
4. Sheath	PVC (For IC-410) Flame Retardant Reduced Toxicity PVC (For IC-411)
5. Colour	Black / Blue / Green

CORE IDENTIFICATION

Each Pair - Black and White cores printed with pair number.

1 Triple - Black, White & Red

Note: Unscreened Cables & Triad Cables On Request

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
1 X 2 X 0.5	7.1	56	8 X 2 X 0.75	16.6	330	1 X 4 X 1.5	9.8	140
1 X 3 X 0.5	7.5	68	10 X 2 X 0.75	18.8	409	2 X 2 X 1.5	12.4	165
1 X 4 X 0.5	8.0	81	12 X 2 X 0.75	19.4	466	4 X 2 X 1.5	14.4	276
2 X 2 X 0.5	10.0	95	15 X 2 X 0.75	21.6	579	5 X 2 X 1.5	15.8	339
4 X 2 X 0.5	11.5	150	20 X 2 X 0.75	24.1	745	6 X 2 X 1.5	17.3	405
5 X 2 X 0.5	12.5	186	24 X 2 X 0.75	26.4	890	8 X 2 X 1.5	19.5	511
6 X 2 X 0.5	13.6	221	1 X 2 X 1.0	7.9	74	10 X 2 X 1.5	22.1	634
8 X 2 X 0.5	15.3	273	1 X 3 X 1.0	8.4	93	12 X 2 X 1.5	22.9	730
10 X 2 X 0.5	17.3	338	1 X 4 X 1.0	9.0	114	15 X 2 X 1.5	25.6	906
12 X 2 X 0.5	17.9	382	2 X 2 X 1.0	11.3	137	20 X 2 X 1.5	28.6	1174
15 X 2 X 0.5	19.9	462	4 X 2 X 1.0	13.2	216	1 X 2 X 2.5	9.9	121
20 X 2 X 0.5	22.2	593	5 X 2 X 1.0	14.4	275	1 X 3 X 2.5	10.5	164
24 X 2 X 0.5	24.2	708	6 X 2 X 1.0	15.7	318	1 X 4 X 2.5	11.4	205
1 X 2 X 0.75	7.6	64	8 X 2 X 1.0	17.6	410	2 X 2 X 2.5	14.6	239
1 X 3 X 0.75	8.0	79	10 X 2 X 1.0	20.0	496	4 X 2 X 2.5	17.1	407
1 X 4 X 0.75	8.6	96	12 X 2 X 1.0	20.7	582	5 X 2 X 2.5	18.8	499
2 X 2 X 0.75	10.7	117	15 X 2 X 1.0	23.1	707	6 X 2 X 2.5	20.5	596
4 X 2 X 0.75	12.4	180	20 X 2 X 1.0	25.8	914	8 X 2 X 2.5	23.2	773
5 X 2 X 0.75	13.5	230	1 X 2 X 1.5	8.6	88	10 X 2 X 2.5	26.5	959
6 X 2 X 0.75	14.7	265	1 X 3 X 1.5	9.1	113			

Flame Retardant Non-Armoured Instrumentation Cables

IC-111 / IC-110 (CU/PE/OS/PVC) & IC-211 / IC-210 (CU/XLPE/OS/PVC)



APPLICATION

This cable is specially designed to provide optimum properties of flexibility and intrinsic safety required for process instrumentation. It is used in electronic equipment, instrument panel, power station and petrochemical plant.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	70 °C (For IC-111 / IC-110) 90 °C (For IC-211 / IC-210)

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A (For IC-111 / IC-211)
IEC 60754-1 (<17%) (For IC-111 / IC-211)
ASTM D 2863 Min. 30% (For IC-111 / IC-211)

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	PE (For IC-111 / IC-110) XLPE (For IC-211 / IC-210)
3. Collective Screen	Aluminium Mylar Foil with Drain Wire
4. Sheath	PVC (For IC-110 / IC-210) Flame Retardant Reduced Toxicity PVC (For IC-111 / IC-211)
5. Colour	Black / Blue / Green

CORE IDENTIFICATION

Each Pair - Black and White cores printed with pair number.

1 Triple - Black, White & Red

Note: Unscreened Cables & Triad Cables On Request

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
1 X 2 X 0.5	7.1	53	8 X 2 X 0.75	16.6	307	1 X 4 X 1.5	9.8	129
1 X 3 X 0.5	7.5	64	10 X 2 X 0.75	18.8	380	2 X 2 X 1.5	12.4	154
1 X 4 X 0.5	8.0	76	12 X 2 X 0.75	19.4	432	4 X 2 X 1.5	14.4	255
2 X 2 X 0.5	10.0	89	15 X 2 X 0.75	21.6	536	5 X 2 X 1.5	15.8	313
4 X 2 X 0.5	11.5	140	20 X 2 X 0.75	24.1	687	6 X 2 X 1.5	17.3	373
5 X 2 X 0.5	12.5	172	24 X 2 X 0.75	26.4	821	8 X 2 X 1.5	19.5	469
6 X 2 X 0.5	13.6	205	1 X 2 X 1.0	7.9	70	10 X 2 X 1.5	22.1	582
8 X 2 X 0.5	15.3	251	1 X 3 X 1.0	8.4	87	12 X 2 X 1.5	22.9	667
10 X 2 X 0.5	17.3	311	1 X 4 X 1.0	9.0	105	15 X 2 X 1.5	25.6	827
12 X 2 X 0.5	17.9	350	2 X 2 X 1.0	11.3	128	20 X 2 X 1.5	28.6	1068
15 X 2 X 0.5	19.9	421	4 X 2 X 1.0	13.2	198	1 X 2 X 2.5	9.9	115
20 X 2 X 0.5	22.2	539	5 X 2 X 1.0	14.4	253	1 X 3 X 2.5	10.5	155
24 X 2 X 0.5	24.2	644	6 X 2 X 1.0	15.7	292	1 X 4 X 2.5	11.4	192
1 X 2 X 0.75	7.6	62	8 X 2 X 1.0	17.6	375	2 X 2 X 2.5	14.6	226
1 X 3 X 0.75	8.0	75	10 X 2 X 1.0	20.0	452	4 X 2 X 2.5	17.1	382
1 X 4 X 0.75	8.6	90	12 X 2 X 1.0	20.7	529	5 X 2 X 2.5	18.8	467
2 X 2 X 0.75	10.7	111	15 X 2 X 1.0	23.1	641	6 X 2 X 2.5	20.5	558
4 X 2 X 0.75	12.4	169	20 X 2 X 1.0	25.8	826	8 X 2 X 2.5	23.2	722
5 X 2 X 0.75	13.5	216	1 X 2 X 1.5	8.6	83	10 X 2 X 2.5	26.5	895
6 X 2 X 0.75	14.7	248	1 X 3 X 1.5	9.1	105			

Flame Retardant Non-Armoured Instrumentation Cables

IC-200 (CU/XLPE/OS/LSOH) & **IC-300** (CU/LSOH/OS/LSOH)



APPLICATION

This cable is specially designed to provide optimum properties of flexibility and intrinsic safety required for process instrumentation. It is used in electronic equipment, instrument panel, power station and petrochemical plant where flame retardant and low smoke halogen free properties are required.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	70 °C (For IC-300) 90 °C (For IC-200)

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1 & IEC 60754-2
IEC 61034-1 & IEC 61034-2
ASTM D 2863 Min. 30%

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	XLPE (For IC-200) LSOH (For IC-300)
3. Collective Screen	Aluminium Mylar Foil with Drain Wire
4. Sheath	Flame Retardant LSOH (Low Smoke and Zero Halogen)
5. Colour	Black / Blue / Green

CORE IDENTIFICATION

Each Pair - Black and White cores printed with pair number.

1 Triple - Black, White & Red

Note: Unscreened Cables & Triad Cables On Request

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
1 X 2 X 0.5	7.1	53	8 X 2 X 0.75	16.6	307	1 X 4 X 1.5	9.8	129
1 X 3 X 0.5	7.5	64	10 X 2 X 0.75	18.8	380	2 X 2 X 1.5	12.4	154
1 X 4 X 0.5	8.0	76	12 X 2 X 0.75	19.4	432	4 X 2 X 1.5	14.4	255
2 X 2 X 0.5	10.0	89	15 X 2 X 0.75	21.6	536	5 X 2 X 1.5	15.8	313
4 X 2 X 0.5	11.5	140	20 X 2 X 0.75	24.1	687	6 X 2 X 1.5	17.3	373
5 X 2 X 0.5	12.5	172	24 X 2 X 0.75	26.4	821	8 X 2 X 1.5	19.5	469
6 X 2 X 0.5	13.6	205	1 X 2 X 1.0	7.9	70	10 X 2 X 1.5	22.1	582
8 X 2 X 0.5	15.3	251	1 X 3 X 1.0	8.4	87	12 X 2 X 1.5	22.9	667
10 X 2 X 0.5	17.3	311	1 X 4 X 1.0	9.0	105	15 X 2 X 1.5	25.6	827
12 X 2 X 0.5	17.9	350	2 X 2 X 1.0	11.3	128	20 X 2 X 1.5	28.6	1068
15 X 2 X 0.5	19.9	421	4 X 2 X 1.0	13.2	198	1 X 2 X 2.5	9.9	115
20 X 2 X 0.5	22.2	539	5 X 2 X 1.0	14.4	253	1 X 3 X 2.5	10.5	155
24 X 2 X 0.5	24.2	644	6 X 2 X 1.0	15.7	292	1 X 4 X 2.5	11.4	192
1 X 2 X 0.75	7.6	62	8 X 2 X 1.0	17.6	375	2 X 2 X 2.5	14.6	226
1 X 3 X 0.75	8.0	75	10 X 2 X 1.0	20.0	452	4 X 2 X 2.5	17.1	382
1 X 4 X 0.75	8.6	90	12 X 2 X 1.0	20.7	529	5 X 2 X 2.5	18.8	467
2 X 2 X 0.75	10.7	111	15 X 2 X 1.0	23.1	641	6 X 2 X 2.5	20.5	588
4 X 2 X 0.75	12.4	169	20 X 2 X 1.0	25.8	826	8 X 2 X 2.5	23.2	722
5 X 2 X 0.75	13.5	216	1 X 2 X 1.5	8.6	83	10 X 2 X 2.5	26.5	995
6 X 2 X 0.75	14.7	248	1 X 3 X 1.5	9.1	105			

Note: Weight mentioned in the table is for IC-200. For IC-300 weights will be provided on request.

Flame Retardant Non-Armoured Instrumentation Cables

IP-411 / IP-410 (CU/PVC/IS/OS/PVC)



APPLICATION

This cable is specially designed to provide optimum properties of flexibility and intrinsic safety required for process instrumentation. It is used in electronic equipment, instrument panel, power station and petrochemical plant.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	70 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A (For IP-411)
IEC 60754-1 (<17%) (For IP-411)
ASTM D 2863 Min. 30% (For IP-411)

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	PVC
3. Individual Screen	Aluminium Mylar Foil with Drain Wire
4. Collective Screen	Aluminium Mylar Foil With Drain Wire
5. Sheath	PVC (For IP-410) Flame Retardant Reduced Toxicity PVC (For IP-411)
6. Colour	Black / Blue / Green

CORE IDENTIFICATION

Each Pair - Black and White cores printed with pair number.

Note: Triad Cables On Request

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
2 X 2 X 0.5	11.4	119	8 X 2 X 0.75	19.1	411	2 X 2 X 1.5	14.0	195
4 X 2 X 0.5	13.2	185	10 X 2 X 0.75	21.7	509	4 X 2 X 1.5	16.4	316
5 X 2 X 0.5	14.4	237	12 X 2 X 0.75	22.4	583	5 X 2 X 1.5	17.9	399
6 X 2 X 0.5	15.7	273	15 X 2 X 0.75	25.0	722	6 X 2 X 1.5	19.6	464
8 X 2 X 0.5	17.7	350	20 X 2 X 0.75	28.0	932	8 X 2 X 1.5	22.2	601
10 X 2 X 0.5	20.1	434	2 X 2 X 1.0	12.8	157	10 X 2 X 1.5	25.3	746
12 X 2 X 0.5	20.8	494	4 X 2 X 1.0	15.0	262	12 X 2 X 1.5	26.2	874
15 X 2 X 0.5	23.1	599	5 X 2 X 1.0	16.4	322	2 X 2 X 2.5	16.1	273
20 X 2 X 0.5	25.9	771	6 X 2 X 1.0	17.9	384	4 X 2 X 2.5	19.0	453
2 X 2 X 0.75	12.2	137	8 X 2 X 1.0	20.2	495	5 X 2 X 2.5	20.9	567
4 X 2 X 0.75	14.2	224	10 X 2 X 1.0	23.0	600	6 X 2 X 2.5	23.0	676
5 X 2 X 0.75	15.5	276	12 X 2 X 1.0	23.8	704	8 X 2 X 2.5	26.1	876
6 X 2 X 0.75	16.9	328	15 X 2 X 1.0	26.6	856			

Flame Retardant Non-Armoured Instrumentation Cables

IP-111 / IP-110 (CU/PE/IS/OS/PVC) & IP-211 / IP-210 (CU/XLPE/IS/OS/PVC)



APPLICATION

This cable is specially designed to provide optimum properties of flexibility and intrinsic safety required for process instrumentation. It is used in electronic equipment, instrument panel, power station and petrochemical plant.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	70 °C (For IP-111 / IP-110) 90 °C (For IP-211 / IP-210)

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A (For IP-111 / IP-211)
IEC 60754-1 (<17%) (For IP-111 / IP-211)
ASTM D 2863 Min. 30% (For IP-111 / IP-211)

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	PE (For IP-111 / IP-110) XLPE (For IP-211 / IP-210)
3. Individual Screen	Aluminium Mylar Foil with Drain Wire
4. Collective Screen	Aluminium Mylar Foil with Drain Wire
5. Sheath	PVC (For IP-110 / IP-210) Flame Retardant Reduced Toxicity PVC (For IP-111 / IP-211)
6. Colour	Black / Blue / Green

CORE IDENTIFICATION

Each Pair - Black and white cores printed with pair number.

Note: Triad Cables On Request

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
2 X 2 X 0.5	11.4	114	8 X 2 X 0.75	19.1	388	2 X 2 X 1.5	14.0	184
4 X 2 X 0.5	13.2	174	10 X 2 X 0.75	21.7	481	4 X 2 X 1.5	16.4	295
5 X 2 X 0.5	14.4	223	12 X 2 X 0.75	22.4	548	5 X 2 X 1.5	17.9	372
6 X 2 X 0.5	15.7	257	15 X 2 X 0.75	25.0	679	6 X 2 X 1.5	19.6	432
8 X 2 X 0.5	17.7	329	20 X 2 X 0.75	28.0	874	8 X 2 X 1.5	22.2	559
10 X 2 X 0.5	20.1	407	2 X 2 X 1.0	12.8	149	10 X 2 X 1.5	25.3	693
12 X 2 X 0.5	20.8	462	4 X 2 X 1.0	15.0	244	12 X 2 X 1.5	26.2	811
15 X 2 X 0.5	23.1	558	5 X 2 X 1.0	16.4	300	2 X 2 X 2.5	16.1	261
20 X 2 X 0.5	25.9	718	6 X 2 X 1.0	17.9	358	4 X 2 X 2.5	19.0	428
2 X 2 X 0.75	12.2	131	8 X 2 X 1.0	20.2	460	5 X 2 X 2.5	20.9	535
4 X 2 X 0.75	14.2	213	10 X 2 X 1.0	23.0	556	6 X 2 X 2.5	23.0	638
5 X 2 X 0.75	15.5	261	12 X 2 X 1.0	23.8	651	8 X 2 X 2.5	26.1	825
6 X 2 X 0.75	16.9	311	15 X 2 X 1.0	26.6	790			

Flame Retardant Non-Armoured Instrumentation Cables

IP-200 (CU/XLPE/IS/OS/LSOH) & **IP-300** (CU/LSOH/IS/OS/LSOH)



APPLICATION

This cable is specially designed to provide optimum properties of flexibility and intrinsic safety required for process instrumentation. It is used in electronic equipment, instrument panel, power station and petrochemical plant, where flame retardant and low smoke halogen free properties are required.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	70 °C (For IP-300) 90 °C (For IP-200)

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1 & IEC 60754-2
IEC 61034-1 & IEC 61034-2
ASTM D 2863 Min. 30%

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	XLPE (For IP-200) LSOH (For IP-300)
3. Individual Screen	Aluminium Mylar Foil with Drain Wire
4. Collective Screen	Aluminium Mylar Foil with Drain Wire
5. Sheath	Flame Retardant LSOH (Low Smoke and Zero Halogen)
6. Colour	Black / Blue / Green

CORE IDENTIFICATION

Each Pair - Black and white cores printed with pair number.

Note: Triad Cables On Request

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
2 X 2 X 0.5	11.4	114	8 X 2 X 0.75	19.1	388	2 X 2 X 1.5	14.0	184
4 X 2 X 0.5	13.2	174	10 X 2 X 0.75	21.7	481	4 X 2 X 1.5	16.4	295
5 X 2 X 0.5	14.4	223	12 X 2 X 0.75	22.4	548	5 X 2 X 1.5	17.9	372
6 X 2 X 0.5	15.7	257	15 X 2 X 0.75	25.0	679	6 X 2 X 1.5	19.6	432
8 X 2 X 0.5	17.7	329	20 X 2 X 0.75	28.0	874	8 X 2 X 1.5	22.2	559
10 X 2 X 0.5	20.1	407	2 X 2 X 1.0	12.8	149	10 X 2 X 1.5	25.3	693
12 X 2 X 0.5	20.8	462	4 X 2 X 1.0	15.0	244	12 X 2 X 1.5	26.2	811
15 X 2 X 0.5	23.1	558	5 X 2 X 1.0	16.4	300	2 X 2 X 2.5	16.1	261
20 X 2 X 0.5	25.9	718	6 X 2 X 1.0	17.9	358	4 X 2 X 2.5	19.0	428
2 X 2 X 0.75	12.2	131	8 X 2 X 1.0	20.2	460	5 X 2 X 2.5	20.9	535
4 X 2 X 0.75	14.2	213	10 X 2 X 1.0	23.0	556	6 X 2 X 2.5	23.0	638
5 X 2 X 0.75	15.5	261	12 X 2 X 1.0	23.8	651	8 X 2 X 2.5	26.1	825
6 X 2 X 0.75	16.9	311	15 X 2 X 1.0	26.6	790			

Note: Weight mentioned in the table is for IP-200. For IP-300 weights will be provided on request.

Flame Retardant Non-Armoured Instrumentation Cables

IM-411 / IM-410 (CU/PVC/OS/PVC)



APPLICATION

This cable is specially designed for use in process industries providing control connections for d.c. or a.c. networks (such as valve and motor control units, auxiliary station controls, circuit breaker indications and operations, etc) with an option of a fixed potential, with respect to earth.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	70 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A (For IM-411)
IEC 60754-1 (<17%) (For IM-411)
ASTM D 2863 Min. 30% (For IM-411)

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	PVC
3. Collective Screen	Aluminium Mylar Foil with Drain Wire
4. Sheath	PVC (For IM-410) Flame Retardant Reduced Toxicity PVC (For IM-411)
5. Colour	Black / Blue / Green

CORE IDENTIFICATION

Each Cores - Black insulated cores with white number printed on the cores

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
2 X 0.5	7.1	56	20 X 0.75	15.8	357	10 X 1.5	14.5	312
3 X 0.5	7.5	68	24 X 0.75	17.4	429	12 X 1.5	15.0	359
4 X 0.5	8.0	81	37 X 0.75	19.9	623	19 X 1.5	17.5	538
6 X 0.5	9.3	108	2 X 1.0	7.9	74	20 X 1.5	18.5	567
10 X 0.5	11.6	166	3 X 1.0	8.4	93	24 X 1.5	20.5	680
12 X 0.5	11.9	188	4 X 1.0	9.0	113	37 X 1.5	23.4	999
19 X 0.5	13.8	275	6 X 1.0	10.6	161	2 X 2.5	9.9	121
20 X 0.5	14.5	290	10 X 1.0	13.2	243	3 X 2.5	10.5	164
24 X 0.5	16.0	339	12 X 1.0	13.7	278	4 X 2.5	11.4	204
37 X 0.5	18.3	491	19 X 1.0	15.9	416	6 X 2.5	13.6	294
2 X 0.75	7.6	64	20 X 1.0	16.8	438	10 X 2.5	17.2	465
3 X 0.75	8.0	79	24 X 1.0	18.5	527	12 X 2.5	17.8	537
4 X 0.75	8.6	96	37 X 1.0	21.2	772	19 X 2.5	20.8	811
6 X 0.75	10.0	129	2 X 1.5	8.6	88	20 X 2.5	22.0	855
10 X 0.75	12.5	201	3 X 1.5	9.1	113	24 X 2.5	24.5	1025
12 X 0.75	12.9	229	4 X 1.5	9.8	139	37 X 2.5	28.1	1516
19 X 0.75	14.9	339	6 X 1.5	11.6	199			

Flame Retardant Non-Armoured Instrumentation Cables

IM-111 / IM-110 (CU/PE/OS/PVC) & **IM-211 / IM-210** (CU/XLPE/OS/PVC)



APPLICATION

This cable is specially designed for use in process industries providing control connections for d.c or a.c. networks (such as valve and motor control units, auxiliary station controls, circuit breaker indications and operations, etc) with an option of a fixed potential, with respect to earth.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	70 °C (For IM-111 / IM-110) 90 °C (For IM-211 / IM-210)

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A (For IM-111 / IM-211)
IEC 60754-1 (<17%) (For IM-111 / IM-211)
ASTM D 2863 Min. 30% (For IM-111 / IM-211)

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	PE (For IM-111 / IM-110) XLPE (For IM-211 / IM-210)
3. Collective Screen	Aluminium Mylar Foil with Drain Wire
4. Sheath	PVC (For IM-110 / IM-210) Flame Retardant Reduced Toxicity PVC (For IM-111 / IM-211)
5. Colour	Black / Blue / Green

CORE IDENTIFICATION

Each Core - Black insulated cores with White numbers printed

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
2 X 0.5	7.1	52	20 X 0.75	15.8	312	10 X 1.5	14.5	280
3 X 0.5	7.5	62	24 X 0.75	17.4	375	12 X 1.5	15.0	321
4 X 0.5	8.0	73	37 X 0.75	19.9	539	19 X 1.5	17.5	477
6 X 0.5	9.3	96	2 X 1.0	7.9	68	20 X 1.5	18.5	503
10 X 0.5	11.6	146	3 X 1.0	8.4	85	24 X 1.5	20.5	603
12 X 0.5	11.9	164	4 X 1.0	9.0	102	37 X 1.5	23.4	881
19 X 0.5	13.8	236	6 X 1.0	10.6	144	2 X 2.5	9.9	112
20 X 0.5	14.5	249	10 X 1.0	13.2	215	3 X 2.5	10.5	151
24 X 0.5	16.0	290	12 X 1.0	13.7	245	4 X 2.5	11.4	186
37 X 0.5	18.3	416	19 X 1.0	15.9	364	6 X 2.5	13.6	267
2 X 0.75	7.6	59	20 X 1.0	16.8	383	10 X 2.5	17.2	421
3 X 0.75	8.0	72	24 X 1.0	18.5	461	12 X 2.5	17.8	484
4 X 0.75	8.6	87	37 X 1.0	21.2	670	19 X 2.5	20.8	727
6 X 0.75	10.0	115	2 X 1.5	8.6	82	20 X 2.5	22.0	766
10 X 0.75	12.5	178	3 X 1.5	9.1	103	24 X 2.5	24.5	918
12 X 0.75	12.9	202	4 X 1.5	9.8	126	37 X 2.5	28.1	1352
19 X 0.75	14.9	296	6 X 1.5	11.6	180			

Flame Retardant Non-Armoured Instrumentation Cables

IM-200 (CU/XLPE/OS/LSOH) & **IM-300** (CU/LSOH/OS/LSOH)



APPLICATION

This cable is specially designed for use in process industries providing control connections for d.c or a.c. networks (such as valve and motor control units, auxiliary station controls, circuit breaker indications and operations, etc) with an option of a fixed potential, with respect to earth where flame retardant and low smoke halogen free properties are required.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	70 °C (For IM-300) 90 °C (For IM-200)

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1 & IEC 60754-2
IEC 61034-1 & IEC 61034-2
ASTM D 2863 Min. 30%

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	XLPE (For IM-200) LSOH (For IM-300)
3. Collective Screen	Aluminium Mylar Foil with Drain Wire
4. Sheath	Flame Retardant LSOH (Low Smoke and Zero Halogen)
5. Colour	Black / Blue / Green

CORE IDENTIFICATION

Each Core - Black insulated cores with white numbers printed on the cores

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
2 X 0.5	7.1	52	20 X 0.75	15.8	312	10 X 1.5	14.5	280
3 X 0.5	7.5	62	24 X 0.75	17.4	375	12 X 1.5	15.0	321
4 X 0.5	8.0	73	37 X 0.75	19.9	539	19 X 1.5	17.5	477
6 X 0.5	9.3	96	2 X 1.0	7.9	68	20 X 1.5	18.5	503
10 X 0.5	11.6	146	3 X 1.0	8.4	85	24 X 1.5	20.5	603
12 X 0.5	11.9	164	4 X 1.0	9.0	102	37 X 1.5	23.4	881
19 X 0.5	13.8	236	6 X 1.0	10.6	144	2 X 2.5	9.9	112
20 X 0.5	14.5	249	10 X 1.0	13.2	215	3 X 2.5	10.5	151
24 X 0.5	16.0	290	12 X 1.0	13.7	245	4 X 2.5	11.4	186
37 X 0.5	18.3	416	19 X 1.0	15.9	364	6 X 2.5	13.6	267
2 X 0.75	7.6	59	20 X 1.0	16.8	383	10 X 2.5	17.2	421
3 X 0.75	8.0	72	24 X 1.0	18.5	461	12 X 2.5	17.8	484
4 X 0.75	8.6	87	37 X 1.0	21.2	670	19 X 2.5	20.8	727
6 X 0.75	10.0	115	2 X 1.5	8.6	82	20 X 2.5	22.0	766
10 X 0.75	12.5	178	3 X 1.5	9.1	103	24 X 2.5	24.5	918
12 X 0.75	12.9	202	4 X 1.5	9.8	126	37 X 2.5	28.1	1352
19 X 0.75	14.9	296	6 X 1.5	11.6	180			

Note: Weight mentioned in the table is for IM-200. For IM-300 weights will be provided on request.

Flame Retardant Armoured Instrumentation Cables

IC-411A / IC-410A (CU/PVC/OS/PVC/SWA/PVC)



APPLICATION

This cable is specially designed to provide optimum properties of flexibility and intrinsic safety required for process instrumentation. It is used in electronic equipment, instrument panel, power station and petrochemical plant.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV / 1 min
Max. Temperature	70 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1 (<17%) (For IC-411A)
ASTM D 2863 Min. 30% (For IC-411A)

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	PVC
3. Collective Screen	Aluminium Mylar Foil with Drain Wire
4. Bedding	PVC (For IC-410A) Flame Retardant Reduced Toxicity PVC (For IC-411A)
5. Armour	Galvanized Round Steel Wires
4. Sheath	PVC (For IC-410A) Flame Retardant Reduced Toxicity PVC (For IC-411A)
7. Colour	Black / Blue / Green

CORE IDENTIFICATION

Each Pair - Black and White cores printed with pair number.

1 Triple - Black, White & Red

Note: Unscreened Cables & Triad Cables On Request

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
1 X 2 X 0.5	11.5	240	8 X 2 X 0.75	22.1	893	1 X 4 X 1.5	14.4	395
1 X 3 X 0.5	11.9	265	10 X 2 X 0.75	24.3	1068	2 X 2 X 1.5	17.1	488
1 X 4 X 0.5	12.5	287	12 X 2 X 0.75	25.2	1138	4 X 2 X 1.5	19.2	667
2 X 2 X 0.5	14.5	358	15 X 2 X 0.75	27.5	1345	5 X 2 X 1.5	21.3	880
4 X 2 X 0.5	16.1	457	20 X 2 X 0.75	30.2	1595	6 X 2 X 1.5	22.9	998
5 X 2 X 0.5	17.2	516	24 X 2 X 0.75	32.4	2450	8 X 2 X 1.5	24.9	1182
6 X 2 X 0.5	18.3	597	1 X 2 X 1.0	12.4	280	10 X 2 X 1.5	27.9	1414
8 X 2 X 0.5	20.8	801	1 X 3 X 1.0	12.8	312	12 X 2 X 1.5	28.7	1537
10 X 2 X 0.5	22.8	933	1 X 4 X 1.0	13.5	348	15 X 2 X 1.5	31.7	1812
12 X 2 X 0.5	23.6	1015	2 X 2 X 1.0	15.9	438	20 X 2 X 1.5	34.9	2192
15 X 2 X 0.5	25.5	1158	4 X 2 X 1.0	17.8	562	1 X 2 X 2.5	14.5	377
20 X 2 X 0.5	28.2	1385	5 X 2 X 1.0	19.1	668	1 X 3 X 2.5	15.1	441
24 X 2 X 0.5	30.1	1870	6 X 2 X 1.0	21.2	859	1 X 4 X 2.5	16.1	504
1 X 2 X 0.75	12.0	255	8 X 2 X 1.0	23.0	1017	2 X 2 X 2.5	19.4	630
1 X 3 X 0.75	12.4	284	10 X 2 X 1.0	25.6	1197	4 X 2 X 2.5	22.7	989
1 X 4 X 0.75	13.1	315	12 X 2 X 1.0	26.5	1311	5 X 2 X 2.5	24.5	1145
2 X 2 X 0.75	15.3	402	15 X 2 X 1.0	29.0	1522	6 X 2 X 2.5	26.1	1307
4 X 2 X 0.75	17.1	508	20 X 2 X 1.0	31.9	1827	8 X 2 X 2.5	29.1	1593
5 X 2 X 0.75	18.2	599	1 X 2 X 1.5	13.1	308	10 X 2 X 2.5	32.7	1907
6 X 2 X 0.75	19.5	664	1 X 3 X 1.5	13.6	353			

Flame Retardant Armoured Instrumentation Cables

IC-111A / IC-110A (CU/PE/OS/PE/SWA/PVC)



APPLICATION

This cable is specially designed to provide optimum properties of flexibility and intrinsic safety required for process instrumentation. It is used in electronic equipment, instrument panel, power station and petrochemical plant.

TECHNICAL DATA

Standard BS EN 50288-7
Max. Rated Voltage 500V
Test Voltage 2.0 KV ac / 1 min
Max. Temperature 70 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1 (<17%) (For IC-111A)
ASTM D 2863 Min. 30% (For IC-111A)

CONSTRUCTION

- | | |
|----------------------|---|
| 1. Conductor | Annealed Stranded Copper |
| 2. Insulation | PE |
| 3. Collective Screen | Aluminium Mylar Foil with Drain Wire |
| 4. Bedding | PE |
| 5. Armour | Galvanized Round Steel Wires |
| 4. Sheath | PVC (For IC-110A)
Flame Retardant Reduced Toxicity PVC (For IC-111A) |
| 7. Colour | Black / Blue / Green |

CORE IDENTIFICATION

Each Pair - Black and White cores printed with pair number.

1 Triple - Black, White & Red

Note: Unscreened Cables & Triad Cables On Request

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
1 X 2 X 0.5	11.5	226	8 X 2 X 0.75	22.1	827	1 X 4 X 1.5	14.4	366
1 X 3 X 0.5	11.9	248	10 X 2 X 0.75	24.3	986	2 X 2 X 1.5	17.1	451
1 X 4 X 0.5	12.5	267	12 X 2 X 0.75	25.2	1050	4 X 2 X 1.5	19.2	611
2 X 2 X 0.5	14.5	334	15 X 2 X 0.75	27.5	1237	5 X 2 X 1.5	21.3	813
4 X 2 X 0.5	16.1	422	20 X 2 X 0.75	30.2	1458	6 X 2 X 1.5	22.9	918
5 X 2 X 0.5	17.2	475	24 X 2 X 0.75	32.4	2270	8 X 2 X 1.5	24.9	1087
6 X 2 X 0.5	18.3	547	1 X 2 X 1.0	12.4	262	10 X 2 X 1.5	27.9	1295
8 X 2 X 0.5	20.8	740	1 X 3 X 1.0	12.8	290	12 X 2 X 1.5	28.7	1404
10 X 2 X 0.5	22.8	857	1 X 4 X 1.0	13.5	322	15 X 2 X 1.5	31.7	1650
12 X 2 X 0.5	23.6	931	2 X 2 X 1.0	15.9	405	20 X 2 X 1.5	34.9	1986
15 X 2 X 0.5	25.5	1063	4 X 2 X 1.0	17.8	516	1 X 2 X 2.5	14.5	353
20 X 2 X 0.5	28.2	1264	5 X 2 X 1.0	19.1	611	1 X 3 X 2.5	15.1	410
24 X 2 X 0.5	30.1	1800	6 X 2 X 1.0	21.2	792	1 X 4 X 2.5	16.1	467
1 X 2 X 0.75	12.0	246	8 X 2 X 1.0	23.0	932	2 X 2 X 2.5	19.4	582
1 X 3 X 0.75	12.4	266	10 X 2 X 1.0	25.6	1098	4 X 2 X 2.5	22.7	915
1 X 4 X 0.75	13.1	294	12 X 2 X 1.0	26.5	1195	5 X 2 X 2.5	24.5	1062
2 X 2 X 0.75	15.3	374	15 X 2 X 1.0	29.0	1386	6 X 2 X 2.5	26.1	1207
4 X 2 X 0.75	17.1	470	20 X 2 X 1.0	31.9	1654	8 X 2 X 2.5	29.1	1467
5 X 2 X 0.75	18.2	552	1 X 2 X 1.5	13.1	287	10 X 2 X 2.5	32.7	1750
6 X 2 X 0.75	19.5	610	1 X 3 X 1.5	13.6	329			

Flame Retardant Armoured Instrumentation Cables

IC-211A / IC-210A (CU/XLPE/OS/PVC/SWA/PVC)



APPLICATION

This cable is specially designed to provide optimum properties of flexibility and intrinsic safety required for process instrumentation. It is used in electronic equipment, instrument panel, power station and petrochemical plant.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	90 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1 (<17%) (For IC-211A)
ASTM D 2863 Min. 30% (For IC-211A)

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	XLPE
3. Collective Screen	Aluminium Mylar Foil with Drain Wire
4. Bedding	PVC (For IC-210A) Flame Retardant Reduced Toxicity PVC (For IC-211A)
5. Armour	Galvanized Round Steel Wires
4. Sheath	PVC (For IC-210A) Flame Retardant Reduced Toxicity PVC (For IC-211A)
7. Colour	Black / Blue / Green

CORE IDENTIFICATION

Each Pair - Black and White cores printed with pair number.

1 Triple - Black, White & Red

Note: Unscreened Cables & Triad Cables On Request

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
1 X 2 X 0.5	11.5	238	8 X 2 X 0.75	22.1	868	1 X 4 X 1.5	14.4	384
1 X 3 X 0.5	11.9	261	10 X 2 X 0.75	24.3	1037	2 X 2 X 1.5	17.1	477
1 X 4 X 0.5	12.5	281	12 X 2 X 0.75	25.2	1104	4 X 2 X 1.5	19.2	646
2 X 2 X 0.5	14.5	353	15 X 2 X 0.75	27.5	1302	5 X 2 X 1.5	21.3	852
4 X 2 X 0.5	16.1	447	20 X 2 X 0.75	30.2	1537	6 X 2 X 1.5	22.9	964
5 X 2 X 0.5	17.2	502	24 X 2 X 0.75	32.4	2400	8 X 2 X 1.5	24.9	1140
6 X 2 X 0.5	18.3	580	1 X 2 X 1.0	12.4	275	10 X 2 X 1.5	27.9	1362
8 X 2 X 0.5	20.8	778	1 X 3 X 1.0	12.8	305	12 X 2 X 1.5	28.7	1473
10 X 2 X 0.5	22.8	904	1 X 4 X 1.0	13.5	338	15 X 2 X 1.5	31.7	1733
12 X 2 X 0.5	23.6	980	2 X 2 X 1.0	15.9	428	20 X 2 X 1.5	34.9	2087
15 X 2 X 0.5	25.5	1118	4 X 2 X 1.0	17.8	543	1 X 2 X 2.5	14.5	371
20 X 2 X 0.5	28.2	1332	5 X 2 X 1.0	19.1	644	1 X 3 X 2.5	15.1	432
24 X 2 X 0.5	30.1	1830	6 X 2 X 1.0	21.2	831	1 X 4 X 2.5	16.1	491
1 X 2 X 0.75	12.0	259	8 X 2 X 1.0	23.0	980	2 X 2 X 2.5	19.4	617
1 X 3 X 0.75	12.4	280	10 X 2 X 1.0	25.6	1149	4 X 2 X 2.5	22.7	961
1 X 4 X 0.75	13.1	309	12 X 2 X 1.0	26.5	1253	5 X 2 X 2.5	24.5	1113
2 X 2 X 0.75	15.3	309	15 X 2 X 1.0	29.0	1451	6 X 2 X 2.5	26.1	1268
4 X 2 X 0.75	17.1	497	20 X 2 X 1.0	31.9	1731	8 X 2 X 2.5	29.1	1542
5 X 2 X 0.75	18.2	585	1 X 2 X 1.5	13.1	303	10 X 2 X 2.5	32.7	1843
6 X 2 X 0.75	19.5	646	1 X 3 X 1.5	13.6	345			

Flame Retardant Armoured Instrumentation Cables

IC-200A (CU/XLPE/OS/LSOH/SWA/LSOH)



APPLICATION

This cable is specially designed to provide optimum properties of flexibility and intrinsic safety required for process instrumentation. It is used in electronic equipment, instrument panel, power station and petrochemical plant, where flame retardant and low smoke halogens free properties are required.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	90 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1
IEC 60754-2
IEC 61034-1 & 2
ASTM D 2863 Min. 30%

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	XLPE
3. Collective Screen	Aluminium Mylar Foil with Drain Wire
4. Bedding	LSOH
5. Armour	Galvanized Round Steel Wires
4. Sheath	Flame Retardant LSOH (Low Smoke and Zero Halogen)
7. Colour	Black / Blue / Green

CORE IDENTIFICATION

Each Pair - Black and White cores printed with pair number.

1 Triple - Black, White & Red

Note: Unscreened Cables & Triad Cables On Request

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
1 X 2 X 0.5	11.5	238	8 X 2 X 0.75	22.1	868	1 X 4 X 1.5	14.4	384
1 X 3 X 0.5	11.9	261	10 X 2 X 0.75	24.3	1037	2 X 2 X 1.5	17.1	477
1 X 4 X 0.5	12.5	281	12 X 2 X 0.75	25.2	1104	4 X 2 X 1.5	19.2	646
2 X 2 X 0.5	14.5	353	15 X 2 X 0.75	27.5	1302	5 X 2 X 1.5	21.3	852
4 X 2 X 0.5	16.1	447	20 X 2 X 0.75	30.2	1537	6 X 2 X 1.5	22.9	964
5 X 2 X 0.5	17.2	502	24 X 2 X 0.75	32.4	2400	8 X 2 X 1.5	24.9	1140
6 X 2 X 0.5	18.3	580	1 X 2 X 1.0	12.4	275	10 X 2 X 1.5	27.9	1362
8 X 2 X 0.5	20.8	778	1 X 3 X 1.0	12.8	305	12 X 2 X 1.5	28.7	1473
10 X 2 X 0.5	22.8	904	1 X 4 X 1.0	13.5	338	15 X 2 X 1.5	31.7	1733
12 X 2 X 0.5	23.6	980	2 X 2 X 1.0	15.9	428	20 X 2 X 1.5	34.9	2087
15 X 2 X 0.5	25.5	1118	4 X 2 X 1.0	17.8	543	1 X 2 X 2.5	14.5	371
20 X 2 X 0.5	28.2	1332	5 X 2 X 1.0	19.1	644	1 X 3 X 2.5	15.1	432
24 X 2 X 0.5	30.1	1830	6 X 2 X 1.0	21.2	831	1 X 4 X 2.5	16.1	491
1 X 2 X 0.75	12.0	259	8 X 2 X 1.0	23.0	980	2 X 2 X 2.5	19.4	617
1 X 3 X 0.75	12.4	280	10 X 2 X 1.0	25.6	1149	4 X 2 X 2.5	22.7	961
1 X 4 X 0.75	13.1	309	12 X 2 X 1.0	26.5	1253	5 X 2 X 2.5	24.5	1113
2 X 2 X 0.75	15.3	309	15 X 2 X 1.0	29.0	1451	6 X 2 X 2.5	26.1	1268
4 X 2 X 0.75	17.1	497	20 X 2 X 1.0	31.9	1731	8 X 2 X 2.5	29.1	1542
5 X 2 X 0.75	18.2	585	1 X 2 X 1.5	13.1	303	10 X 2 X 2.5	32.7	1843
6 X 2 X 0.75	19.5	646	1 X 3 X 1.5	13.6	345			

Flame Retardant Armoured Instrumentation Cables

IC-300A (CU/LSOH/OS/LSOH/SWA/LSOH)



APPLICATION

This cable is specially designed to provide optimum properties of flexibility and intrinsic safety required for process instrumentation. It is used in electronic equipment, instrument panel, power station and petrochemical plant where flame retardant and low smoke halogen free properties are required.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	70 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1 & IEC 60754-2
IEC 61034-1 & IEC 61034-2
ASTM D 2863 Min. 30%

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	LSOH
3. Collective Screen	Aluminium Mylar Foil with Drain Wire
4. Bedding	LSOH
5. Armour	Galvanized Round Steel Wires.
6. Sheath	Flame Retardant LSOH (Low Smoke and Zero Halogen)

CORE IDENTIFICATION

Each Pair - Black and White cores printed with pair number.

1 Triple - Black, White & Red

Note: Unscreened Cables & Triad Cables On Request

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
1 X 2 X 0.5	11.5	240	8 X 2 X 0.75	22.1	893	1 X 4 X 1.5	14.4	393
1 X 3 X 0.5	11.9	265	10 X 2 X 0.75	24.3	1068	2 X 2 X 1.5	17.1	488
1 X 4 X 0.5	12.5	287	12 X 2 X 0.75	25.2	1138	4 X 2 X 1.5	19.2	667
2 X 2 X 0.5	14.5	358	15 X 2 X 0.75	27.5	1345	5 X 2 X 1.5	21.3	880
4 X 2 X 0.5	16.1	457	20 X 2 X 0.75	30.2	1595	6 X 2 X 1.5	22.9	998
5 X 2 X 0.5	17.2	516	24 X 2 X 0.75	32.4	2450	8 X 2 X 1.5	24.9	1182
6 X 2 X 0.5	18.3	597	1 X 2 X 1.0	12.4	280	10 X 2 X 1.5	27.9	1414
8 X 2 X 0.5	20.8	801	1 X 3 X 1.0	12.8	312	12 X 2 X 1.5	28.7	1537
10 X 2 X 0.5	22.8	933	1 X 4 X 1.0	13.5	345	15 X 2 X 1.5	31.7	1812
12 X 2 X 0.5	23.6	1015	2 X 2 X 1.0	15.9	438	20 X 2 X 1.5	34.9	2192
15 X 2 X 0.5	25.5	1158	4 X 2 X 1.0	17.8	562	1 X 2 X 2.5	14.5	377
20 X 2 X 0.5	28.2	1385	5 X 2 X 1.0	19.1	668	1 X 3 X 2.5	15.1	441
24 X 2 X 0.5	30.1	1870	6 X 2 X 1.0	21.2	859	1 X 4 X 2.5	16.1	503
1 X 2 X 0.75	12.0	255	8 X 2 X 1.0	23.0	1017	2 X 2 X 2.5	19.4	630
1 X 3 X 0.75	12.4	284	10 X 2 X 1.0	25.6	1197	4 X 2 X 2.5	22.7	989
1 X 4 X 0.75	13.1	316	12 X 2 X 1.0	26.5	1311	5 X 2 X 2.5	24.5	1145
2 X 2 X 0.75	15.3	402	15 X 2 X 1.0	29.0	1522	6 X 2 X 2.5	26.1	1307
4 X 2 X 0.75	17.1	508	20 X 2 X 1.0	31.9	1827	8 X 2 X 2.5	29.1	1593
5 X 2 X 0.75	18.2	599	1 X 2 X 1.5	13.1	308	10 X 2 X 2.5	32.7	1907
6 X 2 X 0.75	19.5	664	1 X 3 X 1.5	13.6	353			

Flame Retardant Armoured Instrumentation Cables

IP-411A / IP-410A (CU/PVC/IS/OS/PVC/SWA/PVC)



APPLICATION

This cable is specially designed to provide optimum properties of flexibility and intrinsic safety required for process instrumentation. It is used in electronic equipment, instrument panel, power station and petrochemical plant.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	70 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1 (<17%) (For IP-411A)
ASTM D 2863 Min. 30% (For IP-411A)

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	PVC
3. Individual Screen	Aluminium Mylar Foil with Drain Wire
4. Collective Screen	Aluminium Mylar Foil with Drain Wire
5. Bedding	PVC (For IP-410A) Flame Retardant Reduced Toxicity PVC (For IP-411A)
6. Armour	Galvanized Round Steel Wires
7. Sheath	PVC (For IP-410A) Flame Retardant Reduced Toxicity PVC (For IP-411A)
8. Colour	Black / Blue / Green

CORE IDENTIFICATION

Each Pair - Black and White cores printed with pair number.

Note: Triad Cables On Request

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
2 X 2 X 0.5	16.0	404	8 X 2 X 0.75	24.8	1030	2 X 2 X 1.5	18.7	555
4 X 2 X 0.5	17.9	508	10 X 2 X 0.75	27.5	1224	4 X 2 X 1.5	21.9	844
5 X 2 X 0.5	19.2	596	12 X 2 X 0.75	28.3	1323	5 X 2 X 1.5	23.6	992
6 X 2 X 0.5	20.5	671	15 X 2 X 0.75	31.0	1544	6 X 2 X 1.5	24.5	1108
8 X 2 X 0.5	23.3	929	20 X 2 X 0.75	34.1	1870	8 X 2 X 1.5	28.1	1341
10 X 2 X 0.5	25.8	1091	2 X 2 X 1.0	17.5	479	10 X 2 X 1.5	31.3	1599
12 X 2 X 0.5	26.6	1167	4 X 2 X 1.0	19.7	646	12 X 2 X 1.5	32.3	1767
15 X 2 X 0.5	29.0	1364	5 X 2 X 1.0	21.9	841	2 X 2 X 2.5	21.7	813
20 X 2 X 0.5	31.9	1639	6 X 2 X 1.0	23.5	977	4 X 2 X 2.5	24.8	1085
2 X 2 X 0.75	16.8	437	8 X 2 X 1.0	26.0	1165	5 X 2 X 2.5	26.8	1271
4 X 2 X 0.75	18.9	586	10 X 2 X 1.0	28.9	1367	6 X 2 X 2.5	28.9	1457
5 X 2 X 0.75	20.3	658	12 X 2 X 1.0	29.8	1498	8 X 2 X 2.5	32.2	1771
6 X 2 X 0.75	22.5	880	15 X 2 X 1.0	32.6	1750			

Flame Retardant Armoured Instrumentation Cables

IP-111A / IP-110A (CU/PE/IS/OS/PE/SWA/PVC)



APPLICATION

This cable is specially designed to provide optimum properties of flexibility and intrinsic safety required for process instrumentation. It is used in electronic equipment, instrument panel, power station and petrochemical plant.

TECHNICAL DATA

Standard BS EN 50288-7
Max. Rated Voltage 500V
Test Voltage 2.0 KV ac / 1 min
Max. Temperature 70 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1 (<17%) (For IP-111A)
ASTM D 2863 Min. 30% (For IP-111A)

CONSTRUCTION

- | | |
|----------------------|---|
| 1. Conductor | Annealed Stranded Copper |
| 2. Insulation | PE |
| 3. Individual Screen | Aluminium Mylar Foil with Drain Wire |
| 4. Collective Screen | Aluminium Mylar Foil with Drain Wire |
| 5. Bedding | PE |
| 6. Armour | Galvanized Round Steel Wires. |
| 7. Sheath | PVC (For IP-110A)
Flame Retardant Reduced Toxicity PVC (For IP-111A) |
| 8. Colour | Black / Blue / Green |

CORE IDENTIFICATION

Each Pair - Black and White cores printed with pair number.

Note: Triad Cables On Request

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
2 X 2 X 0.5	16.0	376	8 X 2 X 0.75	24.8	958	2 X 2 X 1.5	18.7	512
4 X 2 X 0.5	17.9	471	10 X 2 X 0.75	27.5	1134	4 X 2 X 1.5	21.9	784
5 X 2 X 0.5	19.2	550	12 X 2 X 0.75	28.3	1225	5 X 2 X 1.5	23.6	909
6 X 2 X 0.5	20.5	619	15 X 2 X 0.75	31.0	1425	6 X 2 X 1.5	24.5	1023
8 X 2 X 0.5	23.3	863	20 X 2 X 0.75	34.1	1720	8 X 2 X 1.5	28.1	1232
10 X 2 X 0.5	25.8	1009	2 X 2 X 1.0	17.5	444	10 X 2 X 1.5	31.3	1463
12 X 2 X 0.5	26.6	1077	4 X 2 X 1.0	19.7	594	12 X 2 X 1.5	32.3	1610
15 X 2 X 0.5	29.0	1259	5 X 2 X 1.0	21.9	780	2 X 2 X 2.5	21.7	757
20 X 2 X 0.5	31.9	1507	6 X 2 X 1.0	23.5	903	4 X 2 X 2.5	24.8	1010
2 X 2 X 0.75	16.8	407	8 X 2 X 1.0	26.0	1073	5 X 2 X 2.5	26.8	1179
4 X 2 X 0.75	18.9	542	10 X 2 X 1.0	28.9	1258	6 X 2 X 2.5	28.9	1347
5 X 2 X 0.75	20.3	608	12 X 2 X 1.0	29.8	1373	8 X 2 X 2.5	32.2	1632
6 X 2 X 0.75	22.5	819	15 X 2 X 1.0	32.6	1602			

Flame Retardant Armoured Instrumentation Cables

IP-211A / IP-210A (CU/XLPE/IS/OS/PVC/SWA/PVC)



APPLICATION

This cable is specially designed to provide optimum properties of flexibility and intrinsic safety required for process instrumentation. It is used in electronic equipment, instrument panel, power station and petrochemical plant.

TECHNICAL DATA

Standard BS EN 50288-7
Max. Rated Voltage 500V
Test Voltage 2.0 KV ac / 1 min
Max. Temperature 90 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1 (<17%) (For IP-211A)
ASTM D 2863 Min. 30% (For IP-211A)

CONSTRUCTION

- | | |
|----------------------|---|
| 1. Conductor | Annealed Stranded Copper |
| 2. Insulation | XLPE |
| 3. Individual Screen | Aluminium Mylar Foil with Drain Wire |
| 4. Collective Screen | Aluminium Mylar Foil with Drain Wire |
| 5. Bedding | PVC (For IP-210A)
Flame Retardant Reduced Toxicity PVC (For IP-211A) |
| 6. Armour | Galvanized Round Steel Wires. |
| 7. Sheath | PVC (For IP-210A)
Flame Retardant Reduced Toxicity PVC (For IP-211A) |
| 8. Colour | Black / Blue / Green |

CORE IDENTIFICATION

Each Pair - Black and White cores printed with pair number.

Note: Triad Cables On Request

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
2 X 2 X 0.5	16.0	399	8 X 2 X 0.75	24.8	1006	2 X 2 X 1.5	18.7	544
4 X 2 X 0.5	17.9	497	10 X 2 X 0.75	27.5	1195	4 X 2 X 1.5	21.9	822
5 X 2 X 0.5	19.2	583	12 X 2 X 0.75	28.3	1288	5 X 2 X 1.5	23.6	964
6 X 2 X 0.5	20.5	655	15 X 2 X 0.75	31.0	1501	6 X 2 X 1.5	24.5	1073
8 X 2 X 0.5	23.3	907	20 X 2 X 0.75	34.1	1812	8 X 2 X 1.5	28.1	1294
10 X 2 X 0.5	25.8	1064	2 X 2 X 1.0	17.5	470	10 X 2 X 1.5	31.3	1540
12 X 2 X 0.5	26.6	1135	4 X 2 X 1.0	19.7	628	12 X 2 X 1.5	32.3	1697
15 X 2 X 0.5	29.0	1324	5 X 2 X 1.0	21.9	818	2 X 2 X 2.5	21.7	799
20 X 2 X 0.5	31.9	1586	6 X 2 X 1.0	23.5	949	4 X 2 X 2.5	24.8	1059
2 X 2 X 0.75	16.8	432	8 X 2 X 1.0	26.0	1130	5 X 2 X 2.5	26.8	1239
4 X 2 X 0.75	18.9	574	10 X 2 X 1.0	28.9	1323	6 X 2 X 2.5	28.9	1418
5 X 2 X 0.75	20.3	644	12 X 2 X 1.0	29.8	1446	8 X 2 X 2.5	32.2	1719
6 X 2 X 0.75	22.5	861	15 X 2 X 1.0	32.6	1684			

Flame Retardant Armoured Instrumentation Cables

IP-200A (CU/XLPE/IS/OS/LSOH/SWA/LSOH)



APPLICATION

This cable is specially designed to provide optimum properties of flexibility and intrinsic safety required for process instrumentation. It is used in electronic equipment, instrument panel, power station and petrochemical plant, where flame retardant and low smoke halogens free properties are required.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	90 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1
IEC 60754-2
IEC 61034-1 & 2
ASTM D 2863 Min. 30%

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	XLPE
3. Individual Screen	Aluminium Mylar Foil with Drain Wire
4. Collective Screen	Aluminium Mylar Foil with Drain Wire
5. Bedding	LSOH
6. Armour	Galvanized Round Steel Wires.
7. Sheath	Flame Retardant LSOH (Low Smoke and Zero Halogen)
8. Colour	Black / Blue / Green

CORE IDENTIFICATION

Each Pair - Black and White cores printed with pair number.

Note: Triad Cables On Request

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
2 X 2 X 0.5	16.0	399	8 X 2 X 0.75	24.8	1006	2 X 2 X 1.5	18.7	544
4 X 2 X 0.5	17.9	497	10 X 2 X 0.75	27.5	1195	4 X 2 X 1.5	21.9	822
5 X 2 X 0.5	19.2	583	12 X 2 X 0.75	28.3	1288	5 X 2 X 1.5	23.6	964
6 X 2 X 0.5	20.5	655	15 X 2 X 0.75	31.0	1501	6 X 2 X 1.5	24.5	1073
8 X 2 X 0.5	23.3	907	20 X 2 X 0.75	34.1	1812	8 X 2 X 1.5	28.1	1294
10 X 2 X 0.5	25.8	1064	2 X 2 X 1.0	17.5	470	10 X 2 X 1.5	31.3	1540
12 X 2 X 0.5	26.6	1135	4 X 2 X 1.0	19.7	628	12 X 2 X 1.5	32.3	1697
15 X 2 X 0.5	29.0	1324	5 X 2 X 1.0	21.9	818	2 X 2 X 2.5	21.7	799
20 X 2 X 0.5	31.9	1586	6 X 2 X 1.0	23.5	949	4 X 2 X 2.5	24.8	1059
2 X 2 X 0.75	16.8	432	8 X 2 X 1.0	26.0	1130	5 X 2 X 2.5	26.8	1239
4 X 2 X 0.75	18.9	574	10 X 2 X 1.0	28.9	1323	6 X 2 X 2.5	28.9	1418
5 X 2 X 0.75	20.3	644	12 X 2 X 1.0	29.8	1446	8 X 2 X 2.5	32.2	1719
6 X 2 X 0.75	22.5	861	15 X 2 X 1.0	32.6	1684			

Flame Retardant Armoured Instrumentation Cables

IP-300A (CU/LSOH/IS/OS/LSOH/SWA/LSOH)



APPLICATION

This cable is specially designed to provide optimum properties of flexibility and intrinsic safety required for process instrumentation. It is used in electronic equipment, instrument panel, power station and petrochemical plant, where flame retardant and low smoke halogen free properties are required. .

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	70 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1 & IEC 60754-2
IEC 61034-1 & IEC 61034-2
ASTM D 2863 Min. 30%

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	LSOH
3. Individual Screen	Aluminium Mylar Foil with Drain Wire
4. Collective Screen	Aluminium Mylar Foil with Drain Wire
5. Bedding	LSOH
6. Armour	Galvanized Round Steel Wires.
7. Sheath	Flame Retardant LSOH (Low Smoke and Zero Halogen)
8. Colour	Black / Blue / Green

CORE IDENTIFICATION

Each Pair - Black and white cores printed with pair number.

Note: Triad Cables On Request

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
2 X 2 X 0.5	16.0	404	8 X 2 X 0.75	24.8	1030	2 X 2 X 1.5	18.7	555
4 X 2 X 0.5	17.9	508	10 X 2 X 0.75	27.5	1224	4 X 2 X 1.5	21.9	844
5 X 2 X 0.5	19.2	596	12 X 2 X 0.75	28.3	1323	5 X 2 X 1.5	23.6	992
6 X 2 X 0.5	20.5	671	15 X 2 X 0.75	31.0	1544	6 X 2 X 1.5	24.5	1108
8 X 2 X 0.5	23.3	929	20 X 2 X 0.75	34.1	1870	8 X 2 X 1.5	28.1	1341
10 X 2 X 0.5	25.8	1091	2 X 2 X 1.0	17.5	479	10 X 2 X 1.5	31.3	1599
12 X 2 X 0.5	26.6	1167	4 X 2 X 1.0	19.7	646	12 X 2 X 1.5	32.3	1767
15 X 2 X 0.5	29.0	1364	5 X 2 X 1.0	21.9	841	2 X 2 X 2.5	21.7	813
20 X 2 X 0.5	31.9	1639	6 X 2 X 1.0	23.5	977	4 X 2 X 2.5	24.8	1085
2 X 2 X 0.75	16.8	437	8 X 2 X 1.0	26.0	1165	5 X 2 X 2.5	26.8	1271
4 X 2 X 0.75	18.9	586	10 X 2 X 1.0	28.9	1367	6 X 2 X 2.5	28.9	1457
5 X 2 X 0.75	20.3	658	12 X 2 X 1.0	29.8	1498	8 X 2 X 2.5	32.2	1771
6 X 2 X 0.75	22.5	880	15 X 2 X 1.0	32.6	1750			

Flame Retardant Armoured Instrumentation Cables

IM-411A / IM-410A (CU/PVC/OS/PVC/SWA/PVC)



APPLICATION

This cable is specially designed for use in process industries providing control connections for d.c or a.c. networks (such as valve and motor control units, auxiliary station controls, circuit breaker indications and operations, etc) with an option of a fixed potential, with respect to earth.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	70 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3 Cat A
IEC 60754-1 (<17%) (For IM-411A)
ASTM D 2863 Min. 30% (For IM-411A)

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	PVC
3. Collective Screen	Aluminium Mylar Foil with Drain Wire
4. Bedding	PVC (For IM-410A) Flame Retardant Reduced Toxicity PVC (For IM-411A)
5. Armour	Galvanized Round Steel Wires.
6. Sheath	PVC (For IM-410A) Flame Retardant Reduced Toxicity PVC (For IM-411A)
7. Colour	Black / Blue / Green

CORE IDENTIFICATION

Insulated Cores – Number printed on the cores.

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
2 X 0.5	11.5	240	20 X 0.75	21.3	893	10 X 1.5	19.3	697
3 X 0.5	11.9	265	24 X 0.75	23.0	1026	12 X 1.5	19.8	758
4 X 0.5	12.5	287	37 X 0.75	25.6	1315	19 X 1.5	23.1	1140
6 X 0.5	13.9	355	2 X 1.0	12.4	279	20 X 1.5	24.1	1208
10 X 0.5	16.2	472	3 X 1.0	12.8	311	24 X 1.5	26.3	1393
12 X 0.5	16.6	501	4 X 1.0	13.5	346	37 X 1.5	29.4	1829
19 X 0.5	18.5	651	6 X 1.0	15.2	439	2 X 2.5	14.5	377
20 X 0.5	19.3	692	10 X 1.0	17.9	587	3 X 2.5	15.1	441
24 X 0.5	21.6	894	12 X 1.0	18.4	640	4 X 2.5	16.1	504
37 X 0.5	23.9	1095	19 X 1.0	21.4	966	6 X 2.5	18.3	655
2 X 0.75	12.0	262	20 X 1.0	22.3	1013	10 X 2.5	22.8	1067
3 X 0.75	12.4	284	24 X 1.0	24.2	1177	12 X 2.5	23.4	1155
4 X 0.75	13.1	315	37 X 1.0	27.0	1506	19 X 2.5	26.6	1551
6 X 0.75	14.6	398	2 X 1.5	13.1	308	20 X 2.5	27.9	1636
10 X 0.75	17.1	523	3 X 1.5	13.6	353	24 X 2.5	30.5	1890
12 X 0.75	17.6	573	4 X 1.5	14.4	394	37 X 2.5	34.3	2519
19 X 0.75	19.7	744	6 X 1.5	16.2	499			

Flame Retardant Armoured Instrumentation Cables

IM-111A / IM-110A (CU/PE/OS/PE/SWA/PVC)



APPLICATION

This cable is specially designed for use in process industries providing control connections for d.c or a.c. networks (such as valve and motor control units, auxiliary station controls, circuit breaker indications and operations, etc) with an option of a fixed potential, with respect to earth.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	70 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1 (<17%) (For IM-111A)
ASTM D 2863 Min. 30% (For IM-111A)

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	PE
3. Collective Screen	Aluminium Mylar Foil with Drain Wire
4. Bedding	PE
5. Armour	Galvanized Round Steel Wires.
6. Sheath	PVC (For IM-110A) Flame Retardant Reduced Toxicity PVC (For IM-111A)
7. Colour	Black / Blue / Green

CORE IDENTIFICATION

Each Core - Black insulated cores with White numbers printed on the cores.

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
2 X 0.5	11.5	226	20 X 0.75	21.3	825	10 X 1.5	19.3	637
3 X 0.5	11.9	248	24 X 0.75	23.0	944	12 X 1.5	19.8	691
4 X 0.5	12.5	267	37 X 0.75	25.6	1194	19 X 1.5	23.1	1042
6 X 0.5	13.9	330	2 X 1.0	12.4	261	20 X 1.5	24.1	1104
10 X 0.5	16.2	435	3 X 1.0	12.8	290	24 X 1.5	26.3	1258
12 X 0.5	16.6	460	4 X 1.0	13.5	322	37 X 1.5	29.4	1649
19 X 0.5	18.5	594	6 X 1.0	15.2	409	2 X 2.5	14.5	353
20 X 0.5	19.3	631	10 X 1.0	17.9	546	3 X 2.5	15.1	410
24 X 0.5	21.6	824	12 X 1.0	18.4	594	4 X 2.5	16.1	467
37 X 0.5	23.9	1041	19 X 1.0	21.4	885	6 X 2.5	18.3	605
2 X 0.75	12.0	246	20 X 1.0	22.3	927	10 X 2.5	22.8	989
3 X 0.75	12.4	266	24 X 1.0	24.2	1073	12 X 2.5	23.4	1068
4 X 0.75	13.1	294	37 X 1.0	27.0	1369	19 X 2.5	26.6	1417
6 X 0.75	14.6	374	2 X 1.5	13.1	287	20 X 2.5	27.9	1494
10 X 0.75	17.1	489	3 X 1.5	13.6	329	24 X 2.5	30.5	1721
12 X 0.75	17.6	535	4 X 1.5	14.4	366	37 X 2.5	34.3	2293
19 X 0.75	19.7	683	6 X 1.5	16.2	459			

Flame Retardant Armoured Instrumentation Cables

IM-211A / IM-210A (CU/XLPE/OS/PVC/SWA/PVC)



APPLICATION

This cable is specially designed for use in process industries providing control connections for d.c or a.c. networks (such as valve and motor control units, auxiliary station controls, circuit breaker indications and operations, etc) with an option of a fixed potential, with respect to earth.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	90 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1 (<17%) (For IM-211A)
ASTM D 2863 Min. 30% (For IM-211A)

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	XLPE
3. Collective Screen	Aluminium Mylar Foil with Drain Wire
4. Bedding	PVC (For IM-210A) Flame Retardant Reduced Toxicity PVC (For IM-211A)
5. Armour	Galvanized Round Steel Wires.
6. Sheath	PVC (For IM-210A) Flame Retardant Reduced Toxicity PVC (For IM-211A)
7. Colour	Black / Blue / Green

CORE IDENTIFICATION

Each Core - Black insulated cores with white numbers printed on the cores

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
2 X 0.5	11.5	236	20 X 0.75	21.3	863	10 X 1.5	19.3	674
3 X 0.5	11.9	259	24 X 0.75	23.0	990	12 X 1.5	19.8	734
4 X 0.5	12.5	279	37 X 0.75	25.6	1260	19 X 1.5	23.1	1089
6 X 0.5	13.9	352	2 X 1.0	12.4	273	20 X 1.5	24.1	1154
10 X 0.5	16.2	461	3 X 1.0	12.8	303	24 X 1.5	26.3	1322
12 X 0.5	16.6	492	4 X 1.0	13.5	335	37 X 1.5	29.4	1729
19 X 0.5	18.5	635	6 X 1.0	15.2	431	2 X 2.5	14.5	368
20 X 0.5	19.3	668	10 X 1.0	17.9	568	3 X 2.5	15.1	428
24 X 0.5	21.6	863	12 X 1.0	18.4	621	4 X 2.5	16.1	486
37 X 0.5	23.9	1046	19 X 1.0	21.4	923	6 X 2.5	18.3	641
2 X 0.75	12.0	257	20 X 1.0	22.3	968	10 X 2.5	22.8	1034
3 X 0.75	12.4	277	24 X 1.0	24.2	1123	12 X 2.5	23.4	1115
4 X 0.75	13.1	306	37 X 1.0	27.0	1423	19 X 2.5	26.6	1481
6 X 0.75	14.6	384	2 X 1.5	13.1	302	20 X 2.5	27.9	1570
10 X 0.75	17.1	511	3 X 1.5	13.6	343	24 X 2.5	30.5	1810
12 X 0.75	17.6	546	4 X 1.5	14.4	381	37 X 2.5	34.3	2397
19 X 0.75	19.7	719	6 X 1.5	16.2	488			

Flame Retardant Armoured Instrumentation Cables

IM-200A (CU/XLPE/OS/LSOH/SWA/LSOH)



APPLICATION

This cable is specially designed for use in process industries providing control connections for d.c or a.c. networks (such as valve and motor control units, auxiliary station controls, circuit breaker indications and operations, etc) with an option of a fixed potential, with respect to earth, where flame retardant and low smoke halogen free properties are required.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	90 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1 & IEC 60754-2
IEC 61034-1 & IEC 61034-2
ASTM D 2863 Min. 30%

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	XLPE
3. Collective Screen	Aluminium Mylar Foil with Drain Wire
4. Bedding	LSOH
5. Armour	Galvanized Round Steel
6. Sheath	Flame Retardant LSOH (Low Smoke and Zero Halogen)
7. Colour	Black / Blue / Green

CORE IDENTIFICATION

Each Core - Black insulated cores with white numbers printed on the cores

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
2 X 0.5	11.5	236	20 X 0.75	21.3	863	10 X 1.5	19.3	674
3 X 0.5	11.9	259	24 X 0.75	23.0	990	12 X 1.5	19.8	734
4 X 0.5	12.5	279	37 X 0.75	25.6	1260	19 X 1.5	23.1	1089
6 X 0.5	13.9	352	2 X 1.0	12.4	273	20 X 1.5	24.1	1154
10 X 0.5	16.2	461	3 X 1.0	12.8	303	24 X 1.5	26.3	1322
12 X 0.5	16.6	492	4 X 1.0	13.5	335	37 X 1.5	29.4	1729
19 X 0.5	18.5	635	6 X 1.0	15.2	431	2 X 2.5	14.5	368
20 X 0.5	19.3	670	10 X 1.0	17.9	568	3 X 2.5	15.1	428
24 X 0.5	21.6	863	12 X 1.0	18.4	621	4 X 2.5	16.1	486
37 X 0.5	23.9	1046	19 X 1.0	21.4	923	6 X 2.5	18.3	641
2 X 0.75	12.0	257	20 X 1.0	22.3	968	10 X 2.5	22.8	1034
3 X 0.75	12.4	277	24 X 1.0	24.2	1123	12 X 2.5	23.4	1115
4 X 0.75	13.1	306	37 X 1.0	27.0	1423	19 X 2.5	26.6	1481
6 X 0.75	14.6	384	2 X 1.5	13.1	302	20 X 2.5	27.9	1570
10 X 0.75	17.1	511	3 X 1.5	13.6	343	24 X 2.5	30.5	1810
12 X 0.75	17.6	546	4 X 1.5	14.4	381	37 X 2.5	34.3	2397
19 X 0.75	19.7	719	6 X 1.5	16.2	488			

Flame Retardant Armoured Instrumentation Cables

IM-300A (CU/LSOH/OS/LSOH/SWA/LSOH)



APPLICATION

This cable is specially designed for use in process industries providing control connections for d.c or a.c. networks (such as valve and motor control units, auxiliary station controls, circuit breaker indications and operations, etc) with an option of a fixed potential, with respect to earth, where flame retardant and low smoke halogen free properties are required.

TECHNICAL DATA

Standard	BS EN 50288-7
Max. Rated Voltage	500V
Test Voltage	2.0 KV ac / 1 min
Max. Temperature	70 °C

PRODUCT PERFORMANCE

IEC 60332-1-2
IEC 60332-3-22 Cat A
IEC 60754-1 & IEC 60754-2
IEC 61034-1 & IEC 61034-2
ASTM D 2863 Min. 30%

CONSTRUCTION

1. Conductor	Annealed Stranded Copper
2. Insulation	LSOH
3. Collective Screen	Aluminium Mylar Foil with Drain Wire
4. Bedding	LSOH
5. Armour	Galvanized Round Steel
6. Sheath	Flame Retardant LSOH (Low Smoke and Zero Halogen)
7. Colour	Black / Blue / Green

CORE IDENTIFICATION

Each Core - Black insulated cores with white numbers printed on the cores

No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight	No. of Core & Nominal Area of Conductor	Approx. Overall Diameter	Approx. Weight
No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km	No. X mm ²	mm	Kg / Km
2 X 0.5	11.5	240	20 X 0.75	21.3	893	10 X 1.5	19.3	697
3 X 0.5	11.9	265	24 X 0.75	23.0	1026	12 X 1.5	19.8	758
4 X 0.5	12.5	287	37 X 0.75	25.6	1315	19 X 1.5	23.1	1140
6 X 0.5	13.9	355	2 X 1.0	12.4	279	20 X 1.5	24.1	1208
10 X 0.5	16.2	472	3 X 1.0	12.8	311	24 X 1.5	26.3	1393
12 X 0.5	16.6	501	4 X 1.0	13.5	346	37 X 1.5	29.4	1829
19 X 0.5	18.5	651	6 X 1.0	15.2	439	2 X 2.5	14.5	377
20 X 0.5	19.3	692	10 X 1.0	17.9	587	3 X 2.5	15.1	441
24 X 0.5	21.6	894	12 X 1.0	18.4	640	4 X 2.5	16.1	504
37 X 0.5	23.9	1095	19 X 1.0	21.4	966	6 X 2.5	18.3	655
2 X 0.75	12.0	262	20 X 1.0	22.3	1013	10 X 2.5	22.8	1067
3 X 0.75	12.4	284	24 X 1.0	24.1	1177	12 X 2.5	23.4	1155
4 X 0.75	13.1	315	37 X 1.0	27.0	1506	19 X 2.5	26.6	1551
6 X 0.75	14.6	398	2 X 1.5	13.1	308	20 X 2.5	27.9	1636
10 X 0.75	17.1	523	3 X 1.5	13.6	353	24 X 2.5	30.5	1890
12 X 0.75	17.6	573	4 X 1.5	14.4	394	37 X 2.5	34.3	2519
19 X 0.75	19.7	744	6 X 1.5	16.2	499			

Technical Information - Instrumentation Cables to BS EN 50288-7

Table 1 - Maximum d. c. Conductor Resistance & L/R Ratio

Nominal Area of Conductor	No. and Diameter of Wires	Maximum d. c. Conductor Resistance at 20 °C				Maximum L/R Ratio (For Adjacent Cores)
		Plain Wires		Tinned Wires		
		Multi - Pair	Multi - Core	Multi - Pair	Multi - Core	
mm2	No. / mm	ohm / Km	ohm / Km	ohm / Km	ohm / Km	μH / ohm
0.5	7 / 0.30	36.8	36.0	37.5	36.7	25
	16 / 0.20	39.8	39.0	40.9	40.1	
	1 / 0.80	36.8	36.0	37.5	36.7	
0.75	7 / 0.37	25.0	24.5	25.3	24.8	25
	24 / 0.20	26.5	26.0	27.3	26.7	
1.0	7 / 0.43	18.4	18.1	18.6	18.2	25
	1 / 1.13	18.4	18.1	18.6	18.2	
1.5	7 / 0.53	12.3	12.1	12.5	12.2	40
2.5	7/ 0.67	7.56	7.41	7.71	7.56	60

Note :

As BS EN 60228 / IEC 60228 resistance values only allow for multi-core cables, an additional two percent of the maximum resistant has been allowed for cables of multi-pair/triple construction.

Table 2 - Minimum Insulation Resistance & Maximum Capacitance

Technical Items	PVC Insulated Instrumentation Cables	PE & XLPE Insulated Instrumentation Cables
1. Min. Insulation Resistance	10 MΩ Km	1000 MΩ Km
2. Maximum Capacitance Maximum mutual capacitance of pair	250 nF/km	150 nF/km
3. Maximum capacitance unbalance at 1 KHz	N A	500 pF / 500 m

Technical Information

Table 3 - Minimum Bending Radius

For safety installation without damaging electrical and physical properties, the tabulated minimum bending radius must be observed.

Type of Cables	Overall Diameter (mm)	Minimum Bending Radius
Single - Core PVC or LSOH Insulated Non - Sheathed Cables	Up to 10	3 D
	10 to 25	4 D
	Above 25	6 D
PVC or XLPE Insulated Braided / Armoured Power Cables	Any	8 D
All Type of Instrumentation Cables	Any	8 D

Note : D means the overall diameter of the cable

Side Wall Pressure to Cable

Permissible maximum side wall pressure to the cable at bending point during installation is 500 kgf / m.

$$\begin{aligned}\text{Side Wall Pressure to Cable} &= \frac{\text{Pulling Tension (kgf)}}{\text{Bending Radius (m)}} \\ &= \frac{T}{R}\end{aligned}$$

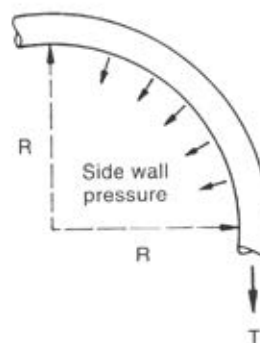


Table 4 - Permissible Maximum Pulling Tension (T)

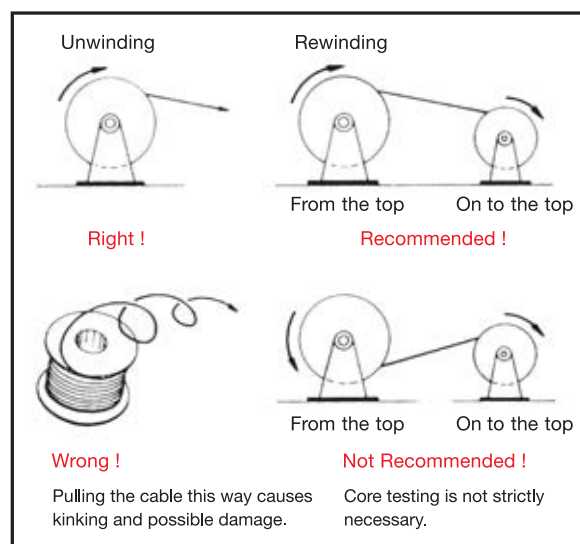
Conductor	Maximum Pulling Tension (Kgf)
Copper	7 x No. of Core x Nominal Area of Conductor

Drum Handling

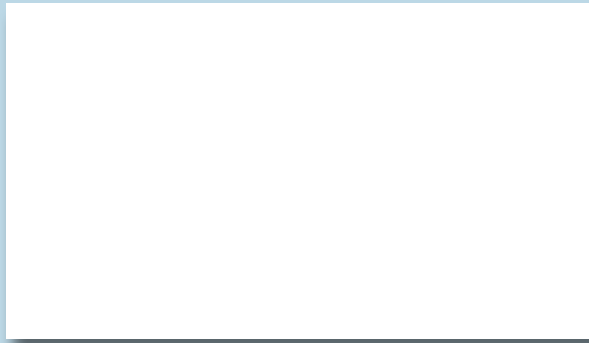
Handling the drums with care!

It is always recommended and a must with heavy drums –

- To lift drums with a fork-life truck or a crane when removing them from the vehicle.
- Always take care to lower the drums into an upright position on their flanges.



Distributed By :



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