



**Control &
INSTRUMENTATION
Cables to
BS 5308: Parts 1 & 2**



Draka

Multipair Instrumentation Cables - Polyethylene Insulated to BS 5308: Part 1

Application

This specification covers multipair cables used in the provision of voice and data services and the interconnection of electrical equipment and instruments, particularly in and around process plants, where transducer generated signals are transmitted through marshalled circuits to panels, controllers and associated devices.

Cables to Part 1 are widely used throughout the petroleum industry, while Part 2 are more common to the chemical and petrochemical industries.

Type 1 unarmoured cables are generally for indoor applications.

Type 2 armoured cables are suitable for burial underground

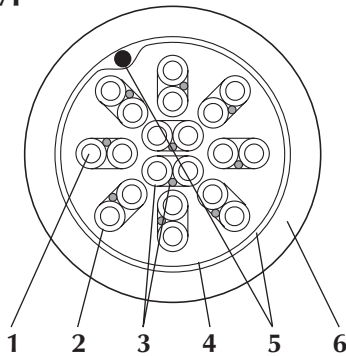
Type 3 lead sheathed cables are recommended for burial underground where there is a high concentration of hydrocarbons in the soil.

These cables are designed for use in Group II intrinsically safe systems. However it must be noted that cables used when installing an intrinsically safe system are required to conform to any relevant requirement on the certification documents, either for the system or for the intrinsically safe and associated apparatus forming parts of the system.

Cables should also be suitable for the environment in which they are going to be used.

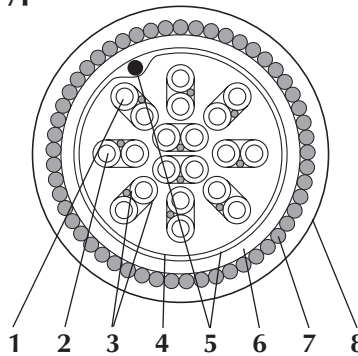
Construction

Type 1



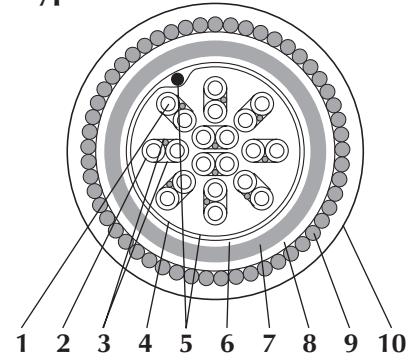
- Type 1 -**
- 1 Plain annealed copper wire conductors to BS 6360.
 - 2 Type 03 polyethylene insulation to BS 6234
 - 3 Individual pair screen (optional):-
 - a) Aluminium/polyester tape, metallic side down, in contact with minimum 0.5mm² tinned copper drain wire.
 - b) Polyester isolating tape(s) numbered for identification
 - 4 Polyester binder tape.
 - 5 Collective screen (optional) - Aluminium/polyester tape, metallic side down, in contact with minimum 0.5mm² tinned copper drain wire.
 - 6 Type TM1 or Type 6 PVC sheath to BS 7655.

Type 2



- Type 2 -**
- 1 Plain annealed copper wire conductors to BS 6360.
 - 2 Type 03 polyethylene insulation to BS 6234
 - 3 Individual pair screen (optional):-
 - a) Aluminium/polyester tape, metallic side down, in contact with minimum 0.5mm² tinned copper drain wire.
 - b) Polyester isolating tape(s) numbered for identification
 - 4 Polyester binder tape.
 - 5 Collective screen (optional) - Aluminium/polyester tape, metallic side down, in contact with minimum 0.5mm² tinned copper drain wire.
 - 6 Type 03C black polyethylene bedding to BS 6234.
 - 7 Single layer galvanised steel wire armour to BS EN 10257-1
 - 8 Type TM1 PVC sheath to BS 7655.

Type 3



- Type 3 -**
- 1 Plain annealed copper wire conductors to BS 6360.
 - 2 Type 03 polyethylene insulation to BS 6234
 - 3 Individual pair screen (optional):-
 - a) Aluminium/polyester tape, metallic side down, in contact with minimum 0.5mm² tinned copper drain wire.
 - b) Polyester isolating tape(s) numbered for identification
 - 4 Polyester binder tape.
 - 5 Collective screen (optional) - Aluminium/PS polyester tape, metallic side down, in contact with minimum 0.5mm² tinned copper drain wire.
 - 6 Type TM1 PVC bedding to BS 7655.
 - 7 Lead alloy sheath to BS 801.
 - 8 Type TM1 PVC bedding to BS 7655.
 - 9 Single layer galvanised steel wire armour to BS EN 10257-1.
 - 10 Type TM1 PVC sheath to BS 7655.

NOTE: These cables are not suitable for direct connection to a low impedance source e.g. the public mains supply.

Technical Data

Maximum conductor operating temp: + 65°C.

Minimum ambient temp: -20°C after installation and only when cable is in a fixed position.

Maximum working voltage: 300/500V r.m.s.

Test voltage: 1000V r.m.s. between conductors and between conductors and screen/armour.

Maximum conductor d.c. resistance:

Conductor Size	Ω/km at 20°C
1/0.80mm (0.5mm ²)	36.8
16/0.20mm (0.5mm ²)	39.7
1/1.13mm (1.0mm ²)	18.4
7/0.53mm (1.5mm ²)	12.3

Minimum insulation resistance: Individual conductors - 5000 MΩ/km at 20°C. Between individual screens - 1 MΩ/km at 20°C

Maximum mutual capacitance at 1Khz: Cables without individual pair screens, 0.5mm² and 1.0mm² - 75 pF/m, 1.5mm² - 85 pF/m. All cables with individual pair screens and 1 or 2 pair cables collectively screened, 115 pF/m.

Maximum capacitance unbalance: 250pF/250m at 1kHz

Maximum L/R ratio: Conductor Size	μH/Ω
0.5mm ²	25
1.0mm ²	25
1.5mm ²	40

Spread of flame: Type 1 complies with BS 4066 : Part 1, EN50265, IEC 60332-1. Type 2 complies as type 1 additionally with BS 4066: Part 3 NMV 1.5, EN 50266, NMV 1.5, IEC 60332-3C. Type 3 complies as Type 2

Minimum bending radius: Type 1 - 5 x overall diameter. Type 2 - 6 x overall diameter. Type 3 - 15 x overall diameter.

Availability

Cables in this range are manufactured to customer order. Reduced propagation or reduced propagation with reduced HCL emission PVC sheaths can be supplied when requested. Alternative constructions e.g. other conductor sizes or pair/core combinations, generally to this specification, can also be produced to order. Specifications to suit individual customer requirements, based on the BS 5308 specification, can also be manufactured. Our technical personnel are available to provide information and assistance in designing cables for your specific installation and operating requirements.

RP, RPLHCL.

For applications where flame spread and the emission of acid gas is critical, **Draka** offer a range of bedding and sheathing compounds with an Oxygen Index between 30 and 35 and, on selected materials acid gas emission of less than 15% by volume at 800°C.

Customers should specify if they require:

RP -	LOI greater than 30
RPLHCL -	LOI greater than 30, acid gas emission less than 15% by volume at 800°C.

Please state a particular LOI if required.

ZERO HALOGEN, LOW SMOKE

For applications where minimal smoke and acid gas emissions are critical, Draka's proprietary OHLS® compounds are rated Zero Halogen, Low Smoke to BS 6425 (IEC 60754) and BS 7622 (IEC 61034).

Where any of these options are ordered customers should specify if the compound is required on the bedding (where applicable), the sheath, or both (where applicable).

Draka offer designs utilising these materials that can comply with the appropriate category for the cable size in BS 4066 : Part 3 (IEC 332-3, EN 50266).

Please contact us to discuss your particular requirements.

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PHYSICAL DATA

BS 5308 Part 1 Type 1 collectively screened, unarmoured

Number of Pairs	Number and Diameter of Wires no./mm	Nominal Conductor Cross-Sectional Area mm ²	Nominal Radial Thickness of Insulation mm	Nominal Diameter of Cable mm	Approx. Nett Weight kg/km
1	1/0.80	0.5	0.5	6.3	50
2	1/0.80	0.5	0.5	7.1	75
5	1/0.80	0.5	0.5	11.6	200
10	1/0.80	0.5	0.5	15.0	270
15	1/0.80	0.5	0.5	17.1	370
20	1/0.80	0.5	0.5	19.4	440
30	1/0.80	0.5	0.5	23.0	630
50	1/0.80	0.5	0.5	28.9	980
1	16/0.20	0.5	0.6	7.0	60
2	16/0.20	0.5	0.6	7.9	80
5	16/0.20	0.5	0.6	13.1	210
10	16/0.20	0.5	0.6	17.2	340
15	16/0.20	0.5	0.6	19.8	440
20	16/0.20	0.5	0.6	22.3	570
30	16/0.20	0.5	0.6	26.9	780
50	16/0.20	0.5	0.6	33.9	1130
1	1/1.13	1.0	0.6	7.4	85
2	1/1.13	1.0	0.6	8.4	115
5	1/1.13	1.0	0.6	14.2	290
10	1/1.13	1.0	0.6	17.4	500
15	1/1.13	1.0	0.6	21.3	670
20	1/1.13	1.0	0.6	24.4	950
30	1/1.13	1.0	0.6	29.0	1030
50	1/1.13	1.0	0.6	37.3	1750
1	7/0.53	1.5	0.6	8.3	100
2	7/0.53	1.5	0.6	9.7	150
5	7/0.53	1.5	0.6	16.4	360
10	7/0.53	1.5	0.6	21.6	690
15	7/0.53	1.5	0.6	25.2	880
20	7/0.53	1.5	0.6	28.5	1230
30	7/0.53	1.5	0.6	34.3	1560
50	7/0.53	1.5	0.6	37.3	2400

NOTE: For cable without a collective screen the nominal cable diameter is reduced by 1mm.

PHYSICAL DATA

BS 5308 Part 1 Type 1 individually and collectively screened, unarmoured

Number of Pairs	Number and Diameter of Wires no./mm	Nominal Conductor Cross-Sectional Area mm ²	Nominal Radial Thickness of Insulation mm	Nominal Diameter of Cable mm	Approx. Nett Weight kg/km
2	1/0.8	0.5	0.5	10.3	150
5	1/0.8	0.5	0.5	13.5	250
10	1/0.8	0.5	0.5	18.3	380
15	1/0.8	0.5	0.5	21.1	490
20	1/0.8	0.5	0.5	23.5	640

Number of Pairs	Number and Diameter of Wires no./mm	Nominal Conductor Cross-Sectional Area mm ²	Nominal Radial Thickness of Insulation mm	Nominal Diameter of Cable mm	Approx. Nett Weight kg/km
30	1/0.8	0.5	0.5	27.9	970
50	1/0.8	0.5	0.5	36.1	1470
2	16/0.2	0.5	0.6	12.0	100
5	16/0.2	0.5	0.6	15.2	250
10	16/0.2	0.5	0.6	21.1	480
15	16/0.2	0.5	0.6	24.5	570
20	16/0.2	0.5	0.6	27.3	780
30	16/0.2	0.5	0.6	32.3	1020
50	16/0.2	0.5	0.6	41.7	1680
2	1/1.13	1.0	0.6	12.8	200
5	1/1.13	1.0	0.6	16.2	290
10	1/1.13	1.0	0.6	22.6	580
15	1/1.13	1.0	0.6	26.2	780
20	1/1.13	1.0	0.6	29.8	1010
30	1/1.13	1.0	0.6	35.4	1430
50	1/1.13	1.0	0.6	44.9	2360
2	7/0.53	1.5	0.6	14.7	250
5	7/0.53	1.5	0.6	18.8	460
10	7/0.53	1.5	0.6	26.5	760
15	7/0.53	1.5	0.6	30.8	1020
20	7/0.53	1.5	0.6	34.4	1350
30	7/0.53	1.5	0.6	41.0	1900
50	7/0.53	1.5	0.6	52.2	3060

NOTE: For cable without a collective screen the nominal cable diameter is reduced by 1mm.

PHYSICAL DATA

BS 5308 Part 1 Type 2 collectively screened, armoured

Number of Pairs	Number and Diameter of Wires no./mm	Nominal Conductor Cross-Sectional Area mm ²	Nominal Insulation Thickness mm	Nominal Diameter over Bedding mm	Nominal Armour Wire Diameter mm	Nominal Diameter of Cable kg/km	Approx. Nett Weight
1	1/0.8	0.5	0.5	6.3	0.9	10.7	200
2	1/0.8	0.5	0.5	7.1	0.9	11.5	260
5	1/0.8	0.5	0.5	11.6	0.9	16.2	460
10	1/0.8	0.5	0.5	15.0	1.25	20.7	790
15	1/0.8	0.5	0.5	17.1	1.25	22.8	1100
20	1/0.8	0.5	0.5	19.4	1.6	26.0	1280
30	1/0.8	0.5	0.5	23.0	1.6	29.8	1520
50	1/0.8	0.5	0.5	28.9	1.6	26.1	2100
1	16/0.2	0.5	0.6	7.0	0.9	11.4	250
2	16/0.2	0.5	0.6	7.9	0.9	12.3	300
5	16/0.2	0.5	0.6	13.1	0.9	17.9	560
10	16/0.2	0.5	0.6	17.2	1.25	22.9	970
15	16/0.2	0.5	0.6	19.8	1.6	26.4	1240
20	16/0.2	0.5	0.6	22.3	1.6	29.1	1640
30	16/0.2	0.5	0.6	26.9	1.6	33.9	1770
50	16/0.2	0.5	0.6	33.9	2.0	42.1	2770

NOTE: For cable without a collective screen the nominal cable diameter is reduced by 1mm.

(cont'd from page 5)

Number of Pairs	Number and Diameter of Wires no./mm	Nominal Conductor Cross-Sectional Area mm ²	Nominal Insulation Thickness mm	Nominal Diameter over Bedding mm	Nominal Armour Wire Diameter mm	Nominal Diameter of Cable kg/km	Approx. Nett Weight
1	1/1.13	1.0	0.6	7.4	0.9	11.8	290
2	1/1.13	1.0	0.6	8.4	0.9	13.0	345
5	1/1.13	1.0	0.6	14.2	1.25	19.7	790
10	1/1.13	1.0	0.6	17.4	-	24.3	1310
15	1/1.13	1.0	0.6	21.3	1.6	28.1	1740
20	1/1.13	1.0	0.6	24.4	1.6	31.2	2040
30	1/1.13	1.0	0.6	29.0	1.6	36.2	2180
50	1/1.13	1.0	0.6	37.3	2.0	45.7	3500
1	7/0.53	1.5	0.6	8.3	0.9	12.9	320
2	7/0.53	1.5	0.6	9.7	0.9	14.3	420
5	7/0.53	1.5	0.6	16.4	1.25	22.1	940
10	7/0.53	1.5	0.6	21.6	1.6	28.4	1500
15	7/0.53	1.5	0.6	25.2	1.6	32.2	1970
20	7/0.53	1.5	0.6	28.5	2.0	36.5	2400
30	7/0.53	1.5	0.6	34.3	2.0	42.5	3170
50	7/0.53	1.5	0.6	43.6	2.5	53.4	5020

NOTE: For cable without a collective screen the nominal cable diameter is reduced by 1mm.

PHYSICAL DATA

BS 5308 Part 1 Type 2 individually and collectively screened, armoured

Number of Pairs	Number and Diameter of Wires no./mm	Nominal Conductor Cross-Sectional Area mm ²	Nominal Insulation Thickness mm	Nominal Diameter over Bedding mm	Nominal Armour Wire Diameter mm	Nominal Diameter of Cable kg/km	Approx. Nett Weight
2	1/0.80	0.5	0.5	10.3	0.9	14.9	380
5	1/0.80	0.5	0.5	13.5	1.25	19.0	640
10	1/0.80	0.5	0.5	18.3	1.25	24.2	890
15	1/0.80	0.5	0.5	21.2	1.6	27.7	1350
20	1/0.80	0.5	0.5	23.5	1.6	30.3	1470
30	1/0.80	0.5	0.5	27.9	1.6	34.9	1870
50	1/0.80	0.5	0.5	36.1	2.0	44.5	3000
2	16/0.2	0.5	0.6	12.0	0.9	16.8	460
5	16/0.2	0.5	0.6	15.2	1.25	20.9	760
10	16/0.2	0.5	0.6	21.1	1.6	27.9	1300
15	16/0.2	0.5	0.6	24.5	1.6	31.3	1440
20	16/0.2	0.5	0.6	27.3	1.6	34.3	1870
30	16/0.2	0.5	0.6	32.3	2.0	40.5	2400
50	16/0.2	0.5	0.6	41.7	2.5	51.5	3930

NOTE: For cable without a collective screen the nominal cable diameter is reduced by 1mm.

(cont'd from page 6)

Number of Pairs	Number and Diameter of Wires no./mm	Nominal Conductor Cross-Sectional Area mm ²	Nominal Insulation Thickness mm	Nominal Diameter over Bedding mm	Nominal Armour Wire Diameter mm	Nominal Diameter of Cable kg/km	Approx. Nett Weight
2	1/1.13	1.0	0.6	12.8	0.9	17.6	515
5	1/1.13	1.0	0.6	16.2	1.25	21.9	950
10	1/1.13	1.0	0.6	22.6	1.6	29.4	1330
15	1/1.13	1.0	0.6	26.2	1.6	33.2	1680
20	1/1.13	1.0	0.6	29.8	2.0	37.8	2540
30	1/1.13	1.0	0.6	35.4	2.0	43.8	2900
50	1/1.13	1.0	0.6	44.9	2.5	54.9	4800
2	7/0.53	1.5	0.6	14.7	1.25	20.4	730
5	7/0.53	1.5	0.6	18.8	1.6	25.4	1180
10	7/0.53	1.5	0.6	26.5	1.6	33.5	1820
15	7/0.53	1.5	0.6	30.8	1.6	38.8	2350
20	7/0.53	1.5	0.6	34.4	2.0	42.6	3030
30	7/0.53	1.5	0.6	41.0	2.5	50.8	4050
50	7/0.53	1.5	0.6	52.2	2.5	62.6	5960

NOTE: For cable without a collective screen the nominal cable diameter is reduced by 1mm.

PHYSICAL DATA

BS 5308 Part 1 Type 3 collectively screened, lead sheathed, armoured

Number of pairs	Number and Diameter of wires no./mm	Nominal Conductor Cross-Sectional Area mm ²	Nominal Insulation Thickness mm	Nominal Diameter under Lead mm	Nominal Diameter over Lead mm	Nominal Diameter over Bedding mm	Nominal Armour Wire Diameter mm	Nominal Diameter of Cable mm	Approx. Nett Weight kg/km
1	1/0.80	0.5	0.5	6.3	8.5	10.1	0.9	14.7	610
2	1/0.80	0.5	0.5	7.1	9.3	10.9	0.9	15.4	685
5	1/0.80	0.5	0.5	11.6	13.8	15.4	1.25	21.1	1190
10	1/0.80	0.5	0.5	15.0	17.2	19.2	1.6	25.8	1720
15	1/0.80	0.5	0.5	17.1	19.5	21.5	1.6	28.3	2100
20	1/0.80	0.5	0.5	19.4	22.0	24.0	1.6	30.8	2420
30	1/0.80	0.5	0.5	23.0	25.8	27.8	1.6	34.8	3180
50	1/0.80	0.5	0.5	28.9	31.9	34.3	2.0	42.5	4600
1	16/0.2	0.5	0.6	7.0	9.2	10.8	0.9	15.4	680
2	16/0.2	0.5	0.6	7.9	10.1	11.7	0.9	16.3	760
5	16/0.2	0.5	0.6	13.1	15.3	16.9	1.25	22.6	1350
10	16/0.2	0.5	0.6	17.2	19.6	21.6	1.6	28.4	2115
15	16/0.2	0.5	0.6	19.8	22.4	24.4	1.6	31.2	2500
20	16/0.2	0.5	0.6	22.3	24.9	26.9	1.6	33.9	2895
30	16/0.2	0.5	0.6	26.9	29.9	32.3	2.0	40.5	4100
50	16/0.2	0.5	0.6	33.9	37.3	40.1	2.5	49.7	6000
1	1/1.13	1.0	0.6	7.4	9.6	11.2	0.9	15.8	730
2	1/1.13	1.0	0.6	8.4	10.6	12.2	0.9	17.0	830
5	1/1.13	1.0	0.6	14.2	16.4	18.4	1.6	25.0	1720
10	1/1.13	1.0	0.6	17.4	20.8	22.8	1.6	29.6	2370
15	1/1.13	1.0	0.6	21.3	23.9	25.9	2.0	32.9	2750
20	1/1.13	1.0	0.6	24.4	27.2	29.6	2.0	37.6	3870
30	1/1.13	1.0	0.6	29.0	32.0	34.4	2.0	42.6	4600
50	1/1.13	1.0	0.6	37.3	40.9	43.7	2.5	53.5	7400
1	7/0.53	1.5	0.6	8.3	10.5	12.1	0.9	16.9	810
2	7/0.53	1.5	0.6	9.7	11.9	13.5	1.25	19.0	1060
5	7/0.53	1.5	0.6	16.4	18.8	20.8	1.6	27.4	1915
10	7/0.53	1.5	0.6	21.6	24.2	26.2	1.6	33.2	2935
15	7/0.53	1.5	0.6	25.2	28.0	30.4	2.0	38.4	3900
20	7/0.53	1.5	0.6	28.5	31.5	33.9	2.0	42.1	4730
30	7/0.53	1.5	0.6	34.3	37.7	40.5	2.5	50.1	6600
50	7/0.53	1.5	0.6	43.6	47.6	50.8	2.5	61.0	9300

NOTE: For cable without a collective screen the nominal cable diameter is reduced by 1mm.

PHYSICAL DATA

BS 5308 Part 1 Type 3 individually and collectively screened, lead sheathed, armoured

Number of pairs	Number and Diameter of wires no./mm	Nominal Conductor Cross-Sectional Area mm ²	Nominal Insulation Thickness mm	Nominal Diameter under Lead mm	Nominal Diameter over Lead mm	Nominal Diameter over Bedding mm	Nominal Armour Wire Diameter mm	Nominal Diameter of Cable mm	Approx Nett Weight kg/km
2	1/0.80	0.5	0.5	10.3	12.5	14.1	1.25	19.6	1055
5	1/0.80	0.5	0.5	13.5	15.7	17.3	1.25	23.0	1390
10	1/0.80	0.5	0.5	18.3	20.7	22.7	1.6	29.3	2175
15	1/0.80	0.5	0.5	21.1	23.7	25.7	1.6	32.7	2600
20	1/0.80	0.5	0.5	23.5	26.3	28.7	2.0	36.5	3400
30	1/0.80	0.5	0.5	27.9	30.9	33.3	2.0	41.3	4060
50	1/0.80	0.5	0.5	36.1	39.7	42.5	2.5	52.1	6400
2	16/0.2	0.5	0.6	12.0	14.2	15.8	1.25	21.5	1250
5	16/0.2	0.5	0.6	15.2	17.4	19.4	1.6	26.0	1770
10	16/0.2	0.5	0.6	21.1	23.7	25.7	1.6	32.7	2695
15	16/0.2	0.5	0.6	24.5	27.3	29.7	2.0	37.7	3760
20	16/0.2	0.5	0.6	27.3	30.3	32.7	2.0	40.9	4155
30	16/0.2	0.5	0.6	32.3	35.5	37.9	2.0	46.3	4790
50	16/0.2	0.5	0.6	41.7	45.5	48.3	2.5	58.5	7500
2	1/1.13	1.0	0.6	12.8	15.0	16.6	1.25	22.3	1330
5	1/1.13	1.0	0.6	16.2	18.6	20.6	1.6	27.2	1940
10	1/1.13	1.0	0.6	22.6	25.2	27.2	1.6	34.2	2920
15	1/1.13	1.0	0.6	26.2	29.2	31.6	2.0	39.8	4000
20	1/1.13	1.0	0.6	29.8	33.0	35.4	2.0	43.8	4780
30	1/1.13	1.0	0.6	35.4	38.8	41.6	2.5	51.4	6100
50	1/1.13	1.0	0.6	44.9	48.9	52.1	2.5	62.5	9300
2	7/0.53	1.5	0.6	14.7	16.9	18.9	1.6	25.5	1670
5	7/0.53	1.5	0.6	18.8	21.2	23.2	1.6	30.0	2280
10	7/0.53	1.5	0.6	26.5	29.5	31.9	2.0	40.1	4070
15	7/0.53	1.5	0.6	30.8	34.0	36.4	2.0	44.8	5150
20	7/0.53	1.5	0.6	34.4	37.8	40.6	2.5	50.2	6345
30	7/0.53	1.5	0.6	41.0	44.8	47.6	2.5	57.6	7600
50	7/0.53	1.5	0.6	52.2	56.5	59.8	2.5	70.6	11400

NOTE: For cable without a collective screen the nominal cable diameter is reduced by 1mm.

PHYSICAL DATA

Unscreened pairs: Are identified by means of coloured insulation in the sequence detailed below

Pair No.	a-wire	b-wire	Pair No.	a-wire	b-wire
1	Black	Blue	26	White	Yellow
2	Black	Green	27	Red	Yellow
3	Blue	Green	28	Orange	Yellow
4	Black	Brown	29	Black	Grey
5	Blue	Brown	30	Blue	Grey
6	Green	Brown	31	Green	Grey
7	Black	White	32	Brown	Grey
8	Blue	White	33	White	Grey
9	Green	White	34	Red	Grey
10	Brown	White	35	Orange	Grey
11	Black	Red	36	Yellow	Grey
12	Blue	Red	37	Black	Violet
13	Green	Red	38	Blue	Violet
14	Brown	Red	39	Green	Violet
15	White	Red	40	Brown	Violet
16	Black	Orange	41	White	Violet
17	Blue	Orange	42	Red	Violet
18	Green	Orange	43	Orange	Violet
19	Brown	Orange	44	Yellow	Violet
20	White	Orange	45	Grey	Violet
21	Red	Orange	46	Black	Turquoise
22	Black	Yellow	47	Blue	Turquoise
23	Blue	Yellow	48	Green	Turquoise
24	Green	Yellow	49	Brown	Turquoise
25	Brown	Yellow	50	White	Turquoise

Screened Pairs: Are identified by numbered polyester tapes with each pair having one Black and one Blue core. Two pair unscreened cables are cabled in a quad formation and colour coded in rotation, Black, Blue, Green, Brown.

Printing of cores: On request. Screened and unscreened pairs can be identified by the printing of both words and numerals in a contrasting colour, throughout the length of each core. However where it is used instead of numbered polyester tapes on screened pairs or with a different colour code to that given above, the cable is marked as generally to the standard.

Multipair and Multicore Instrumentation Cables -

PVC Insulated to BS 5308: Part 2

Application

This specification covers multicore and multipair cables used in the provision of communication services and the interconnection of electrical equipment and instruments, particularly in and around process plants, where transducer generated signals are transmitted through marshalled circuits to panels, controllers and associated devices.

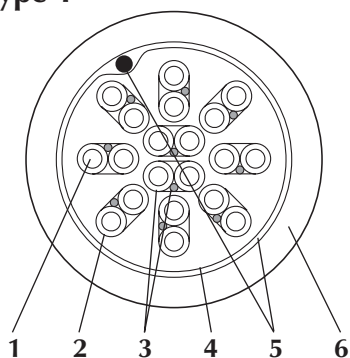
Cables to Part 1 are widely used throughout the petroleum industry, while Part 2 are more common to the chemical and petrochemical industries.

Type 1 unarmoured cables are generally for indoor applications.

Type 2 armoured cables are suitable for burial underground. These cables are designed for use in intrinsically safe systems. However it must be noted that cables used when installing an intrinsically safe system are required to conform to any relevant requirement on the certification documents, either for the system or for the intrinsically safe and associated apparatus forming parts of the system. Cables should also be suitable for the environment in which they are going to be used.

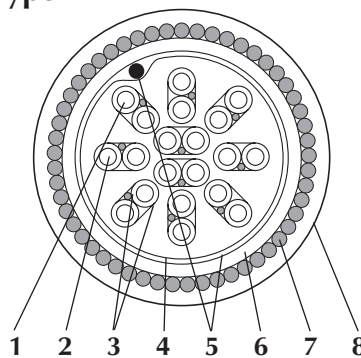
Construction

Type 1



- Type 2 -**
- 1 Plain annealed copper conductors to BS 6360.
 - 2 Type T11 PVC insulation to BS 7655
 - 3 Individual pair screen (optional)-
 - a) Aluminium/polyester tape, metallic side down, in contact with minimum 0.5mm² tinned copper drain wire.
 - b) Polyester isolating tape(s) numbered for identification.
 - 4 Polyester binder tape.
 - 5 Collective screen (optional) - Aluminium/polyester tape, metallic side down, in contact with minimum 0.5mm² tinned copper drain wire.
 - 6 Type TM1 or Type 6 PVC sheath to BS 7655.

Type 2



- Type 2 -**
- 1 Plain annealed copper wire conductors to BS 6360.
 - 2 Type T11 PVC insulation to BS 7655
 - 3 Individual pair screen (optional)-
 - a) Aluminium/polyester tape, metallic side down, in contact with minimum 0.5mm² tinned copper drain wire.
 - b) Polyester isolating tape(s) numbered for identification
 - 4 Polyester binder tape.
 - 5 Collective screen (optional) - Aluminium/polyester tape, metallic side down, in contact with minimum 0.5mm² tinned copper drain wire.
 - 6 Type TM1 PVC bedding to BS 7655.
 - 7 Single layer galvanised steel wire armour to BS EN 10257-1.
 - 8 Type TM1 PVC sheath to BS 7655.

NOTE: These cables are not suitable for direct connection to a low impedance source e.g. the public mains supply.

Technical Data

Maximum conductor operating temp: + 65°C.

Minimum ambient temp: -20°C after installation and only when cable is in a fixed position.

Maximum working voltage: 300/500V r.m.s.

Test voltage: 1000V r.m.s. between conductors and between conductors and screen/armour.

Maximum conductor d.c. resistance: Ω/km at 20°C

Conductor Size	Multicore	Multipair
16/0.20mm (0.5mm ²)	39.0	39.7
24/0.20mm (0.75mm ²)	26.0	26.5
7/0.53mm (1.5mm ²)	12.1	12.3

Minimum insulation resistance: Individual conductors - 25 MΩ/km at 20°C. Between individual screens - 1 MΩ/km at 20°C

Maximum mutual capacitance at 1Khz: Pair of adjacent cores - 250 pF/m at 1kHz.

Maximum capacitance to screen 450pF/m at 1kHz

Maximum L/R ratio:	Conductor Size	μH/Ω
	0.5mm ²	25
	1.0mm ²	25
	1.5mm ²	40

Spread of flame: Type 1 complies with BS 4066 : Part 1, EN 50265, IEC 60332-1. Type 2 complies as type 1 additionally with BS 4066: Part 3 NMV 1.5, EN50266 NMV 1.5, IEC 60332-3C.

Minimum bending radius: Type 1 - 5 x overall diameter. Type 2 - 6 x overall diameter. Type 3 -15 x overall diameter.

Availability

Cables in this range are manufactured to customer order. Alternative constructions e.g. other conductor sizes or pair combinations, generally to this specification, can also be produced to order, as can a range of thermocouple, extension and compensating cables. Specifications to suit individual customer requirements, based on the BS 5308 specification, can also be manufactured. Our technical personnel are available to provide information and assistance in designing cables for your specific installation and operating requirements.

RP, RPLHCL.

For applications where flame spread and the emission of acid gas is critical, **Draka** offer a range of bedding and sheathing compounds with an Oxygen Index between 30 and 35 and, on selected materials acid gas emission of less than 15% by volume at 800°C.

Customers should specify if they require:

RP- LOI greater than 30

RPLHCL - LOI greater than 30, acid gas emission less than 15% by volume at 800°C.

Please state a particular LOI if required.

ZERO HALOGEN, LOW SMOKE

For applications where minimal smoke and acid gas emissions are critical, Draka UK's proprietary OHLS® compounds are rated Zero Halogen, Low Smoke to BS 6425 (IEC 754) and BS 7622 (IEC 61034).

Where any of these options are ordered customers should specify if the compound is required on the bedding (where applicable), the sheath, or both (where applicable).

Draka offer designs utilising these materials that can comply with the appropriate category for the cable size in BS 4066 : Part 3 (IEC 60332-3, EN 50266).

Please contact us to discuss your particular requirements.

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PHYSICAL DATA

BS 5308 Part 2 Type 1 multicore, collectively screened, unarmoured

Number of Pairs	Number and Diameter of Wires no./mm	Nominal Conductor Cross-Sectional Area mm ²	Nominal Radial Thickness of Insulation mm	Nominal Diameter of Cable mm	Approx. Nett Weight
					kg/km
2	16/0.2	0.5	0.6	7.0	60
3	16/0.2	0.5	0.6	7.3	75
4	16/0.2	0.5	0.6	7.9	80
6	16/0.2	0.5	0.6	9.3	110
10	16/0.2	0.5	0.6	11.9	180
20	16/0.2	0.5	0.6	14.9	310
40	16/0.2	0.5	0.6	20.1	570
80	16/0.2	0.5	0.6	26.3	1080
2	24/0.2	0.75	0.6	7.3	75
3	24/0.2	0.75	0.6	7.7	90
4	24/0.2	0.75	0.6	8.3	100
6	24/0.2	0.75	0.6	9.9	140
10	24/0.2	0.75	0.6	12.7	220
20	24/0.2	0.75	0.6	16.0	390
40	24/0.2	0.75	0.6	21.7	710
80	24/0.2	0.75	0.6	28.5	1350
2	7/0.53	1.5	0.6	8.3	105
3	7/0.53	1.5	0.6	8.9	135
4	7/0.53	1.5	0.6	9.7	150
6	7/0.53	1.5	0.6	11.7	205
10	7/0.53	1.5	0.6	14.7	330
20	7/0.53	1.5	0.6	18.7	580
40	7/0.53	1.5	0.6	24.6	1065
80	7/0.53	1.5	0.6	33.6	2025

NOTE: For cable without a collective screen the nominal cable diameter is reduced by 1mm.

PHYSICAL DATA

BS 5308 Part 2 Type 1 multipair, collectively screened, unarmoured

Number of Pairs	Number and Diameter of Wires no./mm	Nominal Conductor Cross-Sectional Area mm ²	Nominal Radial Thickness of Insulation mm	Nominal Diameter of Cable mm	Approx. Nett Weight
					kg/km
1	16/0.2	0.5	0.6	7.0	60
2	16/0.2	0.5	0.6	7.9	80
5	16/0.2	0.5	0.6	12.1	200
10	16/0.2	0.5	0.6	17.2	340
15	16/0.2	0.5	0.6	19.8	480
20	16/0.2	0.5	0.6	22.3	570
30	16/0.2	0.5	0.6	26.9	880
50	16/0.2	0.5	0.6	33.9	1310
1	24/0.2	0.75	0.6	7.3	75
2	24/0.2	0.75	0.6	8.3	100
5	24/0.2	0.75	0.6	14.3	250
10	24/0.2	0.75	0.6	18.7	450
15	24/0.2	0.75	0.6	21.4	600
20	24/0.2	0.75	0.6	24.5	800
30	24/0.2	0.75	0.6	29.5	1080
50	24/0.2	0.75	0.6	37.4	1860
1	7/0.53	1.5	0.6	8.3	100
2	7/0.53	1.5	0.6	9.7	150
5	7/0.53	1.5	0.6	16.4	360
10	7/0.53	1.5	0.6	21.6	670
15	7/0.53	1.5	0.6	25.2	970
20	7/0.53	1.5	0.6	28.5	1230
30	7/0.53	1.5	0.6	34.3	1730
50	7/0.53	1.5	0.6	43.6	2740

NOTE: For cable without a collective screen the nominal cable diameter is reduced by 1mm.

PHYSICAL DATA

BS 5308 Part 2 Type 1 multipair, individually and collectively screened, unarmoured

Number of Pairs	Number and Diameter of Wires no./mm	Nominal Conductor Cross-Sectional Area mm ²	Nominal Radial Thickness of Insulation mm	Nominal Diameter of Cable mm	Approx. Nett Weight
					kg/km
2	16/0.2	0.5	0.6	12.0	170
5	16/0.2	0.5	0.6	15.2	270
10	16/0.2	0.5	0.6	21.1	520
15	16/0.2	0.5	0.6	24.5	650
20	16/0.2	0.5	0.6	27.3	860
30	16/0.2	0.5	0.6	32.3	1130
50	16/0.2	0.5	0.6	41.7	1880
2	24/0.2	0.75	0.6	12.8	200
5	24/0.2	0.75	0.6	16.3	355
10	24/0.2	0.75	0.6	22.7	560
15	24/0.2	0.75	0.6	26.4	770
20	24/0.2	0.75	0.6	29.8	990
30	24/0.2	0.75	0.6	35.5	1380
50	24/0.2	0.75	0.6	45.0	2225
2	7/0.53	1.5	0.6	14.7	265
5	7/0.53	1.5	0.6	18.8	490
10	7/0.53	1.5	0.6	26.5	820
15	7/0.53	1.5	0.6	30.8	1110
20	7/0.53	1.5	0.6	34.4	1470
30	7/0.53	1.5	0.6	41.0	2070
50	7/0.53	1.5	0.6	52.2	3340

NOTE: For cable without a collective screen the nominal cable diameter is reduced by 1mm.

PHYSICAL DATA

BS 5308 Part 2 Type 2 multicore, collectively screened, armoured

Number of Pairs	Number and Diameter of Wires no./mm	Nominal Conductor Cross-Sectional Area mm ²	Nominal Insulation Thickness mm	Nominal Diameter over Bedding mm	Nominal Armour Wire Diameter mm	Nominal Diameter of Cable kg/km	Approx. Nett Weight
							kg/km
2	16/0.2	0.5	0.6	7.0	0.9	11.4	255
3	16/0.2	0.5	0.6	7.3	0.9	11.7	280
4	16/0.2	0.5	0.6	7.9	0.9	12.3	305
6	16/0.2	0.5	0.6	9.3	0.9	13.9	360
10	16/0.2	0.5	0.6	11.9	0.9	16.7	510
20	16/0.2	0.5	0.6	14.9	1.25	20.6	960
40	16/0.2	0.5	0.6	20.1	1.6	26.7	1440
80	16/0.2	0.5	0.6	26.3	1.6	33.3	2200
2	24/0.2	0.75	0.6	7.3	0.9	11.7	280
3	24/0.2	0.75	0.6	7.7	0.9	12.1	305
4	24/0.2	0.75	0.6	8.3	0.9	12.9	335
6	24/0.2	0.75	0.6	9.9	0.9	14.5	400
10	24/0.2	0.75	0.6	12.7	0.9	17.5	565
20	24/0.2	0.75	0.6	16.0	1.25	21.7	950
40	24/0.2	0.75	0.6	21.7	1.6	28.5	1590
80	24/0.2	0.75	0.6	28.5	1.6	35.7	2450
2	7/0.53	1.5	0.6	8.3	0.9	12.9	330
3	7/0.53	1.5	0.6	8.9	0.9	13.5	380
4	7/0.53	1.5	0.6	9.7	0.9	14.3	420
6	7/0.53	1.5	0.6	11.7	0.9	16.3	540
10	7/0.53	1.5	0.6	14.7	1.25	20.4	750
20	7/0.53	1.5	0.6	18.7	1.6	25.3	1260
40	7/0.53	1.5	0.6	24.6	1.6	31.6	2140
80	7/0.53	1.5	0.6	33.6	2.0	41.8	3300

NOTE: For cable without a collective screen the nominal cable diameter is reduced by 1mm.

PHYSICAL DATA

BS 5308 Part 2 Type 2 multipair, collectively screened, armoured

Number of Pairs	Number and Diameter of Wires no./mm	Nominal Conductor Cross-Sectional Area mm ²	Nominal Insulation Thickness mm	Nominal Diameter over Bedding mm	Nominal Armour Wire Diameter mm	Nominal Diameter of Cable kg/km	Approx. Nett Weight
1	16/0.2	0.5	0.6	7.0	0.9	11.4	255
2	16/0.2	0.5	0.6	7.9	0.9	12.3	305
5	16/0.2	0.5	0.6	13.1	0.9	17.9	610
10	16/0.2	0.5	0.6	17.2	1.25	22.9	1060
15	16/0.2	0.5	0.6	19.8	1.6	26.4	1330
20	16/0.2	0.5	0.6	22.3	1.6	29.1	1800
30	16/0.2	0.5	0.6	26.9	1.6	33.9	1980
50	16/0.2	0.5	0.6	33.9	2.0	42.1	3070
1	24/0.2	0.75	0.6	7.3	0.9	11.7	305
2	24/0.2	0.75	0.6	8.3	0.9	12.9	360
5	24/0.2	0.75	0.6	14.3	1.25	19.8	820
10	24/0.2	0.75	0.6	18.7	1.6	25.3	1250
15	24/0.2	0.75	0.6	21.4	1.6	28.2	1600
20	24/0.2	0.75	0.6	24.5	1.6	31.3	1800
30	24/0.2	0.75	0.6	29.5	2.0	37.5	2570
50	24/0.2	0.75	0.6	37.4	2.0	45.8	3800
1	7/0.53	1.5	0.6	8.3	0.9	12.9	360
2	7/0.53	1.5	0.6	9.7	0.9	14.3	460
5	7/0.53	1.5	0.6	16.4	1.25	22.1	1040
10	7/0.53	1.5	0.6	21.6	1.6	28.4	1610
15	7/0.53	1.5	0.6	25.2	1.6	32.2	2060
20	7/0.53	1.5	0.6	28.5	1.6	35.7	2630
30	7/0.53	1.5	0.6	34.3	2.0	42.5	3460
50	7/0.53	1.5	0.6	43.6	2.0	53.4	5520

NOTE: For cable without a collective screen the nominal cable diameter is reduced by 1mm.

PHYSICAL DATA

BS 5308 Part 2 Type 2 multipair, individually and collectively screened, armoured

Number of Pairs	Number and Diameter of Wires no./mm	Nominal Conductor Cross-Sectional Area mm ²	Nominal Insulation Thickness mm	Nominal Diameter over Bedding mm	Nominal Armour Wire Diameter mm	Nominal Diameter of Cable kg/km	Approx. Nett Weight
2	16/0.2	0.5	0.6	12.0	0.9	16.8	505
5	16/0.2	0.5	0.6	15.2	1.25	20.9	830
10	16/0.2	0.5	0.6	21.1	1.6	27.9	1420
15	16/0.2	0.5	0.6	24.5	1.6	31.3	1570
20	16/0.2	0.5	0.6	27.3	1.6	34.3	2040
30	16/0.2	0.5	0.6	32.3	2.0	40.5	2610
50	16/0.2	0.5	0.6	41.7	2.5	51.5	4270
2	24/0.2	0.75	0.6	12.8	0.9	17.6	545
5	24/0.2	0.75	0.6	16.3	1.25	22.0	1005
10	24/0.2	0.75	0.6	22.7	1.6	29.5	1400
15	24/0.2	0.75	0.6	26.4	1.6	33.4	1750
20	24/0.2	0.75	0.6	29.8	2.0	37.8	2300
30	24/0.2	0.75	0.6	35.5	2.0	43.9	2460
50	24/0.2	0.75	0.6	45.0	2.5	55.0	4800
2	7/0.53	1.5	0.6	14.7	1.25	20.4	800
5	7/0.53	1.5	0.6	18.8	1.6	25.4	1290
10	7/0.53	1.5	0.6	26.5	1.6	33.5	1990
15	7/0.53	1.5	0.6	30.8	2.0	38.8	2590
20	7/0.53	1.5	0.6	34.4	2.0	42.6	3310
30	7/0.53	1.5	0.6	41.0	2.5	50.8	4380
50	7/0.53	1.5	0.6	52.2	2.5	62.6	6260

NOTE: For cable without a collective screen the nominal cable diameter is reduced by 1mm.

PHYSICAL DATA

A: Pairs **Unscreened pairs: Are identified by means of coloured insulation in the sequence detailed below**

Pair No.	a-wire	b-wire	Pair No.	a-wire	b-wire
1	White	Blue	26	RED/Blue	Blue
2	White	Orange	27	RED/Blue	Orange
3	White	Green	28	RED/Blue	Green
4	White	Brown	29	RED/Blue	Brown
5	White	Grey	30	RED/Blue	Grey
6	Red	Blue	31	BLUE/Black	Blue
7	Red	Orange	32	BLUE/Black	Orange
8	Red	Green	33	BLUE/Black	Green
9	Red	Brown	34	BLUE/Black	Brown
10	Red	Grey	35	BLUE/Black	Grey
11	Black	Blue	36	YELLOW/Blue	Blue
12	Black	Orange	37	YELLOW/Blue	Orange
13	Black	Green	38	YELLOW/Blue	Green
14	Black	Brown	39	YELLOW/Blue	Brown
15	Black	Grey	40	YELLOW/Blue	Grey
16	Yellow	Blue	41	WHITE/Orange	Blue
17	Yellow	Orange	42	WHITE/Orange	Orange
18	Yellow	Green	43	WHITE/Orange	Green
19	Yellow	Brown	44	WHITE/Orange	Brown
20	Yellow	Grey	45	WHITE/Orange	Grey
21	WHITE/Blue	Blue	46	ORANGE/Red	Blue
22	WHITE/Blue	Orange	47	ORANGE/Red	Orange
23	WHITE/Blue	Green	48	ORANGE/Red	Green
24	WHITE/Blue	Brown	49	ORANGE/Red	Brown
25	WHITE/Blue	Grey	50	ORANGE/Red	Grey

NOTE: For bi- coloured cores the base colour is shown in capitals

Screened pairs: Are identified by numbered polyester tapes with each pair having one White and one Blue core. Two pair unscreened or collectively screened cables are cabled in a quad formation and colour coded in rotation, Blue, Green, Orange, Brown.

Printing of cores: On request, screened and unscreened pairs can be identified by the printing of both words and numerals in a contrasting colour, throughout the length of each core. However where it is used instead of numbered polyester tapes on screened pairs or with a different colour code to that given above, the cable is marked as generally to the standard.

B: Cores

Cores are numbered for identification as follows.

Up to 40 cores: All Yellow and identified 1 to 40 with both printed numbers and written word, in Black, e.g. Core 10 would be coloured Yellow and identified by number "10, TEN" in Black.

41 to 80 cores: All cores Black and identified 1 to 40 with both printed numbers and written word, in Yellow, e.g. Core 50 would be coloured Black and identified by number "50, FIFTY" in Yellow.

Draka Holding N.V.
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Draka UK Ltd


PO Box 6500

Alfreton Road

Derby

DE21 4ZH

 +44 (0)1332 345431

 +44 (0)1332 331237

email: cableuk@draka.com





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