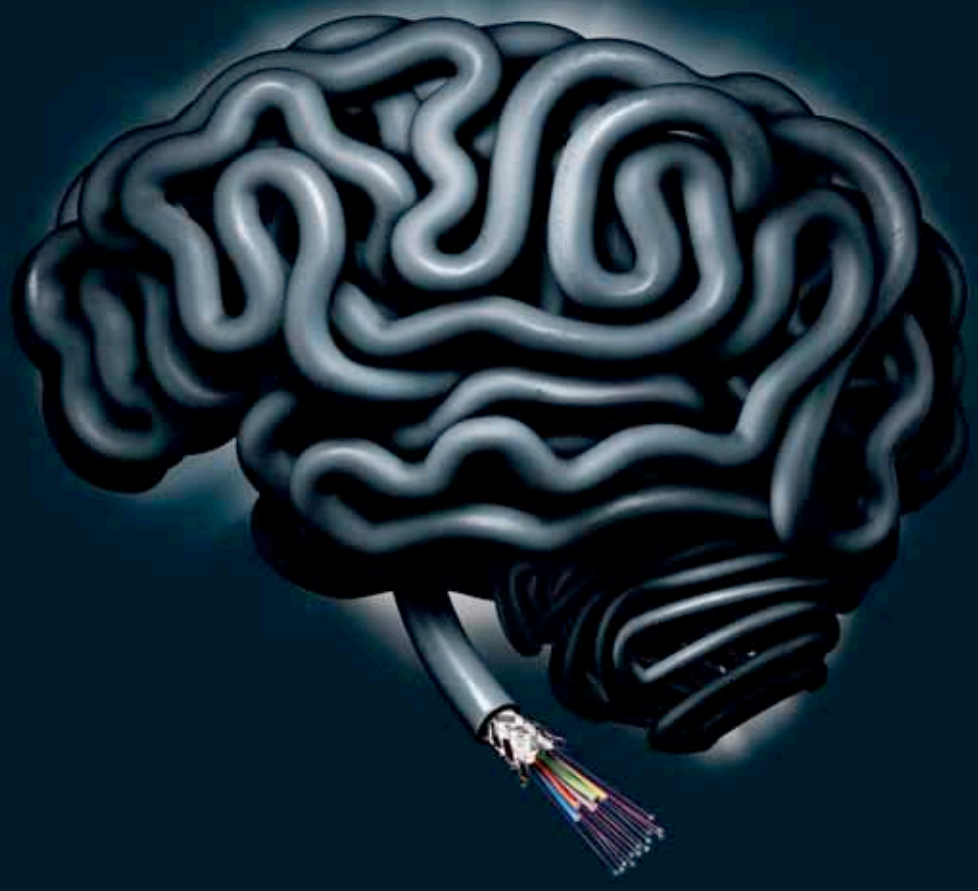
YOUR ENERGY, OUR SYSTEMS, ANYWHERE...

Construction

TWO AND THREE CORE FLAT PVC CABLES WITH AND WITHOUT EARTH



PRYSMIAN
CABLES & SYSTEMS

Prysmian Cables & Systems Australia combines a complete range of Construction Cable products, services and technical support for wholesalers, contractors and industrial customers in the construction and associated industries. Our aim is to contribute to the efficiency of our customers and, wherever possible, make their job easier. Support is available from technical experts in the fields of materials technology, electrical engineering and electrical systems design and operation. Our specialists, with their vast experience in the electrical industry and understanding of day-to-day requirements, can offer invaluable assistance in managing major projects and providing solutions to technical and application issues. We believe this information will be very useful to all energy cable users and reinforces our commitment and dedication to providing a Total Cable Solution to your requirements.

STANDARD CABLES

The cables included in this technical manual are the standard range of cables manufactured by Prysmian Cables & Systems for the Construction industry. Many of the frequently used cables in this manual are held in stock in warehouses throughout Australia and New Zealand. Others are available on a made-to-order basis.

OPTIONAL VARIATIONS

Where installation conditions do not allow the use of standard cables, Prysmian may provide modified designs to meet those conditions. These include the addition of Termitex®, a nylon jacket or double brass tape for protection against termites. Non-standard insulation and sheath colours may also be requested. Please note that where cables are not held in stock or where optional variations are requested, Prysmian reserves the right to decline a requested quotation for those products. Where Prysmian offers to supply such cables, minimum order quantities and manufacturing lead times may apply.

CURRENT RATINGS

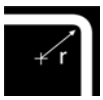
For each design of cable in this manual, indicative current ratings have been included. These ratings are for a single cable installed under the conditions shown. Reference should be made to AS/NZS 3008.1.1 with kind permission of Standard Australia.

CONDUCTOR TEMPERATURES

The maximum continuous operating temperature shown for each product in this design is the conductor temperature at which the cable can be operated on a continuous basis under normal operational conditions without detriment to the cable in its projected lifetime. Many of the products are manufactured with V-90 or V-90HT PVC materials. These materials are designed with improved thermal ageing characteristics and can be operated continuously at temperatures up to 90°C without detriment. V-90HT can operate up to 105°C for limited periods without detriment. However, cables incorporating these materials may be operated at these elevated temperatures only when protected from mechanical forces which might otherwise cause thermoplastic deformation. The use of cables insulated and sheathed with V-90 or V-90HT materials allows the cables to be operated in ambient temperatures up to 55°C without derating for ambient temperature.

CABLE USAGE CHARACTERISTICS

AMBIENT TEMPERATURE
Maximum operating temperature
Minimum operating temperature



MINIMUM BENDING RADIUS
Minimum bending radius of installed cables

MECHANICAL IMPACT RESISTANCE
1 Light Impact
2 Moderate Impact
3 Heavy Impact
4 Very Heavy Impact

RESISTANCE TO SOLAR RADIATION AND WEATHER

Excellent	Permanent
Very Good	Frequent
Good	Occasional
Acceptable	Accidental
Poor	None

RESISTANCE TO WATER

Negligible	No humidity
Water Drops	Occasional condensation
Spray	Water run off
Splashes	Exposed to water splashes
Heavy Sea	Exposed to waves
Immersion	Temporarily covered by water
Submersion	Permanently covered by water

CHEMICAL RESISTANCE

Excellent	Permanent
Very Good	Frequent
Good	Occasional
Acceptable	Accidental
Poor	None

BEHAVIOUR IN FLAME AND FIRE

Reaction To Fire	**Resistant To Fire**
C1 Fire retardant	Level 1 – Ultimate Fire Survival
C2 Flame Retardant	Level 2 – Two Hours Fire Survival
C3 No Fire Performance	Level 3 – Restrained Spread & Self Extinguishing

LOW SMOKE EMISSION
AS/NZS 1660.5.2
IEC 61034

FLEXIBILITY

Rigid	Flexible
Semi-rigid	Very flexible

HALOGEN FREE

AS/NZS 1660.5.3	Halogen free (toxic fume or corrosives)
IEC 60754.1	

LAYING CONDITIONS

MINIMUM BENDING RADIUS DURING INSTALLATION

MINIMUM INSTALLATION TEMPERATURE

IN TRENCH

IN FREE AIR

IN GROUND

IN GROUND WITH PROTECTION

IN DUCT

INCONDUIT

DOMESTIC APPLIANCES

OUTDOOR APPLIANCES

MACHINES

FESTOON

MOBILE EQUIPMENT

INTERNAL WIRING

SUBMERGED

INDUSTRIAL EQUIPMENT

OVERHEAD AERIAL

EXTERNAL BUILDING

CABLE USAGE CHARACTERISTICS
LAYING CONDITIONS

In accordance with research, new material developments and changes in relevant standards, published details may change without notice.

2C+E Flat PVC

PVC INSULATED LAID FLAT AND PVC SHEATHED CABLE TO AS/NZS 5000.2

CABLE CHARACTERISTICS

Semi-rigid	OD≤25 4D OD>25 6D	1	Water Drops	Good	+75°C -15°C	C3	Good

For general wiring, unenclosed, enclosed in conduit, buried direct or in underground ducts for domestic, commercial and industrial installations where not subject to mechanical damage.

CABLE DESIGN

CONDUCTOR:

Plain annealed copper conductor to AS/NZS 1125
Maximum continuous operating temperature: 75°C

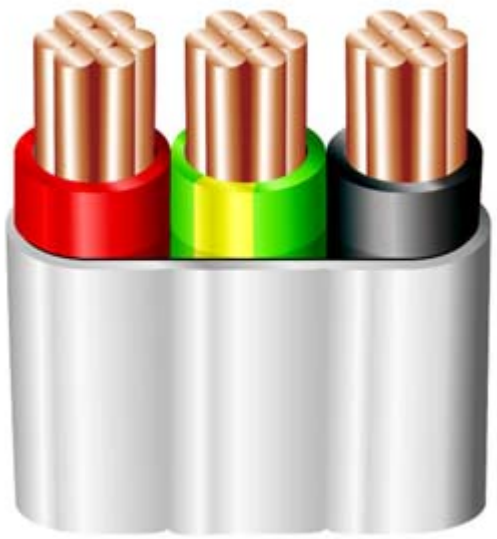
Can also be operated at temperatures up to 90ºC when not exposed to mechanical deformation (see AS/NZS 3008.1)

INSULATION:

V-90 PVC
Colours: Red, Black, Green/Yellow

SHEATH:

3V-90 PVC
Colours: White



INSTALLATION CONDITIONS

INDUSTRIAL EQUIPMENT	OD≤25 6D OD>25 9D	IN FREE AIR	IN CONDUIT	MACHINES	0°C	IN TRENCH	IN GROUND WITH PROTECTION	IN DUCT	FESTOON	EXTERNAL BUILDINGS

2C+E Flat PVC

PVC INSULATED LAID FLAT AND PVC SHEATHED CABLE TO AS/NZS 5000.2

Product Code	Conductor			Cable						Minimum Installed Bending Radius (a) mm
	Nominal C.S.A. mm²	No. and Diameter of wires No/mm	Nominal Diameter mm	Nominal Insulation Thickness mm	Overall Diameter				Approx. Mass kg/100m	
					Minimum		Maximum			
					Major Axis mm	Minor Axis mm	Major Axis mm	Minor Axis mm		
1.0STE	1.0*	1/1.13	1.13	0.6	9.1	4.5	9.3	4.6	8	20
1.5TE	1.5	7/0.50	1.5	0.6	9.8	4.5	10.1	4.6	10	20
2.5STE	2.5*	1/1.78	1.78	0.7	11.7	5.4	11.9	5.5	14	20
2.5TE	2.5	7/0.67	2.0	0.7	12.1	5.4	12.4	5.5	15	20
4TE	4	7/0.85	2.6	0.8	13.8	6.3	14.1	6.5	19	30
6TE	6	7/1.04	3.1	0.8	14.9	6.9	15.3	7.1	24	30
10TE	10	7/1.35	4.1	1.0	18.9	8.4	19.6	8.8	38	35
16TE	16	7/1.70	5.1	1.0	21.8	9.7	22.5	10.0	54	40

(a) Bent in the direction of the minor axis
* Single wire conductor

Conductor Nominal Area mm^2	Current Rating (b)			Electrical Characteristics	
	Unenclosed Spaced A	Buried Direct A	Underground in Duct A	Maximum D.C. Resistance at 20°C Ω/km	Reactance per Core Ω/km
1.0*	15	22	17	18.1	0.119
1.5	19	28	22	13.6	0.111
2.5	27	40	31	7.41	0.102
4	37	52	40	4.61	0.102
6	46	65	51	3.08	0.0967
10	64	87	68	1.83	0.0906
16	85	115	88	1.15	0.0861

(b) Based on 75°C conductor temperature, 40°C ambient air temperature and where applicable, burial depth of 0.5m, soil temperature of 25°C and soil thermal resistivity of 1.2°C.m/W. Refer to AS/NZS 3008.1 for other installation conditions
* Single wire conductor

3C Flat PVC

PVC INSULATED LAID FLAT AND PVC SHEATHED CABLE TO AS/NZS 5000.2

CABLE CHARACTERISTICS

Semi-rigid	OD≤25 4D OD>25 6D	1	Water Drops	Good	+75°C -15°C	C3	Good

For general wiring, unenclosed, enclosed in conduit, buried direct or in underground ducts for domestic, commercial and industrial installations where not subject to mechanical damage.

CABLE DESIGN

CONDUCTOR:

Plain annealed copper conductor to AS/NZS 1125
Maximum continuous operating temperature: 75°C

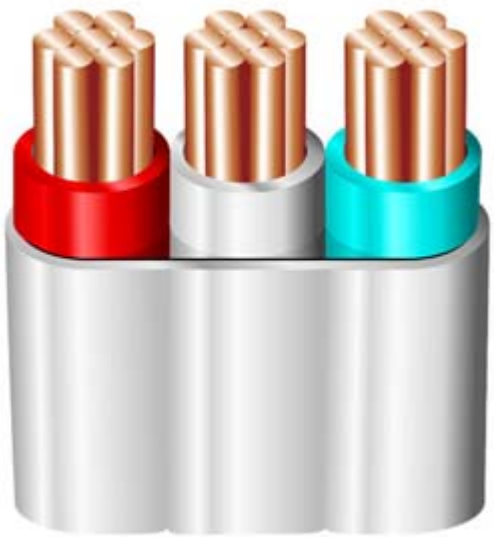
Can also be operated at temperatures up to 90ºC when not exposed to mechanical deformation (see AS/NZS 3008.1)

INSULATION:

V-90 PVC
Colours: Red, White, Blue

SHEATH:

3V-90 PVC
Colours: White



INSTALLATION CONDITIONS

INDUSTRIAL EQUIPMENT	OD≤25 6D OD>25 9D	IN FREE AIR	IN CONDUIT	MACHINES	0°C	IN TRENCH	IN GROUND WITH PROTECTION	IN DUCT	FESTOON	EXTERNAL BUILDINGS

3C Flat PVC

PVC INSULATED LAID FLAT AND PVC SHEATHED CABLE TO AS/NZS 5000.2

Product Code	Conductor			Cable						Minimum Installed Bending Radius (a) mm
	Nominal C.S.A. mm²	No. and Diameter of Wires No/mm	Nominal Diameter mm	Nominal Insulation Thickness mm	Overall Diameter				Approx Mass kg/100m	
					Minimum		Maximum			
					Major Axis mm	Minor Axis mm	Major Axis mm	Minor Axis mm		
1.0S3CF	1.0*	1/1.13	1.13	0.6	8.8	4.1	9.0	4.3	8	20
1.53CF	1.5	7/0.50	1.5	0.6	9.8	4.5	10.1	4.6	10	20
2.53CF	2.5	7/0.67	2.0	0.7	12.1	5.4	12.4	5.5	15	20

(a) Bent in the direction of the minor axis

Conductor Nominal Area mm^2	Current Rating (b)			Electrical Characteristics	
	Unenclosed Spaced A	Buried Direct A	Underground in Duct A	Maximum D.C. Resistance at 20°C Ω/km	Reactance per Core Ω/km
1.0*	13	19	15	18.1	0.184
1.5	16	24	19	13.6	0.172
2.5	23	34	26	7.41	0.159

(b) Based on 75°C conductor temperature, 40°C ambient air temperature and where applicable, burial depth of 0.5m, soil temperature of 25°C and soil thermal resistivity of 1.2°C.m/W. Refer to AS/NZS 3008.1 for other installation conditions
* Single wire conductor

3C+E Flat PVC

PVC INSULATED LAID FLAT AND PVC SHEATHED CABLE TO AS/NZS 5000.2

CABLE CHARACTERISTICS

Semi-rigid	OD≤25 4D OD>25 6D	1	Water Drops	Good	+75°C -15°C	C3	Good

For general wiring, unenclosed, enclosed in conduit, buried direct or in underground ducts for domestic, commercial and industrial installations where not subject to mechanical damage.

CABLE DESIGN

CONDUCTOR:

Plain annealed copper conductor to AS/NZS 1125
Maximum continuous operating temperature: 75°C

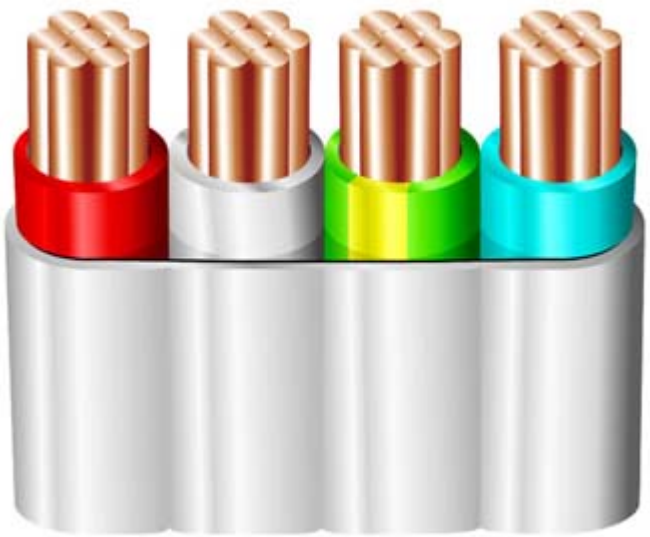
Can also be operated at temperatures up to 90ºC when not exposed to mechanical deformation (see AS/NZS 3008.1)

INSULATION:

V-90 PVC
Colours: Red, White, Blue, Green/Yellow

SHEATH:

3V-90 PVC
Colours: White



INSTALLATION CONDITIONS

INDUSTRIAL EQUIPMENT	OD≤25 6D OD>25 9D	IN FREE AIR	IN CONDUIT	MACHINES	0°C	IN TRENCH	IN GROUND WITH PROTECTION	IN DUCT	FESTOON	EXTERNAL BUILDINGS

3C+E Flat PVC

PVC INSULATED LAID FLAT AND PVC SHEATHED CABLE TO AS/NZS 5000.2

Product Code	Conductor			Cable						Minimum Installed Bending Radius (a) mm
	Nominal C.S.A. mm²	No. and Diameter of Wires No/mm	Nominal Diameter mm	Nominal Insulation Thickness mm	Overall Diameter				Approx. Mass kg/100m	
					Minimum		Maximum			
					Major Axis mm	Minor Axis mm	Major Axis mm	Minor Axis mm		
1.0S3CEF	1.0*	1/1.13	1.13	0.6	11.4	4.5	11.7	4.6	10	20
1.53CEF	1.5	7/0.50	1.5	0.6	12.4	4.5	12.8	4.6	12	20
2.53CEF	2.5	7/0.67	2.0	0.7	15.4	5.4	15.8	5.5	19	20
43CEF	4	7/0.85	2.6	0.8	17.9	6.3	18.3	6.5	26	25
63CEF	6	7/1.04	3.1	0.8	19.5	6.9	20.1	7.1	33	30
103CEF	10	7/1.35	4.1	1.0	24.9	8.4	25.8	8.8	52	35
163CEF	16	7/1.70	5.1	1.0	28.8	9.7	29.7	10.0	75	40

(a) Bent in the direction of the minor axis

Conductor Nominal Area mm²	Current Rating (b)			Electrical Characteristics	
	Unenclosed Spaced A	Buried Direct A	Underground in Duct A	Maximum D.C. Resistance at 20°C Ω/km	Reactance per Core Ω/km
1.0*	13	19	15	18.1	0.184
1.5	16	24	19	13.6	0.172
2.5	23	34	26	7.41	0.159
4	31	44	34	4.61	0.152
6	40	55	43	3.08	0.143
10	54	74	57	1.83	0.134
16	72	96	74	1.15	0.126

(b) Based on 75°C conductor temperature, 40°C ambient air temperature and where applicable, burial depth of 0.5m, soil temperature of 25°C and soil thermal resistivity of 1.2°C.m/W. Refer to AS/NZS 3008.1 for other installation conditions

* Single wire conductor

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