

# Safe even when the alarms go off.

Afumex<sup>®</sup> – there when you need it the most.







A brand of the

### Afumex<sup>®</sup> – there when you need it the most.

It's when the flames consume everything around them and the heat becomes intolerable that our range of Fire Rated Cables, Afumex, display their best qualities. Withstanding the heat, they maintain the supply to critical systems such as fire alarm, emergency lighting and fans (as it is the case of our Fire Resistant cables, Firestop) or simply burn without emitting toxic fumes (like it is the case of our Fire Retardant, non-fire-resistant cables). Low smoke and halogen free – that's the common feature of Afumex, the very well known Prysmian's safe and secure cable family.

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### Why choose Afumex?

Afumex is a series of LSOH cables that save lives and money in case of a fire. The black toxic smoke that obstructs the evacuation is gone, just as the corrosive acid that destroys metal and electronic devices. What remain are the flexible and user-friendly qualities, which makes these cables easy to install. It's time to choose a new path – the safe and sound one: Afumex.

| LSOH CABLES  | PVC CABLES   |
|--|--|
| Reduced smoke formation.   | Heavy smoke formation.   |
| Light smoke, easy to find exits.   | Black smoke, hard to find exits.   |
| Fewer toxic gases, easier to evacuate.                                   | Lots of toxic gases, obstruct evacuation.                                |
| Creates a white harmless powder,<br>spare metals and electronic devices. | Creates hydrochloric acid that destroys electronics and corrodes metals. |
| Easier to sanitise, shorter production interruption of production.       | Inhibits sanitation, longer break.                                       |
| Better for the environment, contain no phthalates and dioxin.            | Harmful to the environment, contain phthalates and dioxin.               |

#### Afumex – saves lives

At a fire scene three decisive factors influence the possibilities for people to rapidly find an exit: smoke formation, visibility and the amount of toxic substances in the air. With Afumex LSOH cables, less and lighter smoke is created compared to a fire containing PVC cables. In addition the smoke includes less toxic substances. That is, people at a fire scene equipped with Afumex cables will have better visibility and more time to find exits, which increase the chance to survive.

#### Afumex - saves money

A fire often involves large financial losses due to damaged electronics, machines and buildings. A contributing cause to these losses is the hydrochloric acid that is developed by traditional PVC cables on fire. The acid corrodes electronics and metals. LSOH cables on the other hand develop a white harmless powder that minimizes damages on buildings as well as equipment. In addition the fire scene will be a lot easier to sanitise, which means the production can be resumed faster.

#### Afumex – better for health and environment

When manufacturing PVC different types of phthalates are added to make the plastic soft and easy to shape. Recent scientific research however, have shown that these substances can be unhealthy and a source to both cancer and hormone-disturbance. Furthermore, burning PVC develops dioxins. Dioxins are very dangerous to our environment as they are hard to break down and stored in the body tissue of both humans and animals. As Afumex LSOH cables don't include phthalates, nor develop dioxins at a fire, these cables are a better choice for our health and the environment.

Low Smoke Zero Halogen cables save lives! You would be lucky to find your way out when it's burning in a room that contains PVC cables.

### Know the difference: Fire resistance vs Fire retardancy

There is a vast difference between cables that are rated fire resistant and those that only have earned the rating fire/flame retardant.

Flame retardant cables prevent the spread of fire into a new area, while fire resistant cables maintain circuit integrity and continue to work for a specified time under defined conditions. The differences between the two ratings are significant for the critical circuits required for life safety or a safe and immediate plant shut down. Additionally, fire resistant cables can be used to replace expensive fire rated structures, blankets or wraps and the difficult to install MI cable. Flame retardant cables are not rated to continue to operate in a fire, and in all probability will not maintain circuit integrity during a fire. The summary of differences between flame retardant and fire resistive cables are shown in table below.

| FIRE RESISTANT                           | FIRE/FLAME RETARDANT                      |
|--|---|
| Approval:                                | Approvals:                                |
| AS/NZS 3013 (WS52W)                      | IEC 60332-1, IEC 60332-3                  |
| A cable that will continue to operate in | A cable that will not convey or propagate |
| the presence of a fire, also identified  | a fire as defined by the Flame Retardant  |
| as Circuit Integrity Cable.              | or Propagation Tests indicated above.     |

For more information about standards and difference between fire performance test methods, go to page 36 of this catalogue.



All fire resistant cables are also flame retardant. However not all flame retardant cables are fire resistant. Know what is required for your application and choose from our Afumex LSOH. We've got it all.

|        |                                  |  | Afumex <sup>®</sup><br>LSOH cables   |
|--------|----------------------------------|--|--|
|        |                                  | AFUMEX LSOH                                      |  |
|        |                                  | FIRE RESISTANT                                   | NON-FIRE RESISTANT   |
|        | Ļ                                | Approval:<br>AS/NZS 3013 (WS52W)                 | Approvals:<br>IEC 60332-1, IEC 60332-3   |
| GOLD   | Class 5                          | FIRESTOP FS110 FLEXIBLE MULTICORE                |  |
| GOLD   | Flexible<br>conductor            | FIRESTOP FS110 FLEXIBLE SDI                      |  |
|        |                                  | FIRESTOP FS110<br>STRANDED CONDUCTOR MULTICORE   | All Fire Resistant cables listed in<br>this catalogue are also available in a<br>NON-FIRE RESISTANT construction |
| SILVER | Class 2<br>Stranded<br>conductor | FIRESTOP FS110<br>STRANDED CONDUCTOR SDI         | with NO FIRE RESISTANCE properties (no Mica glass tape for fire barrier).  |
|        | conductor                        | FIRESTOP FS110<br>STRANDED CONDUCTOR ALARM CABLE | These are still LSOH, flame/fire<br>retardant and meet all requirements<br>of IEC 60332-1 and IEC 60332-3.       |
| 000135 | Class 2                          | FIRESTOP FS90<br>STRANDED CONDUCTOR MULTICORE    | 01 IEC 60332-1 dilu IEC 60332-3.   |
| BRONZE | Stranded<br>conductor            | FIRESTOP FS90<br>STRANDED CONDUCTOR ALARM CABLE  |  |

#### **KEY TERMS**

Fire performing = Fire rated (does not refer to any particular standard or test) Fire resistant = AS/NZS 3013 = Prysmian Firestop Range Fire retardant = Flame retardant = Fire/Flame Propagation = IEC 60332-1, IEC60332-3

- All fire resistant cables are LSOH
- All flame retardant cables are LSOH
- All fire resistant cables are flame retardant
- NOT all flame retardant cables are fire resistant.

### Firestop™

Firestop is a range of polymeric fire resistant cables designed to maintain circuit integrity in a fire situation while minimising the evolution of smoke and gases harmful when exposed to fire. This range is designed to save lives and help protect property in the event of a fire.

Firestop cables are typically used in underground transport tunnels, high-rise building, airports and other densely populated places. They are used where power supply to essential circuits like water pumps, lift motors, emergency lighting, fire alarms and automation and control systems where continued operation is critical in during a fire event.

Prysmian Firestop are low smoke and fume (LSOH) cables that are designed to allow safe evacuation making them ideal for buildings such as multi-storey dwellings, office blocks, hotels and educational institution buildings. The focus of Prysmian research and development has been to reduce potential hazards by developing cable constructions and materials that will limit flame propagation, contribute less smoke and emit combustion by-products that are not harmful. This performance objective has been achieved in the Firestop range of cables.

Firestop is easy to install fire safety cable range fully complying with the latest version of AS/NZS 3013 standard and Building Code of Australia requirements. This range is classified (WS52W) which implies the scope of testing is designed to confirm performance when installed in a wiring system.

#### Firestop<sup>™</sup> – performance levels included:

- Circuit integrity up to an extreme temperature of 1050 °C at the end of 2 hours.
- Moderate mechanical protection rated in line with building codes requirements.
- Stranded class 2 or bunched class 5 conductor for ease of installation.
- 90 °/110 °C rated for increased current rating and hot ambient.
- LSZH Suitable for confined and high people density areas.
- 0.6/1 kV robust construction with improved electrical performance.



# **GOLD** Firestop FS110 Flexible | Class 5

### GOLD | 0.6/1 kV | CLASS 5 FIRESTOP FS110 FLEXIBLE MULTICORE





#### **Cable description**

Fire rated, flexible multicore LSOH cable suitable for installation wiring.

#### Application

- Power supply to essential equipment such as lighting, fans and lifts in the event of a fire in confined spaces.
- Classified (WS52W) meaning the scope of testing is designed to confirm performance when installed in a wiring system.
- Circuit integrity up to an extreme temperature of 1050 °C at the end of 2 hours.
- LSZH Suitable for confined and high people density areas such as underground transport tunnels, airports and public buildings.

#### **Approvals/Qualifications**

NATA accredited facility Qualification (third party) AS/NZS 5000.1. AS/NZS 3013 WS52W

#### Behaviour in flame and fire

Fire performance rating: AS/NZS 3013 WS52W AS/NZS 4507 CI-3

Flame propagation: IEC 60332-3 cat A IEC 60332-1

Halogen free/Low smoke emission: AS/NZS 4507

#### **Temperature range**

Maximum operating temperature: +110 °C Minimum operating temperature: -25 °C

#### Flexibility

Minimum bending radius: Installed cables: 10D During installation: 12D

#### **Resistance to**

Fire:2 hrsChemical exposure:OccasionalMechanical impact:ModerateWater exposure:SpraySolar radiation andUV stabilised

#### **Cable design**

Conductor: Flexible plain annealed copper (class 5) Fire barrier: Mica glass tape Insulation: X-HF-110 (LSOH) Colour: 2 cores: Red, black 3 cores: Red, white, blue 4 cores: Red, white, blue 5 cores and above: White with numbered cores Sheath: Red, HFS-110-TP (LSOH)

#### Installation conditions

In free air In duct Internal wiring External building





#### Characteristics

| FIRESTOP FS110 FLEXIBLE MULTICORE |                    |                               |                                |                          |                          |  |  |  |
|-----------------------------------|--------------------|-------------------------------|--------------------------------|--------------------------|--------------------------|--|--|--|
| Product<br>code                   | Number<br>of cores | Nominal conductor<br>area mm² | Approx. overall<br>diameter mm | Approx. mass<br>kg/100 m | AS/NZS 3013<br>WS Rating |  |  |  |
| 103CEFFFS110RD                    | 3C+E               | 10                            | 21.6                           | 60.3                     | WS52W                    |  |  |  |
| 163CEFFFS110RD                    | 3C+E               | 16                            | 24.2                           | 83.1                     | WS52W                    |  |  |  |
| 253CEFFFS110RD                    | 3C+E               | 25                            | 27.5                           | 113.9                    | WS52W                    |  |  |  |
| 353CEFFFS110RD                    | 3C+E               | 35                            | 30.7                           | 148.3                    | WS52W                    |  |  |  |
| 503CEFFFS110RD                    | 3C+E               | 50                            | 35.2                           | 206.1                    | WS52W                    |  |  |  |
| 703CEFFFS110RD                    | 3C+E               | 70                            | 40.8                           | 283.7                    | WS52W                    |  |  |  |
| 104CEFFFS110RD                    | 4C+E               | 10                            | 23.5                           | 80                       | WS52W                    |  |  |  |
| 164CEFFFS110RD                    | 4C+E               | 16                            | 26.5                           | 108                      | WS52W                    |  |  |  |
| 254CEFFFS110RD                    | 4C+E               | 25                            | 30.9                           | 151                      | WS52W                    |  |  |  |
| 354CEFFFS110RD                    | 4C+E               | 35                            | 33.8                           | 196                      | WS52W                    |  |  |  |
| 504CEFFFS110RD                    | 4C+E               | 50                            | 40.1                           | 275                      | WS52W                    |  |  |  |
| 704CEFFFS110RD                    | 4C+E               | 70                            | 45.3                           | 378                      | WS52W                    |  |  |  |
|                                   |                    |                               |                                |                          |                          |  |  |  |

All other core count constructions available on request.



### GOLD | 0.6/1 kV | CLASS 5 FIRESTOP FS110 FLEXIBLE SDI





#### **Cable description**

Fire rated, flexible single core LSOH cable suitable for installation wiring.

#### Application

- Power supply to essential circuits such as mains, sub mains in areas where circuit integrity is essential in the event of a fire.
- Classified (WS52W) meaning the scope of testing is designed to confirm performance when installed in a wiring system.
- Circuit integrity up to an extreme temperature of 1050 °C at the end of 2 hours.
- LSZH Suitable for confined and high people density areas such as underground transport tunnels, airports a nd public buildings.

#### **Approvals/Qualifications**

NATA accredited facility Qualification (third party) AS/NZS 5000.1. AS/NZS 3013 WS52W

#### Behaviour in flame and fire

Fire performance rating: AS/NZS 3013 WS52W AS/NZS 4507 CI-3

Flame propagation: IEC 60332-3 cat A IEC 60332-1

Halogen free/Low smoke emission: AS/NZS 4507

#### Temperature range

Maximum operating temperature: +110 °C Minimum operating temperature: -25 °C

#### Flexibility

Minimum bending radius: Installed cables: 10D During installation: 12D

#### **Resistance to**

Fire:2 hrsChemical exposure:OccasionalMechanical impact:ModerateWater exposure:SpraySolar radiation andUV stabilised

#### **Cable design**

Conductor: Flexible plain annealed copper (class 5) Fire barrier: Mica glass tape Insulation: X-HF-110 (LSOH) Insulation colour: Natural Sheath: Red, HFS-110-TP (LSOH)

#### Installation conditions

In free air In duct Internal wiring External building



#### Characteristics

| FIRESTOP FS110 FLEXIBLE SDI |                    |                               |                                |                          |                          |  |  |
|-----------------------------|--------------------|-------------------------------|--------------------------------|--------------------------|--------------------------|--|--|
| Product<br>code             | Number<br>of cores | Nominal conductor<br>area mm² | Approx. overall<br>diameter mm | Approx. mass<br>kg/100 m | AS/NZS 3013<br>WS Rating |  |  |
| 251CFFFS110RD               | 1C                 | 25                            | 14.1                           | 35.1                     | WS52W                    |  |  |
| 351CFFFS110RD               | 1C                 | 35                            | 14.9                           | 44.6                     | WS52W                    |  |  |
| 501CFFFS110RD               | 1C                 | 50                            | 16.5                           | 59.7                     | WS52W                    |  |  |
| 701CFFFS110RD               | 1C                 | 70                            | 18.2                           | 79.1                     | WS52W                    |  |  |
| 951CFFFS110RD               | 1C                 | 95                            | 20.2                           | 101                      | WS52W                    |  |  |
| 1201CFFFS110RD              | 1C                 | 120                           | 21.9                           | 126                      | WS52W                    |  |  |
| 1501CFFFS110RD              | 1C                 | 150                           | 24.2                           | 155                      | WS52W                    |  |  |
| 1851CFFFS110RD              | 1C                 | 185                           | 26.2                           | 186                      | WS52W                    |  |  |
| 2401CFFFS110RD              | 1C                 | 240                           | 29.4                           | 241                      | WS52W                    |  |  |
| 3001CFFFS110RD              | 1C                 | 300                           | 32.4                           | 298                      | WS52W                    |  |  |
| 4001CFFFS110RD              | 1C                 | 400                           | 36.4                           | 388                      | WS52W                    |  |  |
| 5001CFFFS110RD              | 1C                 | 500                           | 40.5                           | 496                      | WS52W                    |  |  |
| 6301CFFFS110RD              | 1C                 | 630                           | 46.0                           | 655                      | WS52W                    |  |  |





## Better safe than sorry.

Prysmian cables – if you want to avoid unpleasant shocks.



To us "good enough" is never good enough. We're all depending on safe and reliable cables and Prysmian will always stand in the forefront, manufacturing the safest cables for Australian conditions. That includes making rigorous tests of all cables before letting them out on the market.

A brand of the **Prysmian** Group

# SILVER

# Firestop FS110 Stranded Conductor | Class 2

#### SILVER | 0.6/1 kV | CLASS 2

#### FIRESTOP FS110 STRANDED CONDUCTOR MULTICORE





#### **Cable description**

Fire rated multicore LSOH cable suitable for installation wiring.

#### Application

- Power supply to essential equipment such as lighting, fans and lifts affording circuit integrity in the event of a fire in confined spaces.
- Classified (WS52W) meaning the scope of testing is designed to confirm performance when installed in a wiring system.
- Circuit integrity up to an extreme temperature of 1050 °C at the end of 2 hours.
- LSZH Suitable for confined and high people density areas such as underground transport tunnels, airports and public buildings.

#### **Approvals/Qualifications**

NATA accredited facility Qualification (third party) AS/NZS 5000.1. AS/NZS 3013 WS52W

#### Behaviour in flame and fire

Fire performance rating: AS/NZS 3013 WS52W AS/NZS 4507 CI-3

Flame propagation: IEC 60332-3 cat A IEC 60332-1

Halogen free/Low smoke emission: AS/NZS 4507

#### Temperature range

Maximum operating temperature: +110 °C Minimum operating temperature: -25 °C

#### Flexibility

Minimum bending radius: Installed cables: 10D During installation: 12D

#### **Resistance to**

Fire:2 hrsChemical exposure:OccasionalMechanical impact:ModerateWater exposure:SpraySolar radiation andUV stabilised

#### Cable design

Conductor: Stranded plain annealed copper (class 2) Fire barrier: Mica glass tape Insulation: X-HF-110 (LSOH) Colour: 2 cores: Red, black 3 cores: Red, white, blue 4 cores: Red, white, blue, black 5 cores and above: White with numbered cores Sheath:

Black, HFS-110-TP (LSOH)

#### Installation conditions

In free air In duct Internal wiring External building





#### Characteristics

#### FIRESTOP FS110 STRANDED CONDUCTOR MULTICORE Number Nominal conductor AS/NZS 3013 Product Approx. overall Approx. mass of cores kg/100 m WS Rating area mm<sup>2</sup> diameter mm code 2C+E 1.52CEFS110BK 12.9 20 WS52W 1.5 2.52CEFS110BK 2.5 14.0 25 WS52W 2C+E 42CEFS110BK 2C+E 14.8 WS52W 4 29 62CEFS110BK 2C+E 6 15.8 35 WS52W 102CEFS110BK 2C+E 10 51 WS52W 18.1 162CEFS110BK 20.2 WS52W 2C+E 16 69 252CEFS110BK 2C+E 25 24.9 102 WS52W 352CEFS110BK WS52W 2C+E 35 27.0 129 1.53CEFS110BK 3C+E 1.5 14.0 24 WS52W 2.53CEFS110BK 3C+E 2.5 15.2 31 WS52W 43CEFS110BK 3C+E 4 16.2 36 WS52W 63CEFS110BK 3C+E 6 17.4 44 WS52W 103CEFS110BK 3C+E 10 20.0 65 WS52W 163CEFS110BK 3C+E 16 22.3 88 WS52W 253CEFS110BK 3C+E 25 26.8 130 WS52W 353CEFS110BK 35 29.4 WS52W 3C+E 167 503CEFS110BK 3C+E 50 32.2 216 WS52W 703CEFS110BK 3C+E 70 37.1 296 WS52W 953CEFS110BK 95 40.6 WS52W 3C+E 383 1203CEFS110BK 120 475 WS52W 3C+F 444 1503CEFS110BK 3C+E 150 49.5 589 WS52W 1853CEFS110BK 3C+E 185 55.1 742 WS52W 2403CEFS110BK 240 WS52W 3C+E 61.8 963 1.54CFS110BK 40 1.5 14.0 WS52W 24 2.54CFS110BK 4C 2.5 15.2 31 WS52W 1.54CEFS110BK 4C+E 1.5 15.2 28 WS52W 2.54CEFS110BK 4C+E 2.5 16.5 37 WS52W 44CEFS110BK 4C+E 4 17.7 45 WS52W 64CEFS110BK WS52W 4C+E 6 19.1 55 104CEFS110BK 4C+E 10 22.1 80 WS52W 164CEFS110BK 4C+E 16 24.6 109 WS52W 254CEFS110BK 4C+E 25 29.8 162 WS52W 354CEFS110BK 4C+E 35 32.8 209 WS52W 504CEFS110BK 4C+E 50 272 WS52W 36.0 704CEFS110BK 4C+E 70 41.6 374 WS52W 954CEFS110BK 4C+E 95 45.8 489 WS52W 1204CEFS110BK 4C+E 120 50.0 607 WS52W 1504CEFS110BK 4C+E 150 55.7 751 WS52W 1854CEFS110BK 4C+E 185 62.0 945 WS52W 2404CEFS110BK 4C+E 240 69.5 1225 WS52W



#### SILVER | 0.6/1 kV | CLASS 2 FIRESTOP FS110 STRANDED CONDUCTOR SDI





#### **Cable description**

Fire rated, single core LSOH cable suitable for installation wiring.

#### Application

- Power supply to essential circuits such as mains, sub mains in areas where circuit integrity is essential in the event of a fire.
- Classified (WS52W) meaning the scope of testing is designed to confirm performance when installed in a wiring system.
- Circuit integrity up to an extreme temperature of 1050 °C at the end of 2 hours.
- LSZH Suitable for confined and high people density areas such as underground transport tunnels, airports and public buildings.

#### **Approvals/Qualifications**

NATA accredited facility Qualification (third party) AS/NZS 5000.1. AS/NZS 3013 WS52W

#### Behaviour in flame and fire

Fire performance rating: AS/NZS 3013 WS52W AS/NZS 4507 CI-3

Flame propagation: IEC 60332-3 cat A IEC 60332-1

Halogen free/Low smoke emission: AS/NZS 4507

#### Temperature range

Maximum operating temperature: +110 °C Minimum operating temperature: -25 °C

#### Flexibility

Minimum bending radius: Installed cables: 10D During installation: 12D

#### **Resistance to**

Fire:2 hrsChemical exposure:OccasionalMechanical impact:ModerateWater exposure:SpraySolar radiation andUV stabilised

#### **Cable design**

Conductor: Stranded plain annealed copper (class 2) Fire barrier: Mica glass tape Insulation: X-HF-110 (LSOH) Insulation colour: Natural Sheath: Black, HFS-110-TP (LSOH)

#### Installation conditions

In free air In duct Internal wiring External building



#### Characteristics

#### FIRESTOP FS110 STRANDED CONDUCTOR SDI

| Product<br>code | Number<br>of cores | Nominal conductor<br>area mm² | Approx. overall<br>diameter mm | Approx. mass<br>kg/100 m | AS/NZS 3013<br>WS Rating |
|-----------------|--------------------|-------------------------------|--------------------------------|--------------------------|--------------------------|
| 101CFS110BK     | 1C                 | 10                            | 12.0                           | 21                       | WS52W                    |
| 161CFS110BK     | 1C                 | 16                            | 13.0                           | 28                       | WS52W                    |
| 251CFS110BK     | 1C                 | 25                            | 15.0                           | 40                       | WS52W                    |
| 351CFS110BK     | 1C                 | 35                            | 16.0                           | 49                       | WS52W                    |
| 501CFS110BK     | 1C                 | 50                            | 17.2                           | 63                       | WS52W                    |
| 701CFS110BK     | 1C                 | 70                            | 18.9                           | 82                       | WS52W                    |
|                 |                    |                               |                                |                          |                          |

Bigger sizes available on request only.



#### SILVER | 0.6/1 kV | CLASS 2

#### FIRESTOP FS110 STRANDED CONDUCTOR ALARM CABLE





#### **Cable description**

Fire rated fire alarm circuit LSOH cable suitable for installation wiring.

#### Application

- · Power supply cable to fire alarms.
- Classified (WS52W) meaning the scope of testing is designed to confirm performance when installed in a wiring system.
- Circuit integrity up to an extreme temperature of 1050 °C at the end of 2 hours.
- LSZH Suitable for confined and high people density areas such as underground transport tunnels, airports and public buildings.

#### **Approvals/Qualifications**

NATA accredited facility Qualification (third party) AS/NZS 5000.1. AS/NZS 3013 WS52W

#### Behaviour in flame and fire

Fire performance rating: AS/NZS 3013 WS52W AS/NZS 4507 CI-3

Flame propagation: IEC 60332-3 cat A IEC 60332-1

Halogen free/Low smoke emission: AS/NZS 4507

#### **Temperature range**

Maximum operating temperature: +110 °C Minimum operating temperature: -25 °C

#### Flexibility

Minimum bending radius: Installed cables: 10D During installation: 12D

#### **Resistance to**

Fire: 2 hrs Chemical exposure: Occasional Mechanical impact: Moderate Water exposure: Spray Solar radiation and weather exposure: UV stabilised

#### **Cable design**

Conductor: Stranded plain annealed copper (class 2) Fire barrier: Mica glass tape Insulation: X-HF-110 (LSOH) Colour: 2 cores: Red, white Sheath: Red, HFS-110-TP (LSOH) Installation conditions In free air

In duct Internal wiring External building



#### Characteristics

|                 | FIRE               | STOP FS110 STRANDED                       | CONDUCTOR ALARM C              | ABLE                     |                          |
|-----------------|--------------------|---|--------------------------------|--------------------------|--------------------------|
| Product<br>code | Number<br>of cores | Nominal conductor<br>area mm <sup>2</sup> | Approx. overall<br>diameter mm | Approx. mass<br>kg/100 m | AS/NZS 3013<br>WS Rating |
| 1.52CFS110RD    | 2C                 | 1.5                                       | 12.5                           | 19                       | WS52W                    |
|                 |                    |   |                                |                          |                          |
|                 |                    |   |                                |                          |                          |





# **Only the best for True Blue Aussies.**

Australian made quality cables.

We've been producing tailor-made cables in Australia since 1944. And we will continue to do so. Our great staff of highly skilled and experienced people know what it takes to make cables that withstand everything from termites to hazardous mine sites. Just fair dinkum cables, mate.

Australian made? Yes, of course.



**AUSTRALIAN MADĚ** 

# BRONZE

# Firestop FS90 Stranded Conductor | Class 2

#### BRONZ | 0.6/1 kV | CLASS 2

#### FIRESTOP FS90 STRANDED CONDUCTOR MULTICORE





#### **Cable description**

Fire rated multicore LSOH cable suitable for installation wiring.

#### Application

Power supply to essential equipment such as lighting, fans and lifts affording circuit integrity in the event of a fire in confined spaces.

- Classified (WS52W) meaning the scope of testing is designed to confirm performance when installed in a wiring system.
- Circuit integrity up to an extreme temperature of 1050 °C at the end of 2 hours.
- LSZH Suitable for confined and high people density areas such as underground transport tunnels, airports and public buildings.

#### **Approvals/Qualifications**

NATA accredited facility Qualification (third party) AS/NZS 5000.1. AS/NZS 3013 WS52W

#### Behaviour in flame and fire

Fire performance rating: AS/NZS 3013 WS52W

Flame propagation: IEC 60332-1

Halogen free/Low smoke emission: AS/NZS 4507

#### Temperature range

Maximum operating temperature: +90 °C Minimum operating temperature: -25 °C

#### Flexibility

Minimum bending radius: Installed cables: 10D During installation: 12D

#### **Resistance to**

Fire:2 hrsChemical exposure:OccasionalMechanical impact:ModerateWater exposure:SpraySolar radiation andUV stabilised

#### **Cable design**

Conductor: Stranded copper conductor (class 2) Fire barrier: Mica glass tape Insulation: X-90 (XLPE) Colour: 2 cores: Red, black 3 cores: Red, black, blue 4 cores: Red, black, blue 5 cores: White with numbered cores Sheath: Orange, red or black, HFS-90-TP (LSOH)

#### Installation conditions

In free air In duct Internal wiring External building



#### Characteristics

#### FIRESTOP FS90 STRANDED CONDUCTOR MULTICORE Product Number Nominal conductor Approx. overall Approx. mass AS/NZS 3013 of cores diameter mm kg/100 m WS Rating area mm<sup>2</sup> code 1.52CEFS90 2C+E 1.5 11.9 19 WS52W 2.52CEFS90 2C+E 2.5 13.4 25 WS52W 42CEFS90 2C+E 4.0 14.2 29 WS52W 6.0 WS52W 62CEFS90 2C+E 15.3 35 1.03CFS90 ЗC 1.0 11.9 17 WS51W WS52W 1.53CFS90 ЗC 1.5 12.5 20 WS52W 2.53CFS90 ЗC 2.5 13.6 25 1.53CEFS90 3C+E 13.4 WS52W 1.5 23 2.53CEFS90 3C+E 2.5 29 WS52W 14.6 43CEFS90 3C+E 4.0 15.6 35 WS52W 3C+E 6.0 WS52W 63CEFS90 16.8 43 1.54CFS90 4C 1.5 13.6 23 WS52W 2.54CFS90 4C 2.5 14.8 30 WS52W 1.54CEFS90 4C+E 1.5 14.6 26 WS52W 2.54CEFS90 4C+E 2.5 16 34 WS52W 44CEFS90 4C+E 4.0 16.8 42 WS52W 64CEFS90 4C+E 6.0 18.5 53 WS52W 6C 28 WS52W 1.56CFS90 1.5 16.1 1.56CEFS90 6C+E 1.5 16.1 29 WS52W 2.56CEFS90 6C+E 2.5 17.6 39 WS52W 1.57CF90 7C 1.5 16.1 29 WS52W 1.510CEFS90 10C+E 1.5 20.2 42 WS52W 2.5 22.2 WS52W 2.510CEFS90 10C+E 57 1.520CEFS90 20C+E 1.5 25.7 72 WS52W 2.5 28.4 99 WS52W 2.520CEFS90 20C+E



#### BRONZ | 0.6/1 kV | CLASS 2

#### FIRESTOP FS90 STRANDED CONDUCTOR ALARM CABLE





#### **Cable description**

Fire rated fire alarm circuit LSOH cable suitable for installation wiring.

#### Application

- Power supply cable to fire alarms.
- Classified (WS52W) meaning the scope of testing is designed to confirm performance when installed in a wiring system.
- Circuit integrity up to an extreme temperature of 1050 °C at the end of 2 hours.
- LSZH Suitable for confined and high people density areas such as underground transport tunnels, airports and public buildings.

#### **Approvals/Qualifications**

NATA accredited facility Qualification (third party) AS/NZS 5000.1. AS/NZS 3013 WS52W

#### Behaviour in flame and fire

Fire performance rating: AS/NZS 3013 WS52W

Flame propagation: IEC 60332-1

Halogen free/Low smoke emission: AS/NZS 4507

#### Temperature range

Maximum operating temperature: +90 °C Minimum operating temperature: -25 °C

#### Flexibility

Minimum bending radius: Installed cables: 10D During installation: 12D

#### **Resistance to**

| Fire:               | 2 hrs         |
|---------------------|---------------|
| Chemical exposure:  | Occasional    |
| Mechanical impact:  | Moderate      |
| Water exposure:     | Spray         |
| Solar radiation and |               |
| weather exposure:   | UV stabilised |

#### **Cable design**

Conductor: Stranded plain annealed copper (class 2) Fire barrier: Mica glass tape Insulation: X-90 (XLPE) Colour: 2 cores: Red, white Sheath: Red, HFS-90-TP (LSOH)

#### Installation conditions

In free air In duct Internal wiring External building

#### FIRESTOP FS90 STRANDED CONDUCTOR ALARM CABLE

| Product<br>code | Number<br>of cores | Nominal conductor<br>area mm <sup>2</sup> | Approx. overall<br>diameter mm | Approx. mass<br>kg/100 m | AS/NZS 3013<br>WS Rating |
|-----------------|--------------------|---|--------------------------------|--------------------------|--------------------------|
| 1.5CFS90        | 2C                 | 1.5                                       | 12                             | 18.1                     | WS52W                    |
|                 |                    |   |                                |                          |                          |



# Electrical characteristics

|      |           |  | SINGL           | E CORE                |                      |                     |                 |
|------|-----------|--|-----------------|-----------------------|----------------------|---------------------|-----------------|
|      | -         | · .                                    | Reac            | tance at              | Vo                   | ltage drop (mV/A.   | m)              |
| Size | Res       | istance                                | (oh             | m/km)                 | Three                | phase               |                 |
| Size | DC @ 20°C | AC @ 110°C (FS110)<br>AC @ 90°C (FS90) | 50Hz<br>Trefoil | 50Hz<br>Flat Touching | Lay flat<br>touching | Trefoil<br>touching | Single<br>phase |
|      |           |  | CLASS 5   FS    | 110 SINGLE CORE       |                      |                     |                 |
| 10   | 1.91      | 2.59                                   | 0.107           | 0.123                 | 4.48                 | 4.48                | 5.17            |
| 16   | 1.21      | 1.64                                   | 0.101           | 0.116                 | 2.85                 | 2.84                | 3.28            |
| 25   | 0.780     | 1.06                                   | 0.0973          | 0.113                 | 1.84                 | 1.84                | 2.12            |
| 35   | 0.554     | 0.750                                  | 0.0930          | 0.108                 | 1.31                 | 1.31                | 1.51            |
| 50   | 0.386     | 0.523                                  | 0.0901          | 0.105                 | 0.926                | 0.921               | 1.06            |
| 70   | 0.272     | 0.369                                  | 0.0869          | 0.102                 | 0.665                | 0.658               | 0.760           |
| 95   | 0.206     | 0.280                                  | 0.0849          | 0.100                 | 0.518                | 0.509               | 0.588           |
| 120  | 0.161     | 0.219                                  | 0.0828          | 0.0980                | 0.419                | 0.408               | 0.471           |
| 150  | 0.129     | 0.176                                  | 0.0830          | 0.0982                | 0.353                | 0.34                | 0.393           |
| 185  | 0.106     | 0.145                                  | 0.0821          | 0.0973                | 0.307                | 0.293               | 0.338           |
| 240  | 0.0801    | 0.111                                  | 0.0808          | 0.0960                | 0.259                | 0.242               | 0.279           |
| 300  | 0.0641    | 0.0898                                 | 0.0800          | 0.0953                | 0.232                | 0.213               | 0.246           |
| 400  | 0.0486    | 0.0699                                 | 0.0788          | 0.0941                | 0.208                | 0.187               | 0.216           |
| 500  | 0.0384    | 0.0571                                 | 0.0780          | 0.0932                | 0.194                | 0.172               | 0.199           |
| 630  | 0.0287    | 0.0455                                 | 0.0777          | 0.0929                | 0.182                | 0.159               | 0.184           |
|      |           |  | CLASS 2   FS    | 110 SINGLE CORE       |                      |                     |                 |
| 10   | 1.83      | 2.48                                   | 0.114           | 0.129                 | 4.30                 | 4.30                | 4.97            |
| 16   | 1.15      | 1.56                                   | 0.106           | 0.122                 | 2.71                 | 2.70                | 3.12            |
| 25   | 0.727     | 0.984                                  | 0.102           | 0.118                 | 1.72                 | 1.72                | 1.99            |
| 35   | 0.524     | 0.71                                   | 0.0982          | 0.113                 | 1.25                 | 1.24                | 1.43            |
| 50   | 0.387     | 0.524                                  | 0.0924          | 0.108                 | 0.929                | 0.924               | 1.07            |
| 70   | 0.268     | 0.363                                  | 0.0893          | 0.104                 | 0.657                | 0.650               | 0.751           |
| 95   | 0.193     | 0.262                                  | 0.0868          | 0.102                 | 0.491                | 0.481               | 0.555           |
| 120  | 0.153     | 0.208                                  | 0.0844          | 0.0996                | 0.403                | 0.392               | 0.453           |
| 150  | 0.124     | 0.169                                  | 0.0844          | 0.0996                | 0.344                | 0.331               | 0.382           |
| 185  | 0.0991    | 0.136                                  | 0.0835          | 0.0988                | 0.296                | 0.280               | 0.323           |
| 240  | 0.0754    | 0.105                                  | 0.0818          | 0.0970                | 0.252                | 0.235               | 0.271           |
| 300  | 0.0601    | 0.0846                                 | 0.0809          | 0.0961                | 0.227                | 0.208               | 0.240           |
| 400  | 0.047     | 0.0677                                 | 0.0802          | 0.0955                | 0.208                | 0.187               | 0.216           |
| 500  | 0.0366    | 0.0547                                 | 0.0796          | 0.0948                | 0.195                | 0.172               | 0.199           |
| 630  | 0.0283    | 0.0448                                 | 0.0787          | 0.0940                | 0.184                | 0.160               | 0.185           |
|      |           |  | CLASS 2   FS    | 90 SINGLE CORE        |                      |                     |                 |
| 1.5  | 13.6      | 17.3                                   | 0.155           | 0.170                 | 30.0                 | 30.0                | 34.6            |
| 2.5  | 7.41      | 9.45                                   | 0.141           | 0.156                 | 16.4                 | 16.4                | 18.9            |
| 4    | 4.61      | 5.88                                   | 0.131           | 0.146                 | 10.2                 | 10.2                | 11.8            |
| 6    | 3.08      | 3.93                                   | 0.123           | 0.138                 | 6.81                 | 6.81                | 7.86            |
| 10   | 1.83      | 2.33                                   | 0.114           | 0.129                 | 4.05                 | 4.05                | 4.68            |
| 16   | 1.15      | 1.47                                   | 0.106           | 0.122                 | 2.55                 | 2.55                | 2.94            |
| 25   | 0.727     | 0.927                                  | 0.102           | 0.118                 | 1.62                 | 1.62                | 1.87            |
| 35   | 0.524     | 0.668                                  | 0.0982          | 0.113                 | 1.18                 | 1.17                | 1.35            |
| 50   | 0.387     | 0.494                                  | 0.0924          | 0.108                 | 0.878                | 0.872               | 1.01            |
| 70   | 0.268     | 0.342                                  | 0.0893          | 0.104                 | 0.623                | 0.615               | 0.710           |
| 95   | 0.193     | 0.247                                  | 0.0868          | 0.102                 | 0.467                | 0.457               | 0.528           |
| 120  | 0.153     | 0.197                                  | 0.0844          | 0.0996                | 0.385                | 0.373               | 0.431           |
| 150  | 0.124     | 0.16                                   | 0.0844          | 0.0996                | 0.330                | 0.316               | 0.365           |
| 185  | 0.0991    | 0.129                                  | 0.0835          | 0.0988                | 0.285                | 0.269               | 0.311           |
| 240  | 0.0754    | 0.0991                                 | 0.0818          | 0.0970                | 0.242                | 0.226               | 0.261           |
| 300  | 0.0601    | 0.0803                                 | 0.0809          | 0.0961                | 0.215                | 0.199               | 0.230           |
| 400  | 0.047     | 0.0646                                 | 0.0802          | 0.0955                | 0.192                | 0.176               | 0.203           |
| 500  | 0.0366    | 0.0525                                 | 0.0796          | 0.0948                | 0.174                | 0.158               | 0.182           |
| 630  | 0.0283    | 0.0432                                 | 0.0787          | 0.0940                | 0.159                | 0.144               | 0.166           |



|      |            | MULTI                                  | CORE                 |                  |                 |
|------|------------|--|----------------------|------------------|-----------------|
| Size | Resistance | istance                                | Reactance at<br>50Hz | Voltage<br>(mV/A | e drop<br>A.m)  |
|      | DC @ 20°C  | AC @ 110°C (FS110)<br>AC @ 90°C (FS90) | (ohm/km)             | Three<br>phase   | Single<br>phase |
|      |            | CLASS 5   FS11                         | IO MULTICORE         |                  |                 |
| 10   | 1.91       | 2.59                                   | 0.0810               | 4.48             | 5.17            |
| 16   | 1.21       | 1.64                                   | 0.0779               | 2.84             | 3.28            |
| 25   | 0.780      | 1.06                                   | 0.0783               | 1.84             | 2.12            |
| 35   | 0.554      | 0.750                                  | 0.0761               | 1.31             | 1.51            |
| 50   | 0.386      | 0.523                                  | 0.0754               | 0.917            | 1.06            |
| 70   | 0.272      | 0.369                                  | 0.0744               | 0.654            | 0.755           |
| 95   | 0.206      | 0.280                                  | 0.0729               | 0.504            | 0.582           |
| 120  | 0.161      | 0.219                                  | 0.0723               | 0.403            | 0.465           |
| 150  | 0.129      | 0.176                                  | 0.0728               | 0.334            | 0.386           |
| 185  | 0.106      | 0.146                                  | 0.0730               | 0.286            | 0.330           |
| 240  | 0.0801     | 0.111                                  | 0.0722               | 0.234            | 0.270           |
| 300  | 0.0641     | 0.0905                                 | 0.0718               | 0.204            | 0.236           |
|      |            | CLASS 2   FS11                         | 0 MULTICORE          |                  |                 |
| 10   | 1.83       | 2.48                                   | 0.0840               | 4.29             | 4.95            |
| 16   | 1.15       | 1.56                                   | 0.0805               | 2.70             | 3.12            |
| 25   | 0.727      | 0.984                                  | 0.0808               | 1.71             | 1.97            |
| 35   | 0.524      | 0.710                                  | 0.0786               | 1.24             | 1.43            |
| 50   | 0.387      | 0.524                                  | 0.0751               | 0.92             | 1.06            |
| 70   | 0.268      | 0.364                                  | 0.0741               | 0.645            | 0.745           |
| 95   | 0.193      | 0.262                                  | 0.0725               | 0.475            | 0.548           |
| 120  | 0.153      | 0.209                                  | 0.0713               | 0.385            | 0.445           |
| 150  | 0.124      | 0.170                                  | 0.0718               | 0.322            | 0.372           |
| 185  | 0.0991     | 0.136                                  | 0.0720               | 0.271            | 0.313           |
| 240  | 0.0754     | 0.105                                  | 0.0709               | 0.224            | 0.259           |
| 300  | 0.0601     | 0.0852                                 | 0.0704               | 0.196            | 0.226           |
|      |            |  | 0 MULTICORE          |                  |                 |
| 1.5  | 13.6       | 17.3                                   | 0.107                | 30.0             | 34.6            |
| 2.5  | 7.41       | 9.45                                   | 0.0988               | 16.4             | 18.9            |
| 4    | 4.61       | 5.88                                   | 0.0930               | 10.2             | 11.8            |
| 6    | 3.08       | 3.93                                   | 0.0887               | 6.80             | 7.85            |
| 10   | 1.83       | 2.33                                   | 0.084                | 4.05             | 4.68            |
| 16   | 1.15       | 1.47                                   | 0.0805               | 2.55             | 2.94            |
| 25   | 0.727      | 0.927                                  | 0.0808               | 1.61             | 1.86            |
| 35   | 0.524      | 0.669                                  | 0.0786               | 1.17             | 1.35            |
| 50   | 0.387      | 0.494                                  | 0.0751               | 0.868            | 1.00            |
| 70   | 0.268      | 0.343                                  | 0.0741               | 0.609            | 0.703           |
| 95   | 0.193      | 0.248                                  | 0.0725               | 0.450            | 0.520           |
| 120  | 0.153      | 0.197                                  | 0.0713               | 0.366            | 0.423           |
| 150  | 0.124      | 0.16                                   | 0.0718               | 0.307            | 0.354           |
| 185  | 0.0991     | 0.129                                  | 0.072                | 0.259            | 0.299           |
| 240  | 0.0754     | 0.0998                                 | 0.0709               | 0.216            | 0.249           |
| 240  |            |  |                      |                  |                 |

| Nominal<br>conductor |             | Unenclosed                  |                          | Enc                                      | losed                             |
|----------------------|-------------|-----------------------------|--------------------------|--|-----------------------------------|
| area<br>mm²          | Spaced<br>A | Spaced from<br>surface<br>A | Touching<br>surface<br>A | Metallic wiring<br>enclosure in air<br>A | Underground duct<br>one duct<br>A |
|                      |             | TWO SING                    | ILE CORE                 |  |                                   |
| 10                   | 102         | 98                          | 80                       | 77                                       | 88                                |
| 16                   | 135         | 129                         | 105                      | 102                                      | 115                               |
| 25                   | 178         | 170                         | 139                      | 133                                      | 148                               |
| 35                   | 221         | 210                         | 172                      | 167                                      | 177                               |
| 50                   | 279         | 263                         | 218                      | 207                                      | 214                               |
| 70                   | 351         | 329                         | 273                      | 263                                      | 262                               |
| 95                   | 422         | 395                         | 329                      | 312                                      | 321                               |
| 120                  | 500         | 466                         | 390                      | 364                                      | 366                               |
| 150                  | 577         | 536                         | 450                      | 426                                      | 420                               |
| 185                  | 660         | 611                         | 516                      | 481                                      | 477                               |
| 240                  | 794         | 732                         | 621                      | 583                                      | 561                               |
| 300                  | 916         | 841                         | 716                      | -  | 648                               |
| 400                  | 1105        | 1006                        | 860                      | -  | 738                               |
| 500                  | 1290        | 1164                        | 999                      | -  | 837                               |
| 630                  | 1529        | 1359                        | 1168                     | -  | 973                               |
|                      |             | THREE SIN                   | GLE CORE                 |  |                                   |
| 10                   | 99          | 85                          | 80                       | 70                                       | 76                                |
| 16                   | 130         | 112                         | 105                      | 91                                       | 97                                |
| 25                   | 173         | 149                         | 139                      | 121                                      | 125                               |
| 35                   | 214         | 184                         | 172                      | 148                                      | 151                               |
| 50                   | 270         | 233                         | 217                      | 190                                      | 188                               |
| 70                   | 340         | 292                         | 273                      | 234                                      | 229                               |
| 95                   | 410         | 353                         | 329                      | 277                                      | 268                               |
| 120                  | 487         | 418                         | 390                      | 331                                      | 316                               |
| 150                  | 562         | 482                         | 450                      | 378                                      | 357                               |
| 185                  | 644         | 553                         | 516                      | 438                                      | 404                               |
| 240                  | 775         | 665                         | 620                      | 538                                      | 481                               |
| 300                  | 895         | 766                         | 714                      | 612                                      | 542                               |
| 400                  | 1079        | 918                         | 855                      | 757                                      | 648                               |
| 500                  | 1260        | 1064                        | 990                      | 864                                      | 729                               |
| 630                  | 1493        | 1240                        | 1154                     | 993                                      | 828                               |

#### CURRENT CARRYING CAPACITY\* | CLASS 5 | FS110 SINGLE CORE

| Nominal<br>conductor | Unen        | closed                   | Enclosed                                 |                                   |  |  |
|----------------------|-------------|--------------------------|--|-----------------------------------|--|--|
| area<br>mm²          | Spaced<br>A | Touching<br>surface<br>A | Metallic wiring<br>enclosure in air<br>A | Underground duct<br>one duct<br>A |  |  |
|                      |             | TWO CORE                 |  |                                   |  |  |
| 10                   | 94          | 88                       | 75                                       | 84                                |  |  |
| 16                   | 124         | 116                      | 100                                      | 109                               |  |  |
| 25                   | 163         | 154                      | 129                                      | 139                               |  |  |
| 35                   | 202         | 190                      | 163                                      | 171                               |  |  |
| 50                   | 254         | 238                      | 202                                      | 209                               |  |  |
| 70                   | 318         | 299                      | 257                                      | 259                               |  |  |
| 95                   | 381         | 357                      | 303                                      | 304                               |  |  |
| 120                  | 450         | 421                      | 362                                      | 357                               |  |  |
| 150                  | 515         | 482                      | 412                                      | 403                               |  |  |
| 185                  | 586         | 547                      | 474                                      | 456                               |  |  |
| 240                  | 698         | 652                      | 577                                      | 541                               |  |  |
| 300                  | 799         | 745                      | 656                                      | 611                               |  |  |
|                      |             |                          |  |                                   |  |  |

#### CURRENT CARRYING CAPACITY\* | CLASS 5 | FS110 MULTICORE

|     |     | THREE & FOUR CORE |     |     |
|-----|-----|-------------------|-----|-----|
| 10  | 80  | 75                | 65  | 71  |
| 16  | 106 | 99                | 84  | 91  |
| 25  | 140 | 131               | 112 | 118 |
| 35  | 173 | 162               | 137 | 143 |
| 50  | 218 | 204               | 175 | 178 |
| 70  | 273 | 255               | 217 | 217 |
| 95  | 327 | 306               | 263 | 259 |
| 120 | 387 | 360               | 306 | 298 |
| 150 | 444 | 413               | 356 | 341 |
| 185 | 505 | 470               | 402 | 381 |
| 240 | 602 | 559               | 489 | 453 |
| 300 | 688 | 638               | -   | 509 |
|     |     |                   |     |     |
|     |     |                   |     |     |
|     |     |                   |     |     |
|     |     |                   |     |     |

| Nominal<br>onductor | Unenclosed  |                             |                          | Enclosed                                 |                                   |                                   |                                     |  |
|---------------------|-------------|-----------------------------|--------------------------|--|-----------------------------------|-----------------------------------|-------------------------------------|--|
| area<br>mm²         | Spaced<br>A | Spaced from<br>surface<br>A | Touching<br>surface<br>A | Metallic wiring<br>enclosure in air<br>A | Underground<br>duct one duct<br>A | Underground<br>duct two duct<br>A | Underground<br>duct three duct<br>A |  |
|                     |             |                             | TWO SIN                  | IGLE CORE                                |                                   |                                   |                                     |  |
| 10                  | 103         | 99                          | 81                       | 78                                       | 88                                | 97                                | -                                   |  |
| 16                  | 137         | 131                         | 107                      | 104                                      | 115                               | 127                               | -                                   |  |
| 25                  | 183         | 175                         | 143                      | 137                                      | 148                               | 163                               | -                                   |  |
| 35                  | 225         | 214                         | 176                      | 165                                      | 177                               | 195                               | -                                   |  |
| 50                  | 276         | 261                         | 215                      | 205                                      | 214                               | 236                               | -                                   |  |
| 70                  | 349         | 328                         | 272                      | 255                                      | 262                               | 288                               | -                                   |  |
| 95                  | 434         | 406                         | 339                      | 321                                      | 321                               | 352                               | -                                   |  |
| 120                 | 505         | 471                         | 394                      | 369                                      | 366                               | 400                               | -                                   |  |
| 150                 | 581         | 540                         | 454                      | 430                                      | 420                               | 448                               | -                                   |  |
| 185                 | 673         | 624                         | 527                      | 493                                      | 477                               | 517                               | -                                   |  |
| 240                 | 806         | 743                         | 630                      | 594                                      | 561                               | 600                               | -                                   |  |
| 300                 | 934         | 857                         | 730                      | -  | 648                               | 694                               | -                                   |  |
| 400                 | 1094        | 998                         | 853                      | -  | 738                               | 790                               | -                                   |  |
| 500                 | 1278        | 1155                        | 990                      | -  | 837                               | 921                               | -                                   |  |
| 630                 | 1498        | 1334                        | 1146                     | -  | 973                               | 1045                              | -                                   |  |
|                     |             |                             | THREE SI                 | NGLE CORE                                |                                   |                                   |                                     |  |
| 10                  | 99          | 86                          | 81                       | 71                                       | 77                                | -                                 | 88                                  |  |
| 16                  | 132         | 114                         | 107                      | 93                                       | 99                                | -                                 | 115                                 |  |
| 25                  | 177         | 153                         | 143                      | 125                                      | 130                               | -                                 | 148                                 |  |
| 35                  | 218         | 188                         | 176                      | 151                                      | 155                               | -                                 | 176                                 |  |
| 50                  | 267         | 230                         | 215                      | 182                                      | 184                               | -                                 | 212                                 |  |
| 70                  | 339         | 291                         | 272                      | 234                                      | 230                               | -                                 | 259                                 |  |
| 95                  | 422         | 363                         | 339                      | 285                                      | 277                               | -                                 | 315                                 |  |
| 120                 | 492         | 422                         | 394                      | 337                                      | 322                               | -                                 | 357                                 |  |
| 150                 | 565         | 486                         | 453                      | 382                                      | 362                               | -                                 | 400                                 |  |
| 185                 | 656         | 564                         | 526                      | 449                                      | 415                               | -                                 | 461                                 |  |
| 240                 | 786         | 674                         | 629                      | 548                                      | 492                               | -                                 | 533                                 |  |
| 300                 | 912         | 780                         | 727                      | 626                                      | 556                               | -                                 | 617                                 |  |
| 400                 | 1069        | 910                         | 847                      | 718                                      | 631                               | -                                 | 700                                 |  |
| 500                 | 1248        | 1053                        | 981                      | 865                                      | 736                               | -                                 | 815                                 |  |
| 630                 | 1462        | 1217                        | 1132                     | 983                                      | 827                               | _                                 | 920                                 |  |

#### CURRENT CARRYING CAPACITY\* | CLASS 2 | FS110 SINGLE CORE

| Nominal conductor | Unen        | closed                   | Enclosed                                 |                                   |  |  |
|-------------------|-------------|--------------------------|--|-----------------------------------|--|--|
| area<br>mm²       | Spaced<br>A | Touching<br>surface<br>A | Metallic wiring<br>enclosure in air<br>A | Underground duct<br>one duct<br>A |  |  |
|                   |             | TWO CORE                 |  |                                   |  |  |
| 10                | 95          | 89                       | 76                                       | 85                                |  |  |
| 16                | 126         | 118                      | 102                                      | 111                               |  |  |
| 25                | 168         | 158                      | 133                                      | 144                               |  |  |
| 35                | 206         | 194                      | 166                                      | 175                               |  |  |
| 50                | 251         | 236                      | 200                                      | 208                               |  |  |
| 70                | 317         | 298                      | 256                                      | 260                               |  |  |
| 95                | 392         | 367                      | 312                                      | 313                               |  |  |
| 120               | 455         | 426                      | 368                                      | 363                               |  |  |
| 150               | 519         | 486                      | 417                                      | 409                               |  |  |
| 185               | 598         | 559                      | 486                                      | 468                               |  |  |
| 240               | 708         | 662                      | 588                                      | 554                               |  |  |
| 300               | 815         | 760                      | 670                                      | 626                               |  |  |
|                   |             |                          |  |                                   |  |  |

#### CURRENT CARRYING CAPACITY\* | CLASS 2 | FS110 MULTICORE

|     |     | THREE & FOUR CORE |     |     |
|-----|-----|-------------------|-----|-----|
| 10  | 81  | 76                | 64  | 71  |
| 16  | 107 | 101               | 86  | 93  |
| 25  | 144 | 135               | 116 | 122 |
| 35  | 177 | 166               | 140 | 146 |
| 50  | 216 | 202               | 174 | 177 |
| 70  | 272 | 255               | 217 | 217 |
| 95  | 337 | 314               | 270 | 267 |
| 120 | 391 | 364               | 311 | 304 |
| 150 | 447 | 416               | 360 | 346 |
| 185 | 515 | 479               | 411 | 391 |
| 240 | 611 | 567               | 498 | 463 |
| 300 | 701 | 650               | -   | 522 |
|     |     |                   |     |     |
|     |     |                   |     |     |
|     |     |                   |     |     |
|     |     |                   |     |     |

| Nominal<br>conductor |             | Unenclosed                  |                          | Enclosed                        |                                   |                                   |                                     |  |
|----------------------|-------------|-----------------------------|--------------------------|---------------------------------|-----------------------------------|-----------------------------------|-------------------------------------|--|
| area<br>mm²          | Spaced<br>A | Spaced from<br>surface<br>A | Touching<br>surface<br>A | Wiring<br>enclosure in air<br>A | Underground<br>duct one duct<br>A | Underground<br>duct two duct<br>A | Underground<br>duct three duct<br>A |  |
| TWO SINGLE CORE      |             |                             |                          |                                 |                                   |                                   |                                     |  |
| 1,5                  | 26          | 25                          | 20                       | 21                              | 26                                | 30                                | -                                   |  |
| 2,5                  | 36          | 36                          | 28                       | 30                              | 36                                | 41                                | -                                   |  |
| 4                    | 48          | 47                          | 37                       | 38                              | 46                                | 53                                | -                                   |  |
| 6                    | 61          | 60                          | 47                       | 47                              | 58                                | 66                                | -                                   |  |
| 10                   | 84          | 82                          | 65                       | 65                              | 78                                | 87                                | -                                   |  |
| 16                   | 112         | 108                         | 86                       | 84                              | 100                               | 112                               | -                                   |  |
| 25                   | 151         | 145                         | 117                      | 113                             | 131                               | 146                               | -                                   |  |
| 35                   | 186         | 177                         | 144                      | 135                             | 157                               | 175                               | -                                   |  |
| 50                   | 228         | 216                         | 176                      | 166                             | 189                               | 211                               | -                                   |  |
| 70                   | 291         | 273                         | 224                      | 204                             | 233                               | 258                               | -                                   |  |
| 95                   | 361         | 338                         | 278                      | 255                             | 285                               | 309                               | -                                   |  |
| 120                  | 422         | 393                         | 325                      | 292                             | 325                               | 358                               | -                                   |  |
| 150                  | 486         | 451                         | 375                      | 329                             | 365                               | 401                               | -                                   |  |
| 185                  | 565         | 522                         | 436                      | 387                             | 423                               | 463                               | -                                   |  |
| 240                  | 678         | 622                         | 522                      | 461                             | 497                               | 536                               | -                                   |  |
| 300                  | 787         | 718                         | 605                      | -                               | 562                               | 620                               | -                                   |  |
| 400                  | 923         | 836                         | 708                      | -                               | 653                               | 706                               | -                                   |  |
| 500                  | 1078        | 966                         | 821                      | -                               | 739                               | 800                               |                                     |  |
| 630                  | 1261        | 1113                        | 950                      | -                               | 856                               | 930                               | -                                   |  |
|                      |             |                             | THREE SIN                | IGLE CORE                       |                                   |                                   |                                     |  |
| 1,5                  | 25          | 21                          | 20                       | 18                              | 22                                | -                                 | 27                                  |  |
| 2,5                  | 35          | 30                          | 28                       | 25                              | 31                                | -                                 | 38                                  |  |
| 4                    | 46          | 40                          | 37                       | 33                              | 40                                | -                                 | 49                                  |  |
| 6                    | 59          | 50                          | 47                       | 42                              | 50                                | -                                 | 60                                  |  |
| 10                   | 81          | 69                          | 65                       | 56                              | 67                                | -                                 | 79                                  |  |
| 16                   | 108         | 92                          | 86                       | 72                              | 86                                | -                                 | 101                                 |  |
| 25                   | 146         | 125                         | 117                      | 97                              | 113                               | -                                 | 132                                 |  |
| 35                   | 180         | 154                         | 14.4                     | 120                             | 137                               | -                                 | 158                                 |  |
| 50                   | 221         | 188                         | 176                      | 143                             | 163                               | -                                 | 190                                 |  |
| 70                   | 282         | 240                         | 224                      | 183                             | 203                               | -                                 | 232                                 |  |
| 95                   | 350         | 298                         | 278                      | 220                             | 244                               | -                                 | 276                                 |  |
| 120                  | 410         | 349                         | 325                      | 261                             | 284                               | -                                 | 320                                 |  |
| 150                  | 472         | 403                         | 375                      | 295                             | 320                               | -                                 | 358                                 |  |
| 185                  | 550         | 468                         | 435                      | 335                             | 363                               | _                                 | 413                                 |  |
| 240                  | 660         | 560                         | 521                      | 399                             | 426                               | -                                 | 477                                 |  |
| 300                  | 766         | 648                         | 602                      | 469                             | 491                               | _                                 | 552                                 |  |
| 400                  | 899         | 756                         | 702                      | 534                             | 557                               | -                                 | 626                                 |  |
| 500                  | 1051        | 874                         | 812                      | 633                             | 648                               | _                                 | 707                                 |  |
| 630                  | 1230        | 1010                        | 938                      | 714                             | 727                               | -                                 | 820                                 |  |

#### CURRENT CARRYING CAPACITY\* | CLASS 2 | FS90 SINGLE CORE

| Nominal<br>conductor      | Un          | enclosed                 | Enc                             | losed                             |  |  |  |
|---------------------------|-------------|--------------------------|---------------------------------|-----------------------------------|--|--|--|
| area<br>mm²               | Spaced<br>A | Touching<br>surface<br>A | Wiring<br>enclosure in air<br>A | Underground duct<br>one duct<br>A |  |  |  |
| TWO CORE & 2 CORE + EARTH |             |                          |                                 |                                   |  |  |  |
| 1,5                       | 24          | 22                       | 20                              | 24                                |  |  |  |
| 2,5                       | 34          | 31                       | 28                              | 34                                |  |  |  |
| 4                         | 45          | 42                       | 37                              | 45                                |  |  |  |
| 6                         | 57          | 53                       | 46                              | 56                                |  |  |  |
| 10                        | 78          | 73                       | 63                              | 75                                |  |  |  |
| 16                        | 104         | 97                       | 82                              | 98                                |  |  |  |
| 25                        | 140         | 131                      | 110                             | 128                               |  |  |  |
| 35                        | 173         | 162                      | 132                             | 154                               |  |  |  |
| 50                        | 211         | 197                      | 162                             | 185                               |  |  |  |
| 70                        | 268         | 250                      | 200                             | 228                               |  |  |  |
| 95                        | 331         | 309                      | 250                             | 279                               |  |  |  |
| 120                       | 385         | 359                      | 285                             | 318                               |  |  |  |
| 150                       | 441         | 411                      | 332                             | 365                               |  |  |  |
| 185                       | 509         | 473                      | 377                             | 413                               |  |  |  |
| 240                       | 604         | 562                      | 448                             | 485                               |  |  |  |
| 300                       | 694         | 645                      | 523                             | 558                               |  |  |  |

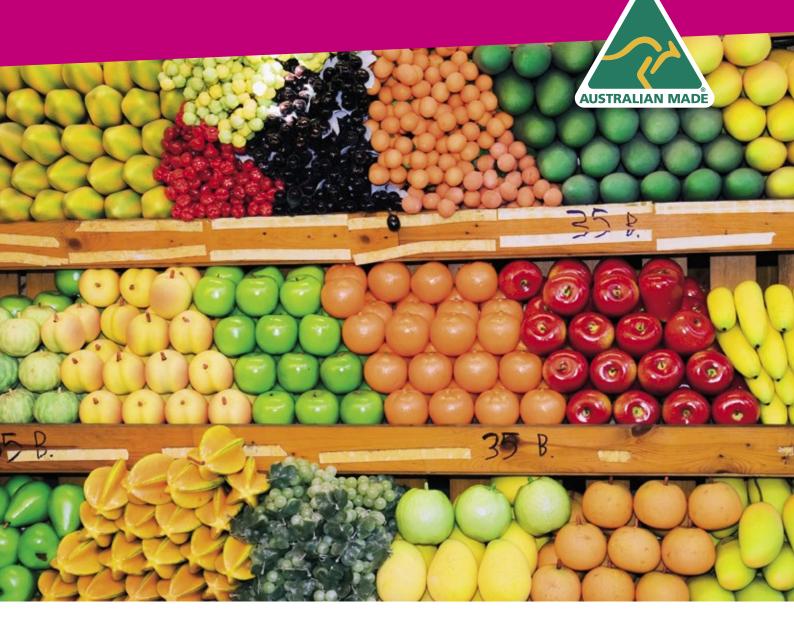
#### CURRENT CARRYING CAPACITY\* | CLASS 2 | FS90 MULTICORE

|     | THREE & FOUR CORE |     |     |     |  |  |  |  |
|-----|-------------------|-----|-----|-----|--|--|--|--|
| 1,5 | 20                | 19  | 16  | 20  |  |  |  |  |
| 2,5 | 28                | 26  | 24  | 29  |  |  |  |  |
| 4   | 38                | 35  | 30  | 37  |  |  |  |  |
| 6   | 48                | 45  | 38  | 46  |  |  |  |  |
| 10  | 66                | 62  | 53  | 63  |  |  |  |  |
| 16  | 88                | 83  | 68  | 81  |  |  |  |  |
| 25  | 119               | 111 | 91  | 107 |  |  |  |  |
| 35  | 147               | 137 | 114 | 130 |  |  |  |  |
| 50  | 180               | 168 | 136 | 155 |  |  |  |  |
| 70  | 229               | 213 | 173 | 193 |  |  |  |  |
| 95  | 283               | 263 | 209 | 233 |  |  |  |  |
| 120 | 330               | 306 | 246 | 270 |  |  |  |  |
| 150 | 377               | 350 | 277 | 304 |  |  |  |  |
| 185 | 436               | 404 | 322 | 348 |  |  |  |  |
| 240 | 517               | 479 | 386 | 411 |  |  |  |  |
| 300 | 594               | 549 | -   | 463 |  |  |  |  |
|     |                   |     |     |     |  |  |  |  |
|     |                   |     |     |     |  |  |  |  |



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#### **GENERAL INFORMATION**

#### The Difference between AS/NZS 3013 and BS 6387

In relation to fire resistance, ultimate performance is maintaining circuit integrity for a period of time to allow safe evacuation in the event of a fire hazard. This performance imperative requires a holistic approach to system design as opposed to independent focus on system components. With regards to cable systems, AS/NZS 3013 differs from other fire test methods such as BS6387 and IEC 60331 in that its test configuration is closely designed to reflect real life installation set up and affords a wiring system (WS) rating. Below are brief insights into the Australian industry perspective to wiring systems and fire test principles.

#### Wiring System Perspective

AS/NZS 3013 stands out in scope and application in comparison to international standards in that it provides a clear guide to an installation "deemed to comply" to safety requirements as included Australian wiring rules and building code. The inclusion of any wiring system component not tested to this standard implies the whole system requires type testing to demonstrate compliance to the principles of safety as defined by the regulations. To this end, cables tested to BS6387 or other international standard can therefore not be assumed to be equivalent to cables complying with AS/NZS3013 as such cables do not have any wiring system rating.

#### **Test Method**

The fundamental difference between AS/NZS 3013 and BS6387 (including IEC 60331) is the Australian standard fire test is a furnace test while the latter are flame tests. While no test method will replicate fire conditions exactly, it is generally accepted in the industry that heat and therefore temperature plays a significant role in a fire situation and could be sustained longer than flame. Below is a summary of key differences between AS/NZS3013 usual classification requirement of WS52W and BS6387 (highest classification (CWZ). Both standards have similar circuit integrity testing during water spray.

| TEST METHODS – SUMMARY OF KEY DIFFERENCES |  |  |  |  |  |
|---|--|--|--|--|--|
|   | AS/NZS 3013  | BS6387 (CWZ)   |  |  |  |
| Scope of Tests                            | <ul> <li>Wiring System e.g. WS52W.</li> <li>Deemed to comply with AS/NZS 3000<br/>and Building code of Australia.</li> <li>Cable installed on a tray with two<br/>90° changes in direction mimicking<br/>installed condition.</li> </ul> | <ul> <li>Cable classification only.</li> <li>Demonstration of compliance to the principles of safety of wiring system as installed may be required for installations in Australia.</li> <li>Cable supported on test rig with no bearing on installation set up.</li> </ul> |  |  |  |
| Temperature Curve                         | WS5X<br>Furnace temperature increases up to around<br>1050°C in 2 hours.<br>- All cable components attain<br>the test temperature.   | <ul> <li>(C) 950°C flame for duration of 3 hrs.</li> <li>Test temperature is regulated for the flame only. All heat is not necessarily transferred to the cable.</li> </ul>  |  |  |  |
| Mechanical protection rating              | WSX2 stands for;<br>Moderate protection representing 15 joules<br>impact and 1.0 kN cutting test at operating<br>temperature. This test relates to robustness<br>of the cable in normal operation.                                       | (Z) Mechanical shock during fire test at<br>reduced flame temperature of 650°C - this<br>test is not intended to depict mechanical<br>protection during the life of the cable.   |  |  |  |

#### TEST METHODS – SUMMARY OF KEY DIFFERENCES



#### **GENERAL INFORMATION**

#### WS rating simplified

#### What happens in a fire situation?

As the fire starts spreading across the building one aspect becomes critical to guide people to safety: the Emergency Exit signs must remain on, so people can find a safe way out. For the signs to remain on, it must be guaranteed that the power supply will remain on the circuit over a certain period of time, which could be challenged by the cables being exposed to high temperatures and mechanical impact.

#### How the testing compares to the real fire situation?

The duration of time in which a cable keeps working even under high temperatures generated during the fire situation is assessed as the Level of circuit integrity in fire condition. This is the first digit WSXYW on the rating code. In simple words, it represents the number of minutes the system remained energized while under fire. For Prysmian cables it is mostly WS5YW, which means 120 minutes of power supply to the system. In addition to high temperatures, parts of the building structure may brake hitting the cable as they fall. The ability to resist such mechanical impact is known as the Level of protection against mechanical damage. This is the second digit of the rating code WS5YW. For Prysmian cables it is mostly 2 or 3 (WS52W or WS53W) meaning moderate to heavy impact protection.

Finally, it would be expected for the water sprinklers to activate during a fire, so the cable is also submitted to a water spray test. In the rating code, this element is represented by a final supplementary letter WS52W.

A more comprehensive detail of the possible ratings in AS/NZS3013 are provided in the table below.

| WS RATING                        |   |   |         |   |   |                 |                             |
|----------------------------------|---|---|---------|---|---|-----------------|-----------------------------|
| WS                               | 1 <sup>st</sup> Numeral<br>Electrical performance |   |         | 2 <sup>nd</sup> Numeral<br>Mechanical performance |   |                 | Supplementary<br>letter     |
| Characteristic<br>lettering "WS" | Level of circuit integrity<br>in fire condition   |   |         | Level of protection against mechanical damage     |   |                 | Water spray test<br>applied |
|                                  | 1   | = | 15 min  | 1   | = | Light           |                             |
|                                  | 2   | = | 30 min  | 2   | = | Moderate        | The letter "W"              |
| WS                               | 3   | = | 60 min  | 3   | = | Heavy           | shall be applied            |
|                                  | 4   | = | 90 min  | 4   | = | Very heavy      | as appropriate.             |
|                                  | 5   | = | 120 min | 5   | = | Extremely heavy |                             |

As an example a WS52W rated cable will have the following characteristics;

WS - be suitable for inclusion in a wiring system.

- 5 have electrical performance (circuit integrity) for 120 minutes (two hours) in a fire condition.
- 2 provide a moderate level of protection against impact damage during normal service.
- W have electrical performance (circuit integrity) following exposure to water from overhead sprinklers.

#### **GENERAL INFORMATION**

#### Recommended guidelines

The major consideration when installing AS/NZS 3013 fire rated cable is to maintain the integrity of the circuit when exposed to fire or other mechanical damage. In order to achieve this, the following needs to be considered:

- Firestop cable is to be used in fixed applications only.
- Firestop cable to be installed in areas where temperature is minus 30 °C or warmer (minus 20 °C or warmer for FS-90 flat cable).
- Firestop cable should be installed without joints or breaks through the fire hazard zone.
- Junctions or Termination Boxes within the fire hazard zone should have a rating commensurate with the cable.
- Bending radius of cable should be no less than 10 x OD set in position and 12 x OD during installation.
- Cables must be strapped to the cable support tray or ladder using stainless steel cable ties or other approved ways.
- Direct surface mounted multicore cables may be fastened to equally rated fire walls using galvanised ferrous saddle or P-clips.

Components of a wiring system can be used with Firestop Cables providing they are approved as per Wiring Systems Standard AS/NZS 3013.

#### Recommended fixing distances

- Vertical not more than 0.6 metres.
- Horizontal not more than 1 metre where supported by cable tray, cable ladder or other continuous fire rated surface. Not more than 0.6 metres when installed on the underside of a continuous fire rated surface.
- Catenary not more than 0.3 metres.

These are considered minimum requirements, all cables or bunches over 25 mm in diameter need to be supported every 300 mm.





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