REFERENCE

- Arc-Flash Categories
- Arc-Flash Care/User & Sizing Guide
- ABC & CCT Specifications
- AAC, AAAC, ACSR, SC/GZ, SC/AC & HD/CU Specifications
- American Wire Gauge Cross Reference
- Conductor Cross-Sectional Area Reference Guide
- Common Metric/Imperial Conversions
- IP Rating Chart
- PVC Conduit/Pipe Specification Guide

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Arc Flash

Arc Flash PPE Categories

NFPA 70E Protective Clothing & Personal Protective Equipment (PPE)

For more detailed information or other options, refer to NFPA 70E 2018 for Electrical Safety in the Workplace.
*PPE requirements applicable to all categories are: Hard Hat, Safety Glasses, Hearing Protection (ear canal inserts) & Leather Footwear

PPE Category	cal/cm²	PPE
0	<1.2	Untreated natural fibre
		Shirt (long sleeve)
		Pants (long)
		Safety Glasses & Hearing Protection
		Leather & Voltage-rated gloves (as needed)
1	4 Minimum	Arc-rated long sleeve shirt
		Arc-rated pants or coverall
		Arc-rated face shield with hard hat
		Safety Glasses & Hearing Protection
		Leather & Voltage-rated gloves (as needed)
		Leather footwear
2	8 Minimum	Arc-rated long sleeve shirt & pants/overall
		Arc-rated rain wear (as needed)
		Arc-rated face shield & balaclava/suit & hard hat
		Safety Glasses & Hearing Protection
		Leather & Arc-rated gloves (as needed)
		Leather footwear
3	25 Minimum	Arc-rated long sleeve shirt & pants/overall
		Arc-rated rain wear (as needed)
		Arc-rated flash hood
		Safety Glasses & Hearing Protection
		Leather & Arc-rated gloves (as needed)
		Leather footwear
4	40 Minimum	Arc-rated long sleeve shirt & pants/overall
		Arc-rated rain wear (as needed)
		Arc-rated flash hood
		Safety Glasses & Hearing Protection
		Leather & Arc-rated gloves (as needed)
		Leather footwear

Reference: www.safetychoice.com.au

See Safety & PPE Section for TEN's range of Arc-Flash Garments

Arc Flash PPE User, Care & Maintenance Guide

Safety

- Garment must be fully fastened before entering the live working environment.
- Unrated or melting under layers should not be worn.
- It is the user's responsibility to read and understand all warnings prior to use of each product.
- A full arc flash suit requires additional suitable protective equipment, which includes protective footwear & arc rated insulated gloves.

Training

- Arc flash risk assessments are required to determine incident energy, proper training of hazards and application should follow.
- Users should also be trained on care and use of arc flash PPE including but not limited to: Inspection, Laundering, Donning/Doffing & Storage

Usage

- Garments have been designed oversized to fit as outerwear.
- When worn as a complete suit with all closures fastened, the jacket collar should cover the neck, the jacket sleeves should come to the wrists, and gloves should be worn over sleeves.
- Jacket should be worn over pants or bibs, jacket hem should overlap the waist of the bottoms, pant legs should come down to the ankles.
- When worn with a hood or face shield and balaclava, the hood or balaclava should drape over the shoulders covering the collar of the jacket.

Care & Maintenance

- It is recommended to wash garments prior to wearing.
- User must follow all care and maintenance instructions on the interior label of the garment. (See Launder labels and warning below)
- In order to perform its protective function, an Arc-Flash garment must be maintained in its original condition.
- Garments with rips, tears and abrasion to the fabric cannot be worn and must be removed from service, as they pose a potential safety risk.

Garment Launder Instruction Labels

Jacket, Bib Overalls & Hood

Important:
- DO NOT use chlorine bleach or detergents containing bleach
- DO NOT use hydrogen peroxide
- DO NOT use fabric softeners or starch

Wash/Laundering Instructions:
- Dry Cleanable
- Machine wash warm (Max. 74ºC/165ºF)
- Detergent only

Wash according to the instructions above to remove any contaminants in order to maintain fabric performance when garment becomes soiled with dirt, greases, oils, etc.

If contaminants cannot be removed after laundering, it is best to discontinue use of the garment.

Balaclavas/Knit Hoods

Important:
- DO NOT use chlorine bleach or detergents containing bleach
- DO NOT use hydrogen peroxide
- DO NOT use fabric softeners

Wash/Laundering Instructions:
- Dry Cleanable
- Turn garment inside out prior to laundering
- Machine wash warm (Max. 50ºC /120ºF)
- Tumble dry warm

Wash according to the instructions above to remove any contaminants in order to maintain fabric performance when garment becomes soiled with dirt, greases, oils, etc.

If contaminants cannot be removed after laundering, it is best to discontinue use of the garment.

Face-shields, Goggles & Glasses

Important:
- DO NOT use ammonia based cleaners
- DO NOT use any abrasives or polishes
- NEVER use if cracked or broken

Wash/Laundering Instructions:
- Remove from hood if applicable
- Wash with warm soapy water - Mild soap only
- Rinse thoroughly - Pat dry with a soft cloth

Always transport and store your faceshield, goggles, and glasses in a soft cloth bag to minize wear & tear

Wash according to the instructions above to remove any contaminants in order to maintain fabric performance when garment becomes soiled with dirt, greases, oils, etc.

If contaminants cannot be removed after laundering, it is best to discontinue use of garment.

Visual Inspections

Garments

Check for any holes, rips, tears or other damage to fabric. Remove from service if garments are damaged

Test closure systems like zippers, hook and loop, buckles, etc for dirt & wear.

Face-Shields

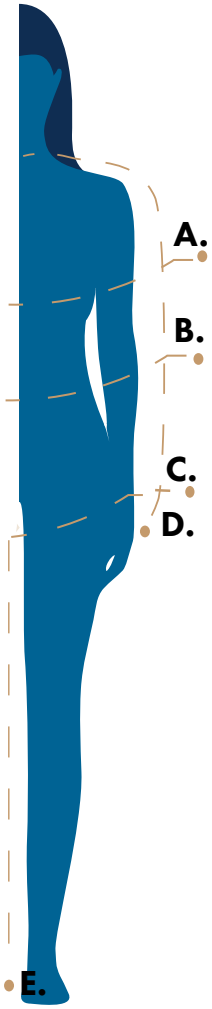
Check for significant scratches, cracks, etc.

Remove from service if shields are damaged

Warnings

- Warnings on the proper use of arc flash apparel are indicated on the inner garmented warning label.
- Each garment contains the following warnings:
- This garment is flame resistant and constructed from flame resistant fabric and components.
  The user of this garment should read and understand all warnings printed on the reverse side of this label prior to using this product.
- This garment is not intended for fire protection, fire entry, structural or wildlands firefighting activities and provides no personal protection from chemical exposures. Remove at once if fouled with flammable material. To prevent the generation of potentially hazardous static electricity, do not don or remove in a hazardous area.
- DO NOT use this garment if it is torn, abraded or altered from its original condition.
  DO NOT use this garment unless it has been properly inspected and maintained by your employer.
- The user assumes all risks associated with the use of this product. The manufacturer is not liable for any loss, injury or death arising out of the use of this product.
- Failure to comply with these warnings may result in SERIOUS INJURY or DEATH

Measurement Guide



A. BUST
Measure loosely around the fullest part of your bust. Keep the measuring tape as horizontal as possible.

B. WAIST
For pants: Measure around your waist where you would like your pants waistband to sit.

For tops & full body garments: Measure the fullest part of your waist.

C. HIP
Measure loosely around the fullest part of your hips. Keep the measuring tape as horizontal as possible.

D. SLEEVE
To measure your sleeve, start from the center of the back of your neck, over to your shoulder, down past your elbow, and to your wrist.

E. INSIDE LEG
Use a pair of pants similar to the style you are ordering, which fit to your liking, Measure along the inseam from the crotch to the hem

A. NECK
Measure around the base of the neck, where your collar typically lies. Measure from one button hole to the center of the button on the opposite side.

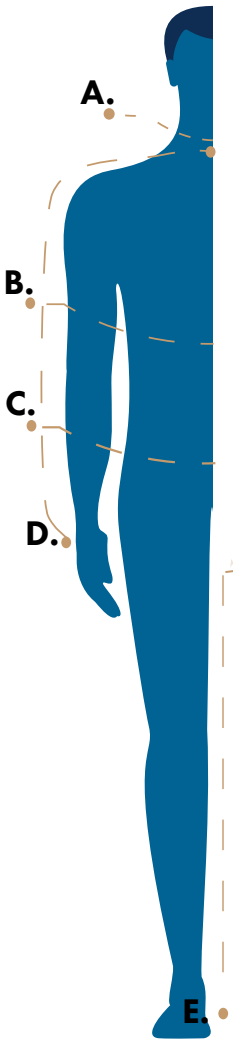
B. CHEST
Measure around the fullest part of your chest. The best way to assess this is to start just under your armpit.

C. WAIST
For pants: Measure around your waist where you would like your pants waistband to sit.

For tops & full body garments: Measure the fullest part of your waist.

D. SLEEVE
To measure your sleeve, start from the center of the back of your neck, over to your shoulder, down past your elbow, and to your wrist.

E. INSIDE LEG
Use a pair of pants similar to the style you are ordering, which fit to your liking, Measure along the inseam from the crotch to the hem



Available 40cal Garments

Arc Flash PPE KITS

Arc Flash Bibs & Jackets

Arc Flash Hoods

Conductor References

ABC - Aerial Bundled Conductor

Cross-Sectional Area (mm²)	Nominal Conductor OD (mm)	Average Insulation Thickness (mm)	Nominal Dia. over Insulation (mm)	Nominal Dia. Over Laid-Up Cores (mm)	Approx. Mass (kg/km)	Minimum Bending Radius - Installed (mm)		Min. Breaking Load of Cable (kN)	Rec. Tension	
						Core	Cable		Highest Everyday Tension (kN)	Max Working Tension (kN)
2 CORE										
16	4.7	1.3	7.4	14.8	130	30	90	4.4	0.79	1.23
25	5.9	1.3	8.6	17.2	190	35	100	7.0	1.26	1.96
35	6.9	1.3	9.6	19.3	250	60	120	9.8	1.76	2.74
50	8.1	1.5	11.2	22.3	340	65	130	14.0	2.52	3.92
95	11.4	1.7	14.9	29.8	640	90	270	26.6	4.79	7.45
3 CORE										
25	5.9	1.3	8.6	18.5	290	35	110	10.5	1.89	2.94
35	6.9	1.3	9.6	20.8	370	60	120	14.7	2.65	4.12
50	8.1	1.5	11.2	24.1	510	65	140	21.0	3.78	5.88
4 CORE										
16	4.7	1.3	7.4	17.8	270	30	110	8.8	1.58	2.46
25	5.9	1.3	8.6	20.8	390	35	120	14.0	2.52	3.92
35	6.9	1.3	9.6	23.2	500	60	140	19.6	3.53	5.49
50	8.1	1.5	11.2	27.0	670	65	160	28.0	5.04	7.84
70	9.7	1.5	12.8	30.8	930	75	280	39.2	7.06	11.00
95	11.4	1.7	14.9	36.0	1280	90	320	53.2	9.58	14.90
120	12.8	1.7	16.3	39.3	1570	100	350	67.2	12.10	18.80
150	14.2	1.7	17.7	42.8	1890	110	390	84.0	15.10	23.50

CCT - Covered Conductor Thick

Nominal Conductor Area (mm²)	No. & Nominal X of Wires (No./mm)	Nominal Conductor (mm)	Average Insulation Thickness (mm)	Nominal Dia. Over Insulation (mm)	Approx. Mass (kg/km)	Minimum Bending Radius - Installed (mm)	Min. Breaking Load of Cable (kN)	Rec. Tension	
								Highest Everyday Tension (kN)	Max Working Tension (kN)
6.35/11kV									
40	7/2.75	8.4	3.4	15.8	260	240	9.9	1.49	4.96
80	7/3.75	11.4	3.4	18.8	400	280	17.6	2.64	8.80
120	7/4.75	14.5	3.4	21.9	580	330	27.1	4.07	13.60
180	19/3.50	17.7	3.4	25.0	790	380	41.7	6.26	20.90
240	19/4.01	20.2	3.4	27.7	1000	420	52.3	7.85	26.20
17.7/22kV									
80	7/3.75	11.4	5.5	23.0	530	350	17.5	2.64	8.80
120	7/4.75	14.5	5.5	26.1	720	390	27.1	4.07	13.60
180	19/3.50	17.7	5.5	29.2	960	440	41.7	6.26	20.90

AAC - All Aluminium Conductor - Australian Standard

Conductor Name	Reference Strands/Wire Diameter (mm)	Overall Diameter (mm)	Nominated Minimum Breaking Load (kN)	Nominated Mass kg per km (km)
GEMINI	7/1.75	5.25	3.01	46.1
JUPITER	7/2.25	6.75	4.76	75.9
LEO	7/2.50	7.50	5.7	94.3
LIBRA	7/3.00	9.00	7.9	135
MARS	7/3.75	11.30	11.8	211
MERCURY	7/4.50	13.50	16.9	304
MOON	7/4.75	14.30	18.9	339
NEPTUNE	19/3.25	16.30	24.7	433
PLUTO	19/3.75	18.80	31.9	576
SATURN	37/3.00	21.00	42.2	721
TAURUS	19/4.75	23.80	51.3	924
TRITON	37/3.75	26.30	62.2	1120
URANUS	61/3.25	29.30	75.2	1400
URSULA	61/3.50	31.50	87.3	1620
VENUS	61/3.75	33.80	97.2	1890
VIRGO	91/4.50	49.50	207	4010

AAC - All Aluminium Conductor - New Zealand Standard

Conductor Name	Reference Strands/Wire Diameter (mm)	Overall Diameter (mm)	Nominated Minimum Breaking Load (kN)	Nominated Mass kg per km (km)
NAMU	7/2.11	6.33	4.1	70
POKO	7/2.36	7.08	5.1	80
KUTU	7/3.00	9.00	7.9	140
RANGO	7/3.66	10.98	11.7	200
WEKE	7/4.72	14.61	18.5	340
WETA	19/3.35	16.75	26.2	460
MATA	19/3.86	19.30	33.8	610

AAAC 1120 - All Aluminium Alloy Conductor

Conductor Name	Reference Strands/Wire Diameter (mm)	Overall Diameter (mm)	Nominated Minimum Breaking Load (kN)	Nominated Mass kg per km (km)
ARGON	7/1.75	5.25	4.0	46.10
BORON	7/2.25	6.75	6.61	75.9
CHLORINE	7/2.50	7.50	8.1	94.3
CHROMIUM	7/2.75	8.25	9.9	113
FLUORINE	7/3.00	9.00	11.8	135
HELIUM	7/3.75	11.25	17.6	211
HYDROGEN	7/4.50	13.50	24.3	304
IODINE	7/4.75	14.25	27.1	339
KRYPTON	19/3.25	16.25	37.4	433
LUTETIUM	19/3.50	17.50	41.7	503
NEON	19/3.75	18.75	47.8	576
NITROGEN	37/3.00	21.00	62.2	721
NOBELIUM	37/3.25	22.75	72.8	845
OXYGEN	19/4.75	23.75	73.6	924
PHOSPHOROUS	37/3.75	26.25	93.1	1120
SELENIUM	61/3.25	29.25	114	1400
SILICON	61/3.50	31.50	127	1620
SULPHUR	61/3.75	33.75	145	1860
XENON	91/4.5	49.50	300	4000

AAAC - All Aluminium Alloy Conductor

Conductor Name	Reference Strands/Wire Diameter (mm)	Overall Diameter (mm)	Nominated Minimum Breaking Load (kN)	Nominated Mass kg per km (km)
AGATE	7/1.75	5.25	4.71	46.1
AMETHYST	7/2.25	6.75	7.78	75.9
DIAMOND	7/2.50	7.50	9.6	94.3
DOLOMITE	7/2.75	8.25	11.6	113
EMERALD	7/3.00	9.00	13.9	135
GARNET	7/3.75	11.25	21.7	211
JADE	7/4.50	13.50	31.2	304
JASPER	7/4.75	14.25	34.8	339
OPAL	19/3.25	16.25	44.2	433
PATRONITE	19/3.50	17.50	51.3	503
PEARL	19/3.75	18.75	58.8	576
RUBY	37/3.00	21.00	73.5	721
RUTHENIUM	37/3.25	22.75	86.1	845
RUTILE	19/4.75	23.75	94.4	924
SAPPHIRE	37/3.75	26.25	115	1120
SPINEL	61/3.25	29.25	135	1400
TANTALUM	61/3.50	31.50	156	1620
TOPAZ	61/3.75	33.75	179	1860
ZIRCON	91/4.50	49.50	384	4000

Whilst every attempt is made to ensure the accuracy of these tables, they should not be relied upon.
They are provided to assist with tool and equipment selection.

ACSR/AC - AL Conductor (AL Clad) Steel Reinforced

Conductor Name	Reference Strands/Core/Wire Diameter (mm)	Overall Diameter (mm)	Nominated Minimum Breaking Load (kN)	Nominated Mass kg per km (km)
ANGLING	6/1/2.50	7.50	10.6	113
ARCHERY	6/1/3.00	9.00	15.1	163
BASEBALL	6/1/3.75	11.25	22.3	254
BOWLS	6/7/4.75	14.25	32.7	385
CRICKET	30/7/2.50	17.50	64.4	636
DARTS	30/7/3.00	21.00	91.6	913
DICE	30/7/3.25	22.75	106	1070
DIVING	30/7/3.50	24.50	122	1240
GOLF	54/7/3.00	27.00	120	1380
GYMNASTICS	54/7/3.25	29.25	139	1620
HURDLES	54/7/3.50	31.50	159	1880
LACROSSE	54/19/3.75	33.75	180	2150
RUGBY	54/19/4.75	42.75	287	3450
Extra High Strength				
SKATING	3/4/1.75	5.25	12.3	83.5
SOCCER	3/4/2.50	7.50	24.9	170
SWIMMING	4/3/3.00	9.00	28.8	217
TENNIS	4/3/3.75	11.25	42.8	339

ACSR/GZ - AL Conductor (Gal) Steel Reinforced

Conductor Name	Reference Strands/Core/Wire Diameter (mm)	Overall Diameter (mm)	Nominated Minimum Breaking Load (kN)	Nominated Mass kg per km (km)
ALMOND	6/1/2.50	7.50	10.5	119
APPLE	6/1/3.00	9.00	14.9	171
BANANA	6/1/3.75	11.25	22.7	268
CHERRY	6/4.75 + 7/1.60	14.25	33.4	402
GRAPE	30/7/2.50	17.50	63.5	677
LEMON	30/7/3.00	21.00	90.4	973
LYCHEE	30/7/3.25	22.75	105	1140
LIME	30/7/3.50	24.50	122	1320
MANGO	54/7/3.00	27.00	119	1400
ORANGE	54/7/3.25	29.25	137	1600
OLIVE	54/7/3.50	31.50	159	1960
PAWPAW	54/3.75 + 19/2.25	33.75	178	2240
PEACH	54/4.75 + 19/2.85	42.75	284	3600
Extra High Strength				
QUINCE	3/4/1.75	5.25	12.7	95.9
RAISIN	3/4/2.5	7.50	24.4	193
SULTANA	4/3/3.00	9.00	28.3	242
WALNUT	4/3/3.75	11.25	43.9	379

ACSR/AZ - AL Conductor (Aluminised) Steel Reinforced

Conductor Name	Reference Strands/Core/Wire Diameter (mm)	Overall Diameter (mm)	Nominated Minimum Breaking Load (kN)	Nominated Mass kg per km (km)
BARLEY	6/1/2.50	7.50	10.2	118
BEAN	6/1/3.00	9.00	14.5	170
CABBAGE	6/1/3.75	11.25	21.4	265
CARROT	6/7/4.75	14.25	32.0	399
CORN	30/7/2.50	17.50	61.6	675
GARLIC	30/7/3.00	21.00	87.2	973
MILLET	30/7/3.50	24.50	116	1320
OATS	54/7/3.00	27.00	115	1440
ONION	54/7/3.25	29.25	132	1690
PARSNIP	54/7/3.50	31.50	153	1960
POTATO	54/19/3.75	33.75	177	2250
RICE	54/19/4.75	42.75	277	3600

HDC - Hard Drawn Copper

Conductor Name	Reference Strands/Wire Diameter (mm)	Overall Diameter (mm)	Nominated Minimum Breaking Load (kN)	Nominated Mass kg per km (km)
7/1.00	7/1.00	3.00	2.3	49.3
7/1.25	7/1.25	3.75	3.6	76.9
7/0.064	7/1.63	4.88	4.9	-
7/1.75	7/1.75	5.25	6.9	151
7/2.00	7/2.00	6.00	8.9	197
7/0.083	7/2.11	6.30	6.2	-
19/0.064	19/1.63	8.13	8.1	-
7/2.75	7/2.75	8.25	16.2	375
19/1.75	19/1.75	8.75	18.3	413
19/2.00	19/2.00	10.00	23.6	538
7/3.50	7/3.50	10.50	25.4	607
19/0.083	19/2.11	10.50	25.4	-
7/3.75	7/3.75	11.25	28.8	696
37/1.75	37/1.75	12.25	35.6	806
19/0.101	19/2.56	12.80	-	-
19/2.75	19/2.75	13.75	43.1	1020
37/0.083	37/2.11	14.80	-	-
19/3.00	19/3.00	15.00	50.8	1210
37/2.50	37/2.50	17.50	70.3	1640
37/2.75	37/2.75	19.25	83.9	1990
37/3.00	37/3.00	21.00	98.9	2370
61/2.75	61/2.75	24.75	138	3290

Whilst every attempt is made to ensure the accuracy of these tables, they should not be relied upon.
They are provided to assist with tool and equipment selection.

SC/GZ - Steel Conductor/ Galvanised

Conductor Name	Reference Strands/Wire Diameter (mm)	Overall Diameter (mm)	Nominated Minimum Breaking Load (kN)	Nominated Mass kg per km (km)
3/2.00	3/2.00	4.31	11.7	74
7/16 (1.625)	7/1.63	4.88	-	-
3/12 (2.64)	3/2.64	5.28	-	-
3/2.75	3/2.75	5.93	22.2	140
7/2.00	7/2.00	6.00	26.0	173
7/.083 (2.108)	7/2.11	6.32	-	-
7/12 (2.64)	7/2.64	7.92	-	-
7/2.75	7/2.75	8.25	49.0	328
7/3.25	7/3.25	9.75	91.3	458
19/2.00	19/2.00	10.00	70.5	473
3/5 (5.38)	3/5.38	10.77	-	-
7/3.75	7/3.75	11.25	92.6	609
19/2.75	19/2.75	13.75	133	894
7/4.8	7/4.80	14.40	-	-
19/3.25	19/3.25	16.25	186	1250

SC/AC - Steel Conductor/Aluminium Clad

Conductor Name	Reference Strands/Wire Diameter (mm)	Overall Diameter (mm)	Nominated Minimum Breaking Load (kN)	Nominated Mass kg per km (km)
3/2.75	3/2.75	5.93	22.7	118
3/3.00	3/3.00	6.50	27.0	141
7/2.59	7/2.59	7.77	47.8	292
3/3.75	3/3.75	8.08	40.0	220
3/3.25	3/3.25	8.25	31.6	165
7/2.75	7/2.75	8.25	50.1	277
7/3.00	7/3.00	9.00	59.7	330
7/3.25	7/3.25	9.75	69.9	387
7/3.75	7/3.75	11.25	86.9	515
7/4.25	7/4.25	12.75	105	662
19/2.75	19/2.75	13.75	136	755
19/3.00	19/3.00	15.00	162	899
19/3.25	19/3.25	16.25	189	1060
19/3.75	19/3.75	18.75	240	1410
19/4.25	19/4.25	21.25	289	1800

Whilst every attempt is made to ensure the accuracy of these tables, they should not be relied upon.
They are provided to assist with tool and equipment selection.

Conductor Cross Reference

American Wire Gauge Conductor Cross-Sectional Area

AWG (and "Aught"*/0 Equiv)	MCM or kcmil	CIRCULAR MILS	Cross Section (mm²)	Cross Section (In²)	Dia. SOLID (mm)	Dia. SOLID (inch)	Dia. Stranded (mm Approx. Max.)	Dia. Stranded (inch Approx. Max.)
2	66	66361	33.6281	0.0521	6.54	0.258	7.42	0.292
1	84	83680	42.4042	0.0657	7.35	0.289	8.43	0.332
1 /0	106	105518	53.4705	0.0829	8.25	0.325	9.47	0.373
2 /0	133	133056	67.4249	0.1045	9.27	0.365	10.64	0.419
3 /0	168	167780	85.0210	0.1318	10.40	0.410	11.96	0.471
4 /0	212	211566	107.209	0.1662	11.68	0.460	13.41	0.528
4.7 /0	250	250000	126.677	0.1963	12.70	0.500	14.60	0.575
5.5 /0	300	300000	152.012	0.2356	13.91	0.548	16.00	0.630
6.2 /0	350	350000	177.348	0.2749	15.03	0.592	17.30	0.681
6.7 /0	400	400000	202.683	0.3142	16.06	0.632	18.49	0.728
7.3 /0	450	450000	228.018	0.3534	17.04	0.671		
7.7 /0	500	500000	253.354	0.3927	17.96	0.707	30.67	0.814
8.5 /0	600	600000	304.025	0.4712	19.67	0.775	22.68	0.893
9.2 /0	700	700000	354.695	0.5498	21.25	0.837	24.48	0.964
9.5 /0	750	750000	380.031	0.5890	22.00	0.866	25.37	0.999
9.7 /0	800	800000	405.366	0.6283	22.72	0.894	26.21	1.032
10.2 /0	900	900000	456.037	0.7069	24.10	0.949		
10.7 /0	1000	1000000	506.708	0.7854	25.40	1.000	29.29	1.153
11.7 /0	1250	1250000	633.384	0.9817	28.40	1.118	32.74	1.289
12.4 /0	1500	1500000	760.061	1.1781	31.11	1.225	35.89	1.413
13.1 /0	1750	1750000	886.738	1.3744	33.60	1.323		
13.7 /0	2000	2000000	1013.415	1.5708	35.91	1.414	41.45	1.632

Conductor Cross-Sectional Area

Nominal. Cross Sectional Area (mm²)	Conductor O.D.		Nominal. Cross Sectional Area (mm²)	Conductor O.D.	
	mm	Inch		mm	Inch
0.5	0.80	0.031	95	12.60	0.496
1.0	1.13	0.044	120	14.21	0.559
1.5	1.38	0.054	150	15.75	0.620
2.5	2.01	0.079	185	17.64	0.694
4	2.55	0.100	240	20.25	0.797
6	3.12	0.122	300	22.68	0.892
10	4.05	0.159	400	25.65	1.009
16	5.10	0.200	500	28.80	1.133
25	6.75	0.265	630	32.76	1.289
35	7.65	0.301	800	37.05	1.458
50	8.90	0.350	1000	41.60	1.637
70	10.70	0.421			

Common Conversions Table

Metric to Imperial Conversions Table

Type	Convert From	Symbol	Multiply By	Convert To	Symbol
Length	millimetres	mm	**0.03937**	inches	in
	centimetres	cm	**0.3937**	inches	in
	metres	m	**3.3**	feet	ft
	metres	m	**1.1**	yards	yd
	kilometres	km	**0.6**	miles	mi
	inches	in	**2.54**	centimetres	cm
	feet	ft	**30.48**	centimetres	cm
	yard	yd	**0.9**	metres	m
	miles	mi	**1.6**	kilometres	km
Area	square centimetres	cm^2	**0.16**	square inches	in^2
	square metres	m^2	**1.2**	square yards	yd^2
	square kilometres	km^2	**0.4**	square miles	mi^2
	hectares (10,000 m2)	ha^2	**2.5**	acres	ac
	square inches	in^2	**6.5**	sq. centimetres	cm^2
	square feet	ft^2	**0.09**	square metres	m^2
	square yard	yd^2	**0.8**	square metres	m^2
	square miles	mi^2	**2.6**	sq. kilometres	km^2
Weight	grams	g	**0.035**	ounce	oz
	kilograms	kg	**2.2046**	pounds	lb
	tonnes (1,000 kq)	t	**1.1**	short tons	ton
	ounces	oz	**28.3495**	grams	g
	pounds	lb	**0.45**	kilograms	kg
Volume	millilitres	ml	**0.03**	fluid ounces	fl oz
	litres	l	**2.1**	pints	pt
	litres	l	**1.06**	quarts	qt
	litres	l	**0.26**	gallons	gal
	cubic metres	m^3	**35.314**	cubic feet	ft^3
	cubic metres	m^3	**1.3**	cubic yards	yd^3
	teaspoons	tsp	**5**	millimetres	ml
	tablespoons	tbsp	**15**	millimetres	ml
	fluid ounces	fl oz	**30**	millimetres	ml
	cups	c	**0.24**	litres	l
	pints	pt	**0.47**	litres	l
	quarts	qt	**0.95**	litres	l
	gallons	gal	**3.8**	litres	l
	cubic feet	ft^3	**0.03**	cubic metres	m^3
	cubic yards	yd^3	**0.76**	cubic metres	m^3
Pressure	mega pascal	MPa	**10**	barometric	bar
	pounds per square inch	PSI	**0.07**	barometric	bar
Force	kilogram force	kgf	**9.8**	newtons	N
Temperature	fahrenheit	°F	**-32 then x 5/9**	celsius	°C
	celsius	°C	**Divide by 5/9 then +32**	fahrenheit	°F

Fractions - Decimal - mm Conversion Chart

Fractions	Decimal	Millimetres	Fractions	Decimal	Millimetres	Fractions	Decimal	Millimetres
1/64	0.0156	0.3969	11/32	0.3438	8.7313	43/64	0.6719	17.0656
1/32	0.0313	0.7938	23/64	0.3594	9.1281	11/16	0.6875	17.4625
3/64	0.0469	1.1906	3/8	0.3750	9.5250	45/64	0.7031	17.8594
1/16	0.0625	1.5875	25/64	0.3906	9.9219	23/32	0.7188	18.2563
5/64	0.0781	1.9844	13/32	0.4063	10.3188	47/64	0.7344	18.6531
3/32	0.0938	2.3813	27/64	0.4219	10.7156	3/4	0.7500	19.0500
7/64	0.1094	2.7781	7/16	0.4375	11.1125	49/64	0.7656	19.4469
1/8	0.1250	3.1750	29/64	0.4531	11.5094	25/32	0.7813	19.8438
9/64	0.1406	3.5719	15/32	0.4688	11.9063	51/64	0.7969	20.2406
5/32	0.1563	3.9688	31/64	0.4844	12.3031	13/16	0.8125	20.6375
11/64	0.1719	4.3656	1/2	0.5000	12.7000	53/64	0.8281	21.0344
3/16	0.1875	4.7625	33/64	0.5156	13.0969	27/32	0.8438	21.4313
13/64	0.2031	5.1594	17/32	0.5313	13.4938	55/64	0.8594	21.8281
7/32	0.2188	5.5563	35/64	0.5469	13.8906	7/8	0.8750	22.2250
15/64	0.2344	5.9531	9/16	0.5625	14.2875	57/64	0.8906	22.6219
1/4	0.2500	6.3500	37/64	0.5781	14.6844	29/32	0.9063	23.0188
17/64	0.2656	6.7469	19/32	0.5938	15.0813	59/64	0.9219	23.4156
9/32	0.2813	7.1438	39/64	0.6094	15.4781	15/16	0.9375	23.8125
19/64	0.2969	7.5406	5/8	0.6250	15.8750	61/64	0.9531	24.2094
5/16	0.3125	7.9375	41/64	0.6406	16.2719	31/32	0.9688	24.6063
21/64	0.3281	8.3344	21/32	0.6563	16.6688	63/64	0.9844	25.0031
						1	1.0000	25.4000

Metric Units and Conversions

Abbreviations	Means	Multiply Unit By	OR
p	pico	.000000000001	10^{-12}
n	nano	.000000001	10^{-9}
µ	micro	.000001	10^{-6}
m	milli	.001	10^{-3}
.	Unit	1	10^{-0}
k	kilo	1,000	10^{-3}
M	mega	1,000,000	10^{-6}
G	giga	1,000,000,000	10^{-9}

Electrical & Communication Conduit Specification

PVC Conduit/Pipe Specification Chart

Nominal Conduit Size (mm)	Conduit Type	Conduit OD (mm)	Conduit Wall Thickness (min)	Conduit ID (min)
16	16mm MD Power	16.00	1.75	12.50
20	20mm HD Power	20.00	2.45	15.10
20	20mm NBN Comms	26.75	1.70	23.35
25	25mm HD Power	25.00	2.65	19.70
25	25mm Comms (Austel)	25.00	1.85	21.30
32	32mm HD Power	32.00	2.85	26.30
32	32mm Comms (Austel)	32.00	2.30	27.40
40	40mm HD Power	40.00	3.25	33.50
50	50mm HD Power	50.00	3.65	42.70
63	63mm HD Power	63.00	4.20	54.60
63	63mm (Iplex Coil Ref)	63.30	5.00	55.30
80	80mm HD Power	80.00	4.95	70.10
100	100mm HD Power	114.2	6.30	101.6
100	100mm NBN Comms	114.2	5.50	103.2
125	125mm HD Power	140.0	7.65	124.7
150	150mm HD Power	160.0	8.80	142.4
200	200mm HD Power	225.0	9.20	206.6

Common Australian Voltage Levels

Network Voltage Levels - 415V to 500kV

Phase to Phase or Line Voltage	Phase to Earth or Phase Voltage	UNIT	Voltage Value	USAGE
415	240	Volts (V)	Low Voltage (LV)	Customer Installations (historical)
400	230	Volts (V)	Low Voltage (LV)	Customer Installations (converting to align with European standard)
11	6.4	kiloVolts (kV)	High Voltage (HV)	Urban & Rural HV Distribution
22	12.7	kiloVolts (kV)	High Voltage (HV)	
22	12.7	kiloVolts (kV)	High Voltage (HV)	Rural SWER (Single Wire Earth Return)
33	19.1	kiloVolts (kV)	High Voltage (HV)	Rural SWER (Single Wire Earth Return)
33	19.1	kiloVolts (kV)	High Voltage (HV)	Sub-Transmission of High Voltages over middle distances
66	38.1	kiloVolts (kV)	High Voltage (HV)	
110	63.5	kiloVolts (kV)	High Voltage (HV)	
132	76.2	kiloVolts (kV)	High Voltage (HV)	
220	127.0	kiloVolts (kV)	Extra High Voltage (EHV)	Transmission of High Voltages over long distances
275	158.8	kiloVolts (kV)	Extra High Voltage (EHV)	
330	190.5	kiloVolts (kV)	Extra High Voltage (EHV)	
500	288.7	kiloVolts (kV)	Extra High Voltage (EHV)	

IP (Ingress Protection) Ratings Guide

IP (Ingress Protection) against Dust, Solid objects & Water

PROTECTION AGAINST	No protection 0	Vertical water drip 1	Tilted water drip 2	Spray water 3	Splash water 4	Jet water 5	Strong Jet of water 6	Temporary immersion 7	Lasting immersion 8	Close, powerful, high temp water jet 9
	IP00	IP01	IP02	IP03	IP04	IP05	IP06	IP07	IP07	
Solid object ≥50mm	IP10	IP11	IP12	IP13	IP14	IP15	IP16	IP17	IP18	
Solid object ≥12mm	IP20	IP21	IP22	IP23	IP24	IP25	IP26	IP27	IP28	
Solid object ≥2.5mm	IP30	IP31	IP32	IP33	IP34	IP35	IP36	IP37	IP38	
Solid object ≥1mm	IP40	IP41	IP42	IP43	IP44	IP45	IP46	IP47	IP48	
Dust protected	IP50	IP51	IP52	IP53	IP54	IP55	IP56	IP57	IP58	
Dust proot	IP60	IP61	IP62	IP63	IP64	IP65	IP66	IP67		IP69K

NOTES

NOTES

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