

07



Heliformed[®] line fittings

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Technical Guide

Overview

Tyco Electronics, through its brand name Dulmison, have been supplying Heliformed® fittings to markets throughout the world for over 45 years. Dulmison obtained a manufacturing licence in 1957, and became the first and oldest manufacturer of Helical line fittings outside North America.

Over the last 45 years, a range of Heliformed® terminations, joints, and support and repair fittings have been developed. The range of application of these fittings is unsurpassed, and provides the most complete range of electrical distribution fittings of this type.

The apparent simplicity of Heliformed® fittings, their ease of installation in the field and their mechanical and electrical conductive efficiencies, belie the design back-up and manufacturing expertise necessary for what are essentially precision products. Heliformed® fittings are tailor made to match wide ranging differences in conductor materials, diameter configurations and service conditions that vary from coastal climates to hot arid plains.

Design

All Heliformed® fittings are designed to be compliant for use with the following Standards and or Recommendations;

- AS1222.1 SC/GZ Conductors (Galvanised Steel)
- AS1222.2 SC/AC Conductors (Aluminium Clad Steel)
- AS1531 AAC & AAAC Conductors (Aluminium and Aluminium Alloy)
- AS1746 HDC Conductors (Hard Drawn Copper)
- AS3607 ACSR Conductors (Aluminium Clad Steel Reinforced)

Heliformed® fittings are compliant with requirements of AS1154 Part 3.

Installation

Heliformed® fittings may be installed either by hand or by live line methods, and are designed to fit on to the conductor for which they are designed, without any question of malfunction or misapplication.

Colour Coding

Colour Coding is determined by the stranding of the conductor, on which the Heliformed® fitting is to be used as per AS1154 Part 3.

Individual Stranding Dia. mm	Colour Code
1.00	Black
1.25	Green
1.75	Purple
2.00	Yellow
2.25	Brown
2.50	Blue
2.75	White
3.00	Red
3.25	Orange
3.50	Purple
3.75	Black
4.00	Black
4.50	Green
4.75	Blue

Fundamentals

Heliformed® Deadends have two lengths, Overall Length and Applied Length, the latter being the length from the cross over marks. (See fig 1). The cross over mark, (See fig 2) shows the starting point for application of the deadend. The colour code at this cross over point is as per the stranding of the conductor (See colour code page 5). An identification tag is always attached to the loop area of the fitting, and displays the fitting Cat. No., Range of Applications and/or stranding details.

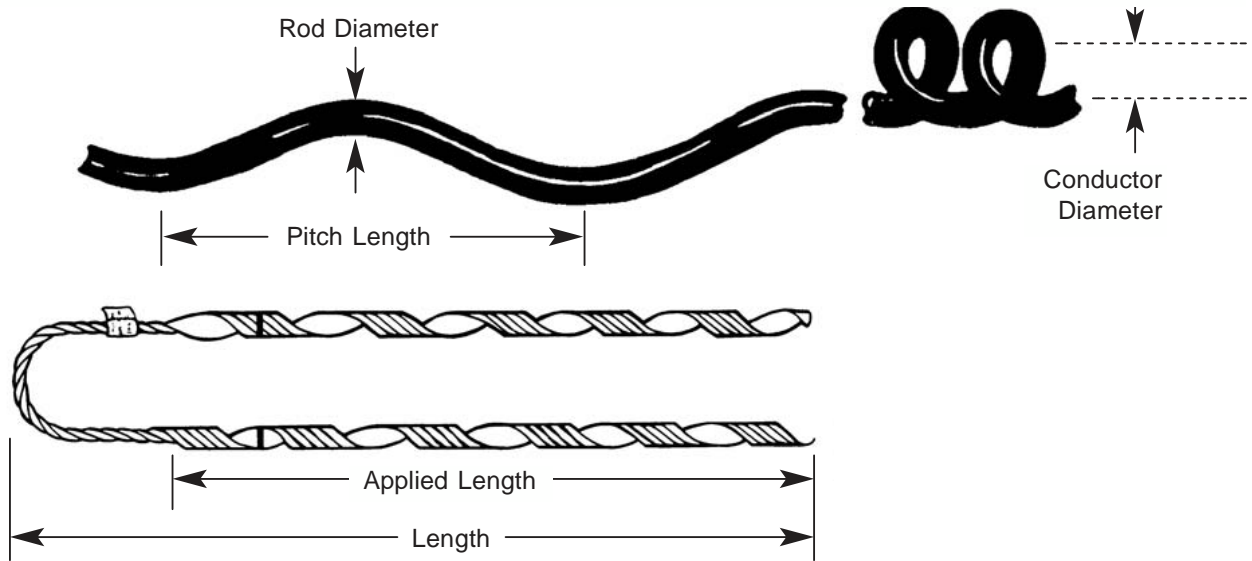


Fig 1

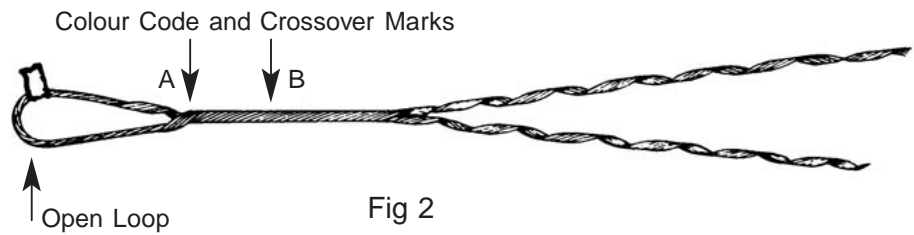
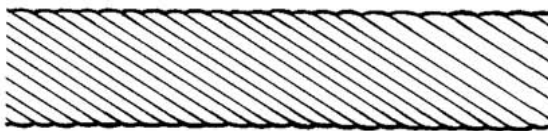
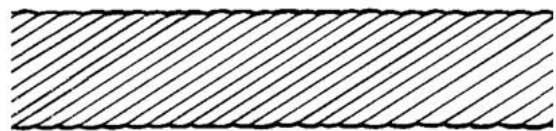


Fig 2

Lay Designation



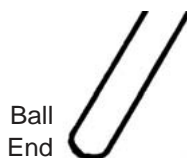
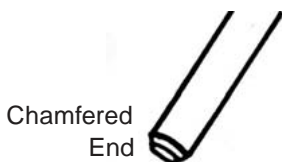
Right Hand Lay



Left Hand Lay

End Finish

Depending on the voltage, ends of the individual rods may be either chamfered, ball ended or EHV (Extra High Voltage) ended. EHV end finish is generally only ever required at a voltage greater than 330kV.



Selection Guide

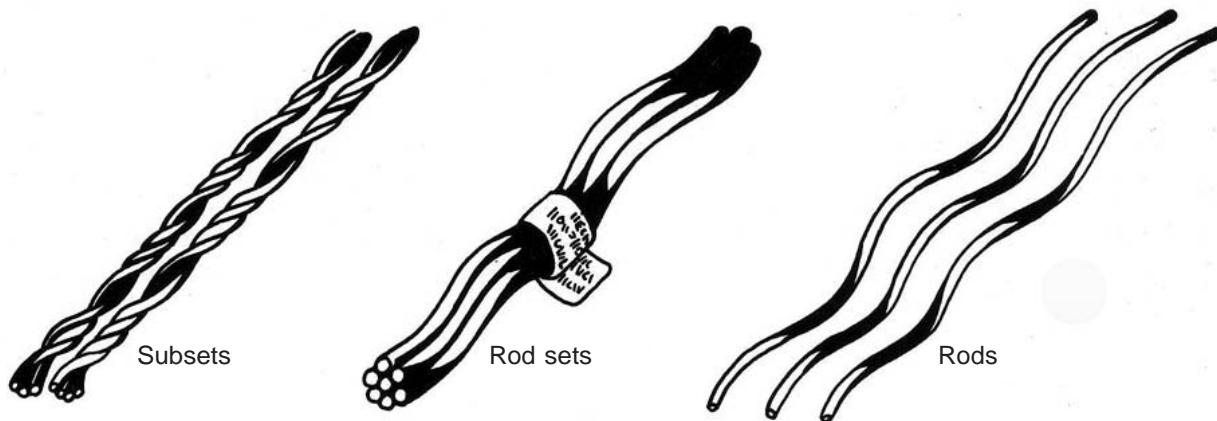
Loop Configuration

Open Helix Looped and Cable Looped Deadends can be provided. Open Helix Looped may be regarded as standard.



Supply Options - Subsets/Rods/Rod Sets

Depending on the intended use, Heliformed® products are supplied as individual rods (Lashing Rods - Line Guards) or sub sets (Deadends-Splices and Ties). Generally only subsets are gritted to enhance the holding strength and/or conductivity.



Important

For Technical and Stranding details of standard Australian and New Zealand conductors, please refer to Section 17. Once the size of the conductor is established, the appropriate range and fitting in each category can be obtained.

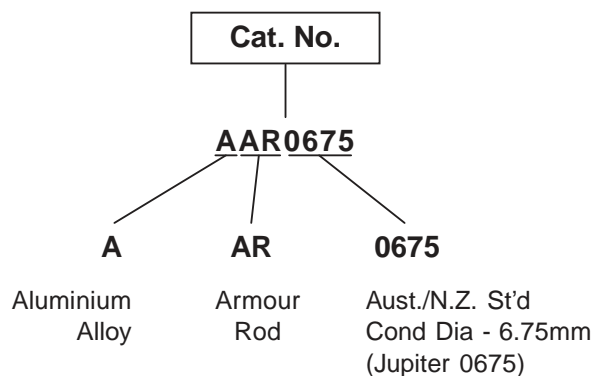
Selection Guide

Catalogue Numbering System

Alpha Numeric Identification

Heliformed® line fittings are identified by an alpha numeric catalogue numbering system derived as follows:

- Nature of fitting material
- Type of fitting
- Conductor diameter range, applicable to fitting (Aust./N.Z Standard Metric)



Although examination of the list of 'prefixes' and 'suffixes' listed below shows the system to be largely mnemonic, and thereby helpful in equating catalogue numbers with fittings, there are traps and, as always, "exceptions to the rule" (see below)

Standard Abbreviations

PREFIXES (Material type)

A Aluminium **L** Aluminium Clad Steel **C** Copper **S** Galvanised Steel

SUFFIXES (Fitting type)

AR Armour Rod **GG** Heligrip® **ST** Side Tie
DC Deadend for Copper **GL** Guy Lok **TG** Twin Grips
DE Deadend **LG** Line Guard **TT** Top Tie
DT Distribution Tie **LS** Line Splice **WT** Helitie®

Steel Deadends are catalogue SGG (steel guy grip) rather than SDE.

Note: A true suffix 'D' appearing at the end of a catalogue number indicates the fitting suits more than one conductor e.g. suits 7/2.75 Copper plus 19/1.75 Copper.

Exceptions to Standard Abbreviations

DIS Double Insulated Service Termination **FDE** Full Tension Deadend (Multi Piece)
FSE Full Tension Deadend (Single Piece) **FTS** Full Tension Splice (Multi Piece)
HSP Heliformed® Support Unit **HSU** Heliformed® Suspension Unit
MSS Multi Strand Splice **NDE** Limited Tension Coated Deadend
PGG Plastic Guy Guard **SVD** Spiral Vibration Damper

Heliformed® Line Fittings

Holding Strengths for Splices & Deadends

Line Splices

Conductor Type	Conductor Stranding	Catalogue Prefix	Tension Rating (% of UTS)
ACSR	6/1 OR 6/7	FTS	90%
ACSR	3/4 OR 4/3	MSS	90%
ACSR	30/7	FTS	90%
AAC & AAAC	ALL	ALS	90%
HDC (Copper)	ALL	CLS	90%
SC/GZ (Galv)	ALL	SLS	90%
SC/AC (Alclad)	ALL	LLS	90%

Deadends

Conductor Type	Conductor Stranding	Catalogue Prefix	Tension Rating (% of UTS)
ACSR	6/1 OR 6/7	ADE	60 - 85%**
		LDE	60 - 85%**
		FSE	90%
		FDE	90%
ACSR	3/4 OR 4/3	ADE	60 - 85%**
		LDE	60 - 85%**
		FSE	90%
ACSR	30/7	ADE	60 - 85%**
		LDE	60 - 85%**
		FDE	90%
AAC & AAAC	ALL	ADE	90%
		LDE	90%
HDC (Copper)	ALL	CDE	90%
		SDC	90%
SC/GZ (Galv)	ALL	SGG	90%
		SGL	90%
SC/AC (Alclad)	ALL	LGG	90%

** For specific details relating to the holding strength of Deadends, please refer to the Termination and Deadend section of this catalogue.

Catalogue Prefix Codes

ALS-Aluminium Line Splice

CLS-Copper Line Splice

FTS-Full Tension Splice

MSS-Multi Strand Splice

SLS-Steel Line Splice

LLS-Aluminium Clad Line Splice

ADE-Aluminium Deadend

CDE-Copper Deadend

FDE-Full Tension Deadend

FSE-Full Tension Deadend (Single Piece)

LDE-Aluminium Clad Deadend

SDC-Steel D'end for Copper

SGG-Steel Heligrip® Deadend

LGG-Aluminium Clad Heligrip®

Heliformed® Line Fittings

Aluminium Based Deadends

Type ADE - Aluminium Range & Guide AAG, AAAG & ACSR Conductors

Type LDE - Aluminium Clad Steel for AAC, AAAC & ACSR Conductors

Heliformed® Line Fitting		Cat. Prefix Code	AAC/AAAC	ACSR Short Leg	HDC	SC/AC	SC/GZ
Intended Use	Identification Tag Type						
Termination		Al. Clad Steel Full Tension, Multi Piece	FDE		■		
		Al. Clad Steel Full Tension, Single Piece	FSE	■	■		
		Double Insulated Neoprene Covered	DIS NDE	For House Service conductors only			
Support and Protection	<p>Aluminium Based Deadends have been designed as a simple and cost effective method of carrying out terminations on overhead distribution networks incorporating AAC, AAAC and ACSR conductors. Their unique single piece design, provides uniform application pressure to the conductor and eliminates cumbersome hardware and other components, which may be lost or damaged during installation or in service.</p>	Guy Lok Aluminium Alloy Helities®	SGL				■
		Aluminium Alloy Distribution Ties	AAR	■	■		
		Copper Alloy Distribution Ties	CAP			■	
Rated Holding Strengths	<p>An entire range of fittings, have been developed, to cover the smallest earth wires, right up to the largest transmission conductors. Each fitting has a specific application range, as indicated in the following tables.</p> <p>On AAC and AAAC conductors, both an ADE and LDE fitting will hold a minimum of 90% of the ultimate tensile strength of the conductor as required by Australian Standard AS1154.1 - 2004. On ACSR conductors, an ADE or LDE fitting will hold 60-85% of the ultimate tensile strength of the conductor, on which it is used.</p>	Galvanised Steel Distribution Ties	SAR				■
		Aluminium Clad Steel Distribution Ties	LAR			■	
		Aluminium Alloy Side Ties	AST	■	■		
Joint and Restorative Repair	<p>INSULATOR TIES</p>	Aluminium Alloy Helities®	AWT	■	■		■
		Galvanised Steel Helities®	SWT				■
		Aluminium Alloy Single Wire Top Ties	ATT	■			
MISCELLANEOUS	<p>LINE GUARDS</p>	Aluminium Alloy	ALG	■	■		
		Copper Alloy	CLG			■	
		Aluminium Alloy Suspension Unit	HSU	■	■		■
MISCELLANEOUS	<p>LINE SPLICES</p>	Galvanised Steel Suspension Unit	SHS			■	■
		Aluminium Alloy Support Unit	HSP	■	■		■
		Aluminium Alloy	ALS	■	See page 7-26		
MISCELLANEOUS	<p>MISCELLANEOUS</p>	Copper Alloy	CLS			■	
		Galvanised Steel	SLS				■
		Galvanised Steel & Al. Alloy Full Tension	MSS/FTS		■		
MISCELLANEOUS	<p>MISCELLANEOUS</p>	Spiral Vibration Damper	SVD	■	■	■	■
		Guy Guard	PGG				■
		Bird/Swan Diverters	BD/SD	■	■	■	■
MISCELLANEOUS	Low Voltage Spreader Rods	LVS	■	■	■	■	

Heliformed® Line Fittings

Aluminium Based Deadends

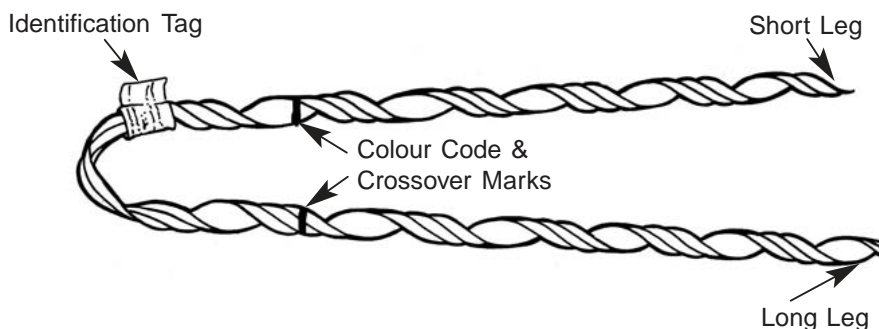
Type ADE - Aluminium Alloy for AAC, AAAC & ACSR Conductors

Type LDE - Aluminium Clad Steel for AAC, AAAC & ACSR Conductors

Conductor Range	AAC/AAAC Stranding	Aluminium Alloy Deadends	ACSR Stranding	Aluminium Clad Steel Deadends	Std Pack
4.10 - 4.42		ADE 0410			50
4.62 - 4.94		ADE 0462		LDE 0462	50
4.95 - 5.14		ADE 0495		LDE 0462	50
5.15 - 5.39	7/1.75	ADE 0525	3/4/1.75	LDE 0525	50
5.60 - 5.79		ADE 0560		LDE 0525	50
5.80 - 6.09		ADE 0580		LDE 0593	50
6.10 - 6.24		ADE 0610			50
6.25 - 6.54		ADE 0625			50
6.55 - 6.89	7/2.25	ADE 0675		LDE 0675	50
6.90 - 7.14		ADE 0690		LDE 0675	50
7.15 - 7.34		ADE 0715		LDE 0675	50
7.35 - 7.59	7/2.50	ADE 0750	6/1/2.50 - 3/4/2.50	LDE 0750	50
7.60 - 7.89		ADE 0760		LDE 0750	50
7.90 - 8.29	7/2.75	ADE 0790	6/1/2.75	LDE 0750	50
8.30 - 8.64		ADE 0830		LDE 0900	40
8.65 - 9.35	7/3.00	ADE 0900	6/1/3.00 - 4/3/3.00	LDE 0900	50
9.35 - 9.69		ADE 0935			30
9.70 - 10.15		ADE 0970			30
10.15 - 10.49		ADE 1015			30
10.50 - 10.79		ADE 1050			25
10.80 - 11.29	7/3.75	ADE 1125	6/1/3.75 - 4/3/3.75	LDE 1125	25
11.30 - 11.74		ADE 1130			25
11.75 - 12.24		ADE 1175			25
12.25 - 12.79		ADE 1225		LDE 1255	25
12.80 - 13.24		ADE 1280		LDE 1255	25
13.24 - 13.84	7/4.50	ADE 1350		LDE 1350D	20
13.85 - 14.44	7/4.75	ADE 1430	6/4.75 + 7/1.60	LDE 1430	20
14.45 - 15.09		ADE 1445			25
15.10 - 15.69		ADE 1510		LDE 1550	25
15.70 - 16.39	19/3.25	ADE 1625		LDE 1625	15
16.40 - 17.04		ADE 1640			25
17.05 - 17.79	19/3.50	ADE 1750	30/7/2.50	LDE 1750	10
17.80 - 18.54		ADE 1780			10
18.55 - 19.34	19/3.75	ADE 1875		LDE 1875	10
19.35 - 20.39		ADE 1989			10
20.40 - 21.82	37/3.00	ADE 2100	30/7/3.00	LDE 2100	10
22.46 - 23.75	37/3.25	ADE 2330	30/7/3.25		10
23.75 - 25.29	19/4.75	ADE 2375	30/7/3.50	LDE 2375	10
25.30 - 27.27	37/3.75	ADE 2625	54/7/3.00	LDE 2625	10
28.60 - 30.83	61/3.25	ADE 2930	54/7/3.25		10

Copper Alloy Deadends

Type CDE - Copper Alloy for Hard Drawn Copper Conductors



Copper Alloy Deadends have been designed as a simple and cost effective method of carrying out terminations on Hard Drawn Copper (HDC) and Copper Alloy conductors. Fittings for smaller ranges are manufactured from Tin Bearing Copper Alloy wire, whilst larger fittings are manufactured from a unique Cadmium 'Free' Copper Alloy wire.

The material used in all fittings is ideally suited to coastal and polluted conditions, and replicates the strength and life of the conductor as closely as possible.

Rated Holding Strengths

On HDC conductors, a CDE fitting will hold a minimum of 90% of the ultimate tensile strength of the conductor as required by Australian Standard AS1154.1 - 2004.

Type CDE - For Hard Drawn Copper (HDC) Conductors

Conductor Range	HDC Conductor Stranding	Copper Alloy Deadends	Std Pack
3.57 - 3.75	7/1.25	CDE 0360	50
3.90 - 4.21		CDE 0400	50
4.80 - 5.25	7/1.75	CDE 0525	50
6.00 - 6.29	7/2.00	CDE 0600	50
6.30 - 6.57		CDE 0630	50
6.58 - 6.85		CDE 0658	40
6.89 - 7.41		CDE 0714	40
7.42 - 7.95		CDE 0742	40
7.70 - 7.99		CDE 0770	40
8.00 - 8.75	7/2.75 & 19/1.75	CDE 0825D	40
9.00 - 9.26		CDE 0900	40
9.30 - 9.99		CDE 0965	40
10.00 - 10.65	19/2.00 & 7/3.50	CDE 1000D	20
10.66 - 11.24		CDE 1068	20
11.25 - 12.04	7/3.75	CDE 1125	20
12.05 - 12.82	37/1.75 & 7/4.15	CDE 1225	15
12.82 - 13.19		CDE 1257	15
13.20 - 13.75	19/2.75	CDE 1375	10
14.50 - 15.03	19/3.00	CDE 1500	10
16.15 - 16.80		CDE 1615	10
17.50 - 18.08	37/2.50	CDE 1750	5
18.09 - 19.00		CDE 1809	5
19.01 - 20.19	37/2.75	CDE 1925	5
20.20 - 21.80	37/3.00	CDE 2100	5
22.60 - 24.36		CDE 2300	5
24.72 - 26.65	61/2.75	CDE 2565	5
28.43 - 30.65		CDE 2950	5

Heliformed® Line Fittings

Full Tension Deadends

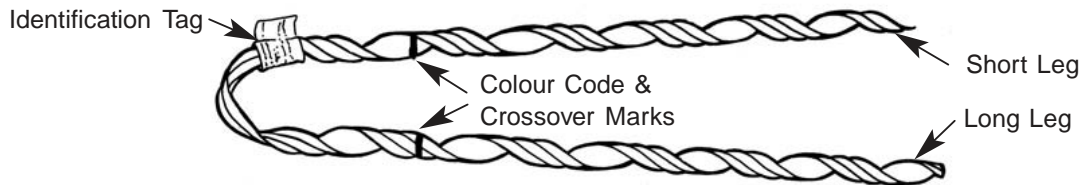
Type FSE - Single Piece, Aluminium Clad Steel for ACSR Conductors

Type FDE or FTDE - Multi Piece, Aluminium Alloy & Gal Steel for ACSR Conductors

Full Tension Deadends have been designed for use as a termination on ACSR - Aluminium Clad Steel Reinforced conductors. Two types of Full Tension Deadends are available -

Type FSE - Single Piece Construction

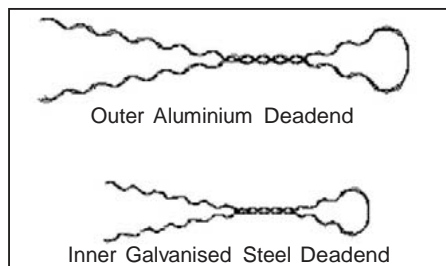
Designed for installation over the outer layer of the conductor only.



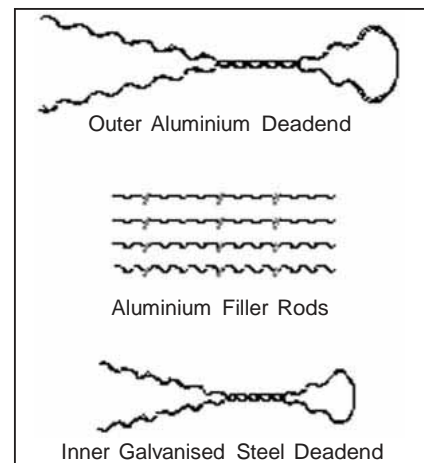
Type FDE or FTDE - Multi Piece Construction

Designed for installations where holding strength on the inner core strands is required. e.g. on greased inner core conductors, with 7 strands or greater in the core. The type FDE or FTDE fitting, can be supplied in two configurations.

Two Deadends
(one deadend for the inner core and one deadend for over the outer strands)
FIGURE 1



Two Deadends plus Filler Rods
(where the inner core deadend cannot be designed so as its diameter will align with the outer strands, so as to enable attachment of the second deadend)
FIGURE 2



Rated Holding Strengths

On ACSR conductors, FSE, FDE and FTDE fittings will hold a minimum of 90% of the ultimate tensile strength of the conductor as required by Australian Standard AS1154.1 - 2004.

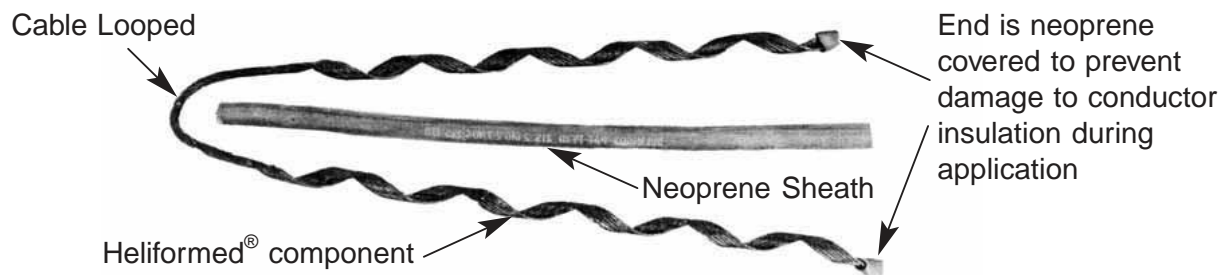
Type FSE/FDE/FTDE - For Aluminium Clad Steel Reinforced (ASCR) Conductors

ACSR Conductor Stranding	FSE Single Piece Fitting	FDE or FTDE Multi Piece Fitting	Std Pack
3/4/1.75	FSE 0525		50
6/1/2.50	FSE 0750		30
3/4/2.50	FSE 0750		30
6/1/3.00	FSE 0900	FTDE 0900	25
4/3/3.00	FSE 0900		25
6/1/3.75	FSE 1125	FDE 1125	25
4/3/3.75	FSE 1125		25
12/7/2.50		FTDE 1250	25
6/4.75 + 7/1.60	FSE 1430		20
30/7/2.50		FDE 1750	5
30/7/3.00		FDE 2100	5

Heliformed® Line Fittings

Double Insulated Deadends

Type DIS - Double Insulated - Copper & Aluminium Aerial Service Cables



The DIS fitting has been designed for terminating insulated aerial service cables of either single, webbed, 2, 3 or 4 core twisted or concentric neutral screened construction. The DIS fitting is designed to terminate the service cable directly to the fascia attachment on the house, without the need for a separate insulator. There is no span limitation in normal urban usage of the DIS fitting.

DIS fittings are composed of two components, a galvanised, gritted and coated (black) Heliformed® fitting, and a non-conductive Neoprene Sheath. The neoprene sheath is wrapped around the service cable prior to attachment of the Heliformed® fitting, to provide the double insulating layer.

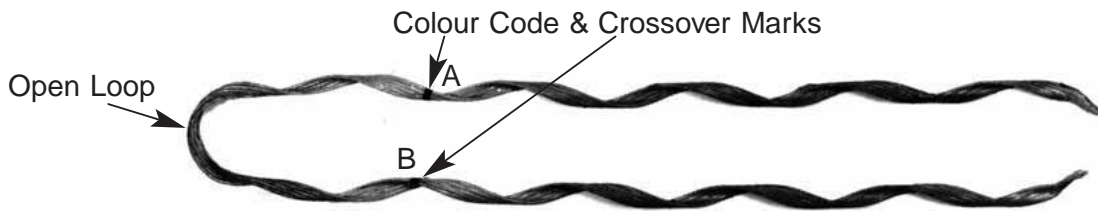
The DIS fitting provides excellent resistance to UV attack and corrosion, and has been designed to operate in harsh operating environments, where temperature extremes, and vibration difficulties are known to occur.

Area mm ²	Stranding	No. of Conductors	Cat. No.	Std. Pack	Colour Code
Twisted Conductors					
6	7/1.04	2, 3 & 4	DIS1400N	25	Red
10	7/1.35	2, 3 & 4	DIS1400N	25	Red
10	7/1.35	4	DIS1600N	25	White
16	7/1.70	2	DIS1400N	25	Red
16	7/1.35	3 & 4	DIS1600N	25	White
25	7/2.00	2	DIS1600N	25	White
25	7/2.00	3 & 4	DIS1900N	20	Blue
35	19/1.35	2	DIS1600N	25	White
35	19/1.35	4	DIS2200N	25	Green
Webbed Conductors					
6	7/1.04		DIS80610	25	Red
10	7/1.35		DIS80610	25	Red
16	7/1.70		DIS81600	25	White
Neutral Screened Conductors					
6	7/1.04	2	DIS1400N	25	Red
6	7/1.04	3 & 4	DIS1900N	20	Blue
10	7/1.35	2	DIS1400N	25	Red
10	7/1.35	3 & 4	DIS1900N	20	Blue
16	7/1.70	2	DIS1600N	25	White
16	7/1.70	3 & 4	DIS1900N	20	Blue

Note: Number of conductors includes the neutral screen.

Limited Tension Deadends

Type NDE - Limited Tension - Copper & Aluminium Aerial Service Cables



The NDE is a coated galvanised steel termination, suitable for application over Polyethylene or Neoprene insulated, aluminium or copper conductors. The coated subsets of each Deadend leg exert a low radial pressure that does not damage the insulation on the conductor.

Because of the number of variables associated with the rating strength of this type of fitting (conductor size, number of cores, insulation thickness etc.), it is impractical to imply a rating as a proportion of the UTS of the conductor. In many applications the strength of the fitting will exceed the UTS of the conductor.

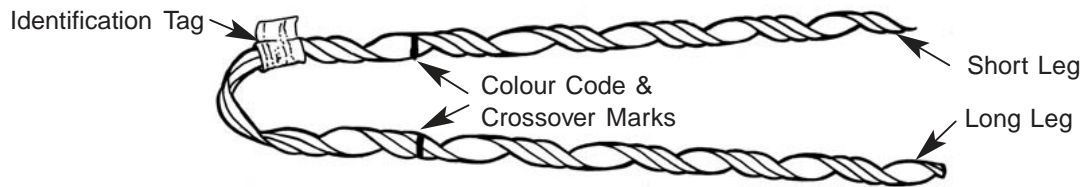
Area mm ²	Stranding	No. of Conductors	Cat. No.	Std. Pack	Colour Code
Twisted Conductors					
6	7/1.04	2 & 3	NDE1036	25	Blue
6	7/1.04	4	NDE1369	25	Red
10	7/1.35	2	NDE1036	25	Blue
10	7/1.35	2 & 3	NDE1369	25	Red
16	7/1.70	2	NDE1369	25	Red
16	7/1.35	2 & 3	NDE1554	20	Black
25	7/2.00	2	NDE1554	20	Black
25	7/2.00	3	NDE1973	15	Yellow
35	19/1.35	4	NDE2216	10	Blue
35	19/1.35	2, 2 & 3	NDE2216	10	Blue
Webbed Conductors					
6	7/1.04		NDE1036	25	Blue
10	7/1.35		NDE1369	25	Red
16	7/1.70		NDE1369	25	Red
25	7/2.00		NDE1554	20	Black
Neutral Screened Conductors					
6	7/1.04	2	NDE1036	25	Blue
6	7/1.04	2 & 3	NDE1554	20	Black
10	7/1.35	2	NDE1036	25	Blue
10	7/1.35	3	NDE1554	20	Black
10	7/1.35	4	NDE1973	15	Yellow
16	7/1.70	2	NDE1369	25	Red
16	7/1.70	3	NDE1554	20	Black
16	7/1.70	4	NDE2216	10	Blue

Heliformed® Line Fittings

SGG Heligrips®

Type SGG - Galvanised Steel for SC/GZ Conductors

Type LGG - Aluminium Clad Steel for SC/AC Conductors



SGG and LGG Heligrips®, are used for terminating guy wires, earthwires and stay conductors. Both SGG and LGG fittings are ideally suited to installations in the most difficult conditions, and will never relinquish their gripping power.

SGG and LGG Heligrips® are manufactured from the same materials as the conductors that they are applied to. This ensures that there is no chance of electrolytic or galvanic corrosion, as the fittings are completely compatible to the conductor to which they are applied.

SGG fittings are supplied as Right Hand Lay as the standard to match the applicable Right Hand Lay conductor. Left Hand Lay fittings are available to suit Left Hand Lay conductors. LGG fittings are always supplied as Left Hand Lay to suit Left Hand Lay conductors.

Rated Holding Strengths

SGG & LGG Heligrips® will hold a minimum of 90% of the UTS of the conductor as required by Australian Standard AS1154.1 - 2004.

Type SGG/LGG - for SC/GZ & SC/AC Conductors

Conductor Range	SC/GZ Stranding	Galvanised Steel Heligrip®	SC/AC Stranding	Aluminium Clad Heligrip®	Std. Pack
2.41 - 2.60		SGG 0245			50
2.80 - 3.15		SGG 0315			50
3.16 - 3.54		SGG 0345			50
3.55 - 3.69		SGG 0355			50
3.70 - 3.84		SGG 0375			50
4.20 - 4.39	3/2.00	SGG 0431			50
4.63 - 4.84	7/1.60	SGG 0480	7/1.60	LGG 0480L	50
4.85 - 5.04		SGG 0485			50
5.50 - 5.94	3/2.75	SGG 0593	3/2.75	LGG 0593L	50
5.95 - 6.19	7/2.00	SGG 0600			50
6.20 - 6.49		SGG 0620			40
6.50 - 7.01		SGG 0675	3/3.25	LGG 0700L	40
7.35 - 7.64		SGG 0750			30
7.65 - 7.99		SGG 0765			30
8.00 - 8.29	7/2.75	SGG 0825**	3/3.75 & 7/2.75	LGG 0825L	20
8.95 - 9.29		SGG 0895			20
9.30 - 9.69		SGG 0930			20
9.70 - 10.20	7/3.25 & 19/2.00	SGG 0975**	7/3.25	LGG 0975L	15
10.84 - 11.69	7/3.75	SGG 1125	7/3.75	LGG 1125L	20
11.85 - 12.19	7/4.00	SGG 1200			15
12.20 - 12.54		SGG 1220			15
13.06 - 13.97	19/2.75	SGG 1375**	19/2.75	LGG 1375L	5
16.00 - 16.40	19/3.25	SGG 1625	19/3.25	LGG 1625L	5

**Note: SGG0825, SGG0975 & SGG1375 are suitable for use with a standard thimble or with GY3 & GY4 insulators.

Heliformed® Line Fittings

Clevis Thimbles & Socket Thimbles

Type CTH - Aluminium for AAC, AAAC & ACSR Conductors

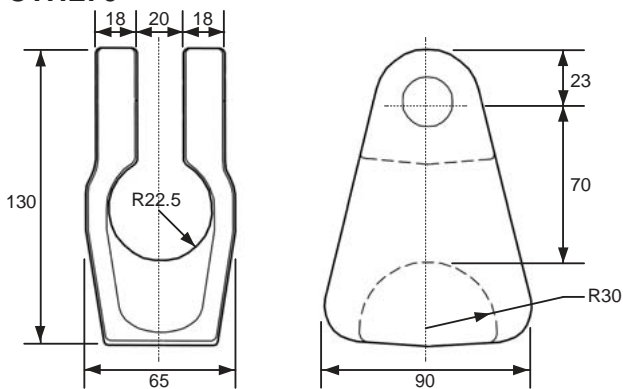
Type CAC - Galvanised MCI for SC/GZ Conductors

Type STH - Galvanised MCI for SC/GZ Conductors

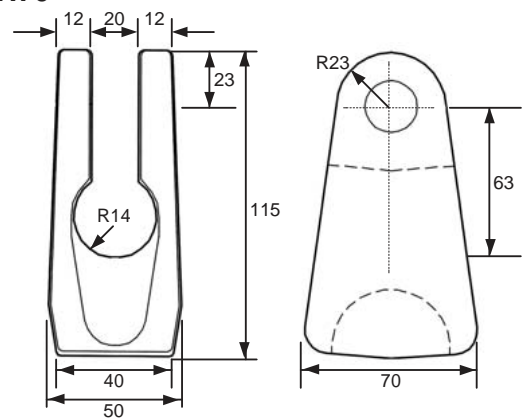
Materials

Aluminium alloy or galvanised MCI castings.

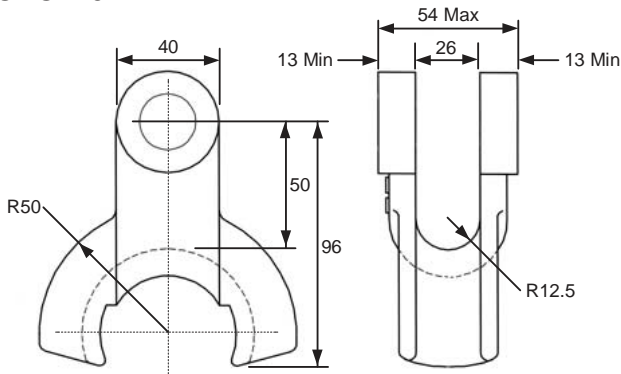
CTHL70*



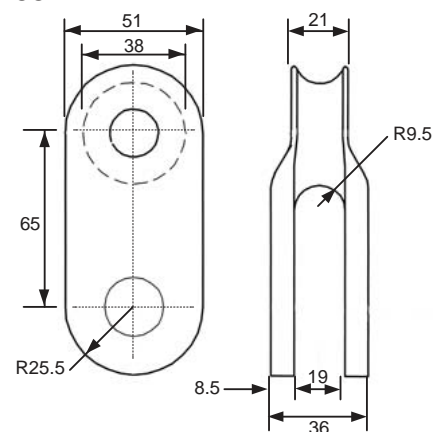
CTH70*



CAC120*



CAC438*

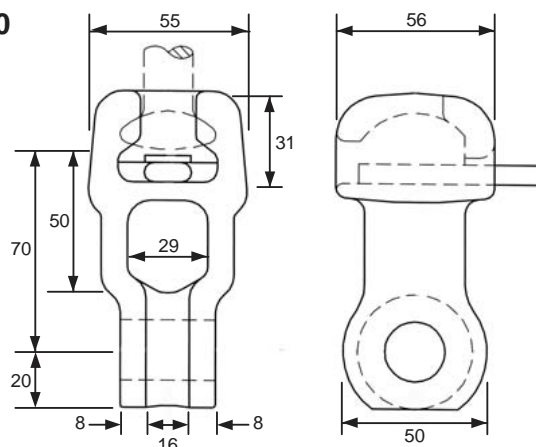


*Hardware

Add suffix 'A' for M16 bolt and nut assembly.

Add suffix 'Q' for 16mm dia. rivet and split pin assembly.

STH70



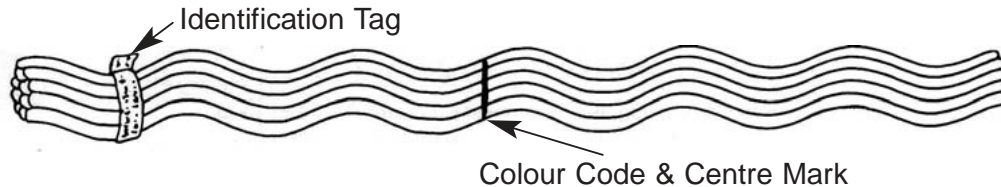
Armour Rods

Type AAR - Aluminium Alloy for AAC, AAAC and ACSR

Type CAR - Copper Alloy for Copper Conductors

Type SAR - Galvanised Steel for SC/GZ Conductors

Type LAR - Aluminium Clad Steel for SC/AC Conductors



Application

Protection of conductors against bending & compressive stresses. Protection against abrasion & arcing damage. Repair of conductors having no more than 20% of outer strands damaged or broken.

Guide to Usage

As the degree of protection in specific situations is affected by such factors as line design, temperature, tension, exposure to wind flow, vibration history, etc., the following recommendations are made:

- (i) Armour Rods should be regarded as minimum protection for clamp style supports or suspension arrangements.
- (ii) They should be considered as minimum protection on hand tied, pin type construction of span lengths greater than 90M in urban areas, having no history of vibration.
- (iii) Armour Rods are not designed to act as vibration dampers. Their role is to provide conductors with an extra degree of protection at support points. In areas where a history of vibration is known, or where vibration is suspected, the supplementary use of Type SVD Heliformed® Spiral Vibration or Dogbone® Dampers should be considered.
- (iv) On pin type construction, the use of Helities® are recommended as being superior to usual armour-clamp arrangements.
- (v) At suspension points Heliformed® type HSU Suspension Units are recommended as superior to usual armour-clamp arrangements.

Restorative Repair

Armour Rods may be used to restore full conductivity and strength to aluminium, ACSR and copper conductors, where damage is outside of the support area and does not exceed 20% of the outer strand layer. Tyco Electronics should be consulted when damage is located at the point of support. The conductor should be scratch brushed and greased prior to the application of Armour Rods used for repair.

Tapping

Heliformed® Armour Rods may be used as tap armour to protect conductors from wear and flash-over damage under hot line taps. Where tapping clamps are to be installed over the Armour Rods a moisture inhibitor, e.g. Alminox, should be applied. The conductor should be scratch brushed and greased prior to the application of Armour Rods used for tapping.

Armour Rods

Type AAR - Aluminium Armour Rods for AAC, AAAC & ACSR Conductors

Conductor Range	AAC/AAAC Stranding	ACSR Stranding	Aluminium Armour Rod	Std. Pack
4.95 - 5.29	7/1.75	3/4/1.75	AAR 0525	50
5.30 - 5.79			AAR 0530	50
5.80 - 6.19			AAR 0580	50
6.20 - 6.59			AAR 0620	50
6.60 - 6.94			AAR 0675	50
6.95 - 7.34			AAR 0695	50
7.35 - 7.84	7/2.50	6/1/2.50 - 3/4/2.50	AAR 07580	50
7.85 - 8.29	7/2.75	6/1/2.75	AAR 0785	40
8.30 - 8.79			AAR 0830	40
8.80 - 9.29	7/3.00	6/1/3.00 - 4/3/3.00	AAR 0900	40
9.30 - 9.89			AAR 0930	40
9.90 - 10.49			AAR 0990	25
10.50 - 11.09			AAR 1050	25
11.10 - 11.79	7/3.75	6/1/3.75 - 4/3/3.75	AAR 1125	25
11.80 - 12.44			AAR 1180	25
12.45 - 13.24			AAR 1245	25
13.25 - 13.99	7/4.50		AAR 1350	20
14.00 - 14.89	7/4.75	6/4.75 + 7/1.60	AAR 1430	20
14.90 - 15.39			AAR 1490	20
15.40 - 16.04			AAR 1540	15
16.05 - 16.64	19/3.25		AAR 1625	15
16.65 - 17.24			AAR 1665	15
17.25 - 17.89	19/3.50	30/7/2.50	AAR 1750	15
17.90 - 18.80	19/3.75		AAR 1875	10
18.81 - 19.89			AAR 1881	10
19.90 - 20.70			AAR 1990	5
20.71 - 21.49	37/3.00	30/7/3.00	AAR 2100	5
21.50 - 23.04	37/3.25	30/7/3.25	AAR 2150	5
23.60 - 24.80	19/4.75	30/7/3.50	AAR 2375	5
24.80 - 25.84			AAR 2480	5
25.85 - 26.30	37/3.75	54/7/3.00	AAR 2630	5
26.31 - 27.04			AAR 2700	5
27.05 - 27.89			AAR 2705	5
27.90 - 28.94			AAR 2790	5
28.95 - 29.49	61/3.25	54/7/3.25	AAR 2930	3
29.50 - 30.69			AAR 2950	3
30.70 - 32.24		54/7/3.50	AAR 3150	3
32.25 - 33.74			AAR 3225	3
33.75 - 35.34	61/3.75	54/3.75 + 19/2.25	AAR 3375	3

Armour Rods

Type CAR - Copper Armour Rods for Copper Conductors

Type SAR - Galvanised Steel for SC/GZ Conductors

Type LAR - Aluminium Clad Steel for SC/AC Conductors

Type CAR - Copper Armour Rods for Copper Conductor

Conductor Range	HDC Conductor Stranding	Copper Armour Rod	Std. Pack
4.88 - 5.29	7/1.75	CAR 0525	25
6.00 - 6.34	7/2.00	CAR 0600	25
7.50 - 7.99		CAR 0750	20
8.00 - 8.49	7/2.75 & 19/1.75	CAR 0825	20
8.50 - 8.94		CAR 0875	20
8.95 - 9.44		CAR 0900	15
9.45 - 9.99	7/3.25	CAR 0945	10
10.00 - 10.64	19/2.00	CAR 1000	10
11.45 - 12.09		CAR 1145	10
12.10 - 12.84	37/1.75 & 7/4.15	CAR 1225	10
12.85 - 13.59		CAR 1285	10
13.60 - 14.39	19/2.75	CAR 1375	5
14.40 - 15.04	19/3.00	CAR 1500	5
15.90 - 16.94		CAR 1590	5
16.95 - 17.84	37/2.50	CAR 1750	5
17.85 - 18.69		CAR 1785	5
18.70 - 19.49	37/2.75	CAR 1925	5

Type SAR - Galvanised Steel for SC/GZ Conductors

Type LAR - Aluminium clad Steel for SC/AC Conductors

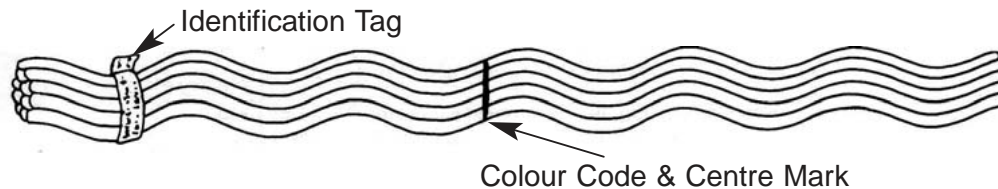
Conductor Range	SC/GZ Stranding	Galvanised Armour Rod	SC/AC Stranding	Aluminium Clad Armour rod	Std. Pack
4.10 - 4.39	3/2.00	SAR 0431			50
4.80 - 6.00	7/1.60, 7/2.00 & 3/2.75	SAR 0480D	3/2.75	LAR 0593L	50
6.75 - 7.27			3/3.25	LAR 0700L	25
7.35 - 7.84				LAR 0735L	25
7.85 - 8.29	7/2.75	SAR 0825	3/3.75 & 7/2.75	LAR 0825L	30
8.78 - 9.23			7/3.00	LAR 0900L	20
9.50 - 10.24		SAR 0975	7/3.25	LAR 0975L	20
11.10 - 11.79	7/3.75	SAR 1125	7/3.75	LAR 1125L	20
11.80 - 12.44	7/4.00	SAR 1200			10
12.45 - 13.24	19/2.50	SAR 1245	19/2.50	LAR 1245L	15
13.25 - 13.99	19/2.75	SAR 1375	19/2.75	LAR 1375L	10
15.75 - 16.51	19/3.25	SAR 1625	19/3.25	LAR 1625L	5

Note: Helities® and Distribution Ties are available for installation over Armour Rods. Refer to table on Page 7-21.

Line Guards

Type ALG - Aluminium Alloy for AAC, AAAC & ACSR Conductors

Type CLG - Copper Alloy for Copper Conductors



Application

Line Guards may be regarded as a light duty version of the armour rod intended for protection of conductors against abrasion and arc-over. They may also be used as patch rods to conductors where damage has occurred.

Compatibility

Suited to highly polluted areas and coastal locations when used with appropriate conductor.

Guide to Usage

As with Armour Rods, the degree of protection afforded conductors against abrasion and arc-over is influenced by such factors as line design, temperature, tension, exposure to wind flow and vibration etc. The following may be taken as a guide:

- (i) Regard as a minimum protection for hand tied spans of less than 107m in urban areas with a history of vibration.
- (ii) It is recommended that Helities® be used in place of normal hand tie combinations on pin type construction.
- (iii) Line Guards are recommended where clamp type supports or suspensions are used or where there are hand tied spans of 91m or more. In these situations Heliformed® Armour Rods are preferable.
- (iv) Line Guards are not recommended where vibration is suspected.

Restorative Repair

Line Guards may be used to restore full conductivity and strength to aluminium, ACSR and copper conductors, where damage is outside of the support area and does not exceed 10 - 15% of the outer strand layer. Tyco Electronics should be consulted when damage is located at the point of support. The conductor should be scratch brushed and greased prior to the application of Line Guards used for repair.

Tapping

Heliformed® Line Guards may be used as tap armour to protect conductors from wear and flash-over damage under hot line taps. Where tapping clamps are to be installed over the Line Guards a moisture inhibitor e.g. Alminox should be applied. The conductor should be scratch brushed and greased prior to application of Line Guards used for tapping.

Line Guards

Type ALG - Aluminium Line Guards for AAC, AAAC & ACSR Conductors

Conductor Range	AAC/AAAC Stranding	ACSR Stranding	Aluminium Line Guards	Std. Pack
5.25 - 5.59	7/1.75	3/4/1.75	ALG 0525	50
5.60 - 6.19			ALG 0560	50
6.20 - 6.59			ALG 0620	50
6.60 - 6.94	7/2.25		ALG 0675	50
6.95 - 7.34			ALG 0695	50
7.35 - 7.84	7/2.50	6/1/2.50 - 3/4/2.50	ALG 0750	50
7.85 - 8.29	7/2.75	6/1/2.75	ALG 0785	50
8.30 - 8.79			ALG 0830	50
8.80 - 9.29	7/3.00	6/1/3.00 - 4/3/3.00	ALG 0900	50
9.30 - 9.89			ALG 0930	50
9.90 - 10.49			ALG 0990	50
10.50 - 11.09			ALG 1050	50
11.10 - 11.79	7/3.75	6/1/3.75 - 4/3/3.75	ALG 1125	40
11.80 - 12.44			ALG 1180	25
12.45 - 13.24			ALG 1245	25
13.25 - 13.99	7/4.50		ALG 1350	25
14.00 - 14.89	7/4.75	6/4.75 + 7/1.60	ALG 1430	25
14.90 - 15.39			ALG 1490	25
15.40 - 16.04			ALG 1540	25
16.05 - 16.64	19/3.25		ALG 1625	25
16.65 - 17.24			ALG 1665	25
17.25 - 17.89	19/3.50	30/7/2.50	ALG 1750	25
17.90 - 18.80	19/3.75		ALG 1875	25
18.81 - 20.14			ALG 1881	25
20.15 - 21.34	37/3.00	30/7/3.00	ALG 2100	20
21.35 - 22.84	37/3.25	30/7/3.25	ALG 2135	15
22.85 - 24.24	19/4.75	30/7/3.50	ALG 2375	15
24.25 - 25.04			ALG 2450	15
25.05 - 25.84			ALG 2505	15
25.85 - 27.04	37/3.75	54/7/3.00	ALG 2625	10
27.05 - 27.89			ALG 2705	10
27.90 - 29.29			ALG 2925	10
29.30 - 30.69	61/3.25	54/7/3.25	ALG 2930	10
30.70 - 32.24		54/7/3.50	ALG 3150	10
32.25 - 33.74			ALG 3225	5
33.75 - 35.34	61/3.75	54/3.75 + 19/2.25	ALG 3375	5

Line Guards

Type CLG - Copper Line Guards for Hard Drawn Copper (HDC) Conductors

Conductor Range	HDC Conductor Stranding	Copper Line Guard	Std. Pack
5.00 - 5.29	7/1.75	CLG 0525	50
6.00 - 6.34	7/2.00	CLG 0600	50
8.00 - 8.49	7/2.75 & 19/1.75	CLG 0825	25
8.50 - 8.94		CLG 0875	25
9.45 - 9.99	7/3.25	CLG 0945	25
10.00 - 10.39	19/2.00	CLG 1000	25
10.40 - 10.79		CLG 1050	15
10.80 - 11.44		CLG 1080	15
12.10 - 12.84	31/1.75 & 7/4.15	CLG 1225	15
13.60 - 14.39	19/2.75	CLG 1375	15
14.40 - 15.04	19/3.00	CLG 1500	10
16.95 - 17.84	37/2.50	CLG 1750	5
18.70 - 19.49	37/2.75	CLG 1925	5

Sizes of Helities® & Distribution Ties for fitting over Armour Rods

Conductor			Cond. Dia. mm	Armour Rods Cat. No.	Dia. over A/Rods	Helitie® Cat. No.	Distribution Tie Cat. No.
ACSR	AAC	SC/GZ					
---	---	7/1.60	4.80	SAR0480D	8.86	SWT0865(*)	SDT0865(*)
3/4/1.75	---	---	5.25	AAR0525	11.15	AWT1125(*)	LDT1125(*)
---	---	3/2.75	5.93	SAR0480D	10.00	SWT1036(*)	SDT1036(*)
3/4/2.50	---	---	7.50	AAR0750	14.80	AWT1430(*)	LDT1350(*)
6/1/3.00	7/3.00	---	9.0	AAR0900	16.30	AWT1625(*)	LDT1625(*)
6/1/3.75	7/3.75	---	11.25	AAR1125	19.37	AWT1900(*)	LDT1900(*)
---	7/4.50	---	13.50	AAR1350	22.44	AWT2150(*)	LDT2150(*)
6/4.75 + 7/1.60	7/4.75	---	14.30	AAR1430	23.24	AWT2290(*)	LDT2290(*)
---	19/3.25	---	16.25	AAR1625	26.01	AWT2588(*)	LDT2588(*)
---	19/3.75	---	18.75	AAR1875	28.51	AWT2751(*)	LDT2751(*)

***Note:** When ordering Helities® and Distribution Ties, nominate insulator type and neck diameter as follows:

- Add suffix 7 to catalogue number for insulators with 76mm neck diameter
- Add suffix 9 for 90mm neck diameter, and
- Add suffix 1 for 112mm neck diameter.

Heliformed® Line Fittings

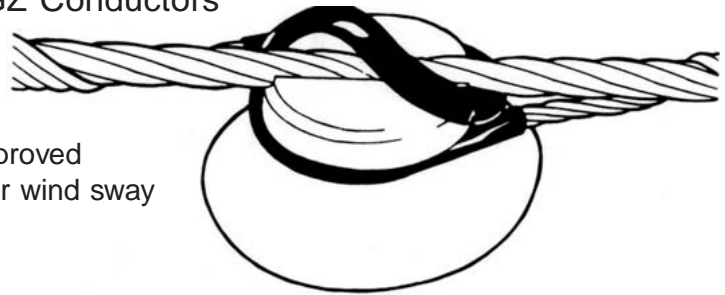
Helities®

Type AWT - Aluminium Alloy for AAC, AAAC & ACSR Conductors

Type SWT - Galvanised Steel for SC/GZ Conductors

Features

Superior to hand ties with Armour Rods Helitie® pad, and Neoprene pad provides improved protection against abrasion and fatigue under wind sway and vibration.



Line Angles

Lines angles of up to 10 degrees can be accommodated. Larger angles can be obtained using Side Ties with pins and brackets of varying cant.

Type AWT - Aluminium Helities® for AAC, AAAC & ACSR Conductor

Conductor Range	AAC/AAAC Stranding	ACSR Stranding	Aluminium Helitie®	Std. Pack
6.30 - 6.59			AWT0630(*)	50
6.60 - 6.84	7/2.25		AWT0675(*)	50
6.85 - 7.14			AWT0685(*)	50
7.40 - 7.69	7/2.50	6/1/2.50 - 3/4/2.50	AWT0750(*)	50
9.00 - 9.34	7/3.00	6/1/3.00 - 4/3/3.00	AWT0900(*)	50
10.45 - 11.14			AWT1045(*)	50
11.15 - 11.79	7/3.75	6/1/3.75 - 4/3/3.75	AWT1125(*)	50
11.80 - 12.89			AWT1180(*)	50
12.90 - 14.09	7/4.50		AWT1350(*)	50
14.10 - 15.09	7/4.75	6/4.75+7/1.60	AWT1430(*)	50
15.10 - 16.04			AWT1510(*)	50
16.05 - 16.89	19/3.25		AWT1625(*)	50
16.90 - 17.94	19/3.50	30/7/2.50	AWT1750(*)	50
17.95 - 18.99	19/3.75		AWT1875(*)	50
19.00 - 20.19			AWT1900(*)	50
20.20 - 21.49	37/3.00	30/7/3.00	AWT2020(*)	50
21.50 - 22.89	37/3.25	30/7/3.25	AWT2150(*)	50
22.90 - 24.34	19/4.75	30/7/3.50	AWT2290(*)	20
25.88 - 27.50	37/3.75	54/7/3.00	AWT2588(*)	20
28.70 - 30.30	61/3.25	54/7/3.25	AWT2950(*)	10

Type SWT - Galvanised Steel Helities® for SC/GZ Conductor

Conductor Range	SC/GZ Stranding	Galvanised Steel Helitie®	Std. Pack
4.85 - 5.04		SWT0485(*)	50
5.58 - 6.16	3/2.75+7/2.00	SWT0593(*)	50
7.37 - 7.75		SWT0765(*)	50
7.76 - 8.35	7/2.75	SWT0825(*)	50
8.65 - 8.99		SWT0865(*)	50
9.50 - 10.30	7/3.25 & 19/2.00	SWT1036(*)	50
11.76 - 12.19	7/4.00	SWT1176(*)	50

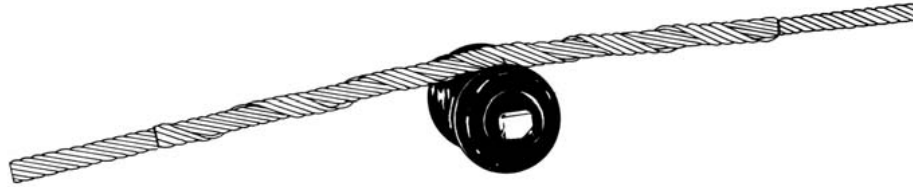
***Note:** When ordering Helities®, nominate insulator type and neck diameter as follows:

- Add suffix 7 to catalogue number for insulators with 76mm neck diameter
- Add suffix 9 for 90mm neck diameter, and
- Add suffix 1 for 112mm neck diameter.

- For conductor diameters over 21.50 we recommend that an insulator be supplied to us to ensure correct application for fitting.

Side Ties

Type AST - Aluminium Alloy for AAC, AAAC & ACSR Conductors



Application

For securing conductors to the side groove on both pin and post type insulators.

Features

Resilient Neoprene pad eliminates conductor abrasion at insulator interface, which is generated by wind sway and vibration. In such locations, Heliformed® side ties are equivalent to armour rod combinations with regard to conductor fatigue. At locations with a history of fatigue damage or excessive vibration, Heliformed® Spiral Vibration Dampers, Type SVD are recommended.

Type AST - Aluminium Side Ties for AAC, AAAC & ACSR Conductor

Conductor Range	AAC/AAAC Stranding	ACSR Stranding	Aluminium Helitie®	Std. Pack
4.95 - 5.29	7/1.75	3/4/1.75	AST0525(*)	50
7.23 - 7.79	7/2.50	6/1/2.50 - 3/4/2.50	AST0750(*)	50
9.00 - 9.34	7/3.00	6/1/3.00 - 4/3/3.00	AST0900(*)	50
10.45 - 11.14			AST1045(*)	50
11.15 - 11.80	7/3.75	6/1/3.75 - 4/3/3.75	AST1125(*)	50
13.00 - 14.00	7/4.50		AST1350(*)	50
14.00 - 15.10	7/4.75	6/4.75+7/1.60	AST1430(*)	50
15.10 - 16.04			AST1510(*)	50
16.04 - 16.89	19/3.25		AST1625(*)	50
16.90 - 17.94	19/3.50	30/7/2.50	AST1750(*)	50
17.95 - 18.99	19/3.75		AST1875(*)	50
19.00 - 20.19			AST1900(*)	50
20.59 - 21.64	37/3.00	30/7/3.00	AST2100(*)	30
22.63 - 23.95	37/3.25	30/7/3.25	AST2375(*)	30
27.80 - 30.70	61/3.25	54/7/3.25	AST2950(*)	10

***Note:** When ordering Side Ties, nominate insulator type and neck diameter as follows:

- Add suffix 7 to catalogue number for insulators with 76mm neck diameter
- Add suffix 9 for 90mm neck diameter, and
- Add suffix 1 for 112mm neck diameter.

Side Ties

Type LST - Aluminium Clad Steel for SC/GZ Conductors

Type SST -Galvanised Steel for SC/GZ Conductors

Type LST - Aluminium Clad Steel Side Tie for SC/AC Conductor Left Hand Lay standard

Conductor Range	SC/AC Stranding	Aluminium Clad Steel Side Tie	Std. Pack
5.05 - 5.29		LST0525(*)	50
5.75 - 5.99	3/2.75	LST0593(*)	50
7.29 - 8.05	3/3.75	LST0750(*)	50
8.47 - 9.35	7/3.00	LST0900(*)	50
10.46 - 11.11		LST1046(*)	50
11.15 - 11.74	7/3.75	LST1125(*)	50
14.10 - 15.09		LST1410(*)	50
16.05 - 16.89	19/3.25	LST1625(*)	50
16.87 - 17.94		LST1750(*)	50
17.95 - 18.99		LST1875(*)	40
19.00 - 20.00		LST1900(*)	40
22.90 - 24.60		LST2290(*)	25
25.88 - 27.50		LST2588(*)	25
27.51 - 30.34		LST2850(*)	25

Note: LST Side Ties may also be used on AAC, AAAC and ACSR conductors.

***Note:** When ordering Side Ties, nominate insulator type and neck diameter as follows:

- Add suffix 7 to catalogue number for insulators with 76mm neck diameter
- Add suffix 9 for 90mm neck diameter, and
- Add suffix 1 for 112mm neck diameter.

Type SST - Galvanised Steel Side Tie for SC/GZ Conductor

Conductor Range	SC/GZ Stranding	Galvanised Steel Side Tie	Std. Pack
4.80 - 5.00	7/1.60	SST0480(*)	50
5.58 - 6.16	7/2.00 & 3/2.75	SST0593(*)	50
7.80 - 8.59	7/2.75	SST0825(*)	25
9.18 - 10.13		SST0975(*)	20
10.84 - 11.69	7/3.75	SST1125(*)	20
13.30 - 14.09	19/2.75	SST1375(*)	15
14.82 - 16.36	19/3.25	SST1575(*)	10

Note: LST Side Ties may also be used on AAC, AAAC and ACSR conductors.

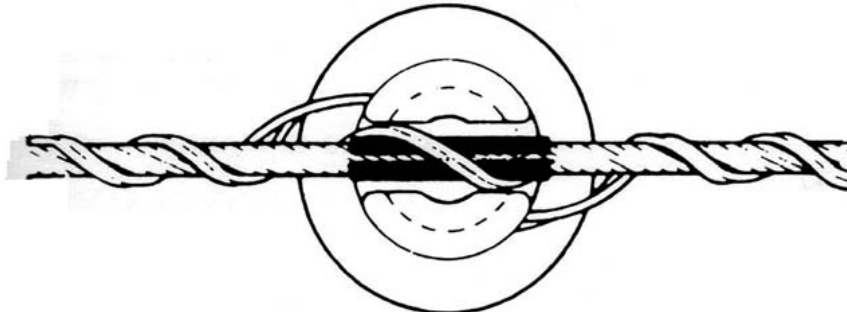
***Note:** When ordering Side Ties, nominate insulator type and neck diameter as follows:

- Add suffix 7 to catalogue number for insulators with 76mm neck diameter
- Add suffix 9 for 90mm neck diameter, and
- Add suffix 1 for 112mm neck diameter.

Distribution Ties

Type LDT - Aluminium Clad Steel for AAC, AAAC & ACSR Conductors

Type SDT - Galvanised Steel for SC/GZ Conductors



Application

For securing conductors in the top groove on both pin and post type insulators. Light duty version of a Helitie®.

Features

Resilient Neoprene pad eliminates conductor abrasion at insulator interface, which is generated by wind sway and vibration. They are recommended as an improvement, over armour rods secured with hand tire wire, as well as clamp top insulators.

Type LDT - Aluminium Clad Steel Distribution Ties for AAC, AAAC & ACSR Conductor

Conductor Range	AAC/AAAC Stranding	ACSR Stranding	Aluminium Clad Distribution Tie	Std. Pack
4.80 - 5.49	7/1.75	3/4/1.75	LDT0525(*)	50
5.50 - 6.24			LDT0593(*)	50
6.25 - 7.04	7/2.25		LDT0625(*)	50
7.05 - 7.99	7/2.50	6/1/2.50 - 3/4/2.50	LDT0750(*)	50
8.47 - 9.35	7/3.00	6/1/3.00 - 4/3/3.00	LDT0900(*)	50
10.59 - 11.69	7/3.75	6/1/3.75 - 4/3/3.75	LDT1125(*)	50
13.25 - 14.94	7/4.50 & 7/4.75	6/4.75+7/1.60	LDT1350(*)	50
14.95 - 16.99	19/3.25		LDT1625(*)	50
17.00 - 18.25	19/3.50	30/7/2.50	LDT1750(*)	50
18.25 - 19.23	19/3.75		LDT1875(*)	50
19.76 - 21.75	37/3.00	30/7/3.00	LDT2150(*)	50
21.75 - 24.58	37/3.25 & 19/4.75	30/7/3.25 & 30/7/3.50	LDT2290(*)	25
24.59 - 26.50	37/3.75	54/7/3.00	LDT2588(*)	25
27.10 - 30.20	61/3.25	54/7/3.25	LDT2950(*)	25

Type SDT - Galvanised Steel Distribution Tie for SC/GZ Conductor

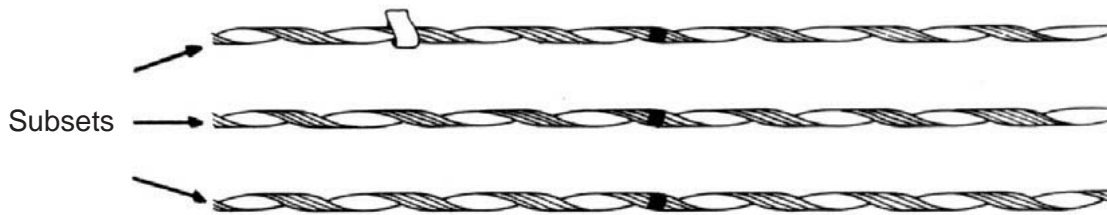
Conductor Range	SC/GZ Stranding	Galvanised Steel Distribution Tie	Std. Pack
5.58 - 6.16	7/2.00 & 3/2.75	SDT0593(*)	50
8.00 - 9.09	7/2.75	SDT0865(*)	25
9.10 - 10.30		SDT0910(*)	20

***Note:** When ordering Distribution Ties, nominate insulator type and neck diameter as follows:

- Add suffix 7 to catalogue number for insulators with 76mm neck diameter
- Add suffix 9 for 90mm neck diameter, and
- Add suffix 1 for 112mm neck diameter.

Line Splices

Type ALS - Aluminium Alloy for AAC & AAAC Conductors



Application

Joining and restorative repair on conductors of aluminium, copper and galvanised steel.

Conductivity

In all cases - aluminium alloy, copper and galvanised steel - Heliformed® Line Splices will provide conductivity equal to, or better than, an equivalent length of unspliced conductor. To ensure a good long term joint, the conductor must be scratch brushed and greased prior to the application of the splice.

Holding Strength

On all aluminium, copper and galvanised steel conductors of homogeneous stranding, Heliformed® Line Splices will hold a minimum of 90% of the ultimate tensile strength of the conductor as required by Australian Standard AS1154.1 - 2004.

Compatibility

As Heliformed® Line Splices relate to their conductor materials - aluminium, copper and galvanised steel - problems due to incompatibility do not arise.

Installation Pointers

Heliformed® Line Splices should not be reused after original installation. Restorative repair should be limited to damage in the span and should not be used at the point of support. Installation should not be closer than 150mm to existing Armour Rods or Line Splice.

Conductor Range	AAC & AAAC Stranding	Aluminium Alloy Splices	Std Pack
5.00 - 5.39	7/1.75	ALS 0525	50
6.25 - 6.54		ALS 0625	50
6.55 - 6.89	7/2.25	ALS 0675	50
6.90 - 7.14		ALS 0690	50
7.35 - 7.59	7/2.50	ALS 0750	50
8.30 - 8.64		ALS 0830	40
8.95 - 9.35	7/3.00	ALS 0900	40
10.15 - 10.49		ALS 1015	20
10.80 - 11.29	7/3.75	ALS 1125	15
13.24 - 13.84	7/4.50	ALS 1350	10
13.85 - 14.44	7/4.75	ALS 1430	10
15.10 - 15.69		ALS 1510	10
15.70 - 16.39	19/3.25	ALS 1625	5
17.05 - 17.79	19/3.50	ALS 1750	5
17.80 - 18.54		ALS 1780	5
18.55 - 19.34	19/3.75	ALS 1875	5
19.35 - 20.14		ALS 1989	5
20.14 - 20.99		ALS 2025	5
21.00 - 21.59	37/3.00	ALS 2100	5
22.89 - 24.68	37/3.25 & 19/4.75	ALS 2375	3
25.65 - 26.69	37/3.75	ALS 2625	2
26.70 - 27.74		ALS 2700	2
28.54 - 30.00	61/3.25	ALS 2930	2

Line Splices

Type CLS - Copper Line Splices for HDC Conductors

Type LLS - Aluminium Clad Steel Line Splices for SC/AC Conductors

Type CLS - Copper Line Splices for HDC Conductor

Conductor Range	HDC Conductor Stranding	Copper Alloy Splices	Std Pack
3.90 - 4.21	7/1.35	CLS 0400	50
4.80 - 5.25	7/1.75	CLS 0525	50
6.00 - 6.27	7/2.00	CLS 0600	50
6.54 - 6.87		CLS 0660	50
7.40 - 7.69		CLS 0740	30
7.70 - 8.09		CLS 0770	20
8.10 - 8.75	7/2.75 & 19/1.75	CLS 0825D	20
8.76 - 9.23		CLS 0900	15
9.24 - 9.99	7/3.25	CLS 0965	10
10.00 - 10.54	19/2.00 & 7/3.50	CLS 1000	10
10.55 - 11.08		CLS 1068	10
11.25 - 11.69	19/2.75	CLS 1125	10
12.05 - 12.54	37/1.75 & 7/4.15	CLS 1225	10
12.55 - 13.09		CLS 1255	10
13.65 - 14.09	19/2.75	CLS 1375	5
14.50 - 15.04	19/3.00	CLS 1500	5
16.39 - 17.66	37/2.50	CLS 1750	5
18.09 - 18.67		CLS 1809	5
18.68 - 19.64	37/2.75	CLS 1885	5
19.65 - 20.48		CLS 1965	2
20.49 - 21.54		CLS 2100	2
23.00 - 23.94		CLS 2300	2
28.43 - 30.65		CLS 2950	2

Type LLS - Aluminium Clad Steel Line Splices for SC/AC Conductor (Left Hand Lay standard)

Conductor Range	SC/AC Stranding	Aluminium Clad Line Splices	Std Pack
5.25 - 5.60		LLS 0525L	50
5.60 - 5.94	3/2.75	LLS 0593L	50
6.75 - 7.27	3/3.25	LLS 0700L	50
8.00 - 8.29	3/3.75 & 7/2.75	LLS 0825L	20
9.70 - 10.04	7/3.25	LLS 0975L	20
10.84 - 11.69	7/3.75	LLS 1125L	20
13.25 - 14.29	19/2.75	LLS 1375L	5
15.75 - 16.51	19/3.25	LLS 1625L	5

Line Splices

Type SLS - Galvanised Steel Line Splices for SC/GZ Conductors

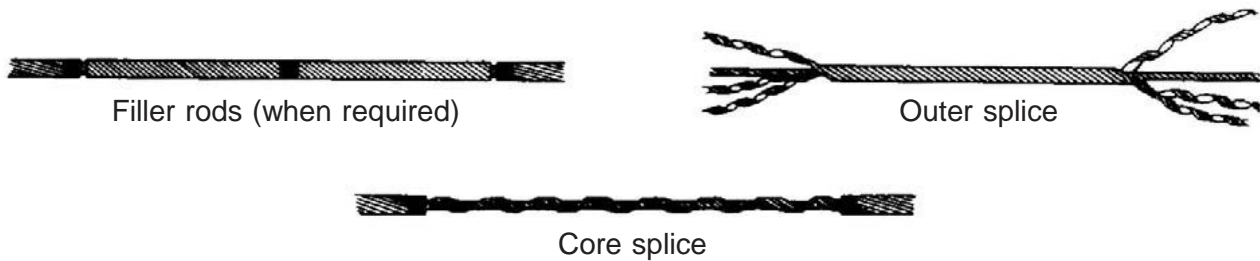
Type SLS - Galvanised Steel Line Splices for SC/GZ Conductor

Conductor Range	SC/GZ Stranding	Galv. Steel Line Splices	Std Pack
2.45 - 2.64		SLS 0245	50
4.15 - 4.49	3/2.00	SLS 0431	50
4.50 - 4.99	7/1.60	SLS 0480	50
5.50 - 5.94	3/2.75	SLS 0593	50
5.95 - 6.19	7/2.00	SLS 0600	50
6.51 - 7.01		SLS 0675	50
7.35 - 7.64		SLS 0735	30
7.92 - 8.29	7/2.75	SLS 0825	30
9.70 - 10.04		SLS 0975	20
11.15 - 11.49	7/3.75	SLS 1125	20
11.85 - 12.19	7/4.00	SLS 1200	10
3.05 - 13.99	19/2.75	SLS 1375	10
16.00 - 16.44	19/3.25	SLS 1625	5

Full Tension Line Splices

Type FTS - Galvanised Steel & Aluminium Alloy for 6/1 or 30/7 ACSR Conductors

Type MSS - Galvanised Steel & Aluminium Alloy for 3/4 or 4/3 ACSR Conductors



Application

Full Tension Splices have been designed for jointing ACSR. Two types of Full Tension Splices are available -

Type FTS - Multi Piece Construction - designed to hold both the inner steel core of the conductor, as well as the outer layers. This is of particular importance on conductors with greased cores. Filler rods may be needed on 30/7 type conductors to bridge the gap between the inner core and the outer strands, for attachment of the outer splice layer.

Type MSS - Multi Strand Construction - designed for installations on 3/4 or 4/3 type conductors. The fitting is comprised of a mixture of galvanised steel and aluminium strands, which typically match the number and strength of those used in the conductor.

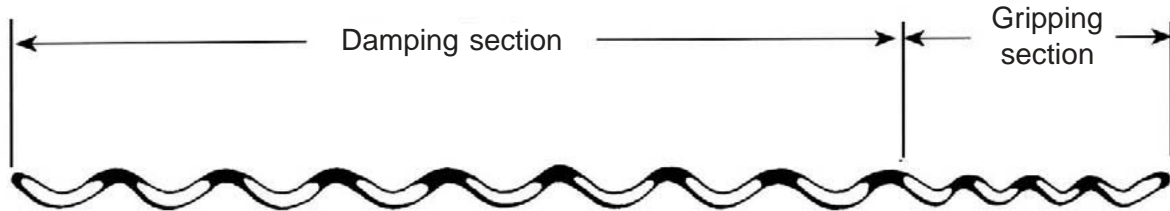
Rated Holding Strengths

On ACSR conductors, FTS and MSS fittings will hold a minimum of 90% of the ultimate tensile strength of the conductor as required by Australian Standard AS1154.1 - 2004. Splices should not be reapplied after original installation.

ACSR Conductor Stranding	FTS Full Tension Splice	MSS Multi Strand Splice	Std. Pack
3/4/1.75		MSS 0525	50
6/1/2.50	FTS 0750		30
3/4/2.50		MSS 0750	50
6/1/3.00	FTS 0900		20
4/3/3.00		MSS 0900	25
6/1/3.75	FTS 1125		10
4/3/3.75		MSS 1125	20
6/4.75 + 7/1.60	FTS 1430		10
30/7/2.50	FTS 1750		5
30/7/3.00	FTS 2100		5

Spiral Vibration Dampers

Type SVD - for all AAC, AAAC, ACSR, Copper, SC/AC & SC/GZ Conductors



Application

Spiral Vibration Dampers are designed to reduce aeolian vibration in conductors, generated by wind turbulence for conductors between 4.4mm and 19.3mm OD.

Vibration control would be recommended in areas as follows:

- In Rural Areas
- Where are normally associated with top tie insulators
- Where spans exceed 107m and/or 15% tension 16°C
- As an important supplemental protection at deadends, also at Armour Rods, Helities®, Side Ties and similar tangent support hardware

Materials

Spiral Vibration Dampers are made of solid, non-corrosive high impact strength UV resistant PVC rod. Material withstands ambient temperatures in the range -40°C to 70°C.

Installation

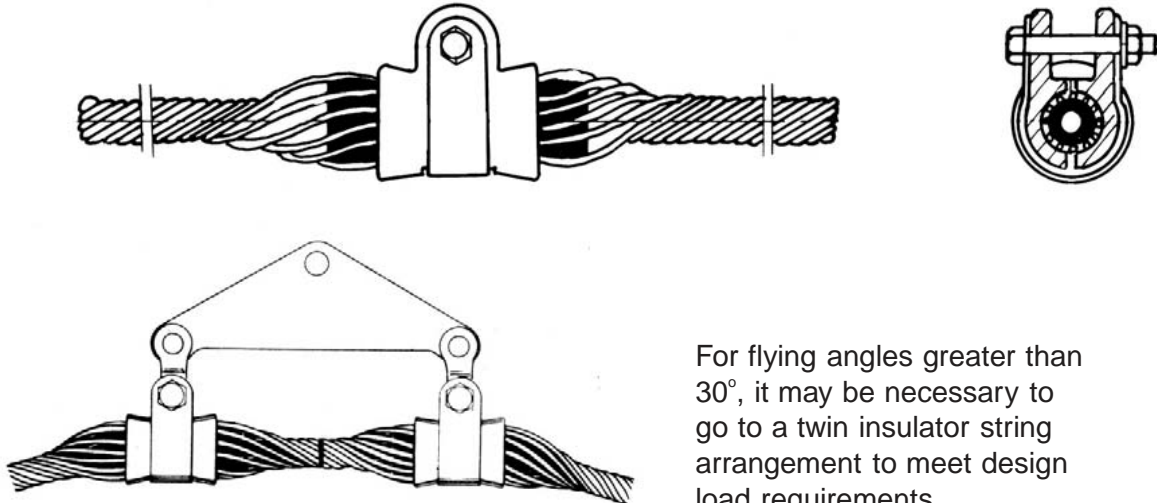
Engineering calculations are unnecessary for placement. The Gripping Section should be installed approximately 100mm to 120mm from Deadends, Armour Rods or other conductor hardware. Generally, one Spiral Vibration Damper at each end of a span is adequate. However, for spans exceeding 245 metres (800 feet), two Spiral Vibration Dampers at each end of the span are recommended.

Conductor Dia. Range mm	Catalogue Number	Std. Pack	Colour Code
4.41 - 6.34	SVD 0441	25	Red
6.35 - 8.29	SVD 0635	25	Blue
8.30 - 11.72	SVD 0830	25	Black
11.73 - 14.31	SVD 1173	25	Yellow
14.32 - 19.30	SVD 1432	8	Green

Heliformed® Suspension Units

Type HSU - Aluminium Alloy for AAC, AAAC & ACSR Conductors

Type SHS - Galvanised Steel for SC/GZ Conductors



Application

1. For the reduction of static stresses at conductor suspension points and to provide greater protection to conductors against the dynamic stresses of aeolian vibration.
2. To give conductors protection against impulse and flash-over.
3. To protect conductors against abrasion, bending and compression stresses. The protection offered by HSU fittings is superior to armour-clamp combinations.
4. To install line angles up to and including 30° and, through use of double units, up to 60°.

Materials

- Bolt and Nut - Galvanised steel
- Split pin - Stainless steel, humpback
- Strap - High strength aluminium alloy
- Neoprene insert - Formulated for resistance to ozone attack, weathering and temperature extremes. Design embodies aluminium alloy reinforcement moulded into the neoprene.
- Housing - For conductor sizes up to 9.9mm OD and for SC/GZ conductors, housings are pressed galvanised steel. For larger conductors, housings are high strength aluminium castings.

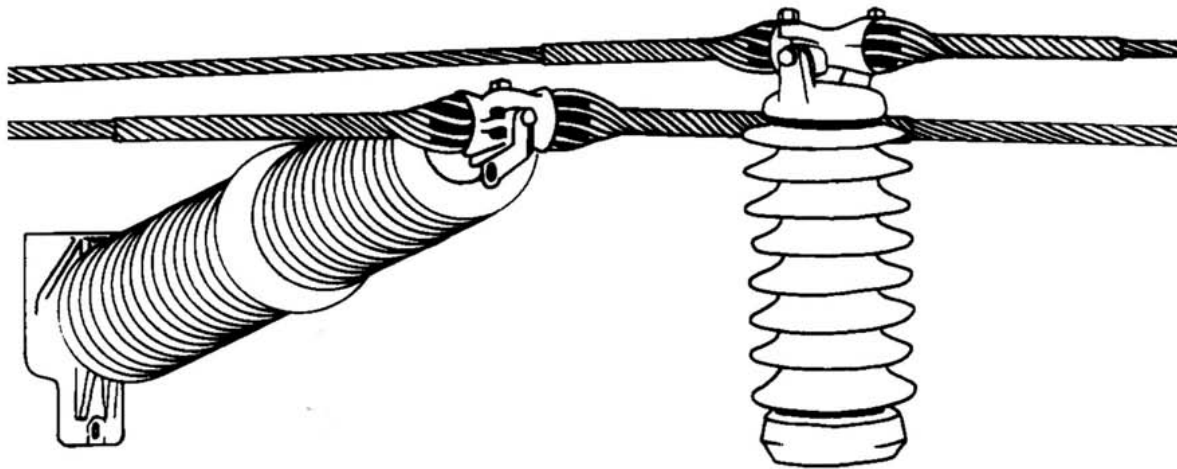
Heliformed® Suspension Units

Type HSU - Aluminium Alloy for AAC, AAAC & ACSR Conductors

Conductor Range	AAC/AAAC Stranding	ACSR Stranding	Heliformed® Suspension Unit
7.23 - 7.79	7/2.50	6/1/2.50 - 3/4/2.50	HSU 0750
7.70 - 8.34	7/2.75	6/1/2.75	HSU 0825
8.35 - 9.04	7/3.00	6/1/3.00 - 4/3/3.00	HSU 0900
9.05 - 9.89			HSU 0975
9.90 - 10.64			HSU 1050
10.65 - 11.44	7/3.75	6/1/3.75 - 4/3/3.75	HSU 1125
11.45 - 12.24			HSU 1145
12.25 - 13.04	7/4.50		HSU 1270
13.05 - 13.79			HSU 1350
13.80 - 14.59	7/4.75	6/4.75 + 7/1.60	HSU 1430
14.60 - 15.09			HSU 1460
15.10 - 15.75			HSU 1510
15.76 - 16.36	19/3.25	30/7/2.50	HSU 1625
16.40 - 17.09			HSU 1640
17.10 - 17.54	19/3.50		HSU 1750
17.55 - 18.04			HSU 1755
18.05 - 18.59			HSU 1805
18.60 - 19.09	19/3.75		HSU 1875
19.10 - 19.54			HSU 1910
19.55 - 20.19			HSU 1955
20.20 - 20.94			HSU 2020
20.95 - 21.49	37/3.00	30/7/3.00	HSU 2100
21.50 - 22.09			HSU 2150
22.10 - 22.69			HSU 2210
22.70 - 23.04	37/3.25	30/7/3.25	HSU 2270
23.05 - 23.84	19/4.75		HSU 2375
23.85 - 24.44			HSU 2385
24.45 - 25.04		30/7/3.50	HSU 2450
25.05 - 25.54			HSU 2505
25.55 - 26.44	37/3.75		HSU 2625
26.45 - 27.29		54/7/3.00	HSU 2700
27.30 - 27.69			HSU 2730
27.70 - 28.39			HSU 2770
28.40 - 28.89			HSU 2840
28.90 - 29.89	61/3.25	54/7/3.25	HSU 2930
29.90 - 30.69			HSU 2990
30.70 - 31.14			HSU 3070
31.15 - 31.99		54/7/3.50	HSU 3150
32.00 - 32.69			HSU 3200
32.70 - 33.39			HSU 3270
33.40 - 34.44	61/3.75	54/3.75 + 19/2.25	HSU 3375
34.94 - 37.66			HSU 3625

Heliformed® Support Units

Type HSP - Aluminium Alloy for AAC, AAAC & ACSR Conductors



Application

To protect conductors against fatigue, abrasion, stress damage and aeolian vibration damage when supported on line post insulators either upright or horizontally.

Materials

The unit comprises of two reinforced neoprene cushion halves for enclosing the conductor within an aluminium rod cage secured by two piece aluminium housing fitted with two hex head cap screws. The assembly mounts directly on the trunnion cap of the horizontal or upright line post insulator.

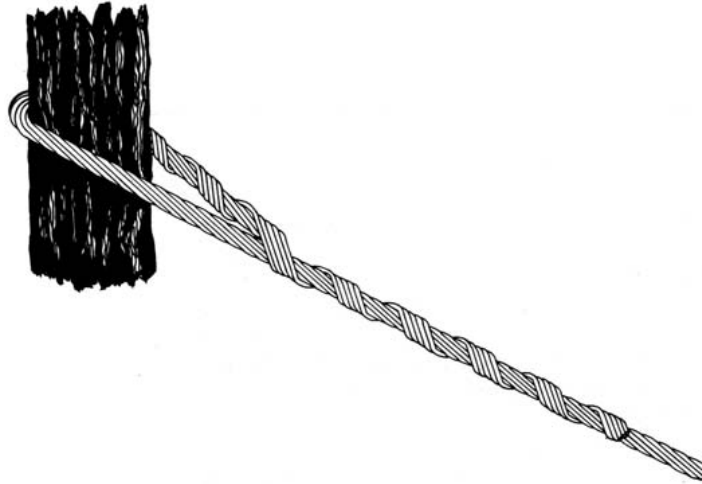
Features

Permits optimum tensioning of conductors with complete safety. Cushioned support grips the conductor gently distributing clamping stresses over a wide support area. Can accommodate line angles up to 30 degrees.

Conductor		Cond. Dia. mm	Heliformed® Support Unit	Colour Code
AAC/AAAC	ACSR			
7/3.75	6/1 + 4/3/3.75	11.25	HSP1125	Black
7/4.50	---	13.50	HSP1350	Green
7/4.75	6/4.75 + 7/1.60	14.30	HSP1430	Blue
19/3.25	---	16.25	HSP1625	Orange
---	30/7/2.50	17.50	HSP1750	Blue
19/3.75	---	18.75	HSP1875	Black

Guy Lok

Type SGL - Galvanised Steel for SC/GZ Conductors



Application

For use with galvanised steel guy strand in most guying applications. Heliformed® Guy Loks are used for a neat, high strength and fast way to secure pole anchoring guys.

Description

Heliformed® Guy Loks are designed to replace the heavier, conventional arrangements of nuts, bolts and thimbles etc. with a low profile, high strength Heliformed® Guy Lok that is quickly made and presents a neat finished appearance.

They take only moments to install or just about as long as it takes to secure one nut and bolt. Once the Heliformed® Guy Lok is in position, the assembly is complete and permanent.

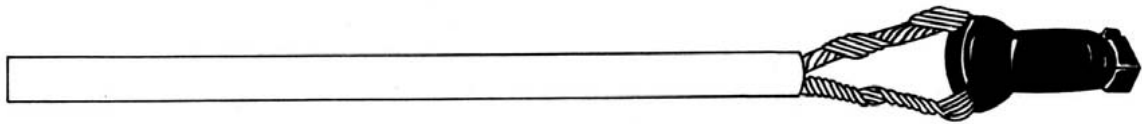
Guide to Usage

Heliformed® Guy Loks are used in single construction at the pole top where the “wrap around” method of construction is designed. It has been established that the Heliformed® Guy Lok will remain fully operative under the most difficult conditions, tension, impact, temperature extremes, in fact, any force to be met in functional performances.

Conductor		Heliformed® Guy Lok	Std. Pack	Colour Code
SC/GZ	Dia. mm			
3/2.00	4.31	SGL0431	50	Yellow
7/1.60	4.80	SGL0480	50	Black
3/2.75	5.93	SGL0593	50	White
7/2.00	6.00	SGL0600	50	Yellow
7/2.75	8.25	SGL0825	50	White
7/3.25	9.75	SGL0975D	40	Orange
19/2.00	10.00	SGL0975D	40	Yellow
7/3.75	11.25	SGL1125	25	Black
7/4.00	12.00	SGL1200	25	Black
19/2.75	13.75	SGL1375	10	White
19/3.25	16.25	SGL1625	10	Orange

Guy Guards

Type PGG - Plastic guy guard



Application

Intended where anchor / pole guys are exposed to cattle, pedestrian or vehicular traffic. To give high visibility to pole anchoring guys, and thereby collision protection in exposed positions. The plastic material is selected for its ability to retain good physical characteristics within a range of extreme temperatures. Fade resistant, gloss white, light weight PVC.

Guide to Usage

Standard lengths are shown in the table, but other lengths can be made to order.

Available in helically split or unsplit for use on existing or new installations.

Plastic Guy Guard	Internal Diameter mm	Standard Length m	Std. Pack
PGG2	25	1.8	50
PGG2S	25	1.8	50
PGG2520	25	2.0	50
PGG2520S	25	2.0	50
PGG3020	30	2.0	50
PGG3020S	30	2.0	50
PGG3025	30	2.5	50
PGG3	35	2.4	20

Note: “S” denotes Guy Guard is split helically along its length for installation on existing guys.

Bird & Swan Flight Diverters

Type BD/SD - for all types of conductors

Application

Bird Flight Diverters provide a visual image which helps birds avoid collisions with power lines. Studies show that proper installation of the flight diverters may reduce collisions by up to 90%.

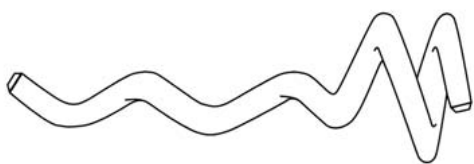
Materials

Bird flight diverters are made from solid, non-corrosive, high impact strength, UV resistant PVC rod. The material withstands ambient temperatures in the range -40° to 70° and is orange in colour as this has proven to be most effective in terms of sighting by various bird species.

Installation

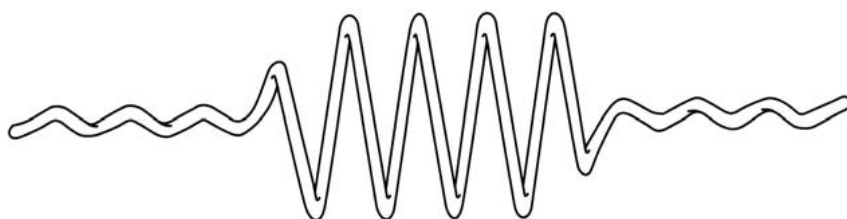
Recommended spacing for Bird Flight Diverters is 5 metres apart on each outer conductor phase, with one phase staggered at half a pitch out of line. In the case of Swan Flight Diverters, installation is recommended at a 3 - 5 meter spacing alternated evenly across all conductor phases.

Bird Flight Diverters



Conductor Dia. Range mm	Catalogue Number	Std. Pack	Colour Code
4.41 - 6.34	BD 0441	50	Red
6.35 - 8.29	BD 0635	50	Blue
8.30 - 11.72	BD 0830	50	Black
11.73 - 14.31	BD 1173	50	Yellow
14.32 - 19.30	BD 1432	50	Green

Swan Flight Diverters



Cat. No.	Conductor Range mm	Rod Dia mm	Overall Length mm	O.D. of Diverter Coil	Colour Code	Weight kg
SFD0445	4.4 - 6.3	9.5	508	175	Black	0.18
SFD0635	6.4 - 8.9	9.5	584.2	175	Blue	0.21
SFD0890	9.0 - 11.4	9.5	635	188	Brown	0.23
SFD1140	11.4 - 15.2	9.5	889	200	Green	0.32
SFD1520	15.2 - 19.6	12.7	965.2	200	Purple	0.64
SFD1960	19.6 - 21.8	12.7	965.2	200	Red	0.64
SFD2220	21.8 - 24.6	12.7	1016	200	Blue	0.68
SFD2460	24.6 - 26.7	12.7	1016	200	Brown	0.68
SFD2700	26.7 - 28.7	12.7	1168.4	200	Green	0.91
SFD3035	28.8 - 30.8	12.7	1168.4	200	Red	0.91

Low Voltage Spreader Rods

Type LVS & FGS - for all types of conductors

Application

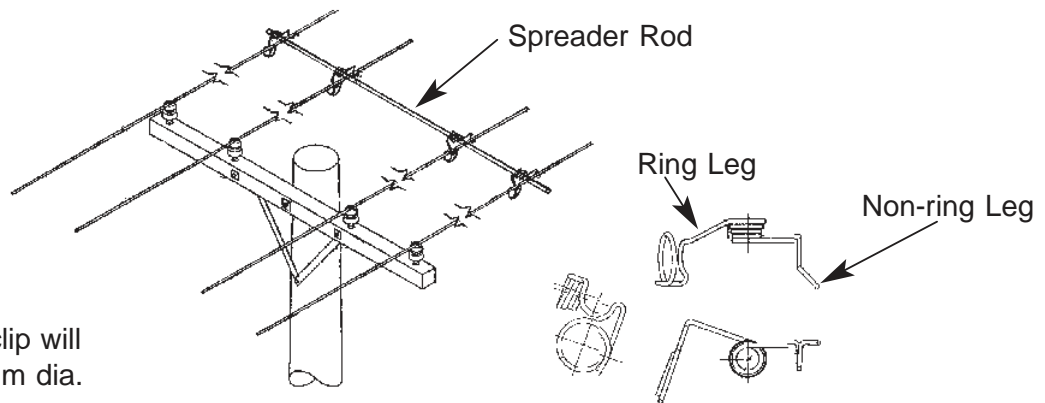
Dulmison Low Voltage Spreader Rods are used to maintain the required midspan spacing of low voltage conductors and thus preventing clashing.

Material

Low Voltage Spreader Rods are made from solid, non-corrosive high impact strength UV resistant PVC rod, or pultruded smooth skinned UV stabilised fibreglass. Material withstands ambient temperatures in the range -40°C to 70°C and is white in colour.

Installation

The spring clips are first fitted to the spreader rod at the required conductor spacings whilst on the ground. The two legs of the clip are hand sprung towards each other to enlarge the hole opening, slid along the spreader rod into position and released. Using the appropriate safety procedures, the assembled spreader rod is laid across the conductors at the midspan location. The non-ring leg of the spring clip is first hooked under the conductor, followed by the ring leg.



Note: Spring clip will suit up to 16mm dia. conductor

Stainless steel spring clip
Cat. No. FGSS125

Length	Catalogue Number	Std. Pack	Material
1350	LVS12135	50	PVC
1800	LVS12180	40	PVC
2100	LVS12210	30	PVC
2400	LVS12240	30	PVC
2700	LVS12270	25	PVC
3000	LVS12300	25	PVC
2000	FGSR125-2	25	Fibreglass
2100	FGSR125-2-1	25	Fibreglass
2500	FGSR125-2-5	25	Fibreglass
3000	FGSR125-3	25	Fibreglass

Heliformed® Line Fittings

Order/Inquiry Information Sheet

All to be supplied to AS1154 and AS2395 standard dimensions unless specified otherwise

Conductor Stranding
Conductor Diametermm
Conductor Code Name
Quantity Required

Please copy this sheet, fill in the relevant details & forward to the Tyco Electronics sales office in your region.

Company:.....

Contact Name:.....

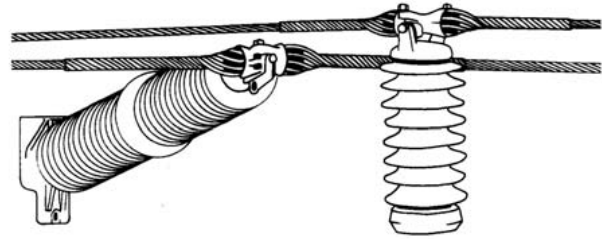
Phone No:.....

Fax/email:.....

Heliformed® Suspension Units



Heliformed® Support Units



Assembly supplied with M16 bolts as standard. Can also be supplied with M20 bolt to suit 160kN tongue fittings. Please clearly indicate type required.

M16

M20