

## Types of terminations available

The days of tying wire rope to a flying bar with a clove hitch and securing the tail with some PVC tape are long gone. Nowadays there is a wide range of fittings available. All wire terminations should be allowed to line up with the direction of pull or severe strain will be placed on the termination. The most perfect design is the strap toggle which allows rotation in all directions.



**Ferrule secured eye** Notes The most common method of termination used in theatre. Sometimes called Talurit secured eyes after a particular manufacturer. Also referred to as crimps.

Advantages Fast, well proven and economical.

Disadvantages To comply with EN13411-3:2004 the ferrules need to be applied by a competent person with the correct machinery and measuring devices. Flints find it very hard to achieve a dimensionally correct ferrule (after compression) when using hand crimpers. For lifting purposes wire rope slings should have the correct certification.



**Nicopress System** Notes A popular method of terminating wire ropes on site. The ferrules (sleeves) generally require more than one compression (when using a hand tool) which gives the Nicopress ferrule its distinctive ribbed look. Nicopress ferrules are made of copper which is plated with either tin (for stainless steel) or zinc (for galvanised wire rope).

Advantages Ability to work onsite. It is often impossible to order pre-made wire rope assemblies until items are in position.

Disadvantages Nicopress ferrules have been widely used in America for over 55 years and are specified by many industries. They are a system (ferrules and tools together) and as such are not covered by EN 13411 which covers a standard European ferrule. If using a Nicopress termination for lifting purposes it should be proof loaded.



**Roll Swaging** Notes Specially formed end fittings are compressed between rollers to attach to the wire rope. Used in particular for display and handrailing purposes and widely used on yachts.

Advantages They provide an extremely smart compact fitting without needing to turnback the wire. They can be used on non flexible wire ropes because there is no turnback needed. Screw threads can be swaged on to wire ends.

Disadvantages The fittings need to be applied with a rather expensive roll swaging machine.



**Sta Lok Fittings** Notes A range of stainless steel fittings designed to be fitted onsite with the use of only simple tools.

Advantages Allows the ability to terminate a wire onsite with a wide range of high quality fittings. The fittings are re-usable. Often used with wires which have to be threaded through drilled holes such as handrail applications. Also widely used on yachts. Can be used on non flexible wire ropes.

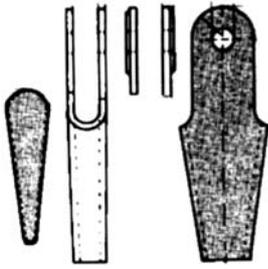
Disadvantages They are expensive.



**Wire Rope Grips - Dogs** Notes Provides a simple and effective means of making a loop or a thimble eye in wire rope. Consists of U bolt, bridge and two hex nuts. The U bolt should be fitted over the non load bearing [short] tail of the loop, the bridge over the load bearing longer part. [Remembered by the mnemonic "Never saddle a dead horse"]. The hex nuts should be tightened equally, using a nutspinner or a torque wrench. For heavier loads use grips to DIN1142 or Crosby Grips.

Advantages A flexible, cheap method of terminating wire rope.

Disadvantages They are generally losing favour for lifting purposes. Always use DIN 1142 grips for lifting but the scope of this DIN standard starts at 5mm wire ropes. In effect the load is taken by the first grip. Commercial grips are often of a poor quality



**Wedge Sockets** Notes These open wedge sockets are made according to DIN 15315. They are the preferred terminations in many industrial sectors and are popular in the theatre industry. Consists of a wedge, socket and pin. On DIN15315 wedge sockets the advice is to put one cable grip across the dead and live parts with the saddle on the loaded wire. If possible re-insert the wedge split pin. When using wedge sockets in conjunction with Flints Hanging Clamps you will need to use the Hanging Clamp Toggle as the jaw width of the wedge sockets will not fit over the clamp itself.

Advantages A very effective re-useable termination which is widely growing in favour.

Disadvantages Limited sizes available and the jaw width can be restrictive. Not for marine use.



**Automatic Deadends [Bullets]** Notes These wire terminations are guaranteed to hold 90% of the rated breaking strength of the wire in use, without slipping, or breaking the strands.

Advantages Once in service they won't let go, yet they can be re-tensioned, if necessary during installation. Widely used for catenary wires in exhibition spaces.

Disadvantages Relatively expensive. Not for marine use.



**Reutlinger Wire Rope Holders** Notes These are black wire grips specially suited for stage applications. The holder has passed testing for the TUV/GS seal and for BGV C1 and is CE marked and is issued with a CE Declaration of Conformity. They will fit 4 or 5mm diameter wire ropes giving safe working loads of 80kg [on 4mm Ø] and 130kg [on 5mm Ø]. Available in three types: eye, fork and M12 thread.

Advantages No tools whatsoever are needed to fit the grip - you just need to press down the sprung plunger and it will slide along the wire. Release it and it will grip. They are protected against accidental release by hand tightening the knurled nut on the top. They are re-useable.

Disadvantages Expensive. Not for marine use.

Typical uses Used where the fittings may be seen but the exact position has to be determined onsite. Loudspeaker positioning, display panels, foyer display, art galleries.



**Gripples** The standard Gripples are suitable where wire rope is used for static bracing but a lockable version is available for dynamic loads. Each Gripple has two channels that only allow the wire to be pushed through in one direction, in this way a termination is made by simply forming a loop, to tighten, pull on the loose end with pliers. An easy to use release key can be inserted so that the wire can be released and repositioned or disassembled. Gripples should not be used to terminate lifting slings and lifting gear in general.

Advantages A fast flexible approach to terminating steel core wire rope allowing easy tensioning of catenary wires etc.

Disadvantages Not be used to terminate lifting slings and lifting gear in general. Not for marine use.

Typical uses Overhead catenary wires and promenade lighting, aerial and marquee bracing, shade cloth bracing, tree bracing and exhibition Hall displays.



**Klein Haven Grips** These grips allow a temporary hauling line or tackle to be attached to a steel wire rope. Ideal for rigging catenary wires or for making adjustments to flown pieces without derigging.

Advantages Allows easy tensioning of catenary wires by being able to attach a fibre hauling line.

Disadvantages Not suitable for permanent anchorage.

Typical uses Tensioning overhead catenary wires in exhibition halls and taking strain off wire ropes while adjustments are made to flown pieces.

