

# Cable Termination With Nicopress® Sleeves and Tools

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Nicopress cable sleeves are one of the fundamental tools of our trade and a critical element of almost every system we install. It is important that installers know how to use these tools and gauges properly, and equally important that we understand the swaging process and how to use the gauges required to inspect their work. The following is a brief description of how to use the Nicopress documentation and gauges to inspect newly installed swages in the field.

**Important Note:** This is designed to be a summary and guide for use of the manufacturer's instructions. For specific information regarding this topic it is important that the reader review the Nicopress documents. The references for this paper are listed on the last page.

**To be installed correctly, a Nicopress swage must include the following:**

1. The correct sleeve for the cable and application.
2. The correct tool for the sleeve.
3. The correct groove in the tool.
4. The correct number of presses for the tool/groove combination.
5. The correct gauge for the tool
6. The correct arrangement of the fittings and proper inspection after crimping.

## Choosing the correct sleeve for the cable and application

Sleeves for use on galvanized steel cable in rigging systems should be solid copper. This is the Nicopress 18 series oval sleeve and 871 series stop sleeve. Tin plated copper sleeves are for use with stainless steel cable. Aluminum sleeves are not to be used for rigging applications.

## Choosing the correct tool for the sleeve

There are a variety of tools available for crimping Nicopress sleeves. Our shop typically uses the 635 series hydraulic bench tool for "pre-made" lift lines and a 3512 series hydraulic hand tool for field use. Swages on 1/4" cable produced by this machine can be recognized because the entire length of the sleeve is pressed instead of a number of discrete presses. Our installers may use any number of hand tools, some of which feature multiple grooves. Hydraulic tools are available in both hand pump and electric models, and must be used for cable sizes of 3/8 and greater. There is a part number plainly marked on each tool that can be used along with the sleeve part number and tool groove letter to look up the number of presses required on the sleeve. This information is found in the instruction sheet for the tool. There is also a partial listing of popular combinations at the end of this document. Note that there are other manufacturers of copper sleeves and crimping tools. Nicopress sleeves must be installed only with Nicopress tools in order to maintain a rated connection.

## Choosing the correct groove in the tool

Some tools have a single groove or feature single interchangeable dies or jaws, while others such as the number 63 and number 64 feature multiple grooves on one set of jaws. Marked on each die, or next to each groove on a tool there is an identifying letter that must be matched to the tool number and sleeve size in order to determine the number of presses required in a given sleeve.

## Choosing the correct number of presses for the tool/groove combination

Although the profile of each tool groove is unique, the width of the tool jaw can vary for a given groove. This is why the number of presses varies for a given groove in different tools. For instance, on 1/8" cable the Oval M groove on a number 3V-XPM tool requires two presses, but the Oval M groove on a number 63V-XPM tool requires 3 presses. This is why you must know the tool and the groove in order to find the right number of presses. The Nicopress catalog does not specify how many presses are required for each tool/groove/sleeve combination. This is found only on the engineering drawing of the sleeve and in the specific instructions for each tool. The attached sheet summarizes the combinations of tools, grooves, and presses for the sizes of galvanized steel cable we most often employ. The chart is for solid copper sleeves only. The sources of this data are the Nicopress instruction sheets listed at the end of this document.

## Gauges

Each tool is supplied with a test gauge appropriate to that tool and must be used for checking terminations. Each tool produces crimps with a unique profile that may, or may not, exactly match the profile of terminations made with other tools having the same groove number. Information on the correct gauge selection can be found in Nicopress tool instruction sheets and in the listing in this document. We have also included descriptions of popular gauges to help in identifying the correct gauge for the tool used.

## Inspecting the hardware and termination

1. Make sure that the dead end of the cable protrudes slightly from the end of the crimped sleeve.
2. In an eye splice there should be a small space between the cable thimble and the Nicopress sleeve to allow the thimble to "self align" without pushing on the sleeve.
3. Identify the tool and tool groove that was used to make the crimp, and verify that the correct number of presses was used.
4. Use the correct inspection gauge for the tool.
5. Use the correct notch in the Nicopress inspection gauge to verify that the crimp is the correct depth. The crimp should pass into the correct part of the gauge without being forced.

If the presses are found to be not deep enough, the tool must be adjusted and the sleeve may be re-crimped *in the same locations and alignment as the existing presses*. Do not re-crimp the sleeve more than once. The tool should be checked every 50 presses or as required to keep the presses within specifications. Finally, although a properly installed Nicopress connection is certified to be equal to the strength of the cable, it should be noted that the manufacturer does call for all critical applications to be proof load tested.

**Nicopress® Tool Groove, And Crimp Combinations <sup>(3)</sup>**

<b>Cable Size</b>	<b>Application</b>	<b>Copper Sleeve <sup>(1)</sup></b>	<b>Tool Number</b>	<b>Tool Groove / Die</b>	<b>Presses Req.</b>	<b>Gauge <sup>(2)</sup></b>
1/8	Eye Splice	18-3-M	51-M-850	OVAL M	3	2930
1/8	Eye Splice	18-3-M	64-CGMP	OVAL M	3	2930
1/8	Eye Splice	18-3-M	63V-XPM	OVAL M	3	2930
1/8	Eye Splice	18-3-M	51-MJ	M	2	2931
1/8	Eye Splice	18-3-M	3V-CGMP	OVAL M	2	2930
1/8	Eye Splice	18-3-M	3V-XPM	OVAL M	2	2930
1/8	Eye Splice	18-3-M	3V-F6:X:M	OVAL M	2	2930
1/8	Eye Splice	18-3-M	5506 Battery Tool	6-OVAL M	1	2930
1/8	Eye Splice	18-3-M	3512 Hydraulic	12-Oval-M Die	1	12-Oval M
1/8	Eye Splice	18-3-M	635 Hydraulic	Oval M	1	3376
1/8	Stop	871-18-J	51-MJ	J	1	2931
1/8	Stop	871-18-J	3-MJ	J	1	2931
1/8	Stop	871-18-J	3512 Hydraulic	12-J Die	1	2931
1/8	Stop	871-18-J	5506 Battery Tool	6-J	1	2930
3/16	Eye Splice	18-6-X	51-X-850	Oval X	4	2930
3/16	Eye Splice	18-6-X	63V-XPM	Oval-X	4	2930
3/16	Eye Splice	18-6-X	3-X-850	Oval X	2	2930
3/16	Eye Splice	18-6-X	3V-XPM	Oval X	2	2930
3/16	Eye Splice	18-6-X	3V-F6:X:M	Oval X	2	2930
3/16	Eye Splice	18-6-X	3512 Hydraulic	12-Oval-X	2	3377A
3/16	Eye Splice	18-6-X	635 Hydraulic	Oval X	1	3375
3/16	Eye Splice	18-6-X	5506 Battery Tool	6-Oval-X	2	2930
3/16	Stop	871-20-M	51-MJ	M	1	2931
3/16	Stop	871-20-M	3-MJ	M	1	2931
3/16	Stop	871-20-M	3512 Hydraulic	12-1-M Die	1	12-1M Gauge
3/16	Stop	871-20-M	5506 Battery Tool	6-1M	1	2930
1/4	Eye Splice	18-10-F6	3-F6-950	OVAL F6	3	2930
1/4	Eye Splice	18-10-F6	3V-F6-X:M	OVAL F6	3	2930
1/4	Eye Splice	18-10-F6	3512 Hydraulic	12-Oval-F6	2	3377A
1/4	Eye Splice	18-10-F6	635 Hydraulic	OVAL F6	1	3375
1/4	Eye Splice	18-10-F6	5506 Battery Tool	6-Oval-F6	2	2930
1/4	Stop	871-23-F6	3-F6-950	OVAL F6	2	2930
1/4	Stop	871-23-F6	3V-F6-X:M	OVAL F6	2	2930
1/4	Stop	871-23-F6	3512 Hydraulic	12-Oval-F6	2	3377A
1/4	Stop	871-23-F6	5506 Battery Tool	6-OVAL- F6	2	2930
5/16	Eye Splice	18-13-G9	3-G9-950	OVAL G9	4	2930
5/16	Eye splice	18-13-G9	3512 Hydraulic	12-Oval-G9	3	3377A
5/16	Eye splice	18-13-G9	635 Hydraulic	OVAL G9	1	3375
5/16	Eye splice	18-13-G9	5506 Battery Tool	6-OVAL-G9	4	2930
5/16	Stop	871-26-F6	3-F6-950	OVAL F6	2	2930
5/16	Stop	871-26-F6	3V-F6-X:M	OVAL F6	2	2930
5/16	Stop	871-26-F6	3512 Hydraulic	12-Oval-F6	2	3377A
5/16	Stop	871-26-F6	5506 Battery Tool	6-OVAL-F6	2	2930
3/8	Eye Splice	18-23-H5	3512 Hydraulic	12-Oval-H5	4	3377A
3/8	Eye splice	18-23-H5	635 Hydraulic	OVAL H5	1	3375
3/8	Stop	871-27-F6	3-F6-950	OVAL F6	2	2930
3/8	Stop	671-27-F6	3V-F6-X:M	OVAL F6	2	2930
3/8	Stop	871-27-F6	3512 Hydraulic	12-Oval-F6	2	3377A
3/8	Stop	871-27-F6	635 Hydraulic	OVAL F6	1	2930
1/2	Eye Splice	18-25-K8	3512 Hydraulic	12-Oval-K8	6	3377A
1/2	Eye Splice	18-25-K8	635 Hydraulic	OVAL K8	2	3376

**NOTES:**

1. Only solid copper sleeves are appropriate for rigging applications using galvanized steel cables.
2. See the following chart for a visual description of the gauges listed in this table.
3. Other too and groove combinations may exist. Consult National Telephone Supply Company.

<b>Nicopress® Gauge Descriptions</b>	
2930	“NICOPRESS OVAL & STOP SLEEVE GAUGE” GROOVES: VX, VP, VG, VB4, VC, VM, VF2, VF6, &G9 5/32” diameter Hole FINISH: Black Oxide
2931	“NICOPRESS SLEEVE GAUGE GROOVE E-J-M-P-T-X” 5/32” diameter Hole FINISH: Clear Chromate
3375	“635 OVAL SLEEVE GAUGE” GROOVES: J8, H5, G9, F6, F2, & X 1/16” diameter Hole FINISH: Black Oxide
3376	“635 OVAL SLEEVE GAUGE” GROOVES: N5, M1, K8, P, M, G, C, & B4 3/16” diameter Hole FINISH: Black Oxide
3377A	“3512 OVAL SLEEVE GAUGE” GROOVES: K8, J8, H5, G9, F6, F2 & X Punched Hole FINISH: Black Oxide
3377B	SINGLE GROOVE GAUGES: “12-OVAL B4”, “12-OVAL C”, “12-OVAL G”, “12-OVAL M”, and “12-OVAL P” FINISH: Black Oxide
12-1M Gauge	SINGLE GROOVE GAUGE: “12-1M” FINISH: Black Oxide

### References:

1. Nicopress catalog No. 4 dated 6/00/WT
2. Nicopress Instruction number 32, revised 1/31/95: “Instructions for splicing flexible steel cables with Nicopress sleeves and tools”
3. Nicopress Instruction number 50, revised December 1996: “Nicopress No. 635 Hydraulic Tool”
4. “Nicopress Products No. 3512 Hydraulic Hand Compressor Operation, Service Instructions & Parts List”
5. Nicopress Instruction number 5506, “Model 5506 Battery Powered Compression Tool”

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