

Colligo Dux Lifeline Kit



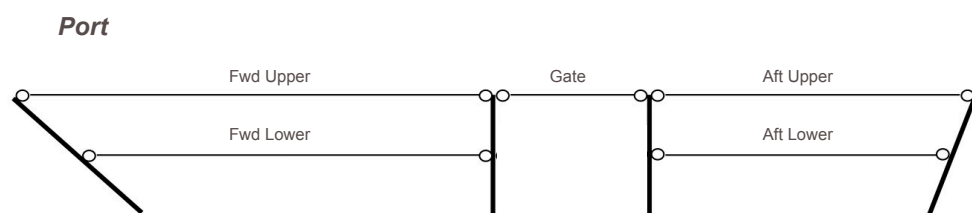
Thanks for purchasing the Colligo Dux synthetic lifeline kit! Dynex Dux is the future of yacht rigging - indeed many boats are currently sailing with full Dux rigs, right on up to the masthead. Dynex Dux is stronger than steel, extremely light and much easier on hands and sails than the wire that your'e likely replacing. It won't corrode beneath the plastic white cover like wire, and it will stand up the harsh tropical sun. Colligo Dux Lifeline kit is the ultimate DIY project - Dux is easy to splice, easy to install and enjoyable to work with.

We recommend reading the installation instructions in their entirety before beginning your project. Dynex Dux is in fact easier to splice than most other line, including double-braid and even three-strand. However, there are certain properties of Dux which make it desirable - like it's low friction - which make it important to splice correctly to get the most strength out of the line. Once you're comfortable with the instructions, complete one section of lifeline at a time, right on through to it's installation and tensioning - that way you'll be sure you've measured correctly and can continue with the project confidently. See www.colligomarine.com for more information, videos on splicing and to take a look at Colligo Marine's other innovative marine products.

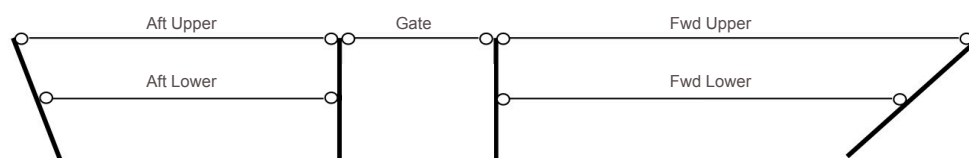
Measuring Instructions:



Before splicing, it's important to measure each section of lifeline. On a boat with gates port and starboard, and both upper and lower lifelines, you will end up with eight sections of Dynex Dux lifelines (two foreword uppers per side, two foreword lowers per side, two after uppers and lowers per side), and one Dyneema gate per side. That's ten total sections, twenty total splices and twenty lashings. It helps maintain order to create a drawing of your lifelines, labeling port and starboard, upper and lower, and filling in the measurements before you begin splicing. Check off each as you go. See template below.



Starboard



Dux lifelines are installed with lashings instead of turnbuckles - they make for easy installs and are vastly simpler (and lighter) than a turnbuckle. For a professional install, each lashing should be equal length, assuring an aesthetic look. Dux shrinks and stretches during splicing - but if you adhere to the old adage "measure twice, cut once" you'll end up okay.

When measuring Dux, take into account an appropriate lashing length. We recommend 6 inches. This allows the lashings to sufficiently tension the lifelines when set up. To measure your lifeline sections, run the tape from the "bearing point" at each end. For example, if you have welded eyes on your bow pulpit, the "bearing point" is on the inside portion of the eye, against which the lashings will "bear." Take these measurements **after** you've installed the gate eyes, if needed (see "Gate Eyes" below).

★ Measure each length. Subtract one foot from the "bearing point" measurements, to account for the lashings at each end. There will be static lashings amidships, and adjustable lashings fore and aft, one for each section of lifeline. Aesthetically, the static lashing should be the same length as the adjustable lashing, for symmetry.

★ Dynex Dux is essentially treated Dyneema, or SK-75 fiber, technically speaking - the resulting braid is incredibly stiff and stretch is nonexistent. By splicing it, however, you are in effect loosening the braid. You're also shortening the line. You must accommodate for this:

For each section, you will need to add the following:

- 14" for the bury
- 6" for the eye
- 1" for the length lost during splicing

You'll end up adding a grand total of 42" to each "bearing point" length you just diagrammed above. For example, a ten-foot section would require 10' plus 21" per splice (42" total), for a total of 10' 42" or 13' 6."

★ Once you have your measurements, splice up **only one section at a time, and only one end** of each section (the midships ends, on installs with gates). You must splice the other end in place, as you'll need the bitter end to "reeve" (pass through) through the stanchions. Splicing and installing one section at a time ensures you are measuring correctly as you go.

★ With one end spliced and the terminator installed, reeve the bitter end through your stanchions. You can now splice the other end in place. The last step is to install the lashings.

Recommended Tools:



Though Dynex Dux can and has been easily spliced using only a magic marker, one chopstick and a pair of scissors, like most things, it's vastly easier when you have the right tools. Every DIY rigger should have a handful of tools anyway, so these recommendations ought to get you off to a good start - and they'll make your Colligo lifelines that much easier to install.

25' Tape Measure

One small Swedish (open) fid.

At least one additional fid, about 1/4" diameter.

Black magic marker.

Ceramic rigger's knife.

3M White electrical tape.

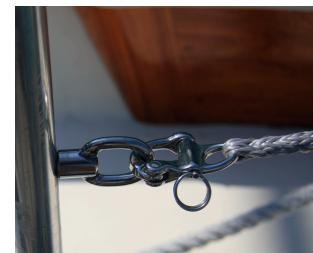
Optional Gate Instructions:



Any lifelines can be installed with or without gates, which is strictly an owner preference. Lifelines without gates are inherently stronger and simpler, yet decidedly more inconvenient, especially dockside.

1/4" standard Dyneema is used for Colligo lifeline gates - the strength is inherent, and untreated Dyneema is vastly more flexible than Dynex Dux, making it better suited to the gate application.

Begin by taking the "bearing point" measurement. Again, subtract twelve inches - six for the lashing, and six for the pelican hook, which we'll splice directly to the end of the gate. The pelican hook splice is even easier than a standard locking brummel, as both ends of the line are available and you do not need to invert the hole at Mark 1 (...read on).



(Older-style gate snap shackle shown - note tight eye splice on shackle).

First, measure 14" from the bitter end and make Mark 1. Then, reeve the bitter end through the hole in the pelican hook. You'll be making a very tight eye, so Mark 2 will be just on the other side of the pelican hook - obviously, you must complete the splice with the hook in place. With the Swedish fid, pass the bitter end through Mark 1 (again, six strands each side of the hole). Now, take the standing end, or long end, and pass it's end through Mark 2 in the same fashion. You'll end up with the same locking brummel, arrived at by a slightly easier means.

Bury and taper the tail as above, then splice a terminator into the other end. You'll have to attach the fid to the Dyneema and bury them together. Tightly wrap tape around the Dyneema, insert into the end of

Splicing:

To maintain strength, Dux - due to low-friction - must be "buried" 72 times it's diameter (14 inches for 5mm). By burying the line after the splice, you create a "finger trap" effect - the braid compresses when the line is tensioned, holding the buried part in place. By relieving the strain on the splice itself, a Dux eye-splice is stronger than the line - in strength tests, if spliced correctly, the line will break before the splice pulls out.

★ One: Begin by measuring 14" (the bury distance) from the bitter end, and put a black mark. This is Mk 1.

★ Two: From Mk 1, measure 6" away from the bitter end, and put two marks. This is Mk 2. The distance from 1-2 is the eye. Test by fitting the Terminator - Mk 1 & 2 should line up just below the Terminator's point.

★ Three: Insert a Swedish fid into Mark 2, making sure that six strands appear on each side of the fid. Reeve the bitter end of the line through the fid until Mark 1 has come through the opening at Mark 2.

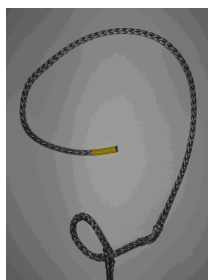
Check #1: You should now have a loop, about the size of the terminator. The next step will create the "locking" brummel. Your loop should be in an "up" position in front of you, with the bitter end of the Dux exiting to your right, Mark 1 through the hole at Mark 2 and also to the right of the loop.

★ Four: Insert the Swedish fid into Mark 1, from top to bottom, again ensuring six strands appear on each side of the opening. Reeve the bitter end **down** through the opening in the fid, making a second loop about the same size as the first.

Checkpoint #2: You should now have two loops, each "up." The bitter end should be exiting Mark 1 and curling back towards your right (see photo).

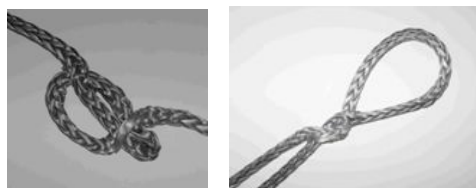


★ Five: Pull the bitter end through Mark 1, inverting the hole in the process. Be sure to keep the first loop "up." It may take some coaxing to get the hole to invert itself. Be sure to keep the inverted hole aligned correctly - don't let the line twist.



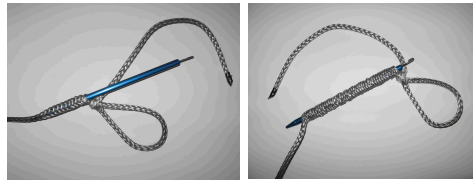
★ Six: Work the inverted hole open as wide as possible using two fids. Again, ensure as you work that the inverted hole remains in the same alignment it was when you made it.

★ Seven: "Dive" the loop it down through the newly opened inverted hole, from your left to right. As it comes through, the inverted hole will "flip" inside-out again. Once the loop is through, open it up and you will feel the brummel splice "lock" into place.

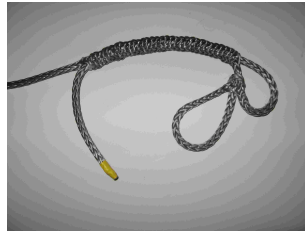


Checkpoint #3: You now should have an eye the size of the line terminator, a locked brummel splice, and a tail about 14" in length.

★ Eight: You should now be able to insert the terminator into the eye you've made with the brummel. You will have to "work" the eye to fit it, and it should be tight. Measure about 20" along the standing part from the eye and make three black ticks, Mark 3. This is where your tail will "exit" after the bury, and is about 6" longer than the tail itself. Then choose an intersection of strands as close to the bottom of the brummel splice as possible, and insert a fid into the center of the line. Work the dux like an accordion to create some slack to facilitate the fid's entry. Run the fid through the center of the line like an inch worm, until you reach Mark 3. Exit here, keeping the dux "accordioned."

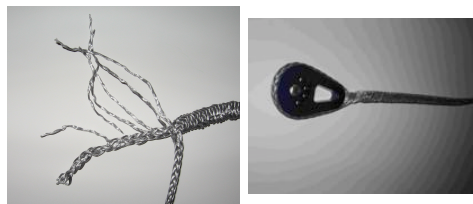


★ Nine: If you've carefully cut the line at a 45 degree angle, you should be able to insert the tail into the standing end, following the path your fid just took. Use some tape if the fibers get caught on one another. Inch-worm the tail through until it exits at Mark 3.



★ Ten: "Accordion" the standing line as much as possible to expose the tail. Measure the tail that exits at Mark 3 - you should have about 8-12 inches exposed. Since Dux has 12-strands, and the goal is to create as even a taper as possible, divide your measurement by 12, and place a mark around the full circumference of the tail (thereby touching each of the 12 strands with ink) at each increment (ie: with 12 inches exposed, you'd mark every inch).

★ Eleven: Beginning with the mark furthest from the bitter end, pull one strand out with a fid (the first one is very challenging, as the Dux braid is incredibly tight). Move to the next mark, pull a strand, and so on. When completed, you should have eleven strands "pulled," the twelfth remaining at the end. Using a very sharp knife or scissors, carefully cut each strand. "Un-accordion" the standing part of the line, smoothing it out as you go, thereby burying your tail inside. You should be left with a perfect splice and a nice, even taper.



Finish Check: Check to ensure the terminator fits snugly in the eye (a little slack is okay). Check the brummel - the line should appear to go through itself twice, and should not appear inside-out, but should look very smooth. Check the taper - during the bury, the line surrounding your taper actually shortens (as it's made wider due to the line now inside it). Try smoothing the taper once more, or cutting the protruding strand (if any) if no more than 1/2" sticks out.

the fid, tape in place, then bury the fid and line together, remembering to "exit" six inches further down the line as you did in the lifeline splices above.

Fix the pelican hook to one side of the gate and lash the other end. Adjust the lashing to achieve the correct tension in the gate to ensure the pelican hook opens and closes easily, yet maintains the tension in the closed gate. Voila!

Installing Gate Eyes:

These consist of one shank with threads on either end, and the two eyes which screw onto it. You'll want to dry fit the gate eyes first - they should be screwed down tight, and the eyes should both line up vertically, to give the nicest look.



When ready to install permanently, apply a generous amount of red Loctite on the threads of both eyes - it may take a vice grip to get both sides unscrewed. With the Loctite applied, thread the eyes back on with the shank in place. You can ensure the eyes line up, as the Loctite will hold them in place.

Lashing Instructions:

The midships ends of each lifeline section will be statically lashed. Tie a double-figure-eight knot around the first lashing hole in the terminator. Reeve the bitter end of the lashing through the stanchion eye and back through the second lashing hole. Adjust the length to six inches and tie another double-figure-eight knot. You now have a "stopper knot" or static lashing.



At the forward and aft ends, you'll install adjustable lashings, to take tension. Begin by tying the same double-figure-eight knot in the first lashing hole and reeving the bitter end back and forth between the stanchion eye and the terminator. At the second pass through the stanchion eye, tie a series of half-hitches around the lashing line, until you have knots up to about halfway across the gap. After the final half-hitch, tie a simple overhand knot in the bitter end to prevent the half-hitches from untying themselves. Both your static and adjustable lashings should be the same length and can be adjusted if they are slightly off.

