



Novel Solutions



Machinery Design * Automation * Product Development * Microcontroller Applications

Striving To Create A More Productive World Through Applied Problem Solving

QuickFish Testing, Limitations, And Uses



Introduction

The patented QuickFish product is a labor and time saving device intended for the electrical construction industry. This product provides a simple solution for the manual installation of pull strings within electrical conduits, by eliminating most of the footwork associated with manual pull string installations. Instead of using a fish tape to pull the strings into a conduit system, this device is utilized by the fish tape to push the strings into the conduit system, so that the electrician, the fish tape, and the polyline dispenser are almost always in the same location, thus eliminating most of the footwork associated with manual pull string installations.

In an effort to promote efficient use of the QuickFish product, it is the intent of this document to help provide a better understanding of its uses and limitations, as well as a few other tips.

As mentioned, the QuickFish Rapid Pullstring Installation Device can be a very useful tool for saving time and labor, however this product does have limitations. Please keep in mind, that in many instances, shoving a fish tape by itself, through a complicated conduit run, can be quite difficult, and using this product in combination with a fish tape can make it even more difficult. If a fish tape is unable to make its way through a conduit run, the QuickFish product won't make it either.

When using the QuickFish product, it is important to remember that this product is under constant tension until it exits a conduit run. This tension exerts pressure against the inside walls of the conduit, which in turn causes friction. Any increase in friction or obstacle in the conduit run will greatly decrease the successful use of the product. It should be obvious, but it is worth noting that higher quality conduits have a smoother finish on the inside walls, which in turn reduces friction for any pulling procedure. QuickFish can be used with lower quality conduits, but higher quality conduits will help reduce the friction against the QuickFish product and provide better results. The reduction of friction is important, but even more important is an obstacle free conduit run.

As mentioned in the QuickFish instructions, this product should only be installed into an empty and professionally constructed conduit system, which meets or exceeds all applicable national, state, and local electrical codes. The utmost care must be taken to ensure that all conduit ends are cut flush and reamed to the proper cross sectional diameter, that there are no kinks in the conduit run, and that all bends have the proper radius.

Testing Of The QuickFish Product Line

Considering that each conduit run is unique, it would be impossible to test the product for every possible scenario that may be encountered. The QuickFish product was initially tested in short conduit runs, having four ninety-degree bends, and the product went through with no problems at all. Prior to the release of the product, all sizes (1/2", 3/4", 1", and 1-1/4") of the product were tested in similar conduit runs, using one hundred feet of EMT conduit and either two or four ninety-degree bends. Figure 1 and Figure 2 depict the conduit runs used for testing. In Figure 1, forty feet of conduit was laid, followed by three consecutive ninety-degree elbows, with each elbow having a ten-foot section of conduit attached, and finally another elbow, with another thirty feet of conduit attached. So in other words, the test run of Figure 1 consisted of one hundred feet of conduit and four ninety-degree bends. The test run of Figure 2 is simply a straight one hundred foot conduit run, with a ninety-degree elbow attached at each end, to simulate a back-to-back run. It is noteworthy to mention that we used the lowest quality conduit available to simulate the real life conditions of cutting material costs and thus putting our test run in close proximity to the worst possible scenario, while remaining within NEC regulations.

During the tests performed in the conduit run of Figure 1, all sizes of the QuickFish product worked as expected up to the fourth ninety-degree bend. When encountering the fourth ninety-degree bend, identical problems occurred at the same location, with all the different sizes. Up to this point, the product worked flawlessly, and had gone through three ninety-degree bends and approximately seventy feet of conduit, without any difficulties. The problem appeared to be an issue of jamming due to friction, and perhaps could have been avoided, by using a higher quality conduit. In the future, when some of the investment has been returned on this product, a similar conduit run might be constructed from glass tubing, just to provide a glimpse of what was actually happening. As for the tests performed in the conduit run of Figure 2, they were a complete success. Each size of the QuickFish product line went through a one hundred foot back-to-back run, like a hot knife going through warm butter.

In the case of the surmised jamming that occurred during the tests of Figure 1, the QuickFish product, the fish tape, and the pull string were all safely removed in every instance. It was simply a matter of grasping the fish tape and the pull string as a unit and pulling them out together.

Figure 1. Illustration of a conduit run used for testing the QuickFish product line.

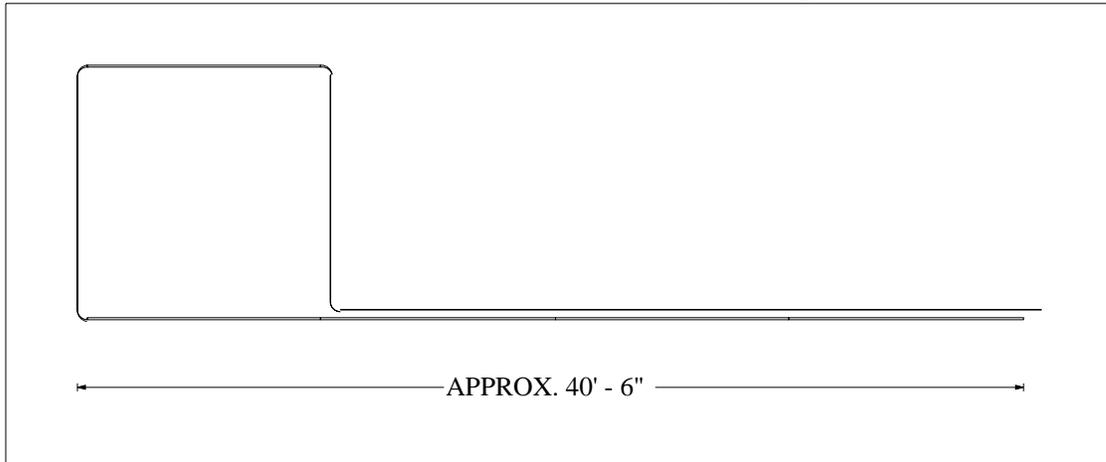
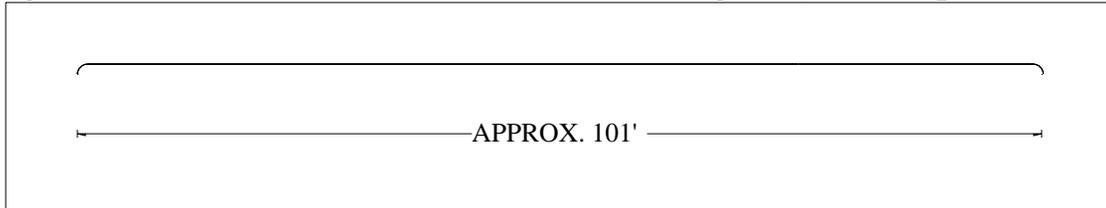


Figure 2. Illustration of a conduit run used for testing the QuickFish product line.



As you can imagine, during the development of this product, additional tests were performed at various stages. Throughout all the testing of this product, there was only one instance in which the product became disengaged from the fish tape. In this instance, the fish tape was first removed from the conduit and was followed by the removal of QuickFish product and pull string. During the removal of the pull string, the QuickFish product became momentarily jammed, and it became necessary to exert a greater pulling force upon the pull string. At which point, the QuickFish product gave way and was easily removed. Upon removal and inspection, it was readily apparent that the QuickFish product was highly disfigured. This basically indicates that the tensile strength of the pull string was greater than the moment of elasticity of the spring wire, from which the QuickFish product is manufactured, which means that the wire will bend before the pull string breaks. The removal of the QuickFish product in this manner should not be a problem, unless the conduit run is improperly constructed, in which case, if the ends of the conduit are not cut flush, it is perhaps possible that the wire could become jammed between the mating surfaces of a coupling and a section of conduit.

Suggested Limitations Of The QuickFish Product

As mentioned earlier, every conduit run is unique, so each use of this product will most likely be unique. However as indicated by the tests mentioned above, the following limitations are suggested:

- Conduit runs having one hundred feet or less of conduit, and two or less ninety-degree elbows.
- Conduit runs having one hundred feet or less of conduit, with three ninety-degree elbows, with the last elbow being placed no further than sixty feet from the beginning of the conduit run.
- Conduit runs having fifty feet or less of conduit, and four ninety-degree elbows.

As mentioned earlier in this document, these suggested limitations may be overcome with the use of higher quality conduits and well-constructed runs.

As you begin to experiment with the QuickFish product and become accustomed to its abilities, you will acquire a knack for judging the conduit runs and successful use of the QuickFish product. It is our recommendation to identify non-conforming conduit runs with a permanent marker. For instance, if you believe the QuickFish product will have a hard time making it through a conduit run, use a permanent marker and place a dot on the exterior of the junction box where the run is attached or on the conduit itself. As an alternative, you could mark conforming conduits instead.

Suggested Uses For QuickFish Product

The current version of the QuickFish product line is primarily intended for EMT conduit installations, and we do not advise attempting the use of this current version in other types of conduit, mostly because it has not been tested for other types of conduit applications. In theory, it should work well with other types of conduit, but if removal becomes a necessity, the QuickFish product will most likely become disfigured during the removal process.

Referring back to the first paragraph of the introduction, it was stated:

“The patented QuickFish product is a labor and time saving device intended for the electrical construction industry. This product provides a simple solution for the manual installation of pull strings within electrical conduits, by eliminating most of the footwork associated with manual pull string installations. Instead of using a fish tape to pull the strings into a conduit system, this device is utilized by the fish tape to push the strings into the conduit system, so that the electrician, the fish tape, and the polyline dispenser are almost always in the same location, thus eliminating most of the footwork associated with manual pull string installations.”

The preceding paragraph is of the utmost importance, especially pertaining to power distribution cabinets, communication distribution cabinets, pull boxes, and junction boxes, which have numerous conduit runs entering or exiting, or when there is difficulty accessing one end of the conduit run. To help explain the importance and the potential possibilities, two examples will be provided.

In example one, there is a communication cabinet, which has one hundred conduit runs exiting from the cabinet, and each conduit run must have a pull string installed for future pulling purposes. Let's further assume that eighty percent of the runs have been approved for QuickFish product use. By using the QuickFish product line, an electrician

could position himself/herself in front of the communication cabinet, along with a fish tape and a bucket of polyline, and install pull strings in eighty percent of the conduit runs, without moving or taking an additional step, thus eliminating the need for a second person or the back and forth walking associated with those specific eighty percent of conduit runs.

As for example two, let's assume there is a five gang switch box at ground level, with five conduit runs that each lead to a separate overhead light. Each of these overhead lights is thirty feet above ground level within a warehouse and all five conduits have been approved for QuickFish product use. By using the QuickFish product line, without the use of any hydraulic lift or ladder, an electrician could position himself/herself in front of the five gang switch box, along with a fish tape and a bucket of polyline, and install pull strings in all five of the conduit runs, without moving, taking an additional step, manipulating and climbing a ladder, or using a hydraulic lift. In which case, it would eliminate the need for a second person, the hassle of moving ladders, back and forth walking, and/or perhaps the cost of renting a hydraulic lift.

To our knowledge, there is no other piece of non-powered (compressed air or vacuum) equipment or hardware that can make such a claim as the previous examples. And of course, the use of this product could save time for other polyline installations as well.

As an additional note and as previously mentioned, the QuickFish product is manufactured from spring wire, and it is resilient enough to reuse, providing they are properly gathered and stored upon being removed from the conduit runs.

Summary

As the proprietor of Novel Solutions and a co-inventor of the QuickFish product, I truly hope that you will give our useful product a serious trial in an effort to save money. At the bare minimum, we advise stocking your service trucks with at least one package of each size, in anticipation of emergency one-man pull string installations.

Bruce Drummond
Proprietor
Novel Solutions

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