

## PowerGlide® Technology Makes Pushing 600V UD Cable Easier

### Tests show PowerGlide 600V UD cable pushing advantage

Pushing 600V UD cable into conduit by hand is common practice in the field for runs of up to 130 feet. Some contractors even push cable into conduit for runs as long as 200 feet. Pushing can save time by eliminating the need to set up pulling equipment. Pulling equipment also requires space that often isn't available. The downside is that pushing can be hard work.

Now, real-life testing at the Georgia Institute of Technology (Georgia Tech) verifies that PowerGlide® 600V UD cable from Southwire makes pushing easier with less effort.



### What is PowerGlide® 600V UD cable?

PowerGlide® 600V UD cable from Southwire is an enhancement to conventional plexed 600V UD cable assemblies. PowerGlide 600V UD cable is manufactured with an exterior Glide Wire™ that helps cables slide easily through empty ducts and prevents cables from spreading apart or “bird-caging”. Crews can push further, and with less effort.

PowerGlide 600V UD cable reduces or eliminates the cost of lube, lube cleanup time, and the potential for lube spills. Plus, if you need to take a cable out for an upgrade, PowerGlide 600V UD cable is easier to remove. In some cases, PowerGlide 600V UD cable may allow engineers to specify smaller ducts that will reduce overall costs.

### Tests simulated a difficult real-life push

Researchers at Georgia Tech simulated difficult cable push situations in two-inch and three-inch buried conduit. The layouts were at the upper end of what linemen would normally attempt. Both layouts were the same length and had the same number of three-foot radius elbows.

The buried conduit layout used in the test can be seen on the next page. Each test layout started with a short vertical section and a three-foot radius vertical sweep leading into a 150-foot horizontal run. At the end of that run, a three-foot radius horizontal sweep connected to a four-foot horizontal section. A third three-foot radius sweep then ran vertically to the surface. The total length was approximately 160 feet.

Traditional Sweetbriar 4/0 triplex ruggedized secondary UD cable from a leading competitor represented the standard cable in the test. Southwire's PowerGlide 600V UD cable was identical to the competitor's cable, except for the addition of the exterior Glide Wire. No lube was used during any of the installations with the standard or PowerGlide 600V UD cable.

### Test commissioning

Southwire commissioned tests to evaluate actual work effort required in 600V UD pushing applications. Testing was performed by the Georgia Tech Research Institute in Atlanta, Georgia.

### Participants were experienced linemen

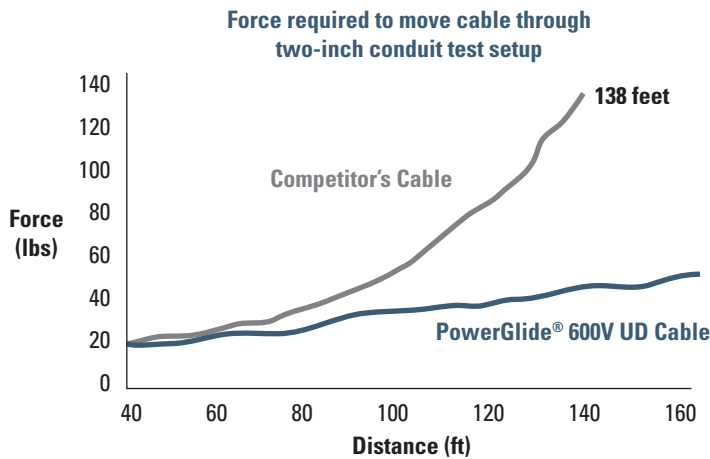
Test participants were eight experienced linemen, four crews of two. The average participant's age was 31.6 years, with a range of 19 to 49. The average height was 5'11" and the average weight was 201.5 pounds. Experience varied from nine months on the low end to twelve years on the high end.

# PowerGlide® 600V UD Cable

## Results compare workload, distance pushed, force, and time required

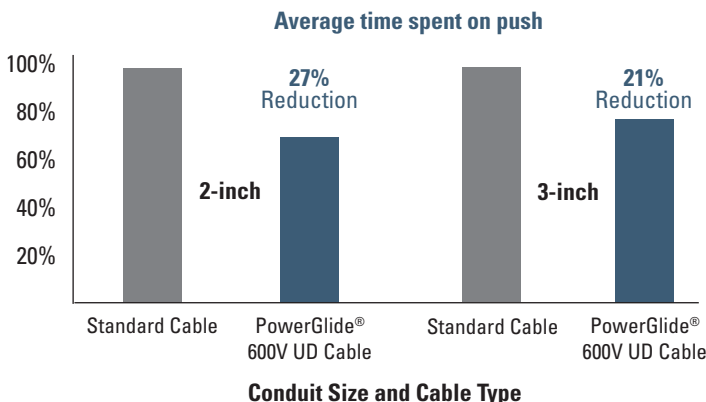
In the 2-inch conduit, the standard cable required a greater pushing force than PowerGlide® 600V UD cable. When the standard cable began to separate or “bird-cage,” the force required to move the cable rose exponentially. The PowerGlide 600V UD cable showed an almost linear resistance increase throughout the 160-foot run.

The last successful push of standard cable required a maximum of 137 pounds of force and stopped after 138 feet (22 short of finish). At that point, the evaluators could no longer push the cable. The graph below shows the test results; the longer the push, the greater the PowerGlide 600V UD cable advantage.

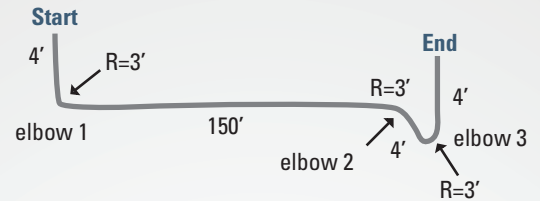


## PowerGlide 600V UD cable time savings vs. traditional 600V UD cable

Participants were evaluated for average time to push traditional 600V UD cable into conduit as compared to PowerGlide 600V UD cable. The evaluation was based on an equal distance for both cables and conduit. In two-inch conduit, participants were able to reduce pushing installation time with PowerGlide 600V UD cable by 27% as compared to standard 600V UD cable, and in three-inch conduit they reduced installation time by 21%.



## Test setup compares PowerGlide® 600V UD Cable with Standard 600V UD Ruggedized cable



Two-inch and three-inch conduit tests were identical. The setup represents a challenging push installation.

**“The PowerGlide 600V UD cable is much easier to work with, hands down. It holds the wires together, and you don’t have to think about it.”**

Lineman A  
Test Participant

**“Cable normally unravels and gets twisted on the reel, but the PowerGlide 600V UD cable stayed together through each pull.”**

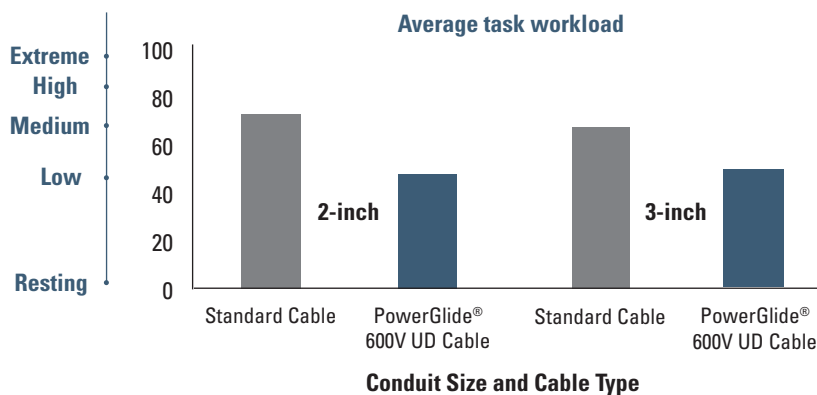
Lineman B  
Test Participant

# PowerGlide® 600V UD Cable

## Workload and fatigue

The tests compared the subjective workload and fatigue the crews experienced installing standard and PowerGlide® 600V UD cables using the NASA-TLX task-difficulty rating scale. Rating factors include mental demand, physical demand, time pressure, overall mental and physical effort, worker performance satisfaction, and worker frustration. Test results can be seen below and are also summarized on the next page.

Participants wore electrodes that recorded muscle strain in the shoulders and forearms during the work. In sustained peak force testing, the monitored muscle groups recorded less muscle activity when using PowerGlide 600V UD cable. Participants reported lower levels of workload and fatigue when pushing PowerGlide 600V UD cable than they did when pushing standard cable.



## Differences also showed up in required grip pressure

Grip-force measurements showed that standard 600V UD cable required more grip pressure to move the cable forward and to counteract the tendency for the cable to “bird-cage” within the conduit. Many participants liked the PowerGlide 600V UD’s Glide Wire™ because it provided increased resistance against slipping after the hands start to sweat.

**Conclusions:** PowerGlide 600V UD cable reduced pushing workload. Both objective and subjective assessments showed PowerGlide 600V UD cable is easier to install than the competitor’s 600V UD cable:

- All eight experienced linemen preferred working with PowerGlide 600V UD cable.
- When installing PowerGlide 600V UD cable, workers experienced less fatigue and reported lower overall workload than with standard cable.
- Pushing PowerGlide 600V UD cable is easier, faster, and allows for longer pushes.

**To learn more about the benefits of PowerGlide 600V UD cable, contact your Southwire representative or visit [southwire.com](http://southwire.com)**

## AVERAGE TIME SPENT ON PUSH

### 2-inch Conduit

27% reduction in average push time using PowerGlide® 600V UD cable over standard 600V UD cable

### 3-inch Conduit

21% reduction in average push time using PowerGlide 600V UD cable over standard 600V UD cable

## TASK WORKLOAD AVERAGE (per NASA-TLX task difficulty rating)

**2-inch Conduit | Standard 600V UD Cable**  
75 (medium-high)

**2-inch Conduit | PowerGlide 600V UD Cable**  
50 (low-medium)  
33% Reduction

**3-inch Conduit | Standard 600V UD Cable**  
70 (medium)

**3-inch Conduit | PowerGlide 600V UD Cable**  
50 (low-medium)  
29% Reduction

**“The PowerGlide 600V UD cable seemed to flow better, the cable moved through the duct better, like it’s on rollers. I noticed right away when it first went in, in the first 10-15 feet.”**

Lineman C  
Test Participant

**“The PowerGlide 600V UD cable held together better, it didn’t flex as much. It was better.”**

Lineman D  
Test Participant