

The background is a dark blue gradient. In the upper left, there is a faint circular graphic with several smaller circles inside, resembling a molecular or cellular structure. On the right side, there is a faint circuit board pattern with lines and nodes. The Polywater logo is prominently displayed in the upper right, with the text 'Polywater' in a bold, white, sans-serif font and a registered trademark symbol. Below it, 'PULL-PLANNER 4.0' is written in a smaller, white, sans-serif font. The number '4.0' is also visible in a large, faint font at the bottom center of the slide.

Polywater[®]
PULL-PLANNER 4.0

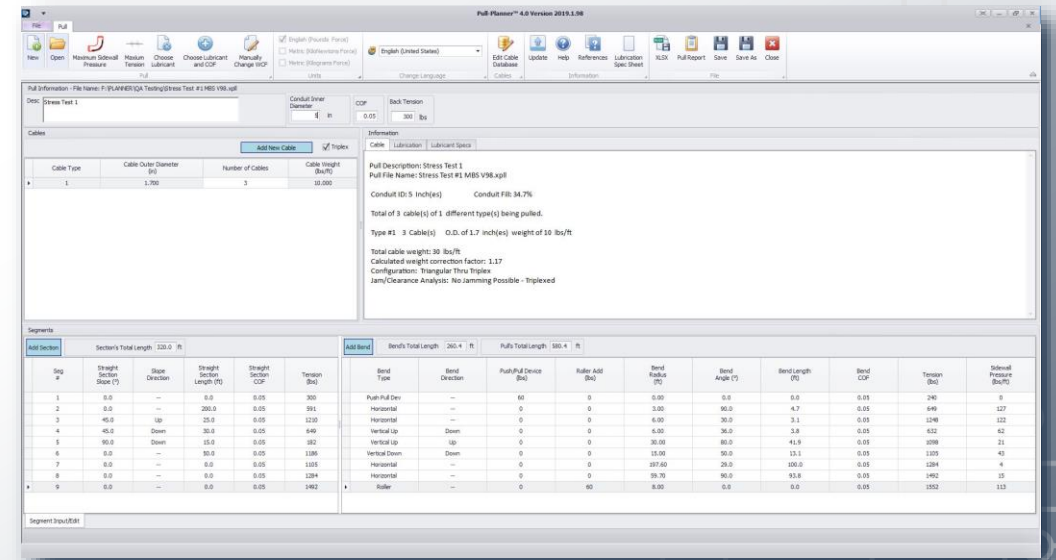
Overview of Pull-Planner[™] 4.0 Program and Capabilities

For global audiences

What is the Pull-Planner software & why is it unique?

- ◆ The Pull-Planner is a customized software program that allows for accurate estimation of cable pulling tension and sidewall pressure.
- ◆ The Pull-Planner offers the world's largest database of field- and lab-proven coefficient of friction data.
- ◆ The Pull-Planner includes a cable database that is customizable by the user for quick access to frequently used cable data.

◆ Pull-Planner 4.0 pull report



Information

Pull Description: Stress Test 1
Pull File Name: Stress Test #1 MBS V38.xpl
Conduit ID: 5 inch(es) Conduit Fill: 34.7%
Total of 3 cable(s) of 1 different type(s) being pulled.
Type #1: 3 Cable(s) O.D. of 1.7 inch(es) weight of 10 lbs/ft
Total cable weight: 30 lbs/ft
Calculated weight correction factor: 1.17
Configuration: Triangular Three Triples
Jam/Clearance Analysis: No Jamming Possible - Triplexed

Segment	Section's Total Length: 122.0 ft	Section's Total Length: 265.4 ft	Pull's Total Length: 387.4 ft												
Seg #	Straight Section Start (ft)	Bend Direction	Straight Section Length (ft)	Straight Section COF	Tension (lbs)	Bend Type	Bend Direction	Pull Force Device (lbs)	Roller Add (lbs)	Bend Radius (ft)	Bend Angle (°)	Bend Length (ft)	Bend COF	Tension (lbs)	SideWall Pressure (lb/ft²)
1	0.0	---	0.0	0.05	300	Push-Pull Dev	---	60	0	0.00	0.0	0.0	0.05	240	0
2	0.0	---	200.0	0.05	991	Horizontal	---	0	0	3.00	90.0	4.7	0.05	649	127
3	45.0	Up	25.0	0.05	1230	Horizontal	---	0	0	6.00	30.0	3.1	0.05	1248	122
4	45.0	Down	25.0	0.05	1490	Vertical Up	Down	0	0	6.00	30.0	3.9	0.05	832	42
5	90.0	Down	15.0	0.05	182	Vertical Up	Up	0	0	30.00	80.0	41.5	0.05	3098	21
6	0.0	---	30.0	0.05	1398	Vertical Down	Down	0	0	15.00	50.0	15.1	0.05	1105	43
7	0.0	---	0.0	0.05	1055	Horizontal	---	0	0	293.00	20.0	100.0	0.05	1294	4
8	0.0	---	0.0	0.05	1294	Horizontal	---	0	0	29.70	90.0	93.8	0.05	2402	15
9	0.0	---	0.0	0.05	1492	Roller	---	0	60	8.00	0.0	0.0	0.05	1552	113

Integrating the Pull-Planner into project design & planning

The Pull-Planner allows for safer & longer cable installations:

- ◆ It allows the user to visualize potential problem areas in the cable installation.
- ◆ It offers fast recalculation of tension due to changes in pull direction, duct configuration, or the use of pulling aids.
- ◆ It provides comparison of technical data for multiple lubricants to optimize friction reduction and material compatibility.
- ◆ It helps plan longer cable pulls and reduce the cost of vaults, splices, pull boxes, and heavy-duty winches.

The Pull-Planner is a beautiful thing that has made my job easier by doing the hard work of calculating pull tension and generating my pull plan for long pulls with heavy wire. I've worked closely with the Polywater team for nearly 20 years, and they are consistently my go-to source of knowledge and resources.

**- Chuck Baird, Owner,
Alaska Line Builders LLC**

Polywater[®]
PULL-PLANNER 4.0

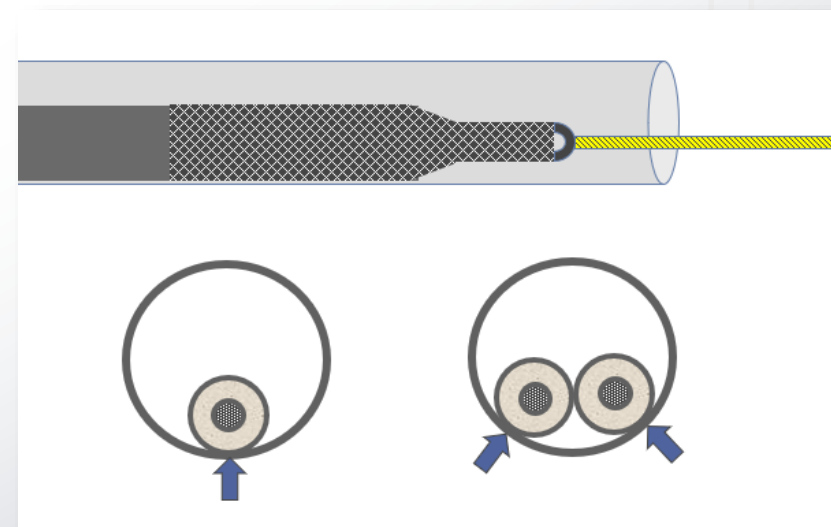
What is the coefficient of friction (COF)? Why is it important?

What?

- ◆ COF is the most important variable in calculating tension. It accounts for cable and conduit type and condition, temperature, normal pressure, cable fill, number of bends, and other field factors.
- ◆ No single coefficient can be used for every cable pull. Each installation's COF depends on cable jacket and duct materials and whether a lubricant is used. COF can also be affected by ambient temperature, conduit condition, and conductor rigidity.

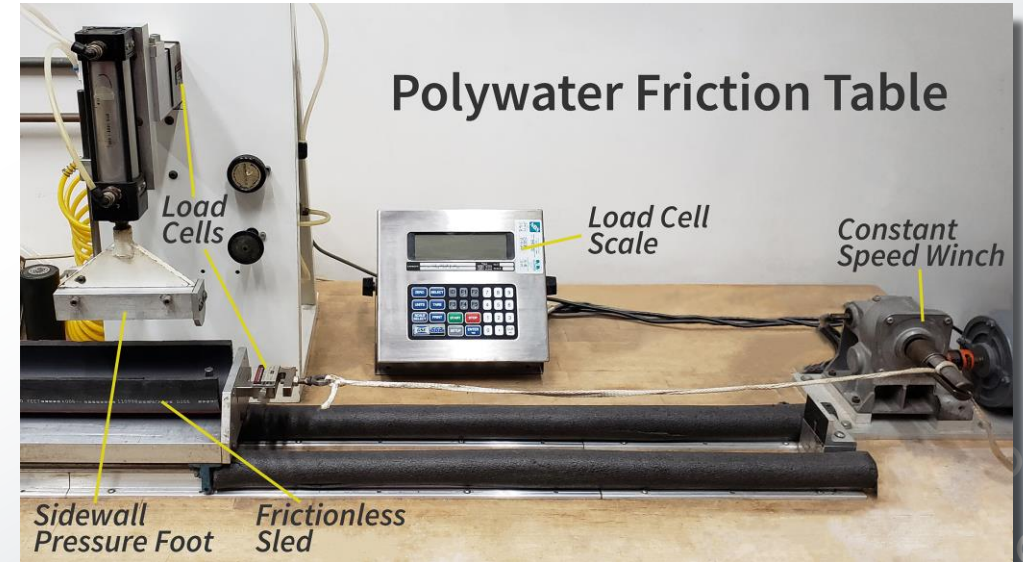
Why?

- ◆ Reliable tension calculations help to optimize pull resources and installation safety while reducing project costs.



What are the key features that the Pull-Planner offers?

- ◆ Reliable COF data from decades of hands-on testing of cables, conduits, and lubricants, combined with industry best practices.
- ◆ Adaptable for different pull methods and field conditions—push/pull devices, variable COF, insertion of rollers or sheaves, reversal of pull direction, large radius bend calculation, and more.
- ◆ Immediate recalculation of tension and sidewall pressures with any data change made.
- ◆ Complete Resource – pull analysis, lubricant quantity calculation, COF data, shareable pull report, back-calculation of field COF, multiple languages, multiple measurement units, and more.



Which measurement units does the Pull-Planner 4.0 use?

The Pull-Planner 4.0 offers users three different measurement units:

- ◆ • English (Pounds (lbs.)_f)
- ◆ • Metric (Kilonewtons (kN)_f)
- ◆ • Metric (Kilograms (Kg))



Polywater[®]

PULL-PLANNER 4.0

Use of the Pull-Planner in foreign languages

- ◆ The Pull-Planner works in multiple languages.
- ◆ The program initially opens in English.
- ◆ You can choose Français, Español, and Deutsch using the language drop-down on the top ribbon.
- ◆ When a user returns to the Pull-Planner, the program re-opens in the last language used.
- ◆ You can change language at any time. When changing language in the middle of entering pull data, you must save your pull and reopen it after the language has been changed.
- ◆ A help menu is currently available in English and will be made available in Français, Español, and Deutsch.

