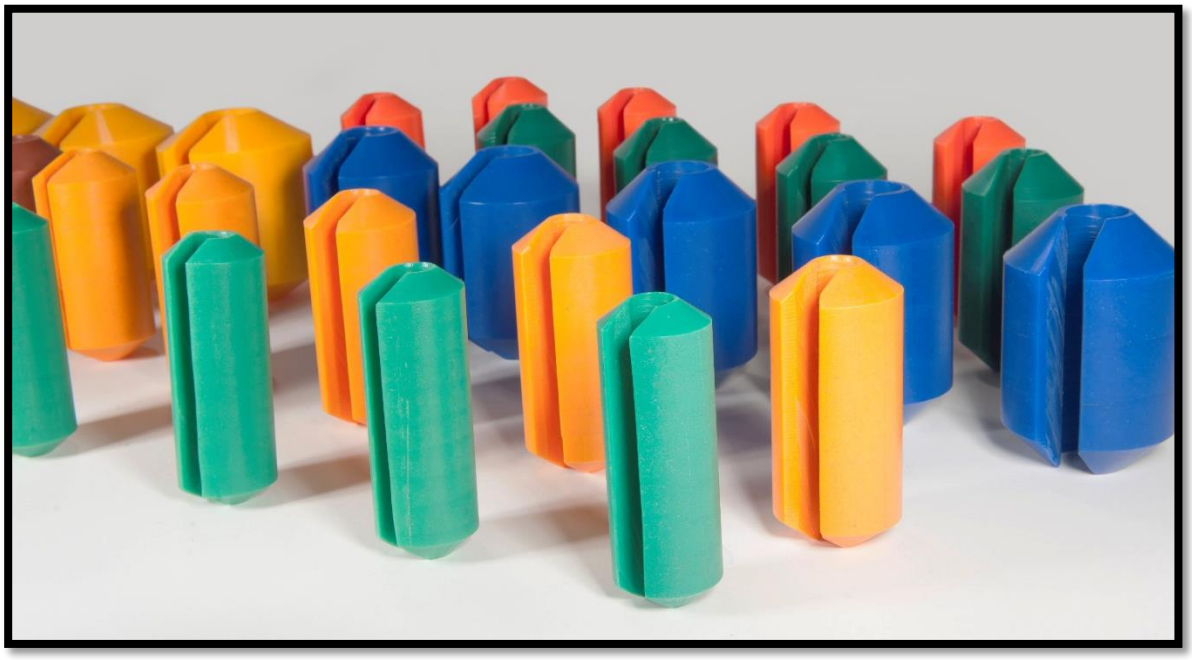
ENDURANCE ™
ROD GUIDES



THE MOST DURABLE FIELD INSTALLED ROD GUIDE AVAILABLE!

LASTS LONGER! HOLDS BETTER! MORE SAVING$!

Time Proven and Patented Technology By

Endurall INC

ENDURANCE ™
ROD GUIDES

The ***ENDURANCE*** rod guide beats the competition hands down! Endurance ™ Rod Guides are patented in the U.S. and Canada. Our guides are light weight, strong, and easily installed. Time tested and proven, Endurance guides are the best in the industry! Our unique rod guides centralize the rod string resulting in decreased tubing leaks, increased pumping efficiencies, reduced wear on rod couplings and tubing & reduced chemical costs.

- Maximum Duration
- Superior Wear & Abrasion Resistance
- Resists Chemicals & Salt Water
- Easily Installed in hot or cold climates
- Extremely Low Coefficient of Friction
- Light Weight
- Maximum Holding Power
- Impact Resistant
- Resists H^2S and CO^2 & other corrosives
- Self Lubricating
- Resists Stress Cracking
- (5) U.S. & Canadian Patents

Ultra High Molecular Weight Polyethylene

THE BEST PRODUCTS START WITH THE BEST RAW MATERIALS!

ENDURANCE guides last longer because they have a high resistance to wear and abrasion and an extremely low coefficient of friction – hence the name – *ENDURANCE*. UHMWPE has "self-lubricating" properties which means our guides work in oil, oil + water, or just water! In addition, UHMWPE has a very high tensile strength; is impact resistant; is chemical resistant; and resists stress cracking. These traits are directly related to our products' high molecular weight.

NOT ALL POLY GUIDES ARE CREATED EQUAL!

We control all aspects of the manufacturing process. We use only the highest quality resins (molecular weight = 6,000,000+) in our plastic extrusion shop. ***Yes*** ~ we manufacture our own poly stock! Our proprietary blend, high molecular weight resins & strict quality controls give our products many physical properties far superior to nylon, rubber & other materials. We simply demand the best from start to finish so you can be assured that we meet the two most important objectives of rod guide manufacturing:
Superior Wear and Maximum Holding Power.

Not only did we introduce this technology to coal bed methane production for PC Pumps & Rod Pumps over 25 years ago, producers have also used the Endurance guide in horizontal wells ~ another Endurall FIRST!

When considering rod guides for your application, choose the original developer of poly rod guides for the oil & gas industry.

ALWAYS INSIST ON GENUINE ENDURANCE ROD GUIDES!

www.endurallinc.com

ENDURANCE ™
ROD GUIDES

* The first **color coded** rod guide. Each color fits a different tubing diameter!

***** Recommended for use in ***fiberglass*** tubing!

* Other companies imitate our guides, but we're the original!
To assure the highest quality…

always specify *ENDURANCE™* Rod Guides!

* Wide variety of sizes: From 1.5" – 4" tubing, all rod sizes AND line pipe!

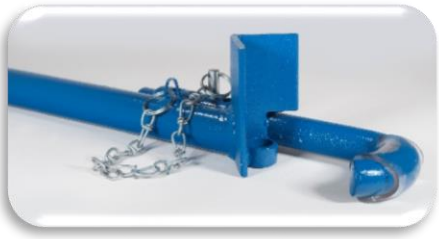
INSTALLATION is a breeze!

Endurance ™ Rod Guides are very easy to install. Use our installation tool to easily snap the guide into place. Although we recommend using our Endurance ™ Installation Tool, our guides can easily be tapped onto the rod using a mallet.

ANOTHER ENDURALL FIRST!

In 2012, we implemented a design change to make the guide easier to install ~ a beveled slot. This small change makes our guide much easier to install, especially using our installation tool.

ENDURANCE ™ Installation Tool



- Solid Construction
- One Man Operation
- Adjustable to fit all sizes
- Installation is a "***Snap***"

ENDURANCE ™
ROD GUIDES

Ultra High Molecular Weight Polyethylene

Thermal & Mechanical Properties	Test Method	Typical Value
Density, g/cm^3	ASTM C 792	0.94
Vicat Softening Point	ASTM D 1525B	1.36
Hardness		
Rockwell R Scale	ASTM D 785	64
Durometer (D/15)	ASTM D 2240	67
Tensile Properties		
Maximum Strength	ASTM D 638, 2 in/min	6,800
Break Elongation	Stress Strain Diagram	450
Break Elongation @ 73º F	Stress Strain Diagram	900
Break Elongation @ 250º F	Stress Strain Diagram	3,400
Environmental Stress Cracking, F_{50} hrs	ASTM D 1693 Mod.	6,000
Tensile Impact, ft.-lbs/in. notch	ASTM D 256A	
23º C		No break
-140º C		No break
Flexural Modulus		
PSI, 1% Secant	ASTM D 790B	170,000
Coefficient of Friction against Cr plated Steel @ 23º C		
Static		0.20 - 0.25
Dynamic		0.15 - 0.20
Flexural modulus of elasticity, PSI	Bend Creep Test, 1 minute	110,000
Shear Strength, PSI	ASTM D 732	3,500
Mean Coefficient of linear thermal expansion, ºC $^{-1}$	ASTM D 696	
-30º C to +30º C		1.4×10^{-4}
+30º C to + 60º C		1.8×10^{-4}

Abrasion Resistance

50-50 Sand/Water Slurry Test

Each material listed below was rotated for 24 hours at 1750 rpm. The weight loss for each material is relative to 100. A lower figure = better abrasive resistance.

Endurance™ Rod Guide	15	Polycarbonate	96
Nylon	31	Hi-Carbon Steel	100
High-Density Polyethylene	44	Teflon Glass Fiber	113
Teflon	72	Low Density Polyethylene	125
Stainless Steel	84	Yellow Brass	409
Polypropylene	87	Phenolic Laminate	571

Endurall INC

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