Enertrols®
EXPERTS IN DECELERATION & MOTION CONTROL

ACE
Enertrols is a division of ACE Controls

Sucker Rod Cushions ...

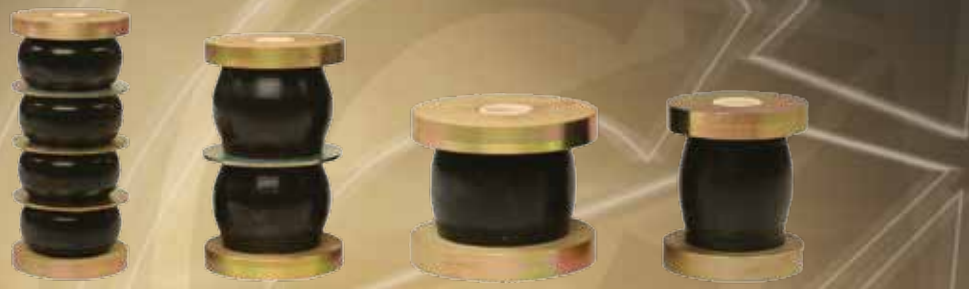
Installed On Oil Well Pumping Units

Significantly Reduces Rod String Breakage

- Lower Operating Costs
- Increases Production
- Increases Life of Pumping Unit & Pump Output
- Easy Installation and Maintenance Free
- Reduces Electrical Usage
- Reduces Pump Downtime
- Reduces Stress on Bearing and Gears in the Pumping Unit
- Reduces Amperage Spikes when the Counter Balance Changes Velocity
- Replaces Existing Steel Coil Spring

Enertrols Sucker Rod Cushions replace the existing steel coil spring with a highly engineered elastomeric product. These long-life units are designed to absorb shock as the sucker rod is raised and lowered. Sucker Rod pads reduce rod vibration and shock on wells with peak polished rod loads up to 44,000 lbs. (196 kN). Up to four pads of elastomer material are fixed between steel plates and mounted on the top of the pumping unit's hanger bar.

Sucker Rod Cushions



44 **20** **15** **9**

Table 1 - W_F

Plunger Size (inches)	Wt. of Fluid/Ft on Plunger
3/4	.191 lb/Ft
7/8	.260 lb/Ft
1	.340 lb/Ft
1-1/8	.383 lb/Ft
1-1/4	.531 lb/Ft
1-1/2	.765 lb/Ft
1-5/8	.900 lb/Ft
1-3/4	1.040 lb/Ft
2	1.360 lb/Ft
2-1/8	1.535 lb/Ft
2-1/4	1.720 lb/Ft
2-1/2	2.120 lb/Ft
2-3/4	2.570 lb/Ft
3-1/4	3.590 lb/Ft
3-3/4	4.780 lb/Ft
4-3/4	7.690 lb/Ft

Table 2 - W_F Weight of Sucker Rods / 1000 Ft

Rod Size (inches)	lbs / 1000 Ft
5/8	1,150
3/4	1,650
7/8	2,200
1	2,850
1-1/8	3,650

Useful Formulas

Straight Rod String
PPRL = 1.2 x W_F + 1.2 x (F x W_R)

Tapered Rod String
PPRL = 1.2 x W_F + 1.2 x (W_{R1} + W_{R2} + etc.)

Minimum Polished Rod Load
MPRL = W_R (1.87-F)

PPRL: Peak polished rod load in libs
MPRL: Minimum polished rod load in lbs
W_F: Wt of fluid in lbs (wt/ft on plunger x depth) see table 1
W_{R1}: Wt of rods in first rod section in lbs
W_{R2}: Wt of rods in second rod section in lbs
F: Impulse factor (F=1 + (SxSPM /70,500) see table 3
S: Stroke length

ESD44 Peak Polished Rod
Load not to exceed 44,000 lbs Total
Height: 13.625"
Width: 6.75"
Weight: 38 lbs

ESD20 Peak Polished Rod
Load not to exceed 20,000 lbs
Total Height: 9.5"
Width: 6.75"
Weight: 29 lbs

ESD15 Peak Polished Rod
Load not to exceed 15,000 lbs
Total Height: 6.5"
Width: 6.75"
Weight: 25 lbs

ESD9 Peak Polished Rod
Load not to exceed 9,000 lbs
Total Height: 6.5"
Width: 5.5"
Weight: 18 lbs

Table 3 - F – Impulse Factor

Stroke Length (inches)	Strokes / Minute								
	6	8	10	12	14	16	18	20	22
24	1.01	1.02	1.03	1.05	1.07	1.09	1.11	1.14	1.16
28	1.01	1.02	1.04	1.06	1.08	1.10	1.13	1.16	1.19
32	1.02	1.02	1.05	1.07	1.09	1.12	1.15	1.18	1.22
36	1.02	1.03	1.05	1.07	1.10	1.13	1.17	1.20	1.25
40	1.02	1.04	1.06	1.08	1.11	1.15	1.17	1.23	1.27
44	1.02	1.04	1.06	1.09	1.12	1.16	1.20	1.25	1.30
48	1.02	1.04	1.07	1.10	1.13	1.17	122	1.27	1.33
52	1.03	1.05	1.07	1.11	1.14	1.19	1.24	1.30	1.36
56	1.03	1.05	1.08	1.11	1.16	1.20	1.26	1.32	1.38
60	1.03	1.05	1.09	1.12	1.17	1.22	1.27	1.34	1.41
64	1.03	1.06	1.09	1.13	1.18	1.23	1.29	1.36	1.44
70	1.04	1.06	1.10	1.14	1.19	1.25	1.32	1.40	-
74	1.04	1.07	1.10	1.15	1.21	1.27	1.34	142	-
78	1.04	1.07	1.11	1.16	1.22	1.28	1.36	-	-
86	1.04	1.08	1.12	1.18	1.24	1.31	1.40	-	-
100	1.05	1.09	1.14	1.20	1.27	1.36	-	-	-
106	1.05	1.10	1.15	1.22	1.30	1.38	-	-	-
120	1.06	1.11	1.17	1.25	1.33	-	-	-	-
144	1.07	1.12	1.20	1.29	1.40	-	-	-	-

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