



# Sentinel™ 2000 RCD

NEXT-GENERATION RCD RELIABILITY

2000 psi Static / 1000 psi Dynamic

## Sentinel™ 2000 RCD Product Sheet

The **Sentinel™ RCD Series** from **X-Energy Pressure Control LLC** represents a significant evolution in rotary seal designs. With low- and intermediate-pressure RCDs currently available, the **Sentinel™ RCD Series** boasts an improved, self-lubricating seal system. This innovative system self-regulates to minimize friction while managing pressure, heat, and higher RPMs. This next-gen technology not only extends seal life but also reduces wear and tear on the internal components of the bearing assembly, thereby prolonging the lifespan of the RCD rubber. Ultimately, this leads to a substantial decrease in rig downtime.



**Long-Lasting Seal**



**Operates Up To 2000 psi**



**Self-Lubricates No Oil Tank or Plug**



**Durable & Reliable**



**Improves Site Safety**



### Upgraded Seal Cartridge Features:

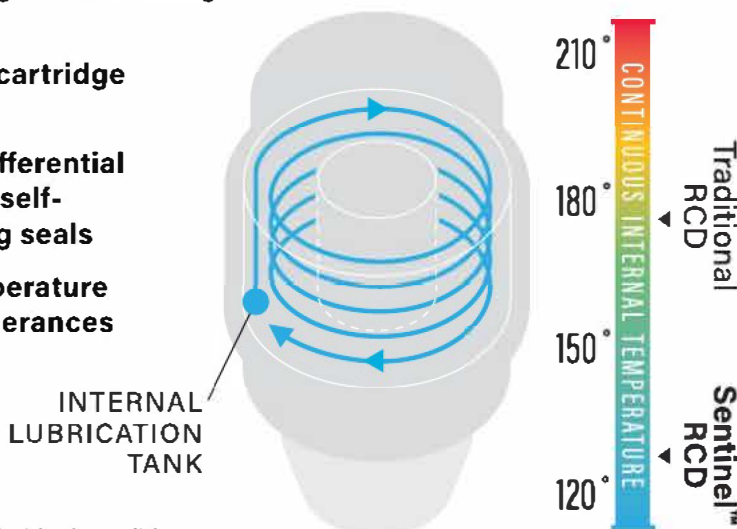
In thousands of hours of testing, the **Sentinel™ 2000 RCD** seal system exponentially outlasts\* other rotary seals.

Longer-lasting self-lubricating seal system:

**A: Patented cartridge system**

**B: Built-in differential pressure, self-lubricating seals**

**C: High temperature & RPM tolerances**



\*Testing is done in ideal conditions. Field conditions and other variables can affect the life of the seals.

### Advantages:

Our state-of-the-art internal bearing design uses a self-lubricating system drawing lubrication from the internal assembly.

This creates a balance that reduces friction, substantially decreasing the internal temperature of the seal bearing, increasing the life of the seal and rubber.

A redundant seal system improves safety and reliability.

Eliminates: oil plug, external oil tank, and electricity for plug.

Prevents breakdowns, downtime, product waste.

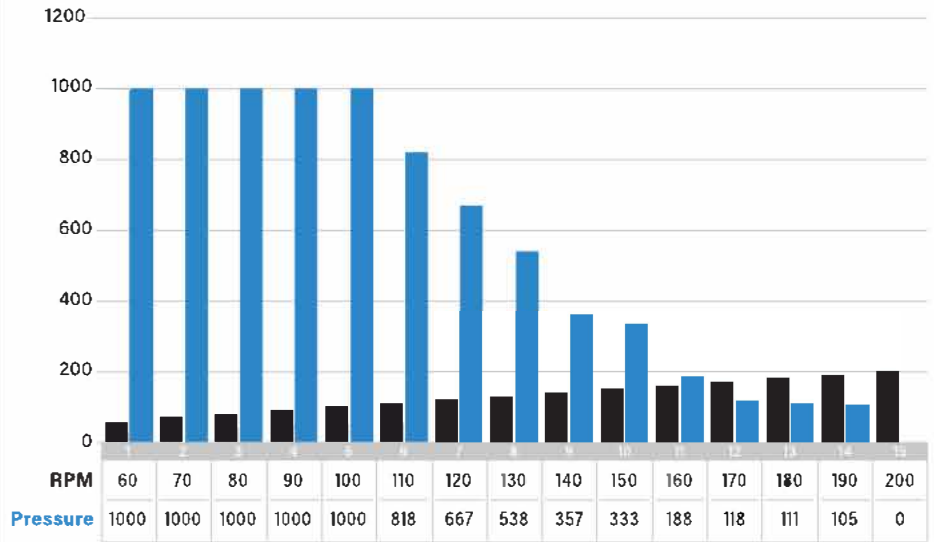
Economical and eco-friendly.

Introducing both low- and intermediate-pressure applications, at one affordable price.

## BE READY FOR THE FUTURE OF DRILLING

Drilling technology and methodologies are changing. The Sentinel™ RCD Series represents a cost-effective upgrade for your operations, making them simpler, safer, cleaner, and more efficient. X-Energy Pressure Control LLC continues to innovate RCD with your operations in mind. Like all our RCD offerings, the Sentinel™ RCD Series is also fully customizable to your operational needs. With two locations in Texas oil country, you can depend on efficient, personal service, when and where you need it.

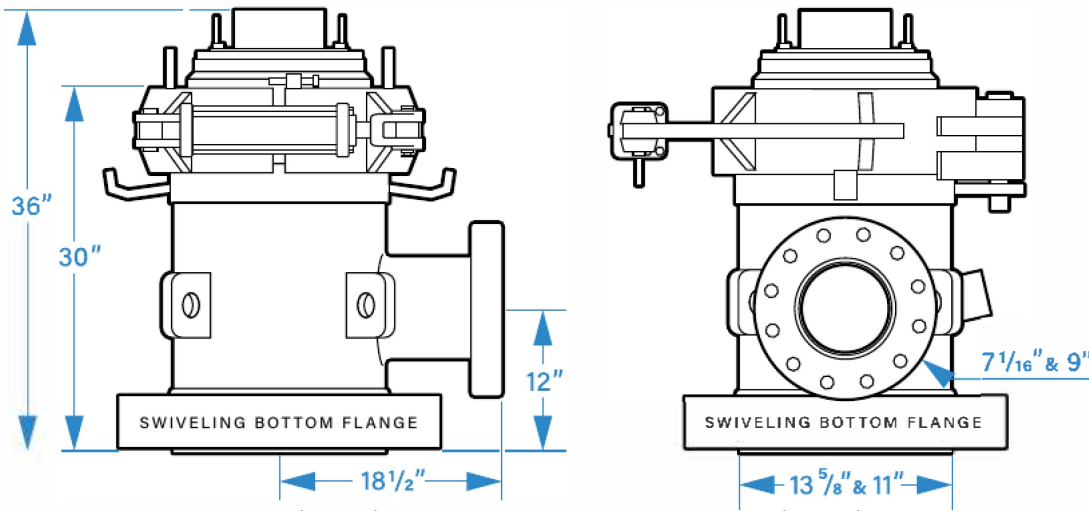
### Sentinel™ 2000 RCD Dynamic Pressure Ratings Sealing Element - Urethane



This chart reflects PSI under ideal conditions.  
For optimal performance, we recommend not exceeding 100 RPM.

#### IP RCD PRESSURE RATING PSI:

2000 psi Static / 1000 psi Dynamic



All measurements assume the bearing is installed and clamps engaged.

#### SPECS:

- 12" Face of bottom flange to center of outlet flange
- 18 1/2" Center of bottom flange to face of outlet flange
- 30" Face of bottom flange to top of clamps
- 36" Face of bottom flange to top of bearing (installed)

#### OUTLET FLANGE:

- 7 1/16" 3M
- 9" 2M

#### BOTTOM FLANGE:

- 13 5/8" 5M
- 11" 5M

Learn more about how the Sentinel™ RCD Series can improve your operations.

Contact your local X-Energy Rental Tools™ representative.



West TX: (432) 563-1965



# Polyurethane Sealing Elements

Polyurethane Sealing Elements from X-Energy Pressure Control LLC are engineered for harsh environments and highly resistant to the oils, greases, and chemicals that degrade the compounds found in other sealing elements. Our specialized Polyurethane Sealing Elements are also impact and abrasion-resistant with strong bonding properties for a longer use life. With X-Energy Pressure Control LLC Polyurethane Sealing Elements, your operation can run faster and safer, with fewer element changes, less downtime, and lower costs - while enjoying more time on bottom and a better bottom line.



Resistant to materials that degrade other sealing elements



Impact & Abrasion Resistant



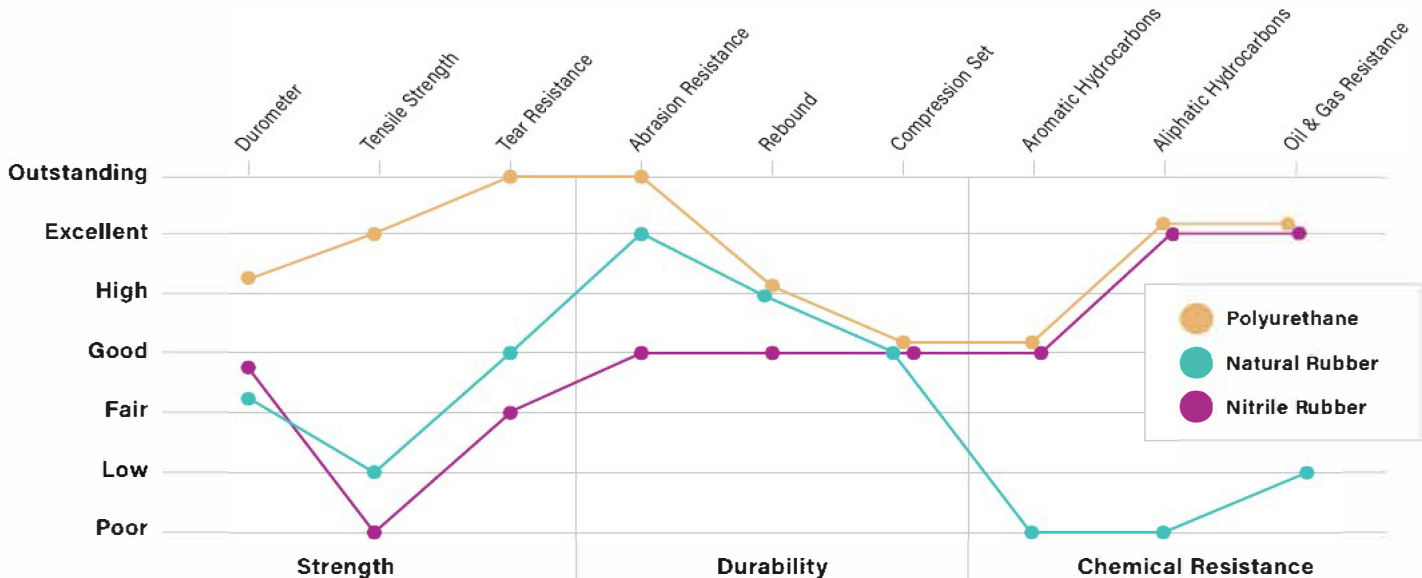
Strong Bonding Properties



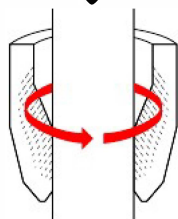
Improve Uptime & Operating Expenses

## Sealing Elements Performance Comparison

Polyurethane vs. Natural & Nitrile Rubber

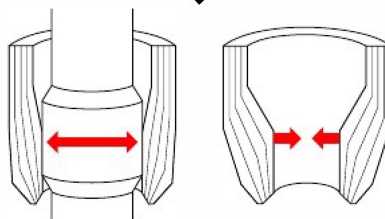


Quality Design & Materials



High durometer rating without compromising tensile strength and tear resistance.

Durability



Only polyurethane enables high-rebound abrasion and tear resistance.

Chemical Resistance



Chemical resistance plus endurance under inherent drilling stresses.

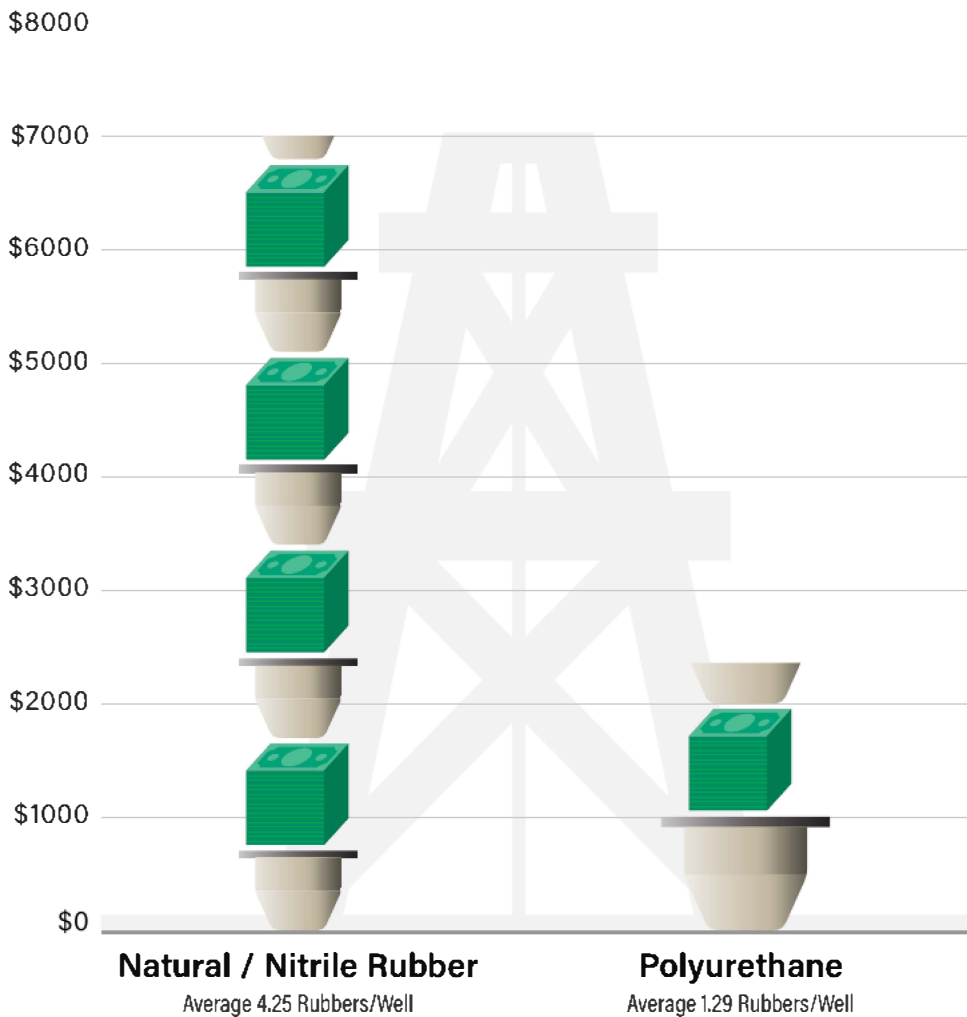
Lasts Up to 4x Longer

**Polyurethane performs the best against both mechanical & environmental stressors.**

**Polyurethane sealing elements can reduce operating expenses by 2.5 times versus natural rubber.**

## Sealing Elements Value Comparison

Polyurethane vs. Natural & Nitrile Rubber



### Non-Productive Downtime

Est. \$1,000/Hour

### RCD Rubber

Natural / Nitrile Rubber Est. \$700 Each

Polyurethane Rubber Est. \$1,000 Each

With up to 4X longer use life, specialized Polyurethane Sealing Elements from **X-Energy Pressure Control LLC** require fewer changes, greatly reducing costly downtime. The lower material cost for natural rubber elements is quickly eclipsed by the need to purchase more of them per well and productive hours lost to change-outs. Use of polyurethane sealing elements can reduce operating expenses by 2.5 times versus natural rubber.

## X-Energy Pressure Control LLC Solution

At **X-Energy Pressure Control LLC**, our choice of polyurethane for our sealing elements is based on a rigorous scientific approach. We carefully analyzed the properties crucial for elements in the drilling process, and polyurethane emerged as the clear standout for tear and abrasion

resistance, chemical resistance, and rebound. This strategic selection not only ensures superior performance but also translates into time and cost savings for our customers, as using fewer sealing elements is a standard part of every RCD rental solution we offer.

All measurements assume the bearing is installed and clamps engaged.

**Discover the Operational Advantages of Long-Lasting Polyurethane Sealing Elements**

Contact your local **Black Gold Rental Tools™** representative.

 Call Us

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# Spacer / Adapter Spools Product Sheet



Regardless of the size of iron you need to get the job done, it's likely that **X-Energy Pressure Control LLC** has it. We have the largest supply of spools on the ground of any company, and all of our spools are API certified and have paperwork available.

DIAMETER	PRESSURE RATING		LENGTH	PRESSURE RATING
13 5/8"	10M	x	12"	10M
13 5/8"	10M	x	6"	10M
13 5/8"	5M	x	12"	5M
13 5/8"	5M	x	6"	5M
11"	10M	x	12"	10M
11"	10M	x	6"	10M
11"	5M	x	12"	5M
11"	5M	x	6"	5M

## Studded Spacer Spool

DIAMETER	PRESSURE RATING		LENGTH
13 5/8"	10M	x	18"

## Adapter Spools

DIAMETER	PRESSURE RATING		DIAMETER	PRESSURE RATING	HEIGHT
13 5/8"	10M	x	13 5/8"	5M	24" Tall
13 5/8"	10M	x	13 5/8"	5M	22 1/2" Tall
13 5/8"	10M	x	13 5/8"	5M	21" Tall
13 5/8"	10M	x	11"	5M	24" Tall
13 5/8"	10M	x	11"	5M	21" Tall
13 5/8"	10M	x	11"	5M	20 1/2" Tall
13 5/8"	10M	x	11"	5M	19" Tall
13 5/8"	10M	x	11"	5M	18" Tall
13 5/8"	10M	x	11"	10M	24" Tall
13 5/8"	10M	x	11"	10M	22" Tall
13 5/8"	10M	x	11"	10M	20 1/2" Tall
13 5/8"	10M	x	11"	10M	16" Tall
13 5/8"	5M	x	11"	5M	24" Tall
13 5/8"	5M	x	11"	10M	16" Tall
7 1/16"	5M	x	4 1/16"	15M	
11"	10M	x	7 1/16"	10M	17"
11"	5M	x	7 1/16"	5M	22"
11"	5M	x	7 1/16"	5M	16"

## Double Studded Adapters (DSAs)

DIAMETER	PRESSURE RATING		DIAMETER	PRESSURE RATING
13 5/8"	10M	x	13 5/8"	5M
13 5/8"	10M	x	11"	10M
13 5/8"	10M	x	11"	5M
13 5/8"	10M	x	7 1/16"	15M
13 5/8"	10M	x	7 1/16"	10M
13 5/8"	10M	x	7 1/16"	5M
13 5/8"	5M	x	13 5/8"	3M
13 5/8"	5M	x	11"	5M
13 5/8"	5M	x	11"	3M
13 5/8"	5M	x	7 1/16"	10M
13 5/8"	5M	x	7 1/16"	5M
11"	10M	x	11"	5M
11"	5M	x	11"	3M
11"	5M	x	7 1/16"	5M
9"	3M	x	9"	2M
9"	3M	x	7 1/16"	3M
9"	2M	x	7 1/16"	3M
9"	2M	x	7 1/16"	2M
7 1/16"	10M	x	7 1/16"	5M
7 1/16"	3M	x	7 1/16"	2M

## Spacer Spools

DIAMETER	PRESSURE RATING		LENGTH
13 5/8"	10M	x	60"
13 5/8"	10M	x	48"
13 5/8"	10M	x	42"
13 5/8"	10M	x	36"
13 5/8"	10M	x	30"
13 5/8"	10M	x	26"
13 5/8"	10M	x	24"
13 5/8"	10M	x	20"
13 5/8"	5M	x	48"
13 5/8"	5M	x	36"
13 5/8"	5M	x	30"
13 5/8"	5M	x	27"
13 5/8"	5M	x	24"
13 5/8"	5M	x	18"
13 5/8"	5M	x	16"
11"	10M	x	36"
11"	10M	x	30"
11"	10M	x	24"
11"	10M	x	18"
11"	5M	x	60"
11"	5M	x	48"
11"	5M	x	36"
11"	5M	x	34"
11"	5M	x	30"
11"	5M	x	24"
11"	3M	x	30"
11"	3M	x	24"



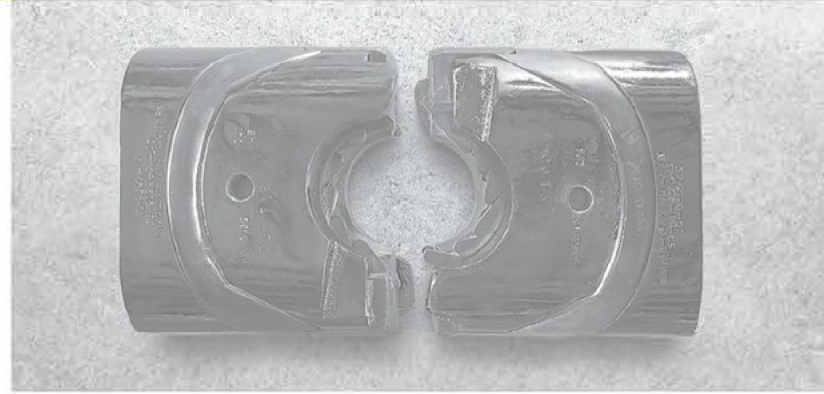
All spools, flanges, and DSAs are manufactured in accordance with the American Petroleum Institute (API) specification 6A (current edition) and the National Association of Corrosion Engineers (NACE) document NACE Standard MR 0175.

# Variable Bore Rams

**X-Energy Pressure Control LLC** offers Variable Bore Ram Rubbers ("VBR") which are designed to seal around a variety of pipe sizes. We also provide the "VBR" Ram Block in both 11" and 13-5/8" sizes to fit Type U Blowout Preventers and LWS.

**Type U:** "The Cameron U Type VBR finger inserts are designed to rotate as the hydraulic pressure is applied and the ram blocks begin to close allowing the ram rubber to seal around a variety of pipe sizes and eliminating changing ram rubbers each time you change pipe sizes improving operational efficiency and certainty during drilling and production." — Cameron

**LWS:** "On the Shaffer type LWS rams, the locking device is actuated automatically whenever the ram is closed. This is called the 'Posilock' system and uses segments that move out radially from the ram piston and lock into a groove in the circumference of the opening cylinder whenever the ram is closed. When hydraulic closing pressure is applied, the complete piston assembly moves inward and pushes the ram toward the wellbore. With the ram closed, the closing pressure then forces a locking piston inside the main piston to move further inwards and force out the segments. A spring holds the locking piston in this position so that the segments are kept locked in the groove even if closing pressure is lost. When hydraulic opening pressure is applied, the locking cone is forced outward, and this allows the locking segments to retract back into the main piston which is then free to move outwards and open the rams." — Shaffer



## Variable Bore Rams

DIAMETER	PRESSURE RATING	TYPE X VBR	SIZE	ADDITIONAL INFO
13 5/8"	3M	Cameron Type U	4 1/2" x 7"	Set of 2
13 5/8"	5M	Cameron Type U	4 1/2" x 7"	Set of 2
13 5/8"	10M	Cameron Type U	4 1/2" x 7"	Set of 2
13 5/8"	3M	Cameron Type U	3 1/2" x 5 1/2"	Set of 2
13 5/8"	5M	Cameron Type U	3 1/2" x 5 1/2"	Set of 2
13 5/8"	10M	Cameron Type U	3 1/2" x 5 1/2"	Set of 2
11"	10M	Shaffer Type 75 SL	3 1/2" x 5 1/2"	Set of 2
11"	5M	Shaffer Type LWS	2 7/8" x 5"	Set of 2
11"	3M	Cameron Type U	2 7/8" x 5"	Set of 2
11"	5M	Cameron Type U	2 7/8" x 5"	Set of 2
11"	10M	Cameron Type U	3 1/2" x 5 1/2"	Set of 2



Shaffer and Cameron VBRs are manufactured in accordance with the American Petroleum Institute (API) specification 6A (current edition) and the National Association of Corrosion Engineers (NACE) document NACE Standard MR 0175. VBRs can also be manufactured in accordance with the API specification 16A.

**Learn more about the wide variety of VBRs and Spools available today.**

Contact your local **X-Energy Pressure Control LLC** representative.

 Call Us

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