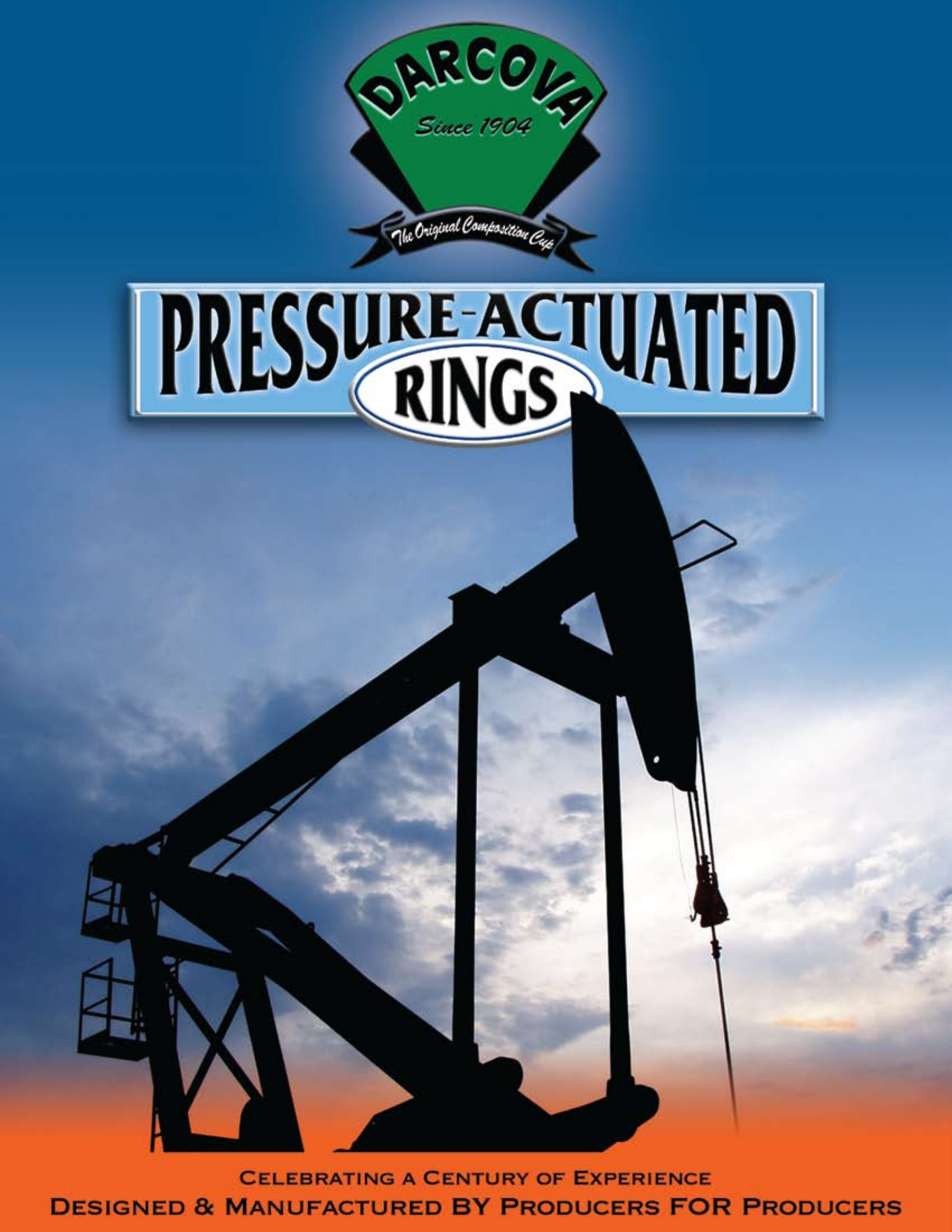
DARCOVA

Since 1904

The Original Composition Cup

PRESSURE-ACTUATED RINGS



CELEBRATING A CENTURY OF EXPERIENCE

DESIGNED & MANUFACTURED BY PRODUCERS FOR PRODUCERS

PRESSURE-ACTUATED (PA) RINGS

Extreme well conditions require extremely tough PA rings. Among manufacturing companies who service the oil industry, **Darcova** stands alone in providing a Teflon®-based PA ring for extreme well conditions.

DARCOVA XT® PA Rings

Darcova XT® PA rings provide unsurpassed performance in the toughest well conditions, including high bottom hole temperatures and high water cut producers. Our exclusive **XT®** PA rings operate in service temperatures up to 400°F. They are eXT®emely resistant to abrasion and oilfield chemicals. **Darcova's XT®** PA rings have changed the industry's concept of the PA plunger.

DARCOVA Nylon® PA Rings

If your well conditions are less than extreme but you still want the long lasting, best-designed PA ring on the market, buy **Darcova** Nylon® PA rings. Our heat-stabilized Nylon®-based thermoplastic possesses many of the same outstanding qualities as Teflon®-based thermoplastic, but to a slightly lesser degree. Our Nylon® PA rings have a slightly lower recommended service temperature (up to 300°F).

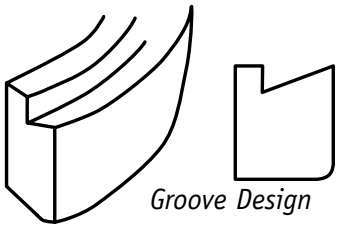
A molded gap in each ring transmits the hydrostatic head along the entire length of the plunger instead of concentrating all of the pressure on the top and bottom ring.

MATERIAL CONSTRUCTION

We mold our **Darcova XT®** and **Darcova** Nylon® PA rings from the highest quality, virgin, 100% thermoplastic resins (no recycled milk jugs and no fillers). And the design of our PA rings is the best in the industry.

RING DESIGN

Darcova's all-plastic PA ring is designed to use the well's hydrostatic head to more efficiently transmit pressure to its advantage. The ring expands on the upstroke (providing the seal necessary for greater pump efficiency), and contracts on the down stroke (allowing less resistance on the falling plunger).



Groove Design

PERFORMANCE

The exclusive design of **Darcova's** PA ring and the outstanding properties of our thermoplastic resins result in the superior performance you've been looking for. **Darcova's** PA rings tolerate sand-laden fluids by passing sand and scale particles between the plunger and barrel when necessary. In addition, the slick surface is less apt to allow abrasive particles to adhere to the ring.

Wellbore abrasives often embed in other inferior composition or fiber rings, turning the plunger into a barrel hone, which wears out the barrel much faster. **Darcova's** slick plastic PA rings provide the lubrication needed to make the pressure-actuated plunger work the way it was intended to work.

Field-tested under the most adverse well conditions, **Darcova's** PA rings have proven themselves time and again, becoming the "ring of choice" of North American producers.

P.O. Box 20736 • Billings, MT 59104 • 514 Foote Street • Billings, MT 59101

Pressure-Actuated (PA) Ring
Dimensions and Tolerances
Nylon® and XT® Rings

PA Ring Base Size	Barrel ID	PA Ring Nominal OD[1]	Ring Undersize	PA Ring Nominal ID[2]	PA Ring Nominal Width	PA Ring Nominal Height[3]
1 1/4	1.2500	1.2400	0.0100	0.8758	0.18250	0.2300
1 1/2	1.500	1.4900	0.0100	1.1250	0.18250	0.2300
1 5/8	1.6250	1.6150	0.0100	1.1250	0.24500	0.2300
1 3/4	1.7500	1.7400	0.0100	1.2500	0.24500	0.2300
1 25/32	1.7813	1.7700	0.0113	1.3000	0.23500	0.2300
2	2.0000	1.9900	0.0100	1.5000	0.24500	0.2300
2 1/4	2.2500	2.2400	0.0100	1.6250	0.30750	0.2300
2 1/2	2.5000	2.4900	0.0100	1.8750	0.30750	0.2300
2 3/4	2.7500	2.7400	0. 0100	2.1250	0.30750	0.2300
3 1/4	3.2500	3.2400	0.0100	2.6250	0.30750	0.2300
3 3/4	3.7500	3.7400	0.0100	3.1250	0.30750	0.2300
4 3/4	4.7500	4.7400	0.0100	4.1250	0.30750	0.2300

[1] Tolerance dimension is ±0.005
[2] Tolerance dimension is +0.005/-0.000
[3] Tolerance dimension is ±0.005

PA Plunger with **Darcova** Nylon® PA Rings

PA Plunger with **Darcova XT**® PA Rings

Contact the **Darcova** rep in your area or call our technical staff directly at the number below.

Compare our rings to the competition

	Darcova		Phenolic Rings
	Nylon® PA Ring	XT® PA Ring	
Performance Characteristics	Nylon® PA rings are made of heat stabilized, lubricated, impact-resistant, super-tough Nylon® 6 resins — the most flexible of the Zytel Nylon® resin line. **Darcova** Nylon® PA rings have a lower recommended service temperature than **XT**® rings.	**XT**® resin is a high performance fluoropolymer, is mechanically tough and offers an excellent balance of properties. **XT**® is inert to most solvents and chemicals, and is hydrolytically stable. Mechanical properties include outstanding impact strength, abrasion resistance, and high service temperature resistance.	Phenolics are too rigid and often crack during installation onto the plunger. They have moderate strength compared to other plastics, but higher hardness and greater rigidity. Phenolics are resistant to hydrocarbons, phenols and ethers, but are attacked by acids.
Temperature Ratings	Melt temperature is 421°F. §Upper recommended service temperature is 300°F.	Melt temperature is 575°F. §Upper recommended service temperature is 400°F.	Phenolic is not a thermoplastic, therefore, melt temperature is not applicable. §Upper recommended service temperature is 375°F.
Hardness, Shore D Durometer	57	67	100
Chemical Resistance			
Benzine	Excellent	Satisfactory	No Effect
Calcium Chloride	Unsatisfactory Stress cracks at high temperatures	Excellent	Satisfactory
Diethylene Glycol	Excellent	Excellent	No Effect
Ethanol	Excellent	Excellent	No Effect
Ethyl Acetate	Excellent	Unsatisfactory	No Effect
Hydrochloric Acid 2.5%	Excellent	Excellent	Satisfactory
Hydrochloric Acid 5.0%	Satisfactory	Excellent	Satisfactory
Hydrochloric Acid 15%	Unsatisfactory	Excellent	Unsatisfactory
Methanol	Excellent	Excellent	No Effect
Phosphoric Acid	Excellent	Excellent	Satisfactory
Potassium Carbonate	Excellent	Excellent	Satisfactory
Potassium Hydroxide	Satisfactory	Satisfactory	Satisfactory
Sodium Acetate	Excellent	Excellent	Satisfactory
Sodium Carbonate	Excellent	Excellent	Satisfactory
Sodium Nitrate	Excellent	Excellent	Satisfactory
Sulfuric Acid	Unsatisfactory	Excellent	Good
Sulfurous Acid	Excellent	Satisfactory	Good
Toluene	Excellent	Satisfactory	Satisfactory
Xylene	Excellent	Satisfactory	Satisfactory

§The upper recommended service temperature is the temperature at which parts begin to soften under continuous operation.

REV 0510

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