



aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



Nano Shield Technology by Parker

NG Series Pack Cylinders for the Waste Industry



ENGINEERING YOUR SUCCESS.

NG Series Nano Shield Technology by Parker



- **2x** Longer Service Life
- **7x** More Corrosion Resistant versus Nitride or Chrome
- **4x** Harder than 1026 Steel Coated with Chrome
- **2x** Harder than 1026 Steel Coated with Nitride
- **2x** Smoother Cylinder Stroke
- **Superior Sealing**
- **Stainless Steel Scraper**
- **4 Year Warranty** (5+ years expected service life)

Cost-Saving Patented Innovation

Pack eject cylinders are the most expensive and hardest to replace hydraulic components on the refuse truck. Damaged, corroded and leaking cylinders are the leading cause for downtime, and the single largest line item on the maintenance manager's hydraulic budget. Cylinders made prior to the NG Series have proven to not hold up in the field. Understanding the demands of the application, Parker's Mobile Cylinder Division has developed innovative technology that addresses the most common failure modes including corrosion, spill over, side load and seal wear.

Incorporating Nano Shield Technology by Parker, Mobile Cylinder Division has developed a **Next Generation Pack Cylinder** (backed with a 4 Year Warranty) to reduce the total cost of ownership over the 10 to 12 year life expectancy of the vehicle. This translates into savings of \$7,932 per vehicle. This savings is conservative, based solely on acquisition cost and R&R (remove and replace) and does not include additional savings related to customer service interruptions, unscheduled downtime, loss of oil, EPA Fines, etc.



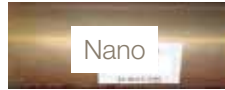
NG Series Cylinders Address Leading Failure Modes:

- Nano coating prevents corrosion
- High strength tubing minimizes external impact damage
- Engineered scraper reduces ingress
- Parker sealing technology protects against seal leaks

A combination of technologies designed to provide extended service life in the toughest of environments.



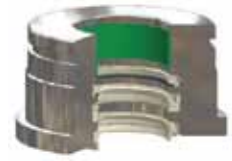
**High Strength
Micro-Alloy Steel**



**Nano Protection
From Corrosion**



**Custom Metallic
Scrapper**



**Parker Sealing
Technology**

Taking the Lead

At the core of the Pack Cylinders is a truly innovative technology, developed for the U.S. Department of Defense. Parker's Mobile Cylinder Division is proud to be the first to apply this nano technology in a commercial mobile application.

Proven Strength & Durability

Parker has impact-tested the coating, showing it improves the life of the cylinder up to 5x longer than competitors' products. Horizontal and vertical seal wear tests ran 800,000 combined leak-free cycles and showed superior performance in environmental chamber tests. Corrosion testing against the harsh "Juice" associated with Refuse Industry resulted in the cylinders withstanding 1500 hours in the ASTM B117 Salt Spray and 200 hours with no failure in the ASTM B368 CASS (Copper Accelerated Acetic Acid Salt Spray). Nano Shield Technology by Parker provides up to 7x the longevity of Chrome and Nitride treated surfaces.

The nano-crystalline structure of the coating protects against abrasive wear (up to 50% lower) and offers a superior coefficient of friction and sliding wear performance compared to hard chrome. This structure extends the life of the coating and rod seals and improves adhesion and ductility.

The high strength tubing and rod material is 20% stronger and 4x harder than standard 1026 DOM. Parker testing revealed no damage from an equivalent impact force of 4,000 lbs (typical force generated by a shovel strike is 2,200 lb).



Product Tested In

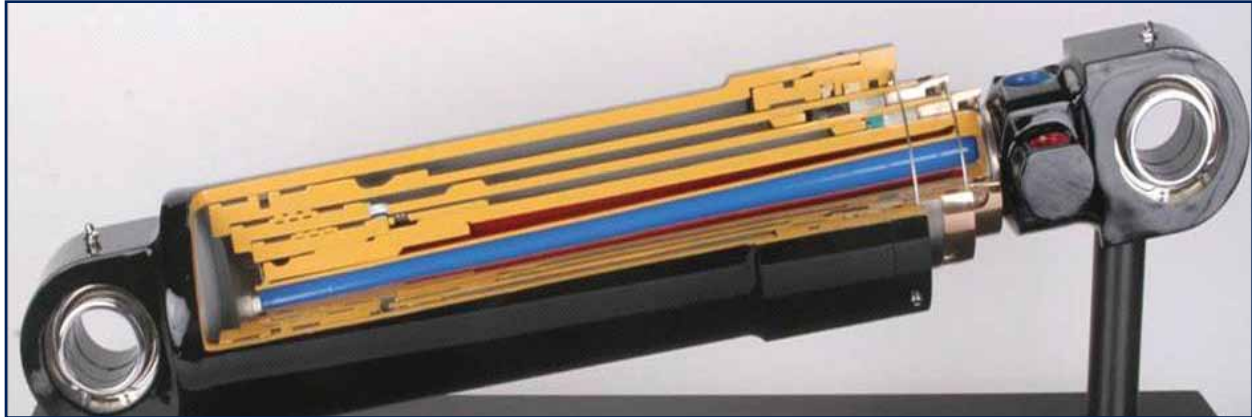
- Sand and Gravel
- Nuts and Bolts
- Hardened Steel Blades



No harmful Chromium used for construction

- Reduced power consumption up to 20 times
- 90% plating efficiency vs. Chrome at 20%
- Reduced carbon footprint

NG Series Nano Shield Technology by Parker



Customer Benefits

- **Extended service life**
- **Reduced downtime**
- **Reduced risk of EPA fines**
- **Lower Total Cost of Ownership**

About Mobile Cylinder Division

Parker Hannifin's Mobile Cylinder Division has been manufacturing multi-stage telescopic and single stage (rod) cylinders for mobile and industrial markets requiring custom engineered designs for over 80 years. Recognized as one of the largest independent manufacturers of hydraulic cylinders for mobile equipment, the Division offers a wide-range of standardized cylinder designs for a variety of industries including oilfield, mining, military, truck, refuse and material handling. Parker's Mobile Cylinder Division products include double- and single-acting telescopic cylinders, rod cylinders, "smart cylinders" with internal electronic controls, and quality custom-built cylinders.

About Parker Hannifin

With annual sales exceeding \$10 billion in fiscal year 2010, Parker Hannifin is the world's leading diversified manufacturer of motion and control technologies and systems, providing precision-engineered solutions for a wide variety of mobile, industrial and aerospace markets. The company employs approximately 52,000 people in 48 countries around the world. Parker has increased its annual dividends paid to shareholders for 53 consecutive years, among the top five longest-running dividend-increase records in the S&P 500 index. For more information, visit the company's web site at <http://www.parker.com>, or its investor information site at <http://www.phstock.com>.

