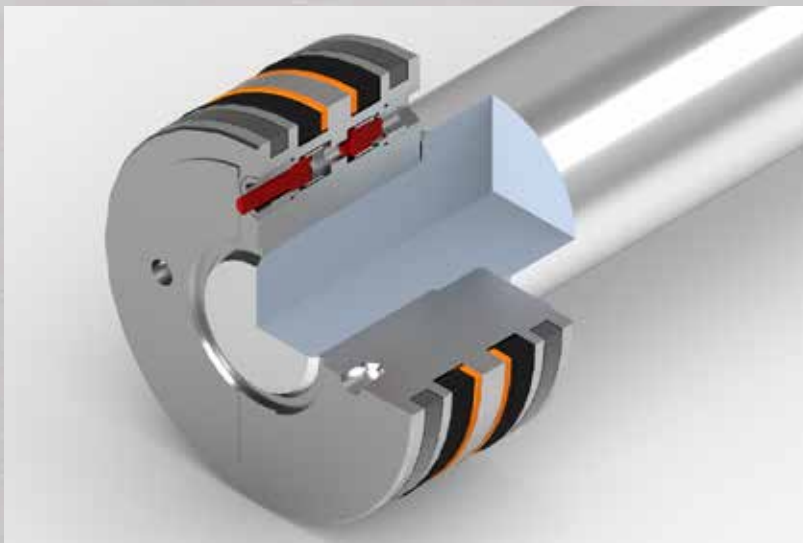


milwaukee
Cylinder
Specials Are Our Standard



ARCTM
ARC
T E C H N O L O G Y

Automatic Recirculating Cylinder



- Helps extend cylinder life
- Automatic operation at end-of-stroke
- Provides cool, filtered oil to cylinders in high temperature applications
- Available as an option for many cylinder sizes
- Available in extend or retract
- Multiple flow rates available

**Flush your cylinder with clean, cool oil,
every time your cylinder reaches
end-of-stroke with ARCTM Technology**

**Proprietary technology designed to increase
cylinder life by a minimum of 25%**

Issue Description

- Depending upon hose length, oil from the power unit never makes it to the cylinder
- Oil in the cylinder becomes stagnant, because it never gets flushed out
- Stagnant oil breaks down, decreasing the life of the cylinder



See our ARC™ video on our website or YouTube channel



See our ARC™ Design Guide available on our website

Solution

- ARC™ Technology is a proprietary opposing poppet valve cartridge built into the piston
- When the piston reaches 3/16" from the end-of-stroke, ARC™ opens and oil is allowed to bypass the piston, flushing the cylinder with new clean, cool oil
- When not at the end-of-stroke, ARC™ closes, allowing the cylinder to obtain full force and speed
- Available on our H-Series family of cylinders, on the rod end or blind end, in two different flow options

Benefit

- **Long Life** – 25% or more increase in cylinder life is possible

ARC™ recirculates clean oil replacing stagnant oil

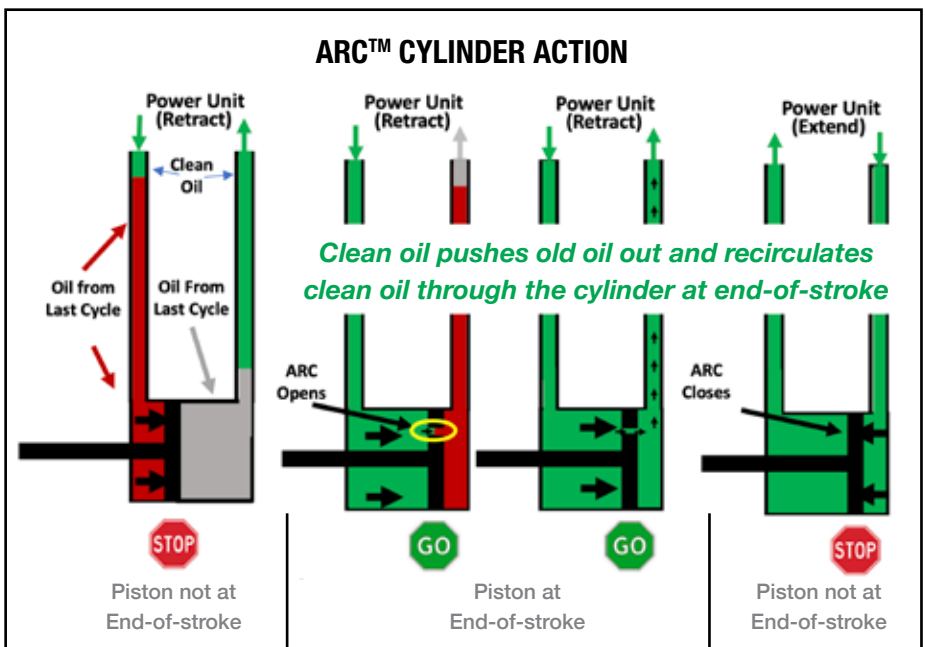
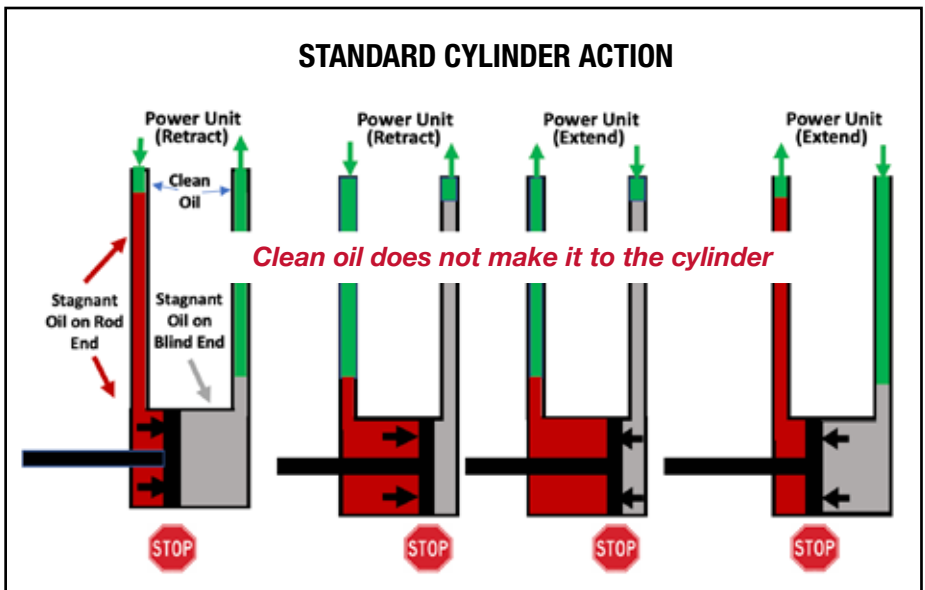
- **Cylinder Cooling**

*ARC™ recirculates cool oil from the power unit, replacing hot oil in the cylinder**

- **Improved Hydraulic Response**

Air in hydraulic oil causes performance problems, ARC™ automatically bleeds/ deaerates the cylinder, removing trapped air

* Note: Some temperature rise will occur as oil flows through the ARC™ Cartridge. This rise is typically less than the cooling affect of cool oil recirculating into the cylinder. See our ARC™ Design Guide for design suggestions.



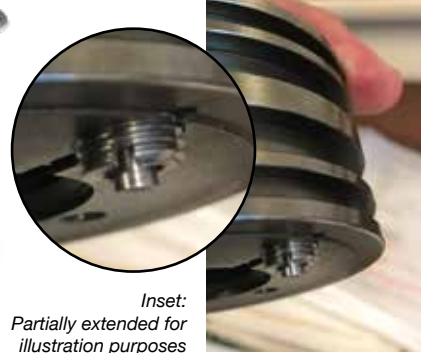
ARC™ CARTRIDGE



Cut-away view showing valve pair in ARC™ Cartridge



Exploded view



Inset: Partially extended for illustration purposes

One side of an ARC™ Cartridge

Product Availability Table H-Series Cylinders

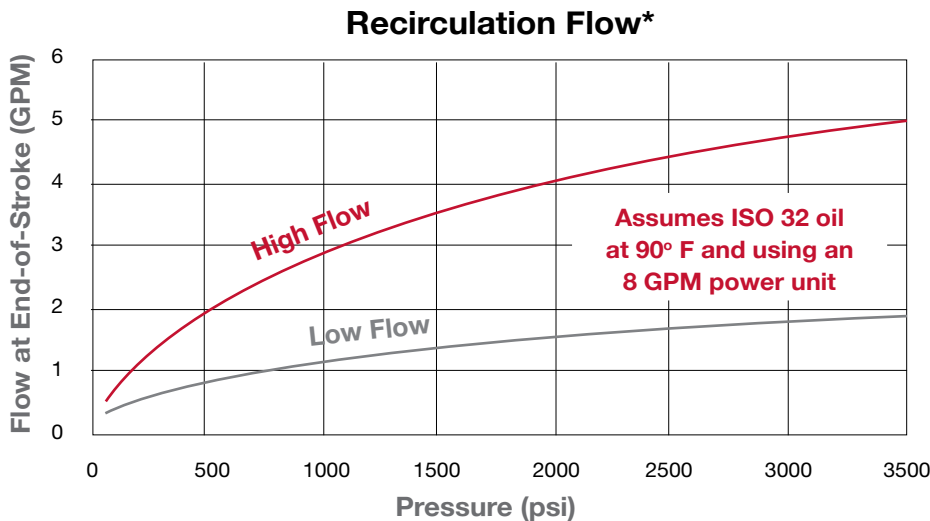
ARC™ is available in the following bore/rod configurations:

| Bore ø (inches) | Rod ø (inches) | Bore ø (inches) | Rod ø (inches) | Bore ø (inches) | Rod ø (inches) |
|-----------------|----------------|-----------------|----------------|-----------------|----------------|
| 3.25 | 1.375 | 6 | 3.5 | 8 | 4.5 |
| 3.25 | 1.75 | 6 | 4 | 8 | 5 |
| 4 | 1.75 | 7 | 3 | 8 | 5.5 |
| 4 | 2 | 7 | 3.5 | 10 | 4.5 |
| 5 | 2 | 7 | 4 | 10 | 5 |
| 5 | 2.5 | 7 | 4.5 | 10 | 5.5 |
| 5 | 3 | 7 | 5 | 12 | 5.5 |
| 6 | 2.5 | 8 | 3.5 | 12 | 7 |
| 6 | 3 | 8 | 4 | | |

Note: For larger bores or other cylinder series, please contact a Milwaukee Cylinder sales representative.

Representative Recirculation Flow* vs. Pressure Chart

ARC™ Technology is offered in a high flow or low flow option. The chart below represents expected recirculation flow for each option based on operating pressure. Actual flow performance may vary, depending on application specific parameters (return line back pressure, fluid viscosity, temperature, power unit capacity, etc.)



* This chart is based on non-cushion cylinders. Cushioned cylinders will have a reduced flow based on the cushion setting. See our ARC™ Design Guide for cushion flow information.

Example - How fast will my cylinder recirculate?

Assume: 4" bore 8" cylinder, 2500 PSI, High Flow ARC

Using the chart above, the recirculation flow rate is approximately 4.7 GPM.

$$\text{Max Cylinder Volume} = 0.7854 (4 \text{ in})^2 (8 \text{ in}) = 101 \text{ in}^3 = .44 \text{ gal}$$

$$\frac{.44 \text{ gal}}{4.7 \text{ GPM}} = .094 \text{ min} \quad \frac{60 \text{ sec}}{1 \text{ min}} = 5.6 \text{ sec}$$

The cylinder will completely recirculate after 5.6 seconds at end-of-stroke

How to Order

ARC™ Technology can be used as an option on any H-Series cylinder with the bore and rod size specified in the **Product Availability Table**.

ARC™ Technology is available in the extend or retract directions, and with high flow or low flow options. Other custom flow rates are available upon request.

When adding ARC™ Technology to a configured cylinder, include "S" for "special" in the configured cylinder model number (see page 32 of our catalog) and include the relevant "ARC-#-#" note in your inquiry.

Nomenclature

ARC - [Side] - [Flow Size]

Side: 1 = Blind End
2 = Rod End
Flow Size: H = High Flow
L = Low Flow

ARC

2

L

Side
Flow Size

This Example:

Low Flow ARC™ Cartridge with recirculation on the rod end

Note: ARC™ Technology is nearly leak proof when mid-stroke. The maximum expected mid-stroke leakage is 0.0009 GPM which equates to .016 in/min drift for a 4" bore cylinder.

Note: Oil cleanliness of ISO 4406 16/18/10 is recommended.



5877 S Pennsylvania Avenue
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 - LINEAR ALIGNMENT TOOLS
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- TEST STANDS

Contact Milwaukee Cylinder for your application needs.

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