

## FLEXFLOW CYLINDERS

High-Speed Reciprocating Compressors

### Overview

To provide higher operational flexibility, Cooper offers a variety of lined cylinders for high-speed reciprocating compressors. Liners replace the inner cylinder bore diameter without needing to replace the entire cylinder body. For example, this can be used to increase asset utilization during wellhead pressure depletion.

We offer lined cylinders with various options such as lubricated, non-lubricated, air-cooled, water-cooled, and high working pressures. These cylinders are also compliant with API-618, which specifies liners and water-cooled jackets.

### Benefits

- › Higher flexibility – as operating conditions change, exchange only the liners in a cylinder instead of a full cylinder to upgrade a compressor to meet new site requirements
- › Higher revenue possible – FlexFlow compressors can achieve higher flow that can result in bonus revenue
- › Reduced investment cost – replace piston and rod assemblies in lieu of cylinder bodies
- › Reduced labor cost – FlexFlow cylinders eliminate complications typically associated with facility expansions
- › Non-lube option – reduces maintenance costs and eliminates gas contamination

### Upgrade summary

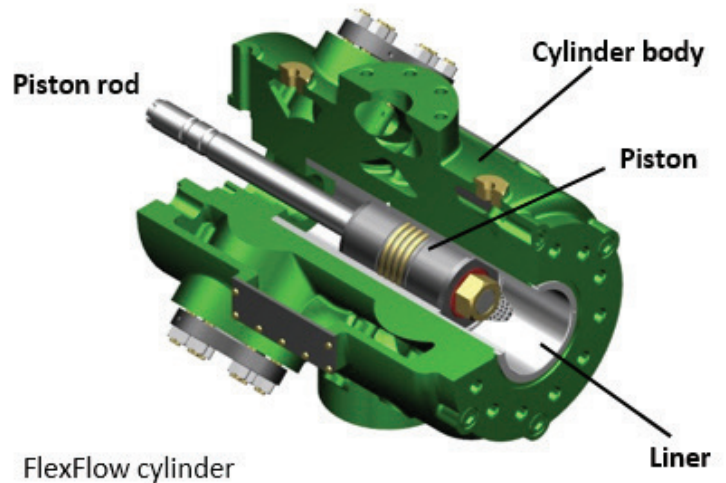
FlexFlow cylinders integrate field-tested solutions to increase asset utilization with safe operation.

Cylinders have steel valve seats and guards; MTX or HTCX valve plates are standard. Valve springs and plates are easily tailored to meet operating conditions. Lined bores are iron nitrided to ensure higher wear resistance.

Pistons are made from aluminum alloy or cast iron material. Weight is precisely controlled during the manufacturing process to eliminate the need to match parts in the field.

Carbon-filled PTFE combo piston rider rings are standard for most applications. Piston rods have rolled threads and are hardened in the packing case traveling area.

Cylinders are offered with options suitable for H<sub>2</sub>S environments.

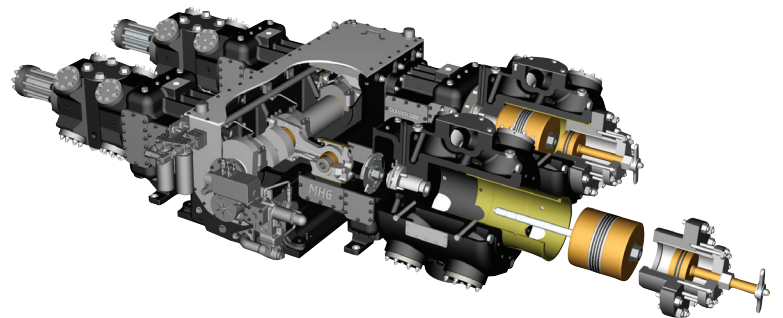


### FlexFlow compressor

Optimize equipment for varying operating conditions – aimed at gas gathering and transmission applications.

The key to FlexFlow technology is removable liners and piston rod assemblies that can be easily replaced, decreasing inventory and labor compared to substituting cylinder bodies.

Cylinders can “flex” up/down in diameter using liners – for example, a single cylinder body can be used with different liners to accommodate a 14”, 14.5” or 15” piston rod diameter. Similarly, a different cylinder body may be used to accommodate a 15.5”, 16” or 16.5” piston rod diameter.



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