



Pioneering non lubricated materials for the PET industry



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CPI, the pioneer of polymer alloys for oil free gas compressors has now developed a range of filled ptfe's specifically for the PET bottle blowing market.

These materials have been formulated and evaluated at CPI's in house research and development department. Using their rapid wear testing facility, CPI is able to accurately predict long term wear rates of materials under development and compare them with alternative materials currently being specified by PET compressor manufacturers.

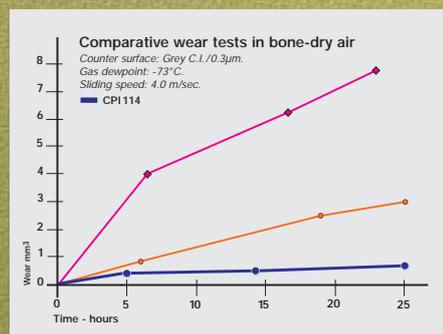
All materials that produce good results in the development laboratory are then performance tested on compressors installed in actual PET plants.

From these ongoing material trials, two materials have been produced for the oil free, 40-45 bar market, both showing significant wear rate improvement over alternative grades being used.

These two materials are:

CPI 114

CPI114 is a self lubricating material developed by CPI specifically for dry air and dry oxygen applications. Its specific application in the PET industry is for compressors in which the air is termed as 'bone dry'. Wear testing of CPI114 indicates that it has a considerably lower wear rate than other materials used in this type of application, as can be seen in the graph below.



Please refer to material descriptions left

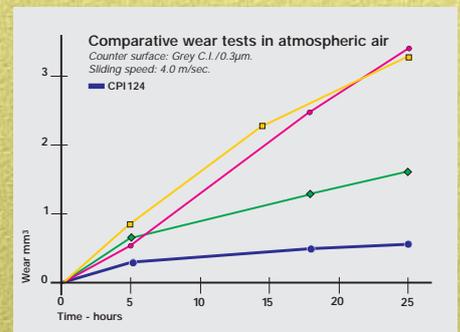
Filled ptfe material descriptions

- Competitors medium glass fibre filled grade with the addition of copper
- Competitors complex carbon filled grade
- Competitors medium filler of two carbon materials and glass fibre
- Competitors graphite glass and molybdenum disulphide filled material

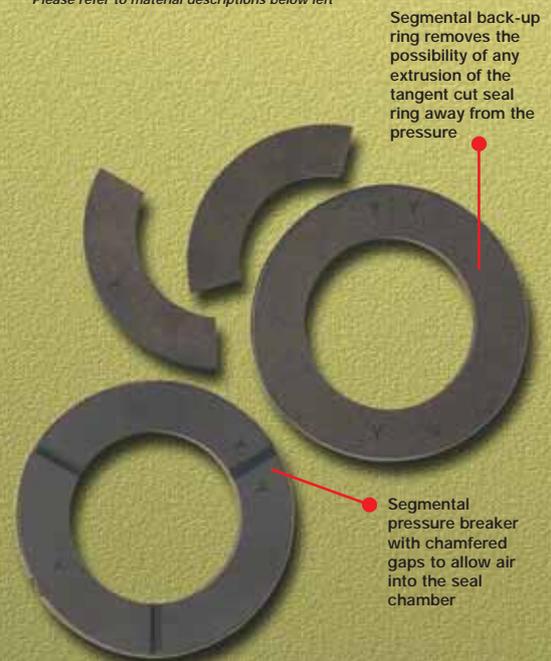
The exceptional flexibility of CPI114 enables it to be successfully used for all designs of piston ring, rider ring and piston rod packing.

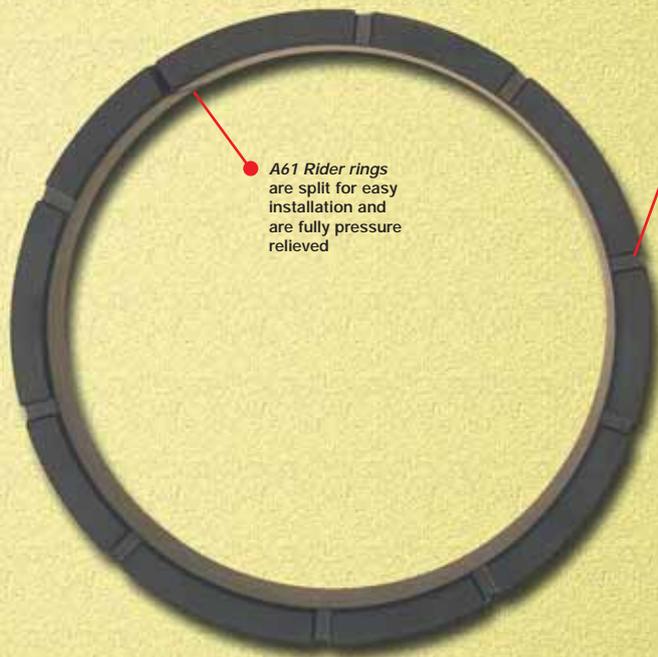
CPI 124

CPI124 is a high duty self lubricating atmospheric air compressor material developed by CPI to provide long and reliable operating life in non lubricated PET compressors where the air is dried after the compression stages. CPI124 has been formulated to give a combination of properties including toughness and greater resilience to elevated temperatures. These properties make it ideally suited for more arduous air compressor applications. The good flexibility of CPI124 enables it to be successfully used for all designs of piston ring, rider ring and piston rod packing.



Please refer to material descriptions below left





A61 Rider rings are split for easy installation and are fully pressure relieved

Alternately angled grooves to ensure the ring does not spin on the piston

Piston rings

The recommended CPI piston ring designs for PET compressor applications is as follows:



The larger 1st and 2nd stages should normally use CPI piston ring styles A00 or A01, which are both single piece designs. The A00 type is straight cut and is specified for aluminium pistons where spinning rings are known to cause piston groove wear. CPI also recommends that the piston groove flanks are hard anodised as standard to

further reduce the potential for wear. The A01 design is 45° angle cut which gives a lower gap leakage area than the A00 design. The air loads on the angled gap tends to encourage the ring to turn on the piston and consequently this design is specified only for steel or cast iron pistons.

A01 Piston ring is angle cut at 45° which gives a lower gap leakage area

Segmental back-up ring removes the possibility of any extrusion of the tangent cut seal ring away from the pressure



Radial cut front ring allows air into the seal chamber via the gaps thus pressure actuating the tangent cut seal ring onto the piston rod



The tangent ring performs the majority of the sealing

The angled gap is specified for steel or cast iron pistons

Rider rings

Each piston is supported and guided by a rider ring of CPI A61 design, which is split for easy installation and fully pressure relieved to ensure that they do not act as piston rings.

The A61 design is a single piece angle cut ring, suitable for all stages.

The pressure relief grooves are on both the shoulder and cylinder contact faces.



Those on the cylinder face are angled alternately to ensure that the rider ring does not spin on the piston, and also to ensure that the maximum cylinder surface is swept by the ring.

CPI is recognised as a world leader in improving the reliability of critical sealing components for reciprocating compressors used widely in the Oil, Gas, Petrochemical, Air Separation and related industries.

Our unrivalled expertise is based on a thorough knowledge of compressor operation and extensive field experience gained over a number of years of collaboration with compressor manufacturers and users around the world.

With CPI's Research and Development team at the forefront of pioneering new materials for reciprocating compressor applications, further ground breaking developments will continue to take place with the emphasis on reliability and efficiency of operation in a variety of applications within the industry.

For further information about CPI's products for the PET industry or general product range which includes the CPI compressor valve, please contact CPI corporate headquarters at the address below.

Piston rod packing

The main piston rod packing design is the CPI B10 which is a radial/tangent pair with a radially cut back up ring. The radial cut front ring faces the cylinder pressure and is designed to allow the air to enter the seal chamber and pressure actuate the tangent cut ring onto the piston rod. It is the tangent ring that performs the majority of the sealing, while the radial cut front ring seals any potential leakage through the tangent ring joints. The back up ring is manufactured with a slight rod clearance and is designed to butt and is therefore not pressure actuated onto the piston rod.

This ring removes any possibility of extrusion of the main sealing ring between the packing cup bore and the piston rod.



Piston rods

CPI recommend that piston rods for non lubricated PET compressors should be manufactured from 400 series stainless steel, induction hardened in the packing area to 50-55Rc.



CPI

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