



"PROTECH" – LABYRINTH - TYPE SEAL

The ProTech™ Line

**Unique Solutions
That Extend
Bearing Life**

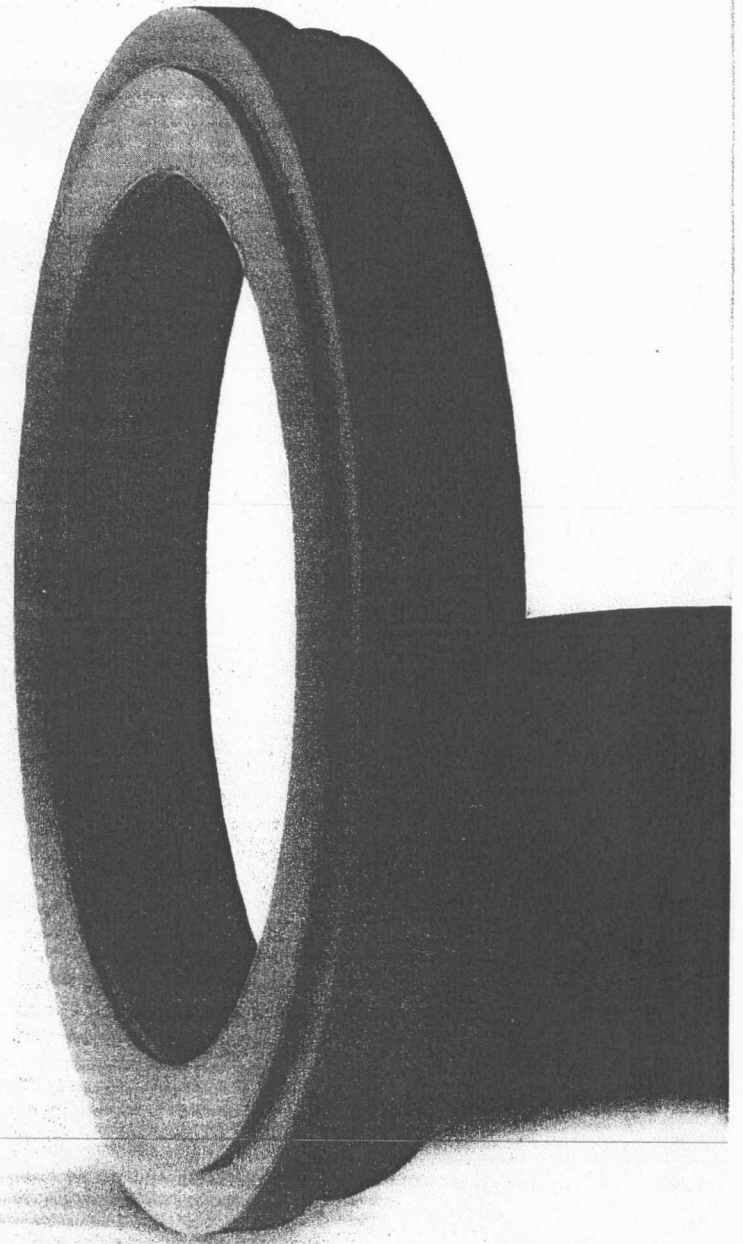
Yesterday's Attempts

Over the years, a standard radial lip oil seal has been a good choice for most shaft sealing applications. However, there are applications in which these seals have some drawbacks: (1) one-way sealing and (2) seal and shaft wear.

The First Problem: The standard radial lip oil seal was designed to keep oil in, not keep contaminants out. **Second:** Riding on the shaft, the seal causes wear on both the shaft and the seal. This eventually results in lubricant leakage and greater intrusion of contaminants, and ultimately there is shaft damage and bearing failure.

Industry Response: A new seal design used an old concept called the labyrinth seal. This seal was designed to solve the most significant problems of radial lip oil seals. Unfortunately, it also has a few drawbacks. The labyrinth seal is not only costly and complicated, it can allow some contamination to reach the lubricating oil when used in critical operating environments.

More new designs were tried, but they relied on the use of **metal** which is costly and requires close tolerances in both the seals and equipment. The introduction of new materials led to some improvement in performance, but progress reached a plateau.



Some manufacturers offered **two-piece seals**. Since these were not unitized, users had to handle and install two pieces, and there were occasional failures when the seal separated because of high pressure wash down or axial shaft movement. Other manufacturers made a **unitized seal**, but these required at least three pieces and as many as four O-rings. All adding to cost and the potential for leakage.



The Solutions!

ProTech™ solves all those problems from the past.

Unlike other labyrinth-type seals, these seals are **unitized**, two-piece PTFE seals that require only two O-rings. ProTech has three unique designs that provide outstanding performance and lower cost; designs that are superior because of simplicity. Additional patents pending.

- **Unitized means ProTech is permanently assembled and will not separate during installation or normal axial shaft movement during operation.**
- **Two-piece design has fewer parts which means fewer leak paths and lower cost.**

New ProTech Designs

JM Clipper has added two new ProTech seals to the original ProTech design so these unique, high-performance seals can be used in thousands of additional applications. All three offer the same benefits that extend bearing life:

- No shaft wear
- Efficient, reliable two-piece construction
- Complete exclusion of contaminants
- Zero lubricant leakage
- Chemically resistant PTFE
- Multiple PTFE compounds for industrial, petrochemical, pulp and paper, and food service applications.
- Low friction allows high shaft speeds

Additional ProTech designs are in development including split seals, pillow-block, grease purgeable, and pressure applications.

An Award-Winning Design

ProTech was recently selected for a Bronze Award for "Product of the Year" by engineers who read *Plant Engineering* magazine. Readers reviewed hundreds of new products and selected those with the most effective features and unique benefits. In addition, Dupont has selected ProTech for special recognition in the 1995 Plunkett Awards for innovative Teflon® designs in the Chemical Process Industries.



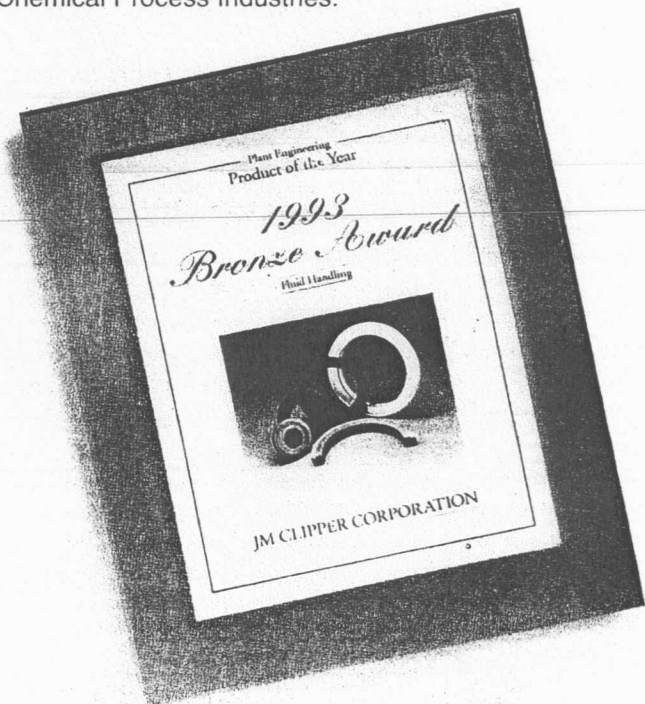
**Standard
Single-Port Flange
Design**

**New
Multi-Port
Design**

**New
Non-Flange
Design**

Just as important, when JM Clipper unitizes the two components, the ProTech is not simply forced or snapped together like other brands. It is uniquely and permanently assembled without the danger of damage or distortion—and without the potential problems of a third piece.

Specify JM Clipper ProTech bearing protector in new (OEM) and rebuilt (MRO) severe duty (IEEE-841) electric motors, gear boxes, and centrifugal pumps.





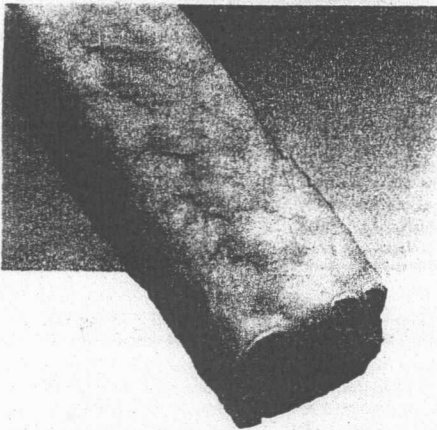
C-45



Carbon yarns are treated with a graphite lubricant, then braided into a tough interlock pattern with a final graphite treatment to create this very popular packing. A very economical packing suitable for an extremely wide range of centrifugal pump applications.

Temperature Limit 600°F (315°C)
 pH Range 0 to 14
 Shaft Speed 3000 FPM
 Pressure 300 PSI
 PV Limit † 525,000

C-49



C-49 is a very popular, general service "work horse" packing for rotating, reciprocating or valve service. It is made from a special glass yarn that is braided with the strong, interlock pattern, saturated with PTFE, then treated with a special blocking wax and a break-in oil. Tests show this packing performs much like the old asbestos/PTFE packing in the critical performance areas of minimum gland adjustments, low shaft wear, low leak rate, and long life. C-49 is not recommended for use in steam service.

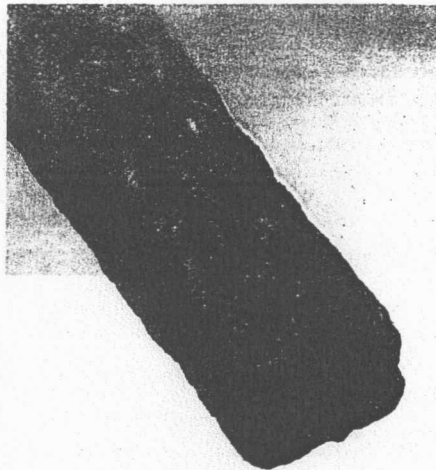
Temperature Limit 500°F (260°C)
 pH Range 3 to 10
 Shaft Speed 1500 FPM
 Pressure 300 PSI
 PV Limit † 325,000

C-51



Style C-51 is an interlock braided, synthetic-yarn packing that utilizes a special wax and graphite lubrication system, plus a proprietary blocking agent to impart exceptionally low friction and excellent sealability properties. An especially friendly packing to use, C-51 can be cut and installed with ease. It needs little or no follow-up adjustment to maintain a very low leakage rate without heat build-up or shaft wear. C-51 handles a wide range of chemicals and is recommended for centrifugal pumps, reciprocating pumps, or valves handling mild acids and alkalines, hot and cold water, alcohol, brine, or petroleum.

Temperature Limit 400°F (205°C)
 pH Range 4 to 10
 Shaft Speed 1500 FPM
 Pressure 500 PSI
 PV Limit † 400,000



C-52



C-52 is the first choice for non-contaminating general service packing. Inexpensive, easy to use and long wearing, it is particularly recommended for pulp and paper service where black packings are a possible contamination source. The strong interlock braided acrylic yarn is treated with PTFE, then finished with a break-in lube and mica for an easy start-up. C-52 will operate in a wide range of chemicals and is recommended for centrifugal pumps, reciprocating pumps and valves handling mild acids and alkalines, hot and cold water, steam, oils and alcohol.

Temperature Limit 400°F (204°C)
 pH Range 4 to 12
 Shaft Speed 1500 FPM
 Pressure 500 PSI
 PV Limit † 400,000

Approximate Feet Per Pound

	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	3/4"	7/8"	1"
C-17			24.0	15.5	11.0	8.0	6.2	4.9	3.8	2.8	2.3	1.8
C-26	73.0	33.0	19.4	13.1	9.0	7.6	5.8	4.6	3.7	2.6	1.9	1.5
C-45	90.0	66.0	52.0	29.5	18.0	14.3	9.3	7.8	6.3	4.4	3.5	2.7
C-49	65.0	46.7	22.4	13.5	10.1	7.7	5.5	4.0	3.4	2.5	1.9	1.3
V-50	89.0	65.6	50.9	29.0	17.7	14.0	9.0	7.3	6.0	4.0	3.1	2.5
C-51			40.8	29.8	22.1	18.2	10.9	9.0	7.8	5.6	4.0	2.9
C-52			24.4	15.6	10.9	8.0	6.1	4.8	3.9	2.7	2.0	1.5