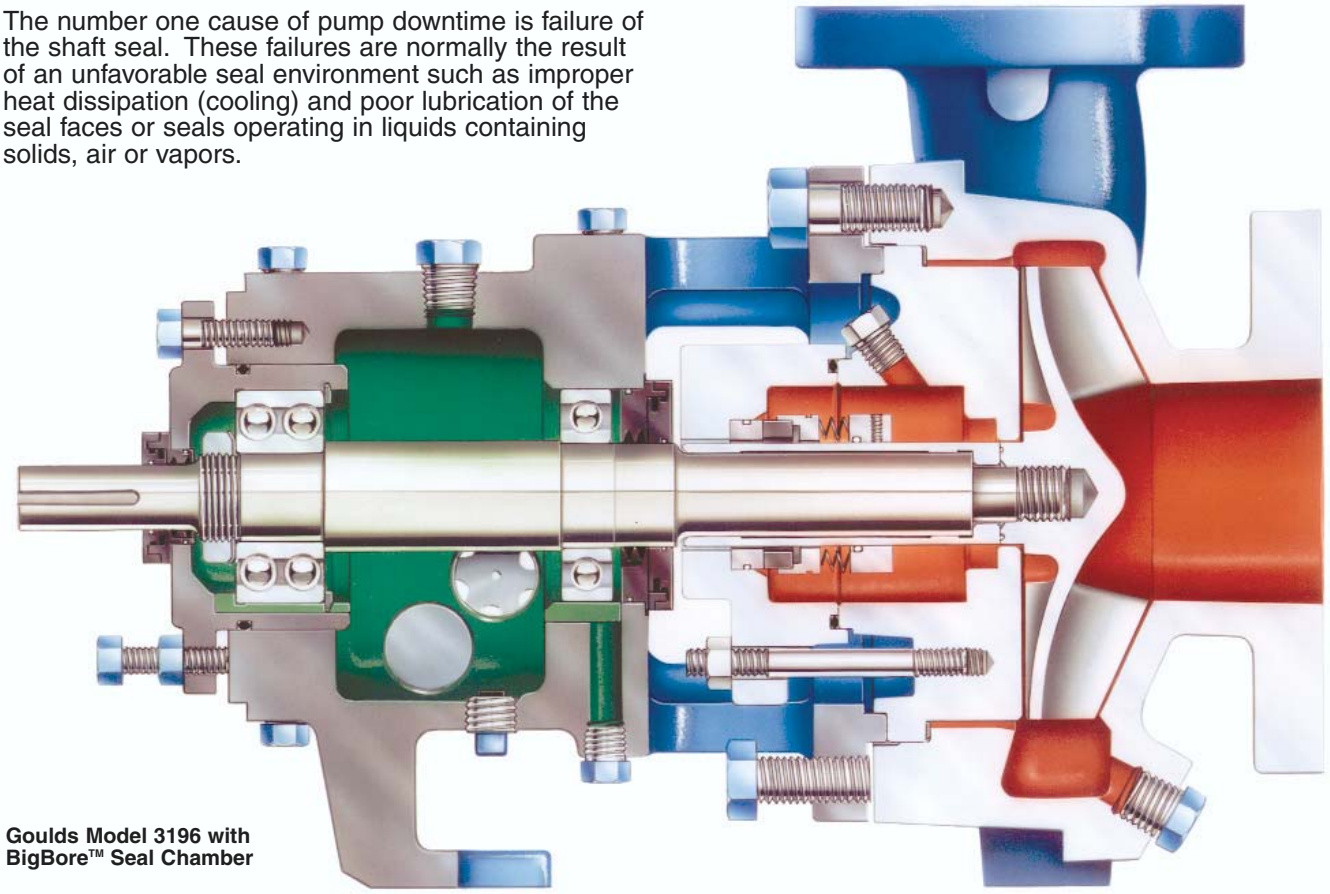
GOULDS TAPERBORE™ PLUS

Patented: No.5,336,048

Engineered Seal Chamber With Vane Particle Ejector For Process Pumps

Seal Environment Is Critical For Extended Seal Life

The number one cause of pump downtime is failure of the shaft seal. These failures are normally the result of an unfavorable seal environment such as improper heat dissipation (cooling) and poor lubrication of the seal faces or seals operating in liquids containing solids, air or vapors.



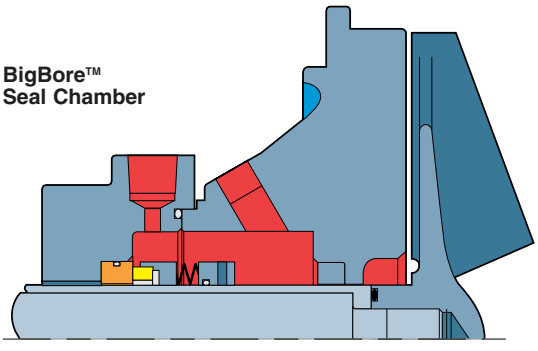
Goulds Model 3196 with BigBore™ Seal Chamber

Large Bore Seal Chambers Extend Seal Life

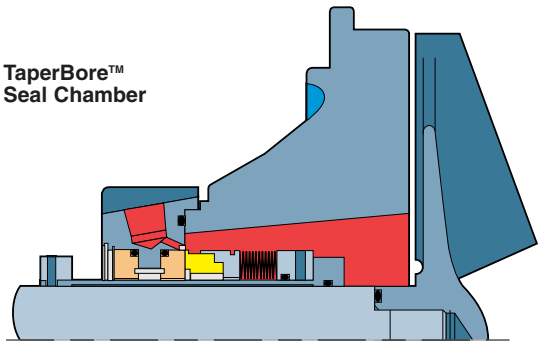
Introduced in the mid-1980's, enlarged bore seal chambers with increased radial clearance between the mechanical seal and seal chamber wall, provided better circulation of liquid to and from seal faces.

Improved lubrication and heat removal (cooling) of seal faces extended seal life and pump uptime. The bottom line was lower maintenance costs.

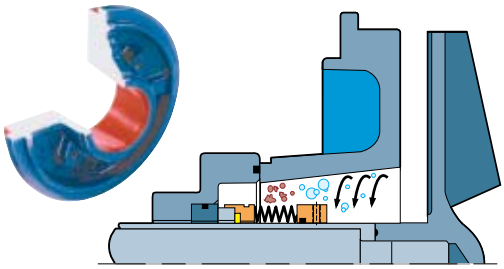
BigBore™ Seal Chamber



TaperBore™ Seal Chamber

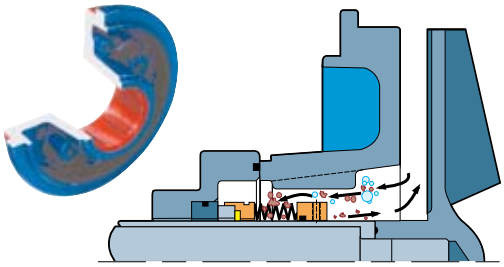


Tapered Bore Seal Chambers...See The Difference



Conventional Tapered Bore Seal Chamber: Mechanical Seals Fail When Solids Or Vapors Are Present In Liquid

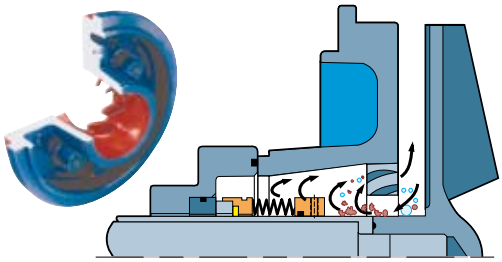
Many users have applied the conventional tapered bore seal chamber to improve seal life on services containing solids or vapors. Seals in this environment failed prematurely due to entrapped solids and vapors. Severe erosion of seal and pump parts, damaged seal faces and dry running were the result.



Modified Tapered Bore Seal Chamber With Axial Ribs: Good For Services Containing Air, Minimum Solids

This type of seal chamber will provide better seal life when air or vapors are present in the liquid. The axial ribs prevent entrapment of vapors through improved flow in the chamber. Dry running failures are eliminated. In addition, solids less than 1% are not a problem.

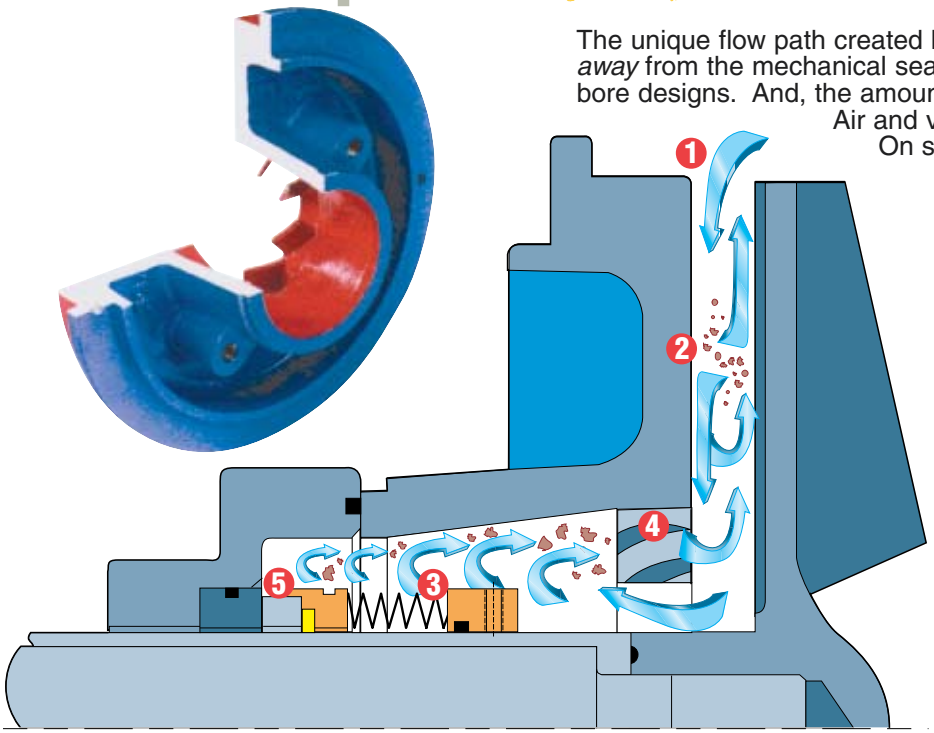
The new flow pattern, however, still places the seal in the path of solids/liquid flow. The consequence on services with significant solids (greater than 1%) is solids packing the seal spring or bellows, solids impingement on seal faces and ultimate seal failure.



Goulds Standard TaperBore™ *PLUS* Seal Chamber: The Best Solution For Services Containing Solids and Air or Vapors

To eliminate seal failures on services containing vapors as well as solids, the flow pattern must direct solids away from the mechanical seal, and purge air and vapors. Goulds Standard TaperBore™ *PLUS* completely reconfigures the flow in the seal chamber with the result that seal failures due to solids are eliminated. Air and vapors are efficiently removed eliminating dry run failures. Extended seal and pump life with lower maintenance costs are the results.

Goulds TaperBore™ *PLUS*: How It Works



The unique flow path created by the Vane Particle Ejector directs solids *away* from the mechanical seal, not *at* the seal as with other tapered bore designs. And, the amount of solids entering the bore is minimized. Air and vapors are also efficiently removed.

On services with or without solids, air or vapors, Goulds TaperBore™ *PLUS* is the effective solution for extended seal and pump life and lower maintenance costs.

1. Solids/liquid mixture flows toward mechanical seal/seal chamber.
2. Turbulent zone. Some solids continue to flow toward shaft. Other solids are forced back out by centrifugal force (generated by back pump-out vanes).
3. Clean liquid continues to move toward mechanical seal faces. Solids, air, vapors flow away from seal.
4. Low pressure zone created by Vane Particle Ejector. Solids, air, vapor liquid mixture exit seal chamber bore.
5. Flow in TaperBore™ *PLUS* seal chamber assures efficient heat removal (cooling) and lubrication. Seal face heat is dissipated. Seal faces are continuously flushed with clean liquid.

Seal Chamber Selection Guide

Goulds Engineered Seal Chambers Provide Best Seal Environment For Selected Sealing Arrangements/Services

A Ideally Suited

B Acceptable

C Not Recommended

Service	**TYPE 1** **Standard Bore** *Designed for packing. Also accommodates mechanical seals.*	**TYPE 2** **BigBore™** *Enlarged chamber for increased seal life through improved lubrication and cooling. Seal environment should be controlled through use of CPI flush plans.*	**TYPE 3** **TaperBore™ *PLUS*** *Lower seal face temperatures, self-venting and draining. Solids and vapors circulated away from seal faces. Often no flush required. Superior patented design maximizes seal life with or without solids and vapor in liquid.*	**TYPE 4** **Jacketed Stuffing Box** *Maintains proper temperature control (heating or cooling) of seal environment.*	**TYPE 5** **Jacketed BigBore™** *Maintains proper temperature control (heating or cooling) of seal environment with improved lubrication of seal faces. Ideal for controlling temperatures on services such as molten sulfur and polymerizing liquids.*
					
Ambient Water with Flush	A	A	A	-	-
Entrained Air or Vapor	C	B	A	C	B
Solids 0-10%, no Flush	C	C	A	C	C
Solids up to and greater than 10% with Flush	B	A	A	B	A
Paper Stock 0-5%, no flush	C	C	A	-	-
Paper Stock 0-5%, with flush	B	A	A	-	-
Slurries 0-5%, no flush	C	C	A	C	C
High Boiling Point liquids, no flush	C	C	A	C	C
Temperature Control	C	C	C	B	A
Self-Venting and Draining	C	C	A	C	C
Seal Face Heat Removal	C	A	A	C	A
Molten or Polymerizing liquid, no flush	C	C	B	C	C
Molten or Polymerizing liquid with flush	C	B	B	C	A

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