

### INTRODUCTION

**REOTEMP Diaphragm Seals** (or Chemical Seals) use a flexible barrier, or *diaphragm*, to isolate a pressure sensor (gauge, switch, transmitter, or transducer) from adverse effects of the process fluid.

Diaphragm seals are useful to:

- 1.) *Protect the sensor* from the process media (corrosive, abrasive, viscous, or crystallizing media)
- 2.) *Protect the process* from the sensor (sanitary process requiring clean-out, or high purity media).

### HOW IT WORKS:

A diaphragm seal, when properly mounted to its sensor and filled, will accurately transmit process pressure to the instrument. Pressure exerted on the flexible diaphragm is transmitted hydraulically to the instrument through the fill fluid, which fills the void between the diaphragm and the instrument, (including the bourdon tube, in the case of a pressure gauge.)

**APPLICATION CONSIDERATIONS:** The following should be considered when choosing a diaphragm seal:

1. Process Characteristics: Pressure, temperature, (see tables, this page) chemical compatibility and viscosity.
2. Seal Mounting: Connection to process (threaded, flanged, clamped, in-line) Connection to instrument (usually NPT).
3. Ambient Characteristics: Temperature, corrosive atmosphere, etc.
4. Instrument Considerations: Sufficient fluid displacement is required to drive instrument through its full range (this means, for example, you can't put a large gauge on a small seal); remote instrument placement requires a capillary connecting instrument to seal.
5. Vacuum Considerations: High vacuums (over 25" Hg vac.) or vacuums with high temperatures require special fill selection, preparation, and procedures, as well as careful diaphragm selection.

**NOTE:** Improper selection may result in system failure and possible damage or injury. REOTEMP can provide application assistance, but final compatibility is the responsibility of the buyer. Proper selection of seal can reduce or eliminate any additional system error caused by adding a Diaphragm Seal to your instrument.

### SEAL TYPES:

**Standard Seals** (pp 22-23): include Threaded off-line, threaded in-line, and flanged off-line types in many materials for a variety of applications:

**Sanitary Seals** (pg 28): are designed for food, pharmaceutical and other sanitary applications. Available to fit most standard piping systems, including "Tri-clamp", "I" line, and others. For straight- thru and in-line sanitary seals with no crevices, see our lit #ILS.

**Mini-Seals** (pg 27): are designed for low-displacement applications where size or economy are considerations.



**SPECIAL DESIGNS:** REOTEMP is ready to work with you on any high-performance diaphragm seal application, (that might exceed the stated limit below) such as high vacuum, high temperature, high sterility, custom design or high static pressure with a low differential span, or high vacuum with high temperature.

### Temperature Limits

Maximum Temperature	Diaphragm Material	Lower Housing
650°F	Welded metal	Metal
450°F	Teflon	Metal
300°F	Viton	Metal
140°F	-	Nonmetal

### Pressure Limits

	psi	Lower Housing	
<b>Maximum working pressure</b>	1,500	metal, with ss bolting	(at 100°F)
	2,500	metal, std bolting	(at 100°F)
	5,000	metal, hi-press bolting	(at 100°F)
	per flange rating 300	ASA flange non-metallic	(per flange spec) (at 140°F)
		Diaphragm	size 5 seal      size 6 seal
<b>Min. working Pressure</b>	Metal	25 psi	10 psi
	Teflon	20 psi	8" W.C.
	Viton	5" W.C.	n/a
<b>Vacuum Limits</b>	Metal	-21" Hg	-24" Hg
	Teflon	-23" Hg	-26" Hg
	Viton	-29" Hg	n/a

**MATERIALS:** Lower housings: 316SS standard, with a large selection to suit a wide variety of applications (see Table 1, pg. 23)

**Diaphragms:** Standard metal diaphragms are convoluted and made of 316SS. Many other materials are available, for corrosion resistance or extra sensitivity. (See Table 6, pg. 23)

**Gaskets:** Standard gaskets are teflon on the process side of diaphragm (grafoil for hi temp.), and viton on the fill side. Other materials are available.