

Sealing Specialty Process Equipment

The Challenge

Mixers, reactors, agitators, specialty dryers, and blenders manufacturing paints, coatings, inks, pharmaceuticals, cosmetics, food, and consumer goods (i.e. toothpaste) under pressure must be sealed with marginally lubricating conditions and allow very little (parts per billion) emissions or product contamination.

One type of equipment known as a Thin Film Evaporator. The purpose of this device is to remove a volatile solvent from a solution via evaporation while discharging a concentrated product in pumpable form. This device feeds fluid into the top of a heated vessel, then wipes the fluid onto the walls of the heated vessel to cause evaporation. The solvent exits the top of the vessel. While the concentrate exits the bottom of the vessel. The top of the vessel must be sealed to prevent vapor from leaking to atmosphere, but cannot be flushed due to contamination of concentrate.

Dryers use a similar process to remove fluid from a slurry mixture. The slurry is heated to drive off the fluid from the slurry leaving a powder. Contamination of the slurry with a flush or barrier fluid is unacceptable. Emissions of the vapor may also be unacceptable. The challenge is to seal this equipment while avoiding liquid leaking into the product or emissions leaking out from the product.

The Chesterton Solution

Chesterton's 4410 seal is the ideal solution to seal poorly lubricating fluids found at the top of thin film evaporators (see figure 1) while allowing zero emissions and very low product contamination. The 4410's non-contacting or lightly contacting seal face technology and gas flow into the product prevents poorly lubricating liquids, paints, polymers or food/pharmaceuticals from damaging seal faces.

Emissions of product to atmosphere and contamination of product are measured at less than 500 ppm. The 4410 may use Chesterton's "Saber Toothed Set Screws" to allow the seal to be driven by hardened equipment shafts.

Service Temperature:
400°F (205°C)

Shaft Speed:
50 RPM

Shaft Size:
8" (200mm)

Operating Pressure:
Vacuum to 40 psig
(2.7 bar g)

Sealing Product:
4410 -64 CB/SSC/FFKM

Date of Installation:
August 8, 2001



Why Use 4410 Seals?

- ✓ **Zero Speed/Slow Speed Capable**
- ✓ **Bi-Directional**
- ✓ **Radial Run-Out to .180 Inches/4,5 mm**
- ✓ **Dynamic Pressure Regulator Built In**
- ✓ **Seals Pressure Upsets or Reversals**
- ✓ **Compact Design**

4410 Hydrostatic Gas Seals

Item #	Product Description	Installation Drawing
177076	4410 2.978 SA CB/SSC S K177076	
802138	4410 -22 SA SSCG/SSCG S FKM	
107181	4410 -28 SA CB/SSC S FKM	
132137	4410 -28 SA CB/SSC S K4079	
132012	4410 -28 SA CB/SSCG S K4079	
131682	4410 -28 SA CBSC NOIGCS 131682	
802139	4410 -28 SA SSCG/SSCG S FKM	
802140	4410 -38 SA SSCG/SSCG S FKM	
802141	4410 -40 SA SSCG/SSCG S FKM	
802142	4410 -56 SA SSCG/SSCG S FKM	
263587	4410 -58 SA CB/SSCG SFKM263587	D36760 REV C
131921	4410 -64 SA CB/SSC S K131921	D35377 REV F
802143	4410 -64 SA SSCG/SSCG S FKM	
266844	4410 70M SA CB/SSC S C550	
218818	4410 80M SA CBPO22/SC S 218818	D36526 REV E
809006	4410 90M SA CB/SSC S FKM	
192529	4410 110M SA CB/SSC S 192529+	D36493 REV C
642008	4410 110M SA RSCCB 642008 BYR	D35113 REV C
644678	4410 110M SA TCTC 644678 BYRON	
242949	4410 160M SA CB/SSCGSK242949+	D36714 REV A

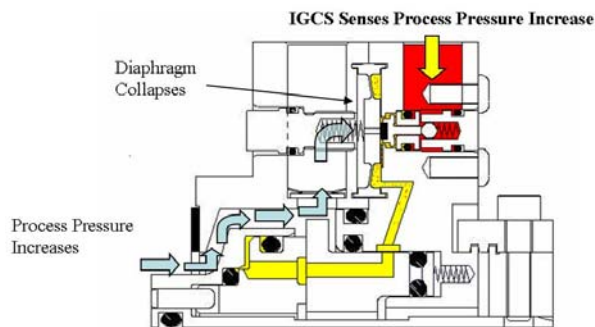


Figure 3 – 4410 Senses Upset or Reversal

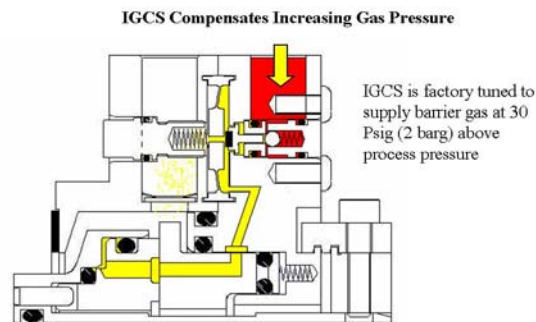


Figure 4 – 4410 Directs More Gas To Seal

A.W. Chesterton Company

500 Unicorn Park Drive,
Woburn, MA. 01801-3343
©A.W. Chesterton Company, 2007

© Registered trademark owned and licensed by A.W. Chesterton Company in USA and other countries

Telephone: **1-781-438-7000**

Fax: **1-781-438-8971**

ChestertonMarketingServices@chesterton.com

www.chesterton.com