

CASE STUDY

How the R. A. Ross team's knowledge and experience can help you.



Empty pot showing leaking existing seal. The barrier fluid is leaking into the process due to inferior design.



The pump installation with PPC seal (behind mesh screen).



R. A. ROSS & ASSOCIATES, INC.
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Eliminating Daily Barrier Fluid Top-Offs in Ethanol Evaporator Service

APPLICATION:

Sulzer APT5 process pump, 3.5" shaft, evaporator service at an ethanol plant. High-temperature service with flashing liquid.

THE PROBLEM:

The pump was sealed with another manufacturer's dual cartridge seal.

The root cause was the press-fit faces. In high-temperature evaporator service with flashing liquid, thermal stress and rapid temperature changes cause press-fit faces to distort. Once the faces lose flatness, a leakage path opens and barrier fluid escapes rapidly into the process.

This problem becomes significantly worse as seal size increases. On a large 3.5" shaft, the greater face diameter amplifies the distortion from thermal gradients and flashing conditions, accelerating barrier fluid loss even further.

In addition, the other design places the inboard faces inside the stuffing box, so barrier fluid does not fully surround and cool both sets of faces.

There's a reason that automatic refill barrier pot systems have been introduced—in this case, our customer experienced persistent seal leakage.

See our solution on page 2

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THE PPC P-3F SOLUTION:

The plant switched to the PPC P-3F dual cartridge seal.

Key design differences that solved the problem:

- Monolithic (non-pressed) faces with large cross-sections that maintain flatness under high temperature and flashing conditions — especially critical on larger seals like this 3.5" size where press-fit distortion is more severe.
- Both sets of faces (inboard and outboard) sit inside the gland, fully bathed in barrier fluid. This provides direct lubrication and maximum cooling/circulation to both faces at all times.
- The inboard faces are not located inside the stuffing box.
- Works equally well on standard-bore or big-bore stuffing boxes.

*The PPC
P-3F Seal
used in this
installation*



- Integrated pumping ring and tangential ports create strong, directed barrier fluid circulation right at the sealing faces.

Results Since installing the PPC P-3F:

- Barrier fluid levels remain stable.
- Daily top-offs have been completely eliminated.
- Both face sets stay properly lubricated and cooled even in high-temperature flashing evaporator service on a large 3.5" seal.
- Maintenance no longer has to chase fluid levels or worry about missing a top-off.

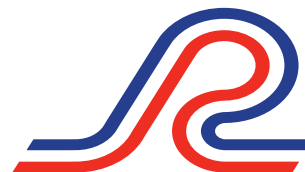
Top-offs are now a thing of the past. The P-3F has delivered a more reliable, lower-maintenance sealing solution for this demanding ethanol evaporator application.



*PPC Seal
installed*

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Keeping process flowing since 1985

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