



KC Sealing System Design Objectives

These are the objectives our UPW customers have told us are most important to them. We tried to meet these objectives in designing the **KC Sealing System** and believe they are important for end-users to consider in evaluating flange component alternatives. We are not aware of any combination of components other than those in the **KC Sealing System** which meet these objectives.

- Seal the joint.
- Seal the joint at bolt-up, during testing and during operation.
- Seal the joint at the pipe ID, not just at the flange face OD. *You only see leaks at the flange face OD. Even though there are no visible signs of a leak, you may have medium trapped between each side of the gasket and the face of opposing flanges.*
- Eliminate areas in which bacteria can grow:
 - Seal at ID of the flange.
 - Fit the flange both before and after bolt-up.
 - Create no "pockets" at pipe ID under normal operating conditions.
 - Minimize voids in the gasket material.
 - Minimize gasket exposed area and compressed (installed) thickness.
 - Provide even stress distribution on the gasket and flange area.
- Minimize total cost of **installed** flange, not just purchase cost of components at the receiving dock. Installation cost includes purchase cost of a flange backing ring, gasket, fasteners **and** mechanical contractor crew cost (labor, tools, scaffolding and clean room) **and** project elapsed time. *Costs at the receiving dock are the most critical costs only if flange components are never installed.*
- Arrive at dock cleaned and ready to install.
- Simplify installation procedure.
- Reduce installation time.
- Reduce chances for installation error, while making allowance for such errors.
- Seal at pipe manufacturer's torque values without requiring costly fasteners (higher grade and/or PTFE-coated) or bolt lubricants, *which cause higher stresses on flanges.*
- Reduce re-installation costs to fix "leakers" during purge and testing.
- Help to geometrically center the pipe for proper laminar flow.
- Minimize the hydraulic forces which the joint must overcome - *you do this by sealing at the flange ID, not the flange OD.*
- Eliminate the distortion, and subsequent thermal set, of flange adapters caused by conventional flange backing rings.
- Manufacture gasket from as pure a material as possible.
- Mass produce components.
- Achieve predictable, reliable, repeatable, measurable and verifiable joint performance.



We didn't set out to design the best **UltraPure** Water sealing system . . .

. . . but we did.

Flanged joints notoriously have been the weakest link in any piping system. This is especially true, and critical, in ultra-pure water (UPW) systems used in today's precision manufacturing of semiconductor, pharmaceutical, and bio-technology products.

Some gaskets are "right on size" before installation, but protrude into the stream flow after bolt-up (elastomeric materials). This causes turbulence and dead spots which may provide an area for bacteria to grow, contaminating your water system, and possibly your finished product. **Do you know whether the gasket you are currently using protrudes into the stream flow, and may be causing some of your purity problems?**

A gasket which is widely used in UPW applications is dark green when installed, but becomes lavender over time. **Did you ever wonder where in your UPW system the "coloring" finally ended up, and if this might be causing purity problems?**

Other backing flanges concentrate clamping force on the outside of the flange face, rather than on the I.D. of the pipe. This results in a seal on the outside of the flange face, but reduced compression at the most critical point - the I.D. of the pipe. While there may be no externally-visible signs of leakage, this may create an internal breeding ground for costly contaminants along side of the gasket. **Did you know that the**

combination of certain widely used backing flanges and PTFE over EPDM gaskets may allow the medium to come in contact with the EPDM substrate?

Properly installed backing flanges are bolted-up in a "star" pattern. Some piping and valve manufacturers suggest maximum torquing for each pipe size and also recommend a 4-pass bolt-up, using a calibrated torque wrench for the final pass. The only sure way to get a good joint is to do a 4-pass bolt up using 33% of the value for each pass and use a calibrated torque wrench for the final pass, but you must also measure the gasket compression using a feeler gauge. This ensures that the seal is good before the system is hydro tested and gaskets get wetted.

KC Sealing System

Gaskets:

UltraPure

- For non metallic piping (full-face and ring).
- For Schedule 10 piping.
- For Old and New ANSI piping.

Other materials available include:

Viton, FPM, EPDM; and Silicone

Installation Tools:

- Both ANSI and DIN

Read on to learn how KC's Sealing System can help you maintain the integrity of your critical piping system. The KC Sealing System consists of an innovative patented low-torque gasket, engineered patented backing flanges.

We would be happy to discuss your sealing issues and problems, and how we can help you resolve them. Let us explain to you why today's leading-edge UPW systems have KC Multi-Ring Products inside and outside.



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