



Leaking Seat Seals on Ball Valves

An industry leading ball valve manufacturer approached us with a complicated sealing problem; they had an issue with a large number of valves that had been specified for use on a submarine. The soft seat seals used on the ball valves were not providing the required leak tightness that had been stipulated by their client and the only way they could reach the requirement was to almost double the torque being placed on the ball. This increase in torque level was unacceptable, so the valves could not be put into service. As we were already a key supplier of PTFE lipseals to this customer, they approached us to find a solution.

ASSESSMENT

We visited our customer to establish the issues that were being witnessed and to see the valve being tested under service conditions. Once again, the valves were not achieving the specified leak rate unless the torque values placed down on the ball were almost doubled. We asked for the valve to be stripped down so that we could examine the existing seat seals and take some measurements of the ball in the seat. The seat seals had been manufactured by another supplier in Virgin PEEK material and upon examination, it was suggested that the surface finish of the actual seat seals was a cause for concern and could be creating a leak path around the ball itself.

SOLUTION

We were supplied with a full manufacturing drawing of the Virgin PEEK seat seal by our client while on site. The next day we drew the part in our CAD/CAM system and manufactured new parts in Virgin PEEK and a special lubricated PEEK material, while utilising our own design of cutting tools and special machining techniques to achieve a superior surface finish on the parts. The final process was to then put the parts through a superfinish cycle in one of our de-burring machines.

RESULT

The new sample seat seals were delivered to our customer within 2 days of our initial assessment and the parts manufactured from Virgin PEEK were assembled into the ball valve to undergo testing. By the end of the test it was confirmed that the seat seals had passed both the leakage and torque requirements and actually exceeded them by 50% and 10% respectively. Our client then tested the special lubricated PEEK seat seals and were astonished to report the same 50% improvement in the leak tightness requirement and a staggering 33% reduction on the original specified torque requirement. Our client delivered their valves on time and stipulated that M Seals be their sole supplier for both spring energised lip seals and soft seat inserts.

