

duotight Design Revision

1.10



KegLand Distribution PTY LTD

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duotight design revision 2020 (1.10)

The duotight range of push in fittings has widely seen to be an extremely popular range of products that make reliable leak proof seals easy and quick to perform. Fittings are able to be left connected indefinitely or tubes easily removed and joints reused if adjustments need to be made to system layouts.

Since these fittings were released in 2018 very few failures have been recorded (below 0.01%).

The duotight fittings were made using an engineering plastic Polyoxymethylene (AKA, POM or Acetal). This is a common plastic that has been used in the brewing industry for many years including in duotight fittings and other push to connect systems like John Guest fittings. As other competitors in the market were already using this resin grade we took the safe option to emulate other established brands and use the same POM resin.

We noticed in some instances that a duotight or John Guest fitting that is made of POM could experience a mild chemical attack if it is washed repeatedly with harsh chemicals that are commonly used in the brewing industry. It was noticed that the surface of a fitting could become chalky in appearance; in severe instances the fitting would become more brittle and crack.

Such a chemical attack could be caused by bleach (sodium hypochlorite) or other sanitisers used in the like Stellarsan. Generally speaking Stellarsan at its normal usage concentration was not an issue which is how it passed our initial chemical testing, however after noticing some damage to the fittings a different chemical resistance testing was completed whereby the Stellarsan was continually sprayed onto a fitting then allowed to dry. This repeated spraying and drying of a correct concentration of the sanitiser would cause the water in the solution to evaporate and a buildup of the residual chemicals would occur. In the case of StellarSan, the acidic base chemicals (phosphoric acid, & LABS acid) would increase in concentration beyond the recommended concentration levels for POM materials.

Eventually the concentration would increase to the point that a surface defect could be observed on a fitting or part of a fitting. Some individual components that are under increased levels of stress could undergo environmental stress cracking. This was observed

in the assembly collar of duotight fittings that is permanently in a state of elastic deformation after being clipped into position. In mild instances it would result in surface etching giving the duotight and John Guest fittings a chalky surface and made the fittings more brittle.

Environmental Stress Cracking

The environmental stress cracking was only noticed on a very small number of fittings sold and would often exhibit failures as shown below.



As this outer ring that pushes over the fitting is under some tension/stress this part was more susceptible to the chemical attack.

Solution

The Kegland Design team has been making some changes to these fittings and has now replaced the collar made from POM with a stronger (better impact resistance & tensile strength & toughness), more chemically resistant plastic called POK (polyketone).

These new POK duotight fittings have been found to be significantly more resistant to a wider range of chemicals and through all testing showed no signs of damage even with very strong acid and bases and other chemicals such as bleach, phosphoric acid, acetic acid, lactic acid, LABS acid, and various other cleaning solutions.



As shown in the image above the new fittings made from POK are shown on the left and the older POM fittings are shown to the right. This change to the injection moulded tooling was made so the parts made from the different polymers were easily distinguishable.