# Cost effective reusable hygienic fittings for hose assemblies

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Fluid transfer can be a demanding and costly element of food and beverage processing. In addition to the need for the highest standards of sanitation in every step of the process, the equipment is put under considerable stress in these aggressive and active applications from everyday wear and tear.

Extending the service life of equipment and saving on cost and replacement can be a game-changer for the industry as long as sanitary levels are maintained or even improved.

The hose assembly serves as a good example of the pressures and demands placed on industry equipment. Once an expensive part of the process, the hose assembly has undergone significant redesign and improvement in recent years and has become much more cost effective.

● **Addressing sanitary requirements.** A lot of effort is made – both by equipment manufacturers and food and beverage processors themselves – to ensure that all elements of these assemblies are sanitary. Whatever the media, hoses are required to impart no taste or flavour to their contents, even after withstanding frequent cleaning – under pressure, at high temperatures – and often with aggressive cleaners.

● **Aggressive use.** Hose assemblies must be able to withstand prolonged rough use, especially in high traffic areas like receiving bays, where they are dragged about, constantly mishandled, and are sometimes even run over by heavy equipment like trucks. These hoses need to be replaced frequently to stop leakage and contamination.

Hoses used in these applications have traditionally had crimped fittings attached – a tight seal has been ensured by compressing the fittings at extremely high pressure. The problem is that when the hose is discarded the permanent fitting is also thrown away.

● **Materials in hose assemblies.** Food and beverage processing requires high performance component assemblies in every stage of the process.

Hoses are often made from materials that are designed for higher temperatures and demanding chemical applications. These hoses must be able to withstand frequent cleaning and sterilisation without imparting taste or odour.

In other areas, crush resistant high pressure hoses must guarantee a secure and flexible connection between system components and piping. These are used for loading and unloading raw products in high traffic areas.

The fittings are usually made of stainless steel so they can stand up to the same rigorous conditions. Plastic components must also meet the same standards as the hoses, in terms of durability and sanitation.

● **The problem of economics.** Crimping is a good choice for indoor, minimal contact applications, where the hose and fitting are left alone. In such enclosed space a carefully handled hose can last several years. However, for applications where hoses need to be replaced frequently, this is not a cost effective choice – new hoses cost a fraction of the price of new fittings, yet both have to be replaced on each occasion. Reusable undamaged fittings that could be re-attached to new replacement hoses would be a better choice.

● **The challenge.** But how do you make a fitting that is practical to reuse? Crimping is not an option because it permanently distorts the metal.

One development has been a two piece fitting with a stem that goes inside the hose and a sleeve that goes on the outside and screws onto it. In this manner both parts can be unscrewed and used agin.

However 'galling' which is a clogging-shearing-locking action causes the stainless steel parts to lock in place.

Food safe lubricants can be applied to the threads to prevent galling, but these quickly wash away during regular cleaning and do not solve the problem.

## Advent of reusable fittings

The problem of galling was solved through an ingenious approach using new technology. Reusable fittings were developed with a threaded insert of sterile thermoplastic fixed inside the stainless steel sleeve.

When the separate stainless steel stem was then inserted inside the hose, it would screw into the insert, rather than the sleeve itself. In this way the metal did not rub against metal, and so galling no longer occurred.

To maintain sanitation levels an O-ring protects the point where the stem and sleeve join. When the assembly is washed down, nothing gets into either the hose or the fitting itself. Consequently, reusable fittings can be classified as completely sanitary and the connections can attain the highest 3-A Sanitary Standard.

As a result, the fittings last longer and are completely reusable to be removed and reattached many times. Without the additional cost of purchasing new fittings there are considerable savings.

## Today's markets

In order to meet different specifications, polymeric lines of reusable fittings have also been introduced. While the stem remains stainless steel – which is all that the media will come into contact with – the sleeve can be composed of a range of plastics that suit the application needs.

The plastic sleeves do not last as long as their metal counterparts, but the result is still a completely sanitary fitting that can be reused several times, saves end-users time and money, without adding any complications.

Re-usable fittings like the Saint-Gobain Performance Plastics ranges have been in use for over 10 years. They have proved to be reliable and have performed in a wide variety of food and beverage industry applications. This experience is invaluable in finding effective and efficient customised solutions. ■