



Preventing contamination in the milk production chain

White Paper



ENGINEERING YOUR SUCCESS.

Introduction



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An appropriate definition of a sanitification plan for milking plants and milk tanks it is essential to minimize the risk of contamination of milk and dairy products, mitigate the risk of cross-contamination between animals, maximize the economic life of milking plants and ensure the food safety by producing milk with a low bacterial load.

Hygiene of the automated milking apparatus is obtained through the use of alkaline detergents for the removal of fats and proteins, descaling agents to remove limescale (milk stone), sanitizing agents based on chlorine and peracetic acid for the removal of pathogenic germs.

As a result of automation and new systems implementation to raise productivity and minimize waste times, production processes are more and more frequently including automated sanitation process and washing cycles.

This is key to answer the challenges in efficiency and production capacity in the milk and dairy supply chain.

The problem with the current technologies

In the milking systems, the use of check valves ensures the separation of the cleaning circuit from the milk circuit and the tanks for storage.

Such technology is however frequently leading to insufficient and instable tightness resulting in critical leakages.

This is where milk contamination by the cleaning agents take place.

Parker product technology advantages

To overcome this problem, Parker has proposed the 201LG series of solenoid valves manufactured from food and milk compatible aseptic materials.

A wide selection of this range is also NSF/ANSI 169 certified and mounts FDA seals, matching the highest food compliance requirements.

The 201LG direct acting solenoid valve range guarantees direct control of the milk fluid from vacuum to the required pressure. Spring return function ensures closure when de-energized leading to intentional and direct control of the circuit.

The FDA approved soft seal material ensures perfect tightness against the 316L grade stainless steel seat, and longest operational life. That seal and the seat materials withstand to the mechanical stress as well as provide broad chemical compatibility.

Valerio Pozzi, Fluid Control Solutions Marketing Manager comments – “Parker’s solenoid valve sealing capabilities are

unmatched as we benefit from the cooperation of Parker’s Engineered materials group expertise, while we have developed the strictest testing processes to ensure unmatched tightness of our products. Each valve has to pass severe automated tests to proof absence of leakage and full compliance with the product specifications”.

Such high flow capacity direct acting valve provides the highest possible flow rate to minimize cleaning times triggering finally productivity improvements.

The handling and control of fluids have therefore achieved an improvement deploying an active technology-based component such as a solenoid valve against a passive check valve technology previously used.

Agile development moves to aseptic connection systems

Raw milk can contain germs and parasites that are dangerous to health, such as Brucella, Campylobacter, Listeria, Mycobacterium bovis, Salmonella, toxin-producing strains of Escherichia coli, noroviruses and parasites such as Giardia. Fermentation processes may take place in circuit areas where dead volumes are present, hence a clean and aseptic design is required.

This critical sanitation requirement of the application has led our engineers to develop and propose a further evolution of the range.

The standard 201LG series has been designed with threaded BSPP connections. Threaded connections are very efficient with high pressure industrial applications, while generate drawbacks in terms of dead volume areas in food processing applications.

Indeed and because of that, they are not suitable for an application with alimentary and perishable fluids such as milk: fermentation phenomena can take place in such areas because of stagnating media.

Parker engineers overcome such issue through an evolution of the basic valve range replacing threads with ISO 2852 Tri-Clamp connection systems.

“The agility and quick reaction on technical adaptations for core ranges are fundamental to grow our business and enter nich markets. Our organization is set to answer quickly to our Customers and Partners demand, evolving our core range and adding new features” – comments Valerio Pozzi - “Indeed and in this specific case, this connection system allow easy installation, cleaning and a general



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improvement in safe and healthy food handling performances, maximizing the impact of our solutions definitely answering our Customer's unmet needs”.

Conclusion

The growing demand for food and dairy products is an important driver for innovation aimed at improving the efficiency of systems. Parker is an agile partner to solve Customer's pain points and through deployment of outstanding quality products and technical solutions.



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— Valerio Pozzi, Fluid Control Solutions Marketing Manager

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