

# **Technical Data Monograph**

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**The Instrument Protection Properties of Prolystica<sup>®</sup> 2X  
Concentrate Alkaline Detergent Versus Other Alkaline Products**



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# 1 Background

Surgical instruments and equipment are a substantial investment for any hospital. It is also one that is continuous with the introduction of ever-changing specialized and customized pieces. Reprocessing instruments in an efficient manner is crucial to maintaining optimum through-put within the sterile processing department. However, processing can also be the source of hidden costs driven by poor cleaning and lack of instrument protection that reduce functionality and necessitate instrument replacement before the end of their useful life.

The chemistry used as part of the cleaning process can have a significant impact on the quality of surgical instruments and equipment. While it is important that a cleaning chemistry be compatible with the metal and plastic materials used in the manufacture of these instruments and thus exhibit no negative impact on them, a cleaning chemistry should also protect against the damaging effects of water. Water is a common solvent used in the cleaning of soils, and comprises >98% of the dilution make-up for a cleaning chemistry in the sterile processing area. It represents most of the liquid volume utilized to drive the mechanical action within a washer/disinfector. Water is certainly an inexpensive and convenient resource. Unfortunately, water itself can be corrosive. It can contain a number of chemical contaminants that have the potential to negatively impact the functionality and useful life of surgical instruments. Common metals such as calcium, copper, iron, and zinc can deposit on instruments, leading to visible stains. Once these metals have deposited on the surface, they can lead to corrosion of the instrument surface. Even high quality water containing few or no contaminants can be highly corrosive to metal surfaces. Instrument corrosion reduces the efficiency of the instrument, causes excessive wear, and leads to expensive repair and replacement costs. Additionally, with hospitals faced with processing loaner sets of instruments on a regular basis, the need to minimize such instrument damage becomes even more critical. The use of a cleaning chemistry that affords protection from the damaging effects of water can optimize instrument reprocessing.

Optimized cleaning using a chemistry formulated to provide instrument protection greatly extends the useful life of surgical instruments by maintaining top functionality and performance. It allows for processing to occur in a highly efficient manner, as well as reducing the need for additional reprocessing. Since corrosion can harbor and protect microorganisms from the sterilization process, controlling instrument corrosion aids in eliminating microbial contamination and helps ensure staff and patient safety.

# 2 Purpose

Prolystica® 2X Concentrated Alkaline Detergent is a concentrated liquid detergent designed for use in ultrasonics and automated washers/disinfectors for the processing of surgical instruments. The purpose of this study was to compare the instrument protection of Prolystica 2X Concentrated Alkaline Detergent and three additional alkaline products with Pakistani stainless steel scissors (floor grade) commonly used in the healthcare field.

# 3 Methods

Prolystica 2X Concentrated Alkaline Detergent (STERIS® Corporation), V. Mueller® Intra-Clean™ Alkaline Detergent (Cardinal Health), MetriClean®2 (Metrex® Research Corporation), and Medline Alka-Wash (Medline Industries, Inc.) were tested for compatibility with Pakistani stainless steel scissors.

The scissors were washed with a dilute solution of Manu-Klenz® Instrument Detergent to remove any processing residues. They were then submerged in the highest recommended use dilution of each product. Tap water was used as a negative control and for all product dilutions. The scissors were allowed to soak for a period of five weeks at 50°C. The elevated temperature was used to accelerate any potential damaging effects as well as mimic the heated conditions within the washer/disinfector under which the instruments are routinely exposed to the chemistry. The scissors were visually observed at 72 hours, one week, three weeks, and five weeks for changes in: appearance; color, dulling, solution appearance, and container residues. This inspection assessed the overall protection of the stainless steel from the damaging effects of water. Observations were recorded in a laboratory notebook. Pictures were taken at the one, three, and five week time points.

# 4 Results and Discussion

Alka-Wash and MetriClean2 did not afford significant instrument protection to the scissors in tap water. Corrosion was noticed on the scissors in Alka-Wash at the 72 hour inspection. Though not as pronounced, iridescent discoloration was beginning on the scissors soaking in MetriClean2 at the 72 hour time point as well. The corrosion on both scissors exponentially worsened as time progressed. V. Mueller Intra-Clean Detergent appeared to protect the scissors from gross corrosion; however, exposure to the chemistry caused the finish of the instrument to dull significantly.

Prolystica 2X Concentrate Alkaline Detergent exhibited superb instrument protection ability. There were no visible signs of rust or discoloration on the scissors after soaking in the product dilution for five weeks. Additionally, the test solution remained clear for the entire duration of the test.

The physical appearance of the scissors after five weeks exposure was documented in the following photographs:

**Tap Water Control**



**Prolystica® 2X Concentrate Alkaline Detergent (STERIS)**



**Alka-Wash™ (Medline)**



## MetriClean® 2 (Metrex)



## V. Mueller® Instra-Clean™ Alkaline Detergent (Cardinal)



# 5 Conclusion

Evaluation of instrument protection is necessary since frequent exposure to detergents or water alone can lead to deterioration of surgical instruments during the cleaning process. The test results demonstrate whether or not damage to the integrity of the metal substrate occurs when exposed to the detergents over a period of time.

The data for the instrument protection summarized in this report represents continuous exposure for five weeks to use-dilutions of Prolystica 2X Concentrate Alkaline Detergent, three competitive products and a tap water control. Under the described test conditions, Prolystica 2X Concentrate Alkaline Detergent provided the most protection for the Pakistani stainless steel scissors at the recommended dose level tested. The overall appearance and visible condition of the scissors was remarkable compared to various competitive products currently available in the market.

**References:** Research and Development Notebook numbers:  
6521: 90 - 93

## Mixed Sources

Product group from well-managed forests, controlled sources and recycled wood or fiber



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