

ProEZ Gel™ Aerosol Spray Pre-Treatment Gel

Gel Efficacy



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1 Introduction

Instrument reprocessing is a crucial part of the daily functions of a hospital and the importance of keeping bodily soils loose and moist on the instruments is paramount in attaining a proper sanitation level post-cleaning. Extended periods of time in between surgeries can lead to hard-to-clean soils as drying occurs, highlighting the importance of pre-treatment products. Pre-treatment gels are used on instruments to begin the cleaning portion of reprocessing immediately following an operation.

For a pre-treatment product to be effective, it must be able to begin breaking the soil down and continue doing so over time. The dissolved contaminants must then be held in solution until they can be rinsed off prior to cleaning. The lower the soil load on instruments as they enter reprocessing, the easier and more efficient the cleaning process. This is especially important when there is considerable downtime in between an operation and reprocessing. For this reason, the 72hr timeframe was used to mimic an extended period of time in between an operation and instrument reprocessing.

2 Purpose

ProEZ Gel™ is a ready to use neutral pH pre-treatment gel applied at point-of-use to prevent soils from drying on instruments and devices used in healthcare. In addition to passive wetting action, ProEZ Gel™ features *Bacillus subtilis*, a microorganism that continuously digests organic soils over time by producing the appropriate enzyme for the soil type. The efficacy of ProEZ Gel™ will be tested by applying the product to a pre-determined amount of bovine protein soil and allowing the product to break the soil down over the course of 72hrs. Three pre-treatment products, OptiPro® by Ecolab, PRE-Klenz® by Steris, and Prepzyme® Forever Wet by Ruhof, will be compared to ProEZ Gel™ as well as ProEZ Gel™ made with no bacillus to highlight the effectiveness of enzyme generation. Efficacy will be defined as the product's ability to minimize the deposition of organic soil and gel. The product should be rinse free and maintain dissolved contaminants in solution until they can be rinsed away.

3 Method

One gram of bovine protein soil is weighed and applied to a stainless-steel tray. The stainless-steel tray is then sprayed with approximately 15g of product. The tray will then be allowed to sit in room temperature conditions for 72hrs. Images of the tray are documented at 24hrs and at 72hrs. Following the 72hr period, the stainless-steel trays will be rinsed with cold tap water at an approximate flow rate of 50 mL/s for 50 seconds and dried under room temperature conditions. The weight of the dry tray is measured to determine the amount of soil and product left over and overall efficacy. In this experiment, efficacy will be calculated by eq. (1) and represented as a percentage of protein soil and product removed following the treatment period.

$$\text{Efficacy} = \frac{(\text{Pre-Rinse Product and Soil Weight} - \text{Post-Rinse Product and Soil Weight})}{\text{Pre-Rinse Product and Soil Weight}} * 100\% \quad (1)$$

4 Results

ProEZ Gel™ was able to begin breakdown of soil and prevent the deposition of 93.21% of the blood soil and product residues onto the surface of the tray. Note that the bacillus isn't acting immediately and will take some time to activate as seen in the difference between the tray immediately upon application and after 72hrs. The product works continuously to break down the contaminants, as evidenced by the differences between the pre-rinse ProEZ Gel™ with bacillus tray and the pre-rinse ProEZ Gel™ without bacillus. The 4-vertical-streak blood pattern that each tray began with can still be observed in the ProEZ Gel™ without bacillus following rinsing and not in the ProEZ Gel™ with bacillus, highlighting the product's ability to continuously work throughout the extended pre-treatment period.



Fig. 1. Bovine Protein Soil Efficacy Test Pre-Application

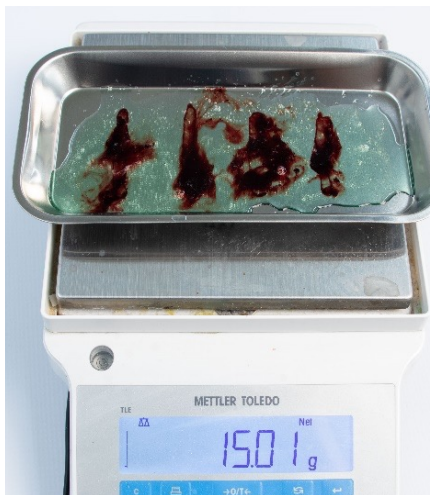


Fig. 2. ProEZ Gel™ Bovine Protein Soil Efficacy Test @ 0 hrs



Fig. 3. ProEZ Gel™ Bovine Protein Soil Efficacy Test @ 24 hrs



Fig. 4. ProEZ Gel™ Bovine Protein Soil Efficacy Test @ 72 hrs, Post-Rinse and Dry



Fig. 5. ProEZ Gel™ No Bacillus Bovine Protein Soil Efficacy Test @ 0 hrs



Fig. 6. ProEZ Gel™ No Bacillus Bovine Protein Soil Efficacy Test @ 24 hrs



Fig. 7. ProEZ Gel™ No Bacillus Bovine Protein Soil Efficacy Test @ 72 hrs, Post-Rinse and Dry



Fig. 8. PRE-Klenz® Bovine Protein Soil Efficacy Test @ 0 hrs



Fig. 9. PRE-Klenz® Bovine Protein Soil Efficacy Test @ 24 hrs



Fig. 10. PRE-Klenz® Bovine Protein Soil Efficacy Test @ 72 hrs, Post-Rinse and Dry



Fig. 11. Prepzyme® Forever Wet Bovine Protein Soil Efficacy Test @ 0 hrs



Fig. 12. Prepzyme® Forever Wet Bovine Protein Soil Efficacy Test @ 24 hrs



Fig. 13. Prepzyme® Forever Wet Bovine Protein Soil Efficacy Test @ 72 hrs, Post-Rinse and Dry



Fig. 14. OptiPro® Bovine Protein Soil Efficacy Test @ 0 hrs



Fig. 15. OptiPro® Bovine Protein Soil Efficacy Test @ 24 hrs



Fig. 16. OptiPro® Bovine Protein Soil Efficacy Test @ 72 hrs, Post-Rinse and Dry

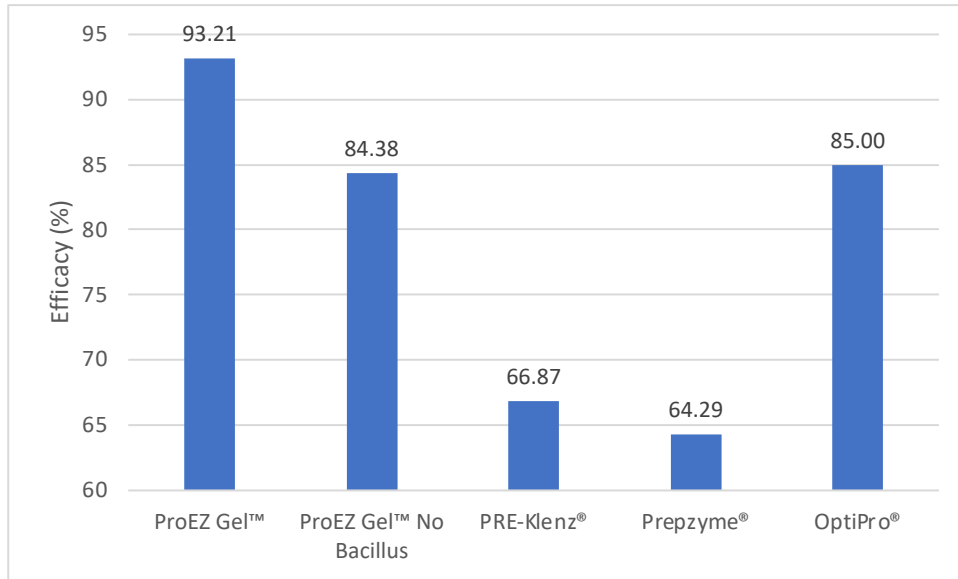


Fig. 17. Bovine Protein Soil Efficacy Results

5 Conclusions

ProEZ Gel™ will work to continuously breakdown organic soils throughout the pre-treatment process. In 72hrs under the described test conditions, ProEZ Gel™ was able to prevent the deposition of 93.21% of organic protein soil. The amount of protein and product removed by rinsing the ProEZ Gel™ tray following the 72hr period was 3x greater than that removed by the next closest competitor product.

ProEZ Gel™ with no Bacillus demonstrates excellent moisture retention and rinsing as it was able to prevent 84.38% of protein and product contaminant from depositing on the surface of the tray, however, it is evident that the presence of Bacillus in the product further boosts its efficacy by generating enzymes over time to digest the contaminants. This difference in efficacy is corroborated by comparing the two samples visually, where it is seen that the four vertical streak pattern of protein contaminant in the ProEZ Gel™ sample with no Bacillus remains unchanged and the protein is allowed to dry out while the sample with Bacillus breaks the soil down and disperses it into solution.

