Technical Data Monograph

Compatibility of Prolystica® HP Enzymatic Automated Detergent and Other Enzymatic Cleaners with Soft Metal Substrates (North America)
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Purpose

Prolystica® HP Enzymatic Automated Detergent is a concentrated liquid detergent designed for use in ultrasonic and automated washer/disinfector cleaning applications for the processing of surgical instruments. The purpose of this study was to compare the compatibility of Prolystica HP Enzymatic Automated Detergent 1C22 and ten additional enzymatic products with three soft metal substrates commonly used in the manufacture of surgical instruments, utensils, trays, and medical devices.

Methods

Prolystica HP Enzymatic Automated Detergent was tested for compatibility with soft metals along with the following ten other enzymatic products commercially available in North America:

- Belimed Protect® 4 Enzymatic Detergent WD
- Asepti-Zyme™ Instrument Presoak and Cleaner
- Rapid-Zyme™ Enzyme Presoak/Detergent
- Eco-Zyme™ Ultra Concentrate Multi-Tiered Enzymatic Detergent
- PowerCon™ Triple Enzyme Detergent Concentrate
- Renuzyme™ Ultra High Performance Enzyme Detergent
- Endozime® AW Triple Plus with A.P.A. Multi-Tiered Enzymatic Detergent with Advanced Proteolytic Action and Rust Inhibitors
- Endozime® AW Plus Multi-Tiered Enzymatic Detergent
- SuperNova® .25 Multi-Enzymatic Cleaner
- EmPower® Dual-Enzymatic Detergent

Coupons representing aluminum, brass, and copper were used in this study. Substrate compatibility was evaluated by static immersion of the given metal substrate in a product dilution of 2x the highest concentration recommended on the label, up to a maximum of 2 oz./gal. To simulate worst-case conditions and effects that might only be apparent over extended time periods, the exposure time and temperature was exaggerated to 48 hours at 50°C (122°F) to maximize effects.

The coupons were cleaned, air dried, and desiccated, and then visually examined for any signs of corrosion or pitting, including discoloration. Additional coupons were exposed to a tap water control under the same test conditions. The control was used to distinguish between the corrosive effects of water and the effects of the detergent product, and to evaluate the detergent’s ability to provide protection from that corrosive water effect.
Results

Visual inspection of all three types of metallic coupons exposed to Prolystica HP Enzymatic Automated Detergent revealed no negative effects. The visual impact was less than that caused by tap water alone.

Aluminum is one of the most difficult metals to protect because it is highly susceptible to corrosion from water alone. Visual inspection of the aluminum coupons revealed that exposure to nine out of ten of the other commercially available enzymatic products caused some level of discoloration. While exposure to four of the enzymatic products caused mild to moderate discoloration, exposure to another five caused heavy dark discoloration, with Asepti-Zyme Instrument Presoak and Cleaner turning almost black and PowerCon Triple Enzyme Detergent Concentrate allowing white corrosion spots to form.

Brass is an alloy that is not only used in the construction of surgical instruments, but also commonly found as parts within automated washer/disinfectors. Thus, good compatibility with this material is important for maintaining both instrumentation and equipment alike. Visual inspection of the brass coupons revealed that exposure to Belimed Protect 4 Enzymatic Detergent WD, Asepti-Zyme Instrument Presoak and Cleaner, Rapid-Zyme Enzyme Presoak/Detergent, and Eco-Zyme Ultra Concentrate Multi-Tiered Enzymatic Detergent turned the coupons a more orangish-brassy color worse than tap water alone, whereas EmPower Dual Enzymatic Detergent caused uneven, dark blotches to form on the coupons.

Copper is another alloy readily susceptible to corrosion. Visual inspection of the copper coupons revealed that exposure to six of the other commercially available enzymatic products caused some level of discoloration, turning the coupons grayish or deeper shades of orange. PowerCon Triple Enzyme Detergent Concentrate exhibited the greatest impact, turning coupons dark orange.

Substrate Compatibility – 48 hours at 50°C (122°F)

Aluminum 1100

- Prolystica HP Enzymatic Automated Detergent
- Belimed Protect 4 Enzymatic Detergent WD
- Renuzyme Ultra High Performance Enzyme Detergent
- Endozime AW Triple Plus with A.P.A. Multi-Tiered Enzymatic Detergent with Advanced Proteolytic Action and Rust Inhibitors
- Rapid-Zyme Enzyme Presoak/Detergent
Aluminum 1100 (continued)

- Asepti-Zyme Instrument Presoak and Cleaner
- EmPower Dual-Enzymatic Detergent
- SuperNova .25 Multi-Enzymatic Cleaner
- Endozime AW Plus Multi-Tiered Enzymatic Detergent
- PowerCon Triple Enzyme Detergent Concentrate
- Tap Water Control
- Unexposed Dry Control
Brass CDA 443

- Prolystica HP Enzymatic Automated Detergent
- Eco-Zyme Ultra Concentrate Multi-Tiered Enzymatic Detergent
- Rapid-Zyme Enzyme Presoak/Detergent
- Asepti-Zyme Instrument Presoak and Cleaner
- Belimed Protect 4 Enzymatic Detergent WD
- EmPower Dual-Enzymatic Detergent
- Tap Water Control
- Unexposed Dry Control
Copper CDA 110

Prolystica HP Enzymatic Automated Detergent

Rapid-Zyme Enzyme Presoak/Detergent

Endozone AW Triple Plus with A.P.A. Multi-Tiered Enzymatic Detergent with Advanced Proteolytic Action and Rust Inhibitors

SuperNova .25 Multi-Enzymatic Cleaner

Asepti-Zyme Instrument Presoak and Cleaner

EmPower Dual-Enzymatic Detergent

PowerCon Triple Enzyme Detergent Concentrate

Tap Water Control

Unexposed Dry Control
Conclusion

Under the exaggerated time and temperature conditions of this study, Prolystica HP Enzymatic Automated Detergent exhibited good substrate compatibility with the three soft metal substrates. All the competitive chemistries evaluated caused some level of negative impact on the metallic materials beyond the impact of tap water alone.

REFERENCES:
1. Prolystica® is a registered trademark of STERIS Corporation
2. Belimed Protect® is a registered trademark of Belimed, Inc.
3. Asepti-Zyme™ is a trademark of Ecolab USA, Inc.
4. Rapid-Zyme™ is a trademark of Ecolab USA, Inc.
5. Eco-Zyme™ is a trademark of Pro-Line Solutions, Inc.
6. PowerCon™ is a trademark of Getinge USA, Inc.
7. Renuzyme™ is a trademark of Getinge USA, Inc.
8. Endozime® is a registered trademark of The Ruhof Corporation
9. SuperNova® is a registered trademark of Case Medical, Inc.
10. EmPower® is a registered trademark of Metrex Research, LLC