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Purpose

Prolystica® HP Enzymatic Manual Cleaner is a concentrated liquid detergent designed for use in manual and ultrasonic cleaning applications for the processing of surgical instruments. The purpose of this study was to compare the compatibility of Prolystica HP Enzymatic Manual Cleaner and six additional enzymatic products with three soft metal substrates commonly used in the manufacture of surgical instruments, utensils, trays, and medical devices.

This testing is applicable to the following products:

- Prolystica HP Enzymatic Manual Cleaner Dye & Fragrance 1C23
- Prolystica HP Enzymatic Manual Cleaner 1C24

Methods

Prolystica HP Enzymatic Manual Cleaner was tested for compatibility with soft metals along with the following six other commercially available enzymatic products:

- PowerCon™ Triple Enzyme Detergent Concentrate
- 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
- Aniosyme Synergy 5 Enzyme Detergent
- Neodisher® MediClean Enzyme Detergent
- Neodisher® MediClean forte Enzyme 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 16 mL/L. 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 Manual Cleaner 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 all the other commercially available enzymatic products caused some level of discoloration. While exposure to two of the enzymatic products caused mild to moderate discoloration, exposure to another two caused heavy dark discoloration, with PowerCon Triple Enzyme Detergent Concentrate also allowing white corrosion spots to form. The greatest impact was from exposure to neodisher MediClean Enzyme Detergent and neodisher MediClean forte Enzyme Detergent which caused discoloration so severe the coupons turned brownish-black.

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 neodisher MediClean Enzyme Detergent, and neodisher MediClean forte Enzyme Detergent caused uneven, dark blotches to form on the coupons, while exposure to Aniosyme Synergy 5 Enzyme Detergent caused severe dark discoloration.

Copper is another alloy readily susceptible to corrosion. Visual inspection of the copper coupons revealed that exposure to neodisher MediClean Enzyme Detergent and Endozime AW Triple Plus with A.P.A. Multi-Tiered Enzymatic Detergent 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 Manual Cleaner
- Aniosyme Synergy 5 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
- PowerCon Triple Enzyme Detergent Concentrate
- neodisher MediClean forte Enzyme Detergent
- neodisher MediClean Enzyme Detergent
- Tap Water Control
- Unexposed Dry Control
Brass CDA 443

- Prolystica HP Enzymatic Manual Cleaner
- neodisher MediClean Enzyme Detergent
- neodisher MediClean forte Enzyme Detergent
- Aniosyme Synergy 5 Enzyme Detergent
- Tap Water Control
- Unexposed Dry Control
Copper CDA 110

- Prolystica HP Enzymatic Manual Cleaner
- neodisher MediClean Enzyme Detergent
- Endozime AW Triple Plus with A.P.A. Multi-Tiered Enzymatic Detergent with Advanced Proteolytic Action and Rust Inhibitors
- 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 Manual Cleaner 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. PowerCon™ is a trademark of Getinge USA Inc.
3. Endozime® is a registered trademark of The Ruhof Corporation
4. Aniosyme Synergy 5 Enzyme Detergent is a product of Laboratories Anios
5. neodisher® is a registered trademark of Chemische Fabrik Dr. Weigert GmbH & Co. KG