LOW TEMPERATURE CHEMICAL-THERMAL DISINFECTION OF TEXTILES IN HEALTHCARE – CLEAN *AND* SAFE?

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Background

The energy spent on laundry constitutes 1.6 % of the total Danish energy consumption; 80% of this goes to heating of water. Washing at lower temperatures, therefore, has the potential for great energy savings. Normally thermal disinfection of textiles is required for Danish healthcare; washing at low temperatures puts high demands on the antimicrobial effect of the powder if a hygienically safe textile is to be obtained.

Objectives

To determine the disinfection effect of a low-temperature washing detergent.

Method

A new product containing enzymes and peracetic acid ("Danlind") was used as the laundry detergent and compared to normal detergent/no detergent. Microbicidal effect was tested according to standards EN1276 and EN1650 towards a test panel of *P. aeruginosa, E. coli, S. aureus, E. hirae, E. faecium, and C. albicans*.The microbicidal effect was tested in the washing process at 40°C, according to the standard prEN 16616: 1x1 cm cotton carriers preincubated with bacteria and dried, +/- addition of sheep blood in the washing process.

Table 1. Overview of microorganisms tested using the disinfection standard tests (EN1276 and EN16450)

Microorganisms tested	Disinfection ability (+/-) (min. log 5 reduction)
Pseudomonas aeruginosa ATCC 15442	+
Escherichia coli (K12) NCTC 10538	+
Staphylococcus aureus ATCC 6538	+
Enterococcus hirae ATCC 10541	+
Enterococcus faecium ATCC 6057	+
Candida albicans ATCC 10231	+

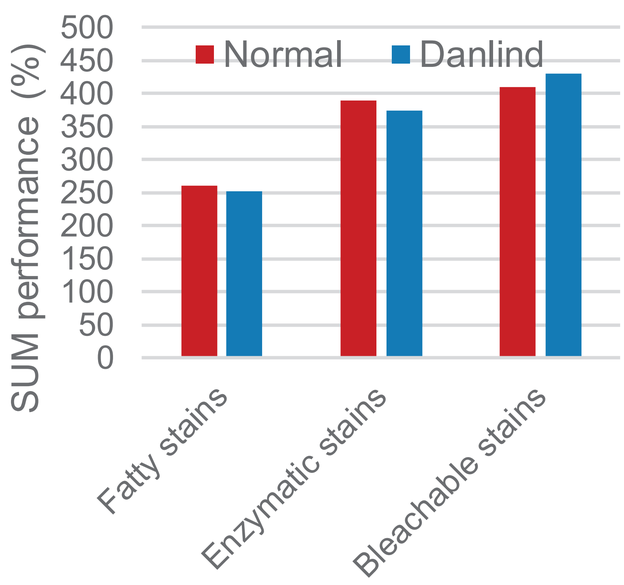
Results

Reduction of log 5 or more was obtained for the test panel, although for *C. albicans* only after adjustment of pH and enzymes (Table 1). Flush water contained no *E. coli* when detergent was used, but 10^6 *E. coli* without detergent. Satisfactory reduction of microorganisms in the washing machine was obtained in the non-bioburden test part (Table 2), but prewash was needed for bioburden conditions. The cleaning performance was comparable to that of conventional detergents (Fig. 1).

Table 2. Effect of detergent during wash: Reduction of *E. coli* on fabric and in flush water?

Detergent added	yes	no
On fabric (log reduction)	> 7	< 2
In flush water (cfu/ml)	0	10^6

Fig. 1. Cleaning performance at 40°C



Discussion and Conclusions

- The detergent had the required chemical disinfectant ability against the test microorganisms.
- Optimization of pH and component concentrations was necessary for satisfactory antifungal effect.
- The prEN 16616 is a good testing tool but challenging in some respects.
- Further studies are required to see if the product will meet the requirements of healthcare laundry in vivo, i.e. have a similar disinfection effect as washing at 80°C for min. 10 minutes as required by Danish guidelines.

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