

## A) Importance of the cleaning test

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### C) Introduction

During use surgical instruments become soiled with blood, liquids, and other substances. In order to guarantee correct use of these instruments and to avoid infections one must clean them properly, eliminating all residue.

We are in charge of the cleaning of these instruments, and we are searching for an even more efficient way to clean them. We are discussing the subject--particularly washing/disinfecting machines and the use of enzymatic detergents—in our meetings and conferences.

Until now quality control could only be done visually or with the “Amido-black” method, both of which are quite unreliable.

Recently we have had the opportunity to try the TOSI indicator. We would like to report the results of validation.

## D) Materials and Methods

### 1) Washer/disinfector: WDT-21CS / Hamo

Detergent: Farmint + J. and Liquid 54

Temperature: 40 C without prerinse

Cleaning time: 1 min. – 3 min. – 5 min.

Drying time: 5 min.

Repetition of this procedure after servicing

### 2) Cleaning efficiency indicator

After using bovine blood on steel we tested TOSI.

Two pieces of metal have been situated on each level of the 3-level washer, and on each piece of metal we put 6 TOSI with the same distance between them.

We controlled the results two ways:

1. Visual check
2. Amido black, Ninhydrin, Rodamin

## E) Results

Table 1 shows the composition of the TOSI test soil.

Table 2 shows the different levels of TOSI evaluation.

Table 3 records the results of the visual validation under the following conditions:

WDT-21CS

Enzymatic detergent

Cleaning: 1 min./3 min./5 min.

Results after 1 min. (mean value)

Upper level: 3.33 remaining fibrin

Middle level: 2.38 remaining fibrin

Lower level: 1.96 remaining fibrin

Results after 3 min. (mean value)

Upper level: 1.67 remaining fibrin

Middle level: 0.96 remaining fibrin

Lower level: 1.17 remaining fibrin

Results after 5 min. (mean value) (normal cleaning time in the hospital)

Upper level: 0.75 remaining fibrin

Middle level: 0.35 remaining fibrin

Lower level: 1.33 remaining fibrin

The washer WDT-21CS we use in our ward has been in use for seven years and has never required service.

Table 4 explains the results after the service and how they improved.

Table 5 shows results with alkaline detergent. Note there is not a big difference between enzymatic detergent and alkaline detergent; however, we did achieve better results with the alkaline detergent when using the washer for one minute.

Tables 3 – 5 contain the results of the visual evaluation after the washing; however, only an expert can evaluate the remaining fibrin on the stainless steel.

Figure 1 shows the results of an alternate method—Amido black, Ninhydrin and Rodamin.

We suppose that the person who uses the washer daily knows that it doesn't work perfectly in certain points. Thus it is important to use an indicator to find these points.

TOSI is a steel plate on which albumin, hemoglobin, and fibrin are applied. Since we are washing instruments soiled with blood, we consider TOSI a very accurate control. In fact, as is illustrated in Table 3, the washer we have used in our ward for the past seven years show the following results after a five-minute wash on the upper level:

0/0/2/0/0/2/2/1/2/2/2/2

This clearly demonstrates that there are parts of the washer that are not cleaning perfectly. After servicing (Table 4), the results were much improved, with values from 0.0 to 1.0 These results should be reassuring to anyone who has doubts about the efficiency of a particular washer. Because the rotating arm on the washer works at high speed

it is only natural that it may break down over time.

Until recently we did not know if there was a difference between alkaline and enzymatic detergent, but now we see (Table 5) that we can achieve better results with alkaline detergents for the short washing times and with enzymatic detergents for the longer washing times.

## F) Conclusion

Thanks to the TOSI we are now able to determine whether our washers are working perfectly to clean our instruments.

We believe it is very important to use TOSI daily.

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