



## Corrosion Effects of Klortab Effervescent NaDCC Tablets



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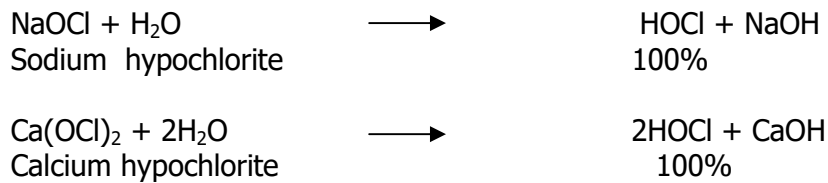




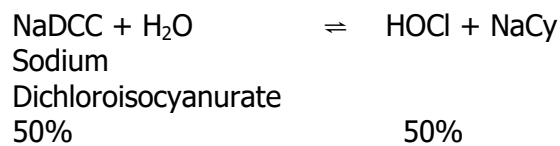
## 1.0 INTRODUCTION

One of the principal drawbacks with the use of hypochlorites is their corrosive effect on metallic objects.

With hypochlorite solutions all the available chlorine is free in the form of hypochlorous acid (HOCl), for example:



However, with NaDCC (sodium dichloroisocyanurate) there is an equilibrium between free available and bound available chlorine:



With NaDCC, 50% of the total available chlorine remains bound (in the form of chloroisocyanurates). This makes NaDCC solutions less corrosive than hypochlorites. Studies (1) comparing the tarnishing and corrosive effects of hypochlorites and NaDCC clearly demonstrate this point.



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## 2.0 COMPARISON OF NaOCl AND NaDCC

Standardised strips of 6 metals were immersed for 4 periods of 25 hours in solutions of up to 1000mg/l available chlorine (1). The metals were found to vary markedly in their resistance to tarnishing and corrosion.

METAL	NaOCl	NaDCC
Stainless Steel 316	No effect	No effect
Aluminium	Tarnished Not corroded	Tarnished Not corroded
Brass	Tarnished Not corroded	Tarnished Not corroded
Galvanised mild steel	Moderately Corroded	Tarnished Not corroded
Copper	Moderately Corroded	Tarnished Not corroded
Mild steel	Heavily Corroded	Heavily tarnished Not corroded

Metals were generally more tarnished or corroded by NaOCl than by NaDCC.



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### 3.0 EVALUATION OF MEDENTECH NaDCC TABLETS

#### 3.1.1 MAFF Tests

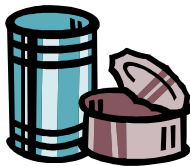
Tests were undertaken by the MAFF (Min. of Agriculture, Fisheries and Food) Laboratory of the Government Chemist, UK to determine corrosive effects of NaDCC tablets at a solution strength of 1000mg/l available chlorine (2).

The test involves the placing of previously weighed discs of stainless steel, mild steel, zinc coated steel, tinsplate, painted steel, copper, brass, aluminium and rubber in contact with the solution for a 4 day period. After this period the discs are dried and re-weighed. If a disc had undergone a weight change of more than 5%, or alternatively, had excessive visible corrosion, then the product failed the corrosion test.

The NaDCC tablet passed the test. ✓

#### 3.1.2 Department of Marine Tests

Further studies were undertaken for license approval by the Dept. of Marine in Ireland (3). The NaDCC tablets also included a compatible detergent. Tests were carried out on plastics (Cyclac - ABS GE and High Density Polyethylene - HDPE), using a solution strength of 500mg/l available chlorine. Four standard samples were exposed to the solution for 21 days at 22°C and 40% rh, and were then compared to a control by visual assessment (colour, opacity, gloss/roughness of surface, cracking or crazing, blistering/pitting, material rubbing off surface, and delamination/warping/distortion) and weight variance. The plastic samples were also reconditioned at 30 °C and 40%rh, and reviewed using the same parameters.



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The product produced no significant adverse effects and passed the criteria. ✓

The same study also undertook a metal corrosion test on stainless steel (316 s/s 18G no.130, 304 s/s 20G no.130 and 420 s/s 20G no.130), zinc (Zintex 18G no.130) and Aluminium (sheet 402 G/4) at a solution strength of 500mg/l available chlorine. The standard metals were placed in the solutions for 5 minutes, removed and rinsed with tap water. The metals were then rinsed with distilled water, which was analysed for residues. The test solution was assessed for corrosion of the 3 metals.

The product showed no significant corrosion. ✓

In a similar test the same metals were reviewed for corrosion after immersion for 72 hours in a 500mg/l available chlorine solution.

Zinc was strongly corroded, whereas the stainless steel and aluminium produced no corrosive effects.

### **In-House Test**

In an in-house study (4), the effects of NaDCC solutions, up to 5000mg/l available chlorine, used to wash mattress covers [thermoplastic polyurethane (Sareo Healthcare) and PVC/polyester (Care Concept)] twice per day for 5 days, showed no adverse effects.

### **Disinfection of Vinyl Upholstery Fabrics**

A series of laboratory trials were carried out using solution strengths up to 5000mg/l available chlorine (NaDCC Tablets) on Chieftain and Lionella vinyl upholstery fabrics (7). The manufacturer (Trimproof Ltd.) recommends the use of the product.



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#### **4.0 CONCLUSIONS**

- 4.1. NaDCC is demonstrably less tarnishing and corrosive to metals than hypochlorites.
- 4.2. The NaDCC tablets passed the U.K. MAFF corrosion test and Dept. of Marine test, when evaluated against metals, plastic and rubber.
- 4.3. The tablets have also been shown to be compatible with automatic dosing equipment.



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