



## **The effects of NaDCC solutions on aluminium and other metals.**

First it is important to remember the difference between the so-called 'hypochlorites', that is Sodium hypochlorite in the form of Milton, Chloros, Domestos or other 'bleach solutions' and the di-isocyanurates such as Troclosene sodium (previously named Sodium dichloroisocyanurate or NaDCC) – the active ingredient in Haz-Tab & Chlor-Clean products.

The hypochlorites have been around since 1820 and are recognised as 'chlorine donors' in pretty well every part of the world. Their effectiveness in killing a broad spectrum of micro organisms is well established but then so are their disadvantages and these include being unstable, seriously inactivated by organic matter (e.g. blood) and highly corrosive to metals.

NaDCC, by contrast, was developed in 1965 (for swimming pools) specifically to be less corrosive to metals and it was not until the early 70's that papers by Sally Bloomfield and her co-workers showed that NaDCC was more effective than hypochlorite at killing micro-organisms, especially in the presence of organic matter. This work was confirmed during the 1980's by David Coates of the PHLS.

NaDCC is now the chlorine donor most commonly used in U.K. hospitals (either as Haz-Tab, Chlor-Clean or Presept tablets or granules), indeed many people misname it with the generic name of 'hypochlorite' or 'hypochlorite tablets'. It is the chemical of choice by virtue of it's long stability in the dry state (i.e. as tablets), its capacity to be more effective in the presence of organic matter and the simplicity of using the granules or making up solutions from the tablets. Its original property, that of being less corrosive to metals has been all but forgotten.

Our own studies have shown that at strengths of up to 1,000 p.p.m. available chlorine, NaDCC solutions show no more than a mild tarnishing effect on aluminium during a period of up to 100 hours of continuous immersion at room temperature.

It is interesting to note that in our studies, tap water had exactly the same effect as the NaDCC solutions, i.e. mild tarnishing at 100 hours. By contrast Chloros, chosen as the 'hypochlorite example', showed moderate tarnishing at 125 p.p.m. and pronounced tarnishing at 1,000 p.p.m. available chlorine after only 50 hours immersion.

We also tested a 5 ppm available chlorine NaDCC solution on aluminium as an example of what strength of chlorine might be left behind after a strong solution had been rinsed off a surface. These studies showed no tarnishing effect after 100 hours immersion. Chloros showed a mild tarnishing effect after 50 hours immersion at the 5 ppm available chlorine strength.

Our tarnishing/corrosion studies included Mild Steel, Galvanised Steel, Copper, Brass, Aluminium and Stainless Steel 316, the latter showing no tarnishing or corrosion being a high quality grade. The first four metals showed the most corrosion, those immersed in hypochlorite being more heavily affected than those in NaDCC. However in all cases the corrosion or tarnishing was either significantly reduced or not present in the metals immersed in the 5 ppm solution.

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