

**Sinks of stainless  
clean best,  
beat bacteria**

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## SINKS OF STAINLESS CLEAN BEST, BEAT BACTERIA

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Required to resist aggressive fluids, abrasive materials and impacting utensils – and to maintain its attractive appearance – that's the demanding role of the domestic sink.

In manufacturing it, a total of about 100 000 tonnes of stainless steel strip

is consumed yearly in North America, Europe and Japan – mainly Unified Numbering System (UNS) S 30200, nominally Cr 17.00-19.00/Ni 8.00-10.00, and S 30400, nominally Cr 18.00-20.00/Ni 8.00-10.50.

One of the popular characteristics of nickel-containing stainless steel – which has become the accepted material for sink construction in many parts of the world during the past 40 years – is the readiness with which its surface can be cleaned free of soil and bacteria

. . . of particular hygienic importance in food handling.

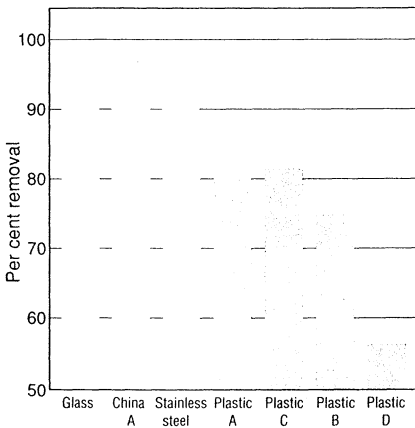
The differences between bacterial cleanability of various surfaces after standardized contamination and washing procedures were dramatically illustrated at the University of Michigan in 1953.

Stainless steel's cleanability was shown to be similar to that of glass and china. And much better than the four plastic materials tested, *Figure 1*.

Using the latest techniques for

quantifying bacterial contamination, Campden Food & Drink Research Association, Chipping Campden, Gloucestershire, England – in test work funded by the Nickel Development Institute – compared stainless steel with mineral-resin composite, polycarbonate plastic and enamelled steel, all sink-making materials. The results will be published in the [United Kingdom] *Journal of Applied Bacteriology*.

**Figure 1**  
Results of cleanability tests on various surfaces



Per cent removal of microcococcus aureus from various worn surfaces when deposited under a protein soil film with detergent wash and rinse at 71°C

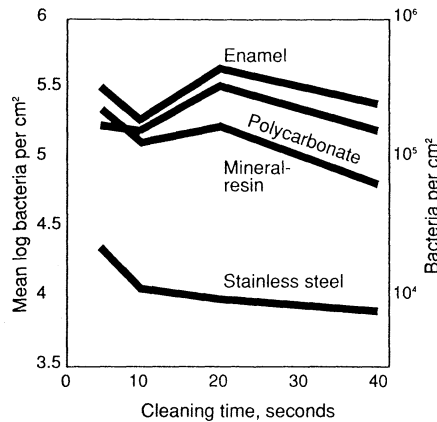
Under standardized conditions, specimens from two sinks of each material were contaminated with acinetobacter calcoaceticus, a bacterium frequently found in food processing and associated with food spoilage. After a bacteria incubation period, they were spray washed in 40°C water containing domestic detergent.

Remaining bacteria were stained with an ultraviolet light-sensitive dye and viewed under a microscope with an ultraviolet source and counting mechanism. All of the surfaces exhibited a similar level of retained bacteria.

Specimens that had been subjected to simulated wear, by rubbing with a 40-grit abrasive cloth, showed significant differences, *Figure 2*.

Stainless steel's bacteria count was ten times lower than that of the other three materials after only five seconds washing time, and it maintained a substantially lower count with washing

**Figure 2**  
Effect of washing time on the number of bacteria remaining on sink surfaces after standardized simulated wear, contamination and washing treatments.



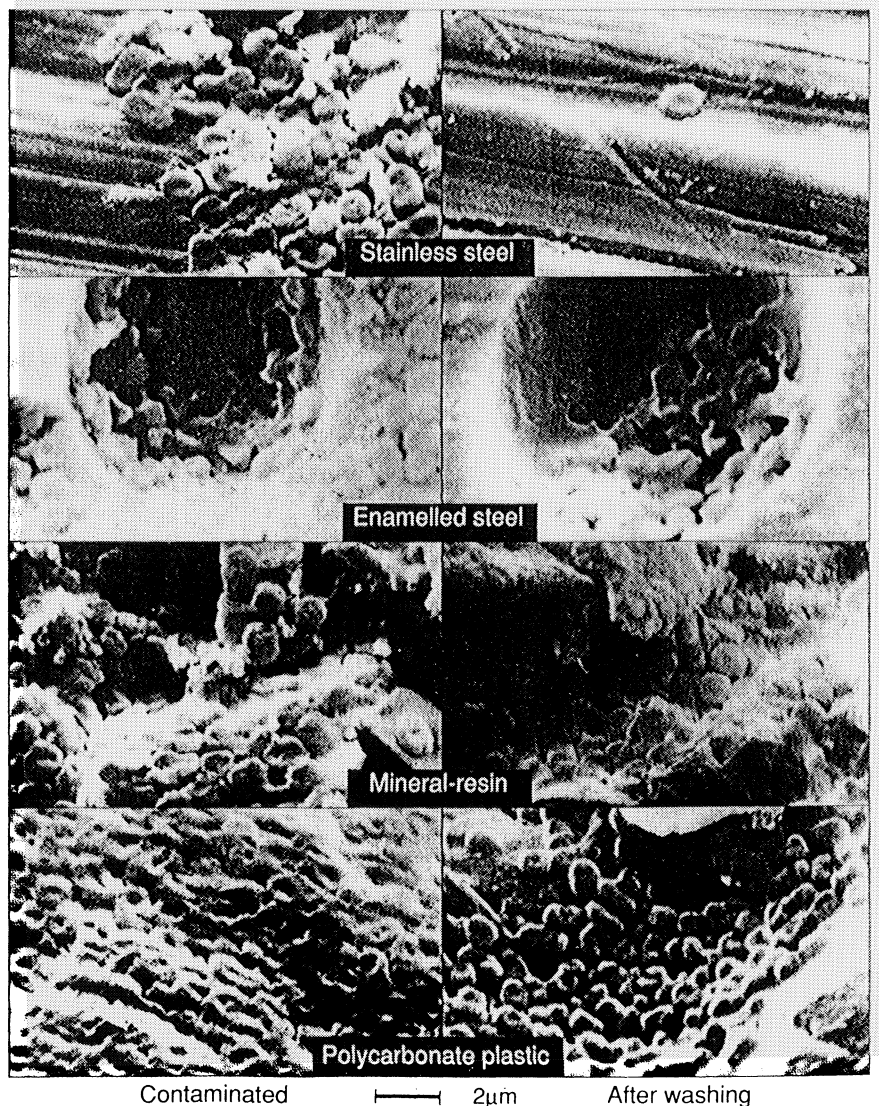
Mean data from 15 tests on each of two sinks in a given material. Number of bacteria on surface before washing  $10^7$  per  $cm^2$ .

times up to 40 seconds. Tests on seven used stainless steel sinks that had been subjected to natural wear processes in service gave similar results.

Enamelled steel surfaces were characterized by rounded pits that clearly harbor bacteria even after washing treatment, *Figure 3*. Mineral-resin and polycarbonate surfaces exhibited roughened scratches that entrap bacteria. In contrast, stainless steel's surfaces featured clean scratches that appear to release bacteria with relative ease.

These are significant findings of relevance to domestic sink and the wide spectrum of hygiene-demanding stainless steel applications – food and beverage industries, commercial catering, pharmaceuticals production, and hospital and related sectors. **NiDI**

**Figure 3**  
Electron micrographs of sink surfaces – after contamination with bacteria, and after washing



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