IOSH Develops Electrolytic Production of Hypochlorous Acid Disinfectant

The Institute of Occupational Safety and Health (IOSH), a unit of the Council of Labor Affairs, recently completed the development of high-concentration hypochlorous acid disinfectant production technology based on electrolytic reaction in cooperation with the Department of Bio-Industrial Mechatronics Engineering at National Taiwan University. Hypochlorous disinfectant produced using this new technology offers a number of advantages: it has a strong bactericidal function, does not irritate the skin, and does not require the storage of hazardous materials. Its use in dental clinics and egg farms has proven that it has significant bactericidal effect:

1. Strong disinfectant: The domestic and overseas research literature shows that the hypochlorous acid has numerous bactericidal pathways and so is highly effective in eliminating kinds of germs, viruses, molds. Compared with bleach, hydrogen peroxide, and alcohol, it has good bactericidal properties. Domestic and foreign experiments have proven that hypochlorous acid produced by electrolysis achieves 99.999% bactericidal efficiency within three minutes, or even less.
2. No adverse side effects: Hypochlorous acid has been widely adopted for hospital disinfectant, food safety, and environmental sanitation uses in the United States and Japan, and experiments from dermal and inhalation exposure to animals resulted in no irritation of the skin or toxic effects. This proves that hypochlorous acid disinfectant has a high degree of biocompatibility.
3. No need to store hazardous materials: The production of disinfectants generally involves the reaction of chlorine with water or the mix of hydrochloric acid (HCl) and bleach (an ingredient of which is sodium hypochlorite, or NaOCl). The new way of producing disinfectant is the non-diaphragm electrolysis method, which uses metal electrodes to oxidize a brine solution and convert it into a solution with hypochlorous acid as its main ingredient.

The bleach and hydrogen peroxide frequently used as disinfectants in Taiwan today may irritate the nose and the skin, and cannot easily be used in personal sanitation practices such as washing the skin. The main

ingredients in other disinfectants, such as alcohol and iodine, do not have wide antibacterial effect. The new technology developed by IOSH and National Taiwan University uses table salt as a raw material to produce, rapidly and cheaply, high-concentration hypochlorous acid that can be diluted and used for washing and for environmental control. The new technology has been tested in dental clinics and cage-fed egg farms and shown to have a 70-80% antibacterial effect against germs and other bioaerosols. IOSH has completed the development of core formulas and prototype machinery for production. Those interested in the transfer or extension of this technology are urged to call (02) 2660-7600, ext. 208: Mr. Po-chen Hung.