

OPTIMIZATION OF CLEANING PROCESS IN BREWERIES AN IMPORTANT TOOL IN EFFICIENT USE OF WATER AND MINIMIZATION OF DISCHARGES

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ABSTRACT

In breweries to produce 1 hl of beer it needed a lot of water ranged from 5 to 10 Hl. The major part of this water is used for cleaning purposes. The longer these waters can be retained in a sanitary condition, the more money is saved in water costs, water discharge and energy to heat replacement water. Optimizations of water consume through conservation and recycling is the best technique to fulfill this goal. The inefficient use of water as a raw material in a brewery can have environmental impacts. Therefore, minimization of waste water should not only include the improved management and control of water discharges, but also an optimization of process water input. The need to recycle water is becoming increasingly important. One of the main factors limiting the potential for water recycling is the high level of Total Dissolved Solids (TDS) and particularly sodium, which is the main compound of cleaning chemicals used to maintain high hygienic and quality levels in the brewery. TDS reduction and substitution at the source appear to be the best approaches as they avoid costly desalination technologies and the difficult handling of the segregated by-products. Therefore, to reduce TDS loads discharged to the sewer it is necessary to review current industrial cleaning practices. The aim of this paper is to identify technologies that can be used to minimize CIP (cleaning in place) running costs in terms of water, energy and detergent savings. Reuse systems that collect and reuse used CIP solutions for subsequent CIP cycles, impact directly on running costs due to lower chemical requirements. Otherwise, several optimization methods can be implemented to control CIP efficiency including the review of cleaning frequency, the use of mechanical action (pigging systems, high pressure sprayers and floor scrubbers) and CIP monitoring.

Keywords: Efficient use of water, reuse, water discharges, cleaning-in-place.