

Introduction

Cleanliness and stainless steel are so closely interrelated and interdependent, that in many applications one is not possible without the other. In the dairy industry, on one hand, stainless steel provides the degree of cleanliness that is required of equipment in contact with the dairy product. On the other hand, the very nature of stainless steel is such that it best serves the widespread purposes for which it is utilized, if it is kept clean and in a passive state. Precautions must be observed to avoid conditions which can destroy or disturb the passive state. Because these precautions involve equipment design, control of the operations used in fabrication, as well as subsequent use and maintenance of the equipment, the complexity of the subject is apparent. Particularly so, when taking into account the multitude of corrodents to which stainless steels are exposed, the variety of soils which are encountered, and the numerous cleaning methods and media which are offered to meet these challenges.

Committee A-1 on Steel, Stainless Steel and Related Alloys, and Committee D-12 on Soaps and Other Detergents, cooperated in sponsoring a symposium on cleaning stainless steel, in an effort to assemble data on the "state-of-the-art" for as many pertinent aspects of the subject as possible and to focus attention on new developments.

This symposium represents a comprehensive coverage devoted exclusively to cleaning stainless steel. The information contained in the 23 papers will be useful to manufacturers of stainless steel products or equipment; to those designing such equipment; to those already using stainless steel equipment or contemplating its use because of new corrosion conditions being encountered; and to those who produce chemicals or devices used in cleaning this equipment.

Practical, up-to-date information on the well-established methods such as alkaline, acid, and solvent cleaning, is presented. New developments are also discussed, such as those which permit automation of vibratory cleaning techniques.

Several papers explore the cleaning requirements faced by nuclear power plants, which utilize stainless steel extensively. Information is also presented on cleaning agent actions on stainless steel components for sodium heat transport systems, which are designed to operate at up to 1200°F.

Another facet of power plants—both nuclear and fossil-fueled—where cleaning of stainless steel is of importance, pertains to condenser tubing. In this service,

2 CLEANING STAINLESS STEEL

which requires cleaning to maintain heat transfer efficiency of the tubing, the cleaning has the added benefit of improving the performance of stainless steel. The role of chemical and in-service mechanical cleaning techniques and their influence on power plant operations and costs, are described.

Cleanliness requirements in the chemical industry, and in the food industry—where cleaning-in-place procedures are employed—are also emphasized.

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