

"NOC" Precipitation During the Sintering of Austenitic Stainless Steels and Their Effect on Corrosion

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INTRODUCTION

Most technical service requests for austenitic P/M stainless steel are related primarily to lack of corrosion resistance as well as a dull or poor appearance and poor machinability. Nearly all of the problems in the technical requests can be determined with an examination of the microstructure and determining the nitrogen, oxygen, and carbon (NOC) content of the sample. Most of the parts have problems with excessive nitrogen, oxygen or carbon. These three elements which are under the control of the part producer have a profound effect on virtually every property of stainless, including strength, ductility or brittleness, machinability, cosmetic appearance and perhaps the most important reason for buying stainless steel, corrosion resistance. Corrosion resistance is extremely dependent on processing. Some commercially produced parts rust in tap water within 24 hours while others can last thousands of hours.

The effect of nitrogen, oxygen, and carbon on stainless is not new. Much of the work on wrought stainless that has been done over the years can be applied to P/M. A number of studies that address nitrogen, oxygen, and carbon and their effect on corrosion and properties for P/M stainless have been published over the past five to ten years. Consequently, most of this paper is a review of published literature to emphasize processing parameters and conditions to avoid in improving corrosion resistance and general overall quality.