



**MECHANICAL BEHAVIOUR OF STAINLESS STEEL GRADE 304 (SS304) UNDER  
DIFFERENT HEAT TREATMENT CONDITIONS**

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## ABSTRACT

The purpose of this research was to find the mechanical behavior of stainless steel grade 304 (SS304) under different heat treatment conditions. Stainless steel 8% Ni -18%Cr is used for heat treatment process by selecting the time, temperature and cooling method as the parameter. The heat treated sample is compared in term of mechanical and physical properties aspect before and after heat treatment processes.

Dumbbell-shape sample is made by using CNC-Lathe machine for a precise tolerant of each sample. The samples were heat treated at 850°C and cooled at various cooling rates which is constant and continuous cooling. The tensile testing was carried out for each sample. There were other tests carried out to the samples such as compositional test, hardness test, density test and impact test. The microstructures were analyzed after the observation under the microscope. Testing was conducted before and after the heat treatment process.

The result shows that the tensile strength of the untreated SS304 is higher compared to the heat treated samples. The heat treated samples become more ductile with the increased times of soaking compared to the untreated samples. The hardness of heat treated SS304 tend to decrease with the increased of heat treatment time. . Meanwhile, the density of heat treated SS304 tend to increase with the increased of heat treatment time.

The heat treated SS304 with different mechanical properties can be used in specific engineering applications which require high ductility compared to the untreated SS304. Further research could be carried to determine the improved properties of the SS304 while maintaining all good properties of untreated SS304.

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