

# Effect of the heat treatment on the microstructural evolution of the Nickel based superlloy

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**Abstract:** The effect of heat treatment on the microstructure of cobalt-rich nickel based superalloy was studied applying scanning electron microscopy (SEM) and transmission electron microscopy (TEM). The aim of the present work was to investigate the formation and evolution of different phases during the heat treatment of superalloy similar to Udimet 500. The presence of a relatively high volume fraction of  $\gamma'$  particles in the  $\gamma$  matrix suggests on inefficient cooling rate during oil quenching from 1150°C. Carbides such as MC primary carbides of the type TiC and MoC as well as secondary carbides M<sub>23</sub>C<sub>6</sub> (Cr<sub>23</sub>C<sub>6</sub>) were found in grains and at grain boundaries.

**Keywords :** superalloy; heat treatment;, SEM and TEM;  $\gamma'$  particles; carbides .