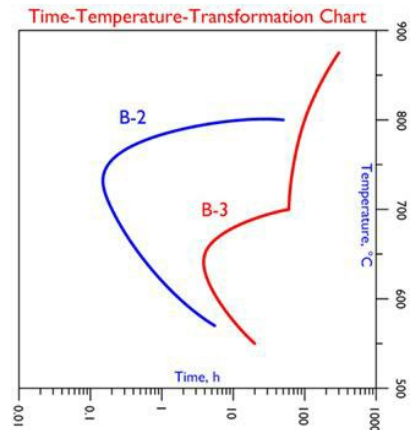


# HASTELLOY<sup>®</sup> B-3<sup>®</sup> alloy

## Thermal Stability (T-T-T Chart)



The molybdenum content of the nickel-molybdenum (B-type) alloys is such that there is a strong tendency for phases other than the desirable (face-centered cubic) gamma phase to form in the microstructure, particularly in the temperature range 500°C to 900°C. The most deleterious of these alternate phases is  $\text{Ni}_4\text{Mo}$ , which forms quickly at certain temperatures, affects ductility, and reduces resistance to stress corrosion cracking.

The chief attribute of B-3 alloy, as compared with other modern B-type materials, is its greatly improved structural stability (in particular its reduced susceptibility to  $\text{Ni}_4\text{Mo}$ ).

The time-temperature-transformation diagram shown above illustrates the advantages of B-3 alloy over its predecessor (B-2 alloy). Whereas B-2 alloy suffers from the rapid formation of  $\text{Ni}_4\text{Mo}$  at around 750°C, it takes several hours (at around 650°C), to induce deleterious second phases in B-3 alloy. This is due to the judicious use of minor elements and a shift in the molybdenum content, to induce the slowly-forming  $\text{Ni}_3\text{Mo}$  instead.