

# **Aging behaviour of hot deformed AA7075 aluminium alloy**

**P.Vikas<sup>a</sup>**

<sup>a</sup> Undergraduate scholar, Department of Mechanical Engineering Department, MVGRCE (A), Vizianagaram,

[vikas.polarmarasetti143@gmail.com](mailto:vikas.polarmarasetti143@gmail.com)

**I.Sudhakar<sup>b</sup>, Dilkush<sup>c</sup>, MohanaRao.G<sup>d</sup>**

<sup>b</sup> Department of Mechanical Engineering Department, MVGRCE (A), Vizianagaram, A.P., India.

<sup>c</sup> Department of Metallurgical & Materials Engineering, RGUKT-Nuzvid, India.

<sup>d</sup> Department of Mechanical Engineering, RGUKT-Nuzvid, India

## **ABSTRACT**

Structural applications where durability i.e. strength to weight ratio is primary requisite, ferrous materials need to be substituted with materials having similar properties. Thus, nonferrous materials such as titanium, magnesium and aluminium and their alloys are considered to be substituted of steels. But, non-availability of magnesium and titanium being costlier, aluminium and its alloys are considered to be the most important one for replacing existing ferrous materials. Heat treatable AA7075 aluminium alloy is considered as one of the aluminium alloys for researchers common interest because of its strength is comparable to that of steels and widely used in automobile, aircraft industries and naval applications. Most of the investigations are focused on aging behaviour, re-aging and RRA (retrogression and re-aging) features of AA 7075 aluminium alloy but scanty of literature is available in the domain of aging behaviour of hot deformed AA 7075 aluminium alloy. Thus, present investigation aims at hot deformation and aging of deformed AA aluminium 7075 alloy at various temperatures such as 300°C, 400°C and 500°C. Deformation of the order of 40% is recommended irrespective of forming temperature. All the deformed samples exhibited improvement in hardness while comparing to base metal and there is a successive increment of hardness with gradually increase of percentage of deformations. It might be attributed to high morphological modification like microstructural refinement, densification and homogenization accomplished during mechanical deformation which led to yield higher hardness. Hot deformation temperature of 400°C and aging temperature of 400°C is recommended for AA 7075 aluminium alloy for both altering dimension and mechanical properties.

*Keywords: AA 7075 aluminium alloy; deformation; aging; hardness; fracture.*