

ANALYSIS OF TEMPERATURE VARIATION EFFECT ON PRECIPITATION SOLUTION PROCESS T6 TOWARDS REMELTING USED MOTOR PISTONS ON PHATIC STRENGTH AND POROSITY USING CENTRIFUGAL CASTING METHOD

Saipul Anwar, Mechanical Engineering, Engineering Faculty
Universitas Muhammadiyah Metro

Saifulanwar95masehi@gmail.com

ABSTRACT

Anwar, Saipul 2020. Analysis of Temperature Variation Effect on Precipitation Solution Process T6 towards Remelting Used Motor Pistons on Fatigue Strength and Porosity Using the Centrifugal Casting Method. Undergraduate Thesis. Mechanical Engineering Study Program. Engineering Faculty. Universitas Muhammadiyah Metro. Advisors: (I) Eko Nugroho. S.T., M.Eng ; (II) Eko Budiyanto. S.T., M.T.

Aluminium is the most abundant metal in the earth's layer and is the third most abundant element after oxygen and silicon. The aluminium content in the earth's layer reaches approximately 8.07% to 8.23% of the earth's crust mass. Remelting is a method that can be used to get material with the desired physical and mechanical properties by changing the base material properties. Casting is a manufacture that uses pre-made liquid metal moulds to finished products, to produce quality castings, high-quality patterns are needed, both in terms of construction, dimensions, and materials used. There are several methods of casting gravity casting, pressure casting, centrifugal casting and several other methods. Centrifugal casting is a casting method in which molten metal solidifies in a rotating mould. The purpose of this study is to determine the effect value of temperature variation precipitation solution of fatigue strength on centrifugal casting aluminium scrap and to determine the effect value of temperature variation precipitation solution porosity strength on centrifugal casting aluminium scrap. The method used is the centrifugal casting method by varying the temperature precipitation solution 190⁰C, 210⁰C, and 230⁰C which tested the fatigue strength and porosity of the specimen material. The study result on the fatigue strength test at 190⁰C ageing temperature were 5000 cycles (turns), at 210⁰C it was 10000 cycles (turns), while at 2300C it was 13000 cycles (turns). And for testing the strength of the porosity at 190⁰C ageing temperature was 13.1%, at 210⁰C it was 9%, while at 230⁰C it was 3.8%.

Kata Kunci : Aluminum, Remelting, Centrifugal Casting, Fatigue Test, Porosity Test

RINGKASAN

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Tujuan dari penelitian ini yaitu untuk mengetahui nilai pengaruh variasi temperatur *precipitation solution* kekuatan fatik terhadap aluminium scrap pengecoran centrifugal casting dan untuk mengetahui nilai pengaruh variasi temperatur *precipitation solution* kekuatan porositas terhadap aluminium scrap pengecoran centrifugal casting. Metode yang digunakan adalah dengan metode centrifugal casting dengan memvariasikan temperatur *precipitation solution* 190°C, 210°C, dan 230°C yang di uji kekuatan fatik dan porositas pada bahan spesimen. Hasil penelitian pada pengujian kekuatan fatik pada temperatur aging 190°C sebesar 5000 siklus (putaran), pada 210°C sebesar 10000 siklus (putaran), sedangkan pada 230°C sebesar 13000 siklus (putaran). Dan untuk pengujian kekuatan porositas pada temperatur aging 190°C sebesar 13,1 %, pada 210°C sebesar 9%, sedangkan pada 230°C sebesar 3,8%.