

Perancangan proses squeeze casting untuk pengembangan flens motor sungai

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Abstrak

Komponen flens motor sungai hasil pengecoran cetakan pasir memperlihatkan kecenderungan mengalami kegagalan keausan. Selain itu kualitas maupun surface finish yang dihasilkan kurang baik.

Metode pengecoran squeeze atau liquid metal forging dapat mengurangi porositas oleh karena pemberian tekanan selama proses pembekuan logam berlangsung. Menurut penelitian sebelumnya squeeze casting juga dapat memperbaiki sifat mekanik dari paduan aluminium.

Penelitian ini mencoba merancang proses pengecoran squeeze paduan aluminium daur ulang yang ada dengan cara memvariasikan parameter tekanan squeeze, dan temperatur punch & die. Langkah proses squeeze casting meliputi pemanasan logam dan die dalam dua dapur induksi berbeda, dilanjutkan dengan penuangan logam cair ke dalam die dan diteruskan dengan pemberian tekanan selama waktu tertentu.

Setelah melakukan beberapa pengujian terhadap spesimen, hasil yang diperoleh menunjukkan bahwa nilai kekerasan spesimen hasil squeeze casting meningkat, surface finish menjadi lebih baik dan persentase porositas yang dihasilkan menurun secara signifikan dibandingkan dengan proses pengecoran cetakan pasir yang ada.

It was found that the flanges component of the river boats which undergo sliding contact to the spindle and produced by sand casting process is subject to wear failure. In addition to the cast quality and surface finish of the product is not good,

Squeeze casting, which is also known as liquid metal forging, could reduce the porosity by the pressure applied during solidification. Previous research shows that the process could improve the mechanical properties of the aluminum alloys casting.

This research is to produce specimens by squeeze casting process using the existing recycled material by combining the process parameter such as squeeze pressure and punch & die temperature. The process consists of melting the alloys and heating the die in two difference resistance furnaces, ladling the melt into pre-heated die cavity and finally applying pressure by hydraulic power until the melt is fully solidified.

After examining the specimens, the results shows the improvement in hardness, the improvement in surface finish and the significant decreasing in the quantity of the porosity as compared to traditional sand casting.