

Pengaruh penambahan mangan terhadap karakteristik paduan cartridge brass hasil pengecoran gravitasi untuk aplikasi selongsong munisi = Effect of manganese addition on the characteristic of cartridge brass alloy produced by gravity casting for bullet shell application

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Abstrak

[ABSTRAK

Selongsong merupakan salah satu bagian penting pada munisi. Material yang biasanya digunakan untuk membuat munisi adalah cartridge brass. Dalam pembuatan munisi, sering terdapat masalah yaitu retak dan robek saat proses tarik dalam. Untuk mengurangi masalah tersebut, maka pada penelitian ini mangan digunakan sebagai unsur paduan untuk meningkatkan keuletan cartridge brass. Penelitian ini bertujuan untuk memfabrikasi paduan cartridge brass dengan penambahan unsur Mn serta mengamati pengaruh Mn (1.26, 3.23, dan 5.83 % berat) terhadap struktur mikro dan sifat mekanisnya. Karakterisasi material meliputi uji kekerasan, uji tarik, dan pengamatan struktur mikro menggunakan mikroskop optik dan SEM/EDX. Hasil pengujian menunjukkan bahwa dengan penambahan 1.26 dan 3.23 wt.% Mn, kekerasan, kekuatan tarik dan keuletan paduan meningkat karena adanya penguatan larutan padat oleh Mn pada fasa α ; Cu.

Sedangkan dengan penambahan Mn sebanyak 5.83 wt.%, kekerasan semakin bertambah namun nilai kekuatan tarik hanya meningkat sedikit dan keuletan menurun karena adanya fasa β ;? yang terbentuk.

ABSTRACT

One important part of bullet is its shell. Common material that is used to make bullet shell is cartridge brass. In the making process of bullet shell there are some problems that are often found such as cracking and tearing. In order to minimize those problems, manganese is used in this research to increase cartridge brass' ductility. This research is intended to fabricate cartridge brass alloy with addition of Mn and to study effect of Mn (1.26, 3.23, and 5.83 wt. %) on microstructure and mechanical properties. It was characterized by hardness testing, tensile testing, and microstructure analysis using optical microscope and SEM/EDX. The result showed that with the addition of 1.26 and 3.23 wt. % Mn, the tensile strength and ductility of the alloys are increased. This is due to solid solution strengthening mechanism of Mn in single α ; Cu phase. In the other hand, with the addition of 5.83 wt.% Mn, the hardness and tensile strength increased and the elongation decreased. The reason is because there are β ;? phases that occur in this composition.

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