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4%Sb in Lead alloys

Background

Sb is normally added to Pb to provide improved mechanical strength.

The principle strengthening mechanisms in Pb – Sb alloys, are affected by the process route.

- i. A solid solution hardened product of minimum hardness, i.e. ~ 18Hv
- ii. A solid solution hardened product with the benefit of aging through GP ** zones, i.e. ~ 25 Hv.

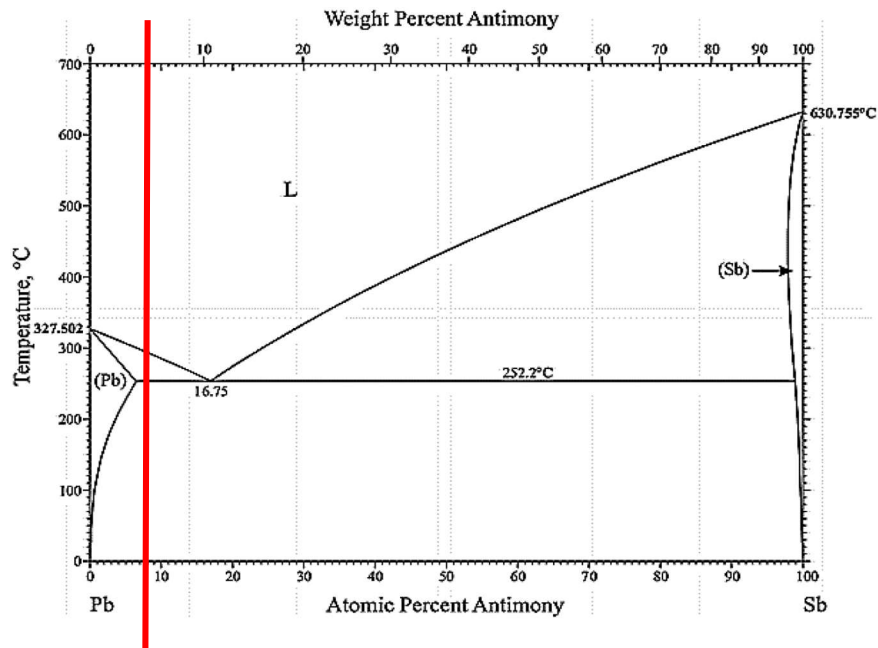
** GP zones are the basis of age hardening in Al alloys – in principle GP zones form as an initial stage of age hardening prior to the formation of actual non-metallic precipitates.

Literature Review – Antimony in Lead

Citation: Seikh AH, Sherif E-SM, Khan Mohammed SMA, Baig M, Alam MA, Alharthi N (2018) Microstructure characterization and corrosion resistance properties of Pb-Sb alloys for lead acid battery spine produced by different casting methods. PLoS ONE 13(4): e0195224

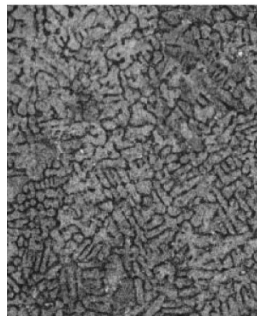
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0195224>

1. Phase Diagram



2. As Cast Microstructure

Dendritic Pb rich phase with a lamellar eutectic mixture in the inter-dendritic regions



Inter-dendritic regions constituted of a Pb α phase (white) and Sb-rich β eutectic phase (dark)

