



SDI Review Form 1.6

Journal Name:	Advances in Research
Manuscript Number:	2015_AIR_18166
Title of the Manuscript:	The Influence of Homogenisation Treatment on Aging Response of 6063 Aluminium Alloy
Type of the Article	Original Research Article

General guideline for Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound.

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PART 1: Review Comments

	Reviewer's comment	Author's comment <i>(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
Compulsory REVISION comments	<p>The strength of this paper resides in having chosen a technologically important subject.</p> <p>However, the treatment of said subject doesn't make sense, since homognization always preceded extrusion rather than the T6 treatment. Other weaknesses are not too good metallography and the conclusions drawn from it. Micrographs are inconclusive and the only phase EDX-analysis are qualitative and do not explain much. The explanation of Fig 1 and Fig 7 behaviour overlooks completely the important issue of grain growth</p> <p>In conclusion, a relatively simple comparison of two group of samples was complicated by inadequate experimental work.</p> <p>Details regarding the above comments follow in the next section (minor revision comments)</p>	<p>All the corrections pointed out had been attended to and highlighted in yellow in the manuscript.</p>



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<p>Minor REVISION comments</p>	<p>INTRODUCTION</p> <p>1) In the abstract, lines 7 to 13 may be omitted as they deal with experimental details</p> <p>2) Repetition: 1st phrase of the 2nd paragraph is almost equal to that of the 1st paragraph</p> <p>3) Line 30: stiffness is not a material's property and is not derived from precipitation hardening</p> <p>4) Lines 31 to 34: same statement is repeated twice</p> <p>5) Lines 60 – 63: I found this sentence incorrect because it is well known that in extrusion plants homogenization precedes extrusion – this reduces segregation, dissolves low m.p. phases and improves workability</p> <p>MATERIALS & METHODS</p> <p>1) For clarity, reposition the sentence beginning on line 73, to line 72; it is more logical.</p> <p>RESULTS AND DISCUSSION</p> <p>1) Fig 1 is quoted after fig 2; please reposition following the usual ordering</p> <p>2) Magnification problem: in figs. 2 - 3 – 4 the magnification bar is 100 μm, but figs. 5 – 6 is 10 μm. How can figs 5 -6 be compared with fig 4 and conclude with the sentence in lines 125 and 126?</p> <p>3. Micrographs: as a general comment the micrographs don't seem conclusive. It is difficult to understand if the voids seen at the surface are phases removed by the polishing or etch pits. Also, the paper mentions dispersoids and precipitates but doesn't make distinction between them.</p> <p>4. Lines 123 to 125: how an "excessive dissolution of solute" can cause precipitation of incoherent phases? It is more probable that after such a long homogenization the yield stress was reduced due to excessive grain growth</p> <p>Line 198 mentions grains but no measurements were performed on this sense.</p> <p>5. Line 182 – 210: contains very basic notions on metallurgy which</p>	<p>1) Lines 7 to 13 gave a brief methodology of the work. Abstract is a brief summary of the work and it consists of aim, methodology, results and conclusion.</p> <p>2) This has been corrected in the manuscript.</p> <p>3) This has been removed from the manuscript.</p> <p>4) This has been corrected in the manuscript.</p> <p>5) Lines 60 to 63 have been removed from the manuscript.</p> <p>1) This has been repositioned accordingly in the manuscript.</p> <p>1) This has been corrected. Figures numbering has been altered due to corrections from other reviewers.</p> <p>2) All the micrographs now have the same magnification bar of 10 μm. Therefore they can be compared.</p> <p>3) These have been corrected in the manuscript.</p>
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	<p>can be omitted. Some sentences make no sense: line 182 – 183, line 193 and line 198</p> <p>6. Precipitation: it is well known that peak hardening is obtained by coherent precipitates. Typically, the volume fraction of dispersoids such as Al-Fe-Mn/Cr-Si is much lower than the volume fraction of the coherent Mg₂Si; how then it can have any effect as a nucleant surface?</p> <p>6. The main effect of a homogenization treatment is the removal of interdendritic segregation and dissolution of some phases (when possible). Thus, one would expect a greater degree of segregation in samples group II, and consequently heterogeneous precipitation and heterogeneous mechanical properties.</p> <p>Figure 1 should show dispersion of strength data so as to permit comparison between groups I and II. Dispersion bars could be added to microhardness data</p> <p>7. Figures: all the numbers, words, etc. superimposed to the micrographs are too small, see fig. 9.</p> <p>8. Phases identification: in as cast 6XXX alloys it is possible to identify Mg₂Si (coarse Widmanstatten in this condition) and Al-Fe-Si (grey chinese script, located in the interdendritic spaces) even with optical microscopy Additionally, a colour etch with Weck can show if segregations were really removed by the homogenization treatment</p> <p>8. Homogenization was wrongly spelled (with 's') in the title and everywhere in the text.</p> <p>9. Line 90 – 91: these plate-like phases will certainly have deleterious effect on the extrusion deformation</p> <p>10. Line 104: how can the authors say, that the precipitates are incoherent, based on figs 2 and 3?</p> <p>11. Line 125: dissolution of 'solute' doesn't exist – it is phase dissolution.</p> <p>12. Lines 180-181: why samples homogenized have a smaller grain size, when it should be the opposite?</p> <p>13. All micrographs are SEM hence have relatively low magnification. How can the authors, based on said micrographs draw conclusions on Mg₂Si whose dimensions are in the nm range? Same observation regarding the EDX spectra.</p>	<p>4) This has been corrected accordingly.</p> <p>This has been corrected in the manuscript.</p> <p>5) These section has been removed.</p> <p>6) No matter how little the volume fraction of dispersoids such as Al-Fe-Mn/Cr-Si may be if they are not of favourable morphology they will act as stress raisers; any way this portion has been expunged from the manuscript.</p> <p>6) Homogenization treatment has other beneficial effects as contained in Rivas <i>et al.</i>, 1999.</p> <p>Yes, the results presented corroborate this assertion.</p> <p>Figure 1 (now Fig 5): The first data plotted on the y axis represented group I while the remaining 4 data are for group II. The LEGEND has shown the dispersion of strength data with different shapes and colours.</p> <p>7) Figures: All the Figures had been modified.</p> <p>8) I agreed with the reviewer's comment; however, the 6063 Al alloy sample used was wrought not cast. Also, the morphology of the phases present can also indicates the influence of</p>
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		<p>homogenization to some extent.</p> <p>8) The letter 's' has been replaced with letter 'z' anywhere the word homogenization appears in the manuscript.</p> <p>9) Yes it will but this article does not involves extrusion but the sample used is extruded sample and its structure contain rod-like phases which ought to have been remove during processing.</p> <p>10. This statement has been withdrawn.</p> <p>11. This statement has been modified in the manuscript.</p> <p>12. This section has been removed from the manuscript.</p> <p>13. The authors agreed with the reviewer's comment. These sections of the manuscript have been corrected and highlighted yellow in the manuscript.</p>
<u>Optional/General</u> comments	The English is relatively good and understandable, but there are many small errors that must be corrected	The indicated errors had been corrected.