

# Study on Fatigue Properties of Al-Mg Alloy Produced by Severe Plastic Deformation by means of In-Situ SEM Observation

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# 1999 Fiscal Year Final Research Report Summary

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## Study on Fatigue Properties of Al-Mg Alloy Produced by Severe Plastic Deformation by means of In-Situ SEM Observation

Research Project

### Project/Area Number

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10650690

### Research Category

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Grant-in-Aid for Scientific Research (C)

### Allocation Type

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Single-year Grants

### Section

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一般

### Research Field

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Structural/Functional materials

### Research Institution

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KANAZAWA UNIVERSITY

### Principal Investigator

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### Co-Investigator(Kenkyū-buntansha)

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### Project Period (FY)

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1998 - 1999

### Keywords

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fine grain / ECAE / A5056 alloy / low cycle fatigue / high cycle fatigue / fatigue crack

### Research Abstract

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There have only been a limited number of studies on the fatigue behavior of ultra-fine grained materials with nano- or sub-microcrystalline structure and no reports are available on the fatigue of Equal-Channel Angular Extrusion (ECAE) Al-alloys. The purpose of the present work is to explore cyclic properties of 5056 Al-alloy after ECAE treatment and to get a better insight on general fatigue and tensile performance of materials with fine-grain metastable structures produced by severe deformation. Since the influence of technological parameters on the resultant ECAE structure and properties has not been fully understood yet and is currently being extensively investigated, we do not believe that the results presented here are the best obtainable with the ECAE technology on the Al-alloys. We attempt to clarify both the benefit and draw back of ECAE for fatigue Properties to provide a guideline for further development of this process towards enhancement of practical characteristics of mat ... More

## Research Products (19 results)

All Other

All Publications (19 results)

- [Publications] A. Vinogradov: "Fatigue Properties of 5056 Al-Mg Alloy Produced by Equal-Channel Angular Pressing"J. of Nanostructured Material. 11. (1999) ▼
- [Publications] S. Hasimoto: "On the Cyclic Behavior of Ultra-Fine Grained Copper Produced by Equi-Channel Angular Pressing"Materials Science Forum. 312-314. 593-598 (1999) ▼
- [Publications] A. Vinogradov: "Acoustic Emission and Strain Localization in Ultra-Fine Grained Copper Produced by Equi-Channel Angular Pressing"Materials Science Forum. 312-314. 607-612 (1999) ▼
- [Publications] Y. Kaneko: "Fatigue Crack Propagation in Single Crystal-and Bicrystals of Ferritic Stainless Steel"Proc. FATIGUE'99 (Beijing). (1999) ▼
- [Publications] A. Vinogradov: "Acoustic Emission in Ultra-Fine Grained Copper"Scripta Materialia. 39. 799-805 (1998) ▼
- [Publications] Y. Kaneko: "Fatigue Crack Propagation in Copper Bicrystals Having the Grain Boundaries of  $\Sigma 3$  Vicinical Domain"Proc. Interface Science (Paris). (1998) ▼
- [Publications] Y. Kaneko: "Hysteresis Loop Shape of a Cyclically-Deformed Copper Tricrystal Having Two Longitudinal Grain Boundaries"Scripta Materialia. 38. 1609-1614 (1998) ▼
- [Publications] Y. Kaneko: "Dependence of Deviation Angle from  $\Sigma 3(111)$  Relation on Intergranular Fatigue Cracking in Copper Bicrystals"Proc. iib98 (Prague). (1998) ▼
- [Publications] A. Vinogradov: "On the Cyclic Response of Ultrafine-Grained Copper"Materials Science Forum. 269-272. 376-380 (1998) ▼
- [Publications] 小南金洋: "分子動力学法を用いた銅の[001]小傾角粒界の構造解析"材料. 48. 376-380 (1998) ▼
- [Publications] A. Vinogradov: "Fatigue Properties of 5056 Al-Mg Alloy Produced by Equal-Channel Angular Pressing"Nanostructured Materials. Vol. 11, No. 7. (1999) ▼
- [Publications] S. Hasimoto: "On the Cyclic Behavior of Ultra-Fine Grained Copper Produced by Equi-Channel Angular Pressing"Materials Science Forum. Vol. 312-314. 593-598 (1999) ▼
- [Publications] A. Vinogradov: "Acoustic Emission and Strain Localization in Ultra-Fine Grained Copper Produced by Equi-Channel Angular Pressing"Materials Science Forum. Vol. 312-314. 607-612 (1999) ▼
- [Publications] Y. Kaneko: "Faique Crack Propagation in Single Crystal-and Bicrystals of a Ferritic Stainless Steel"Proc. FATIGUE'99 (Beijing). (1999) ▼
- [Publications] A. Vinogradov: "Acoustic Emission in Ultra-Fine Grained Copper"Scripta Materialia. Vol. 39, No. 6. 799-805 (1998) ▼
- [Publications] Y. Kaneko: "Fatigue Crack Propagation in Copper Bicrystals Having the Grain Boundaries of  $\Sigma 3$  Vicinical Domain"Proc. Interface Science (Paris). (1998) ▼
- [Publications] Y. Kaneko: "Hysteresis Loop Shape of a Cyclically-Deformed Copper Tricrystal Having Two Longitudinal Grain Boundaries"Scripta Materialia. Vol. 38, No. 11. 1609-1614 (1998) ▼

[Publications] Y. Kaneko: "Dependence of Deviation Angle from  $\Sigma 3(111)$  Relation on Intergranular Fatigue Cracking in Copper Bicrystals"Proc. iib98 (Prague). (1998) 

[Publications] A. Vinogradov: "On the Cyclic Response of Ultrafine-Grained Copper"Materials Science Forum. Vol. 269-272. 987-992 (1998) 

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