

Fatigue Strength Simulation of Natural Porous Structure

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Rice hull which is one of the agricultural wastes in Japan has been demanded to reuse as the industrial materials. Rice hull silica carbon (RHSC) material, made from rice hull is produced by mixing rice hull powder with a phenol resin, and then carbonizing and the mixture in the nitrogen gas atmosphere at high temperatures. The RHSC is a porous carbon material utilizing natural porous structure originated from the rice hull. Therefore, reduction in environmental pollution is expected by the RHSC which is inexpensive and unique. In addition, a core competence of low friction coefficient, lubrication free, and high water resistance was reported for the RHSC in previous research. However, the RHSC has low reliability of strength originated potentially from the porous structure. Since the reliability of the RHSC is evaluated by a fatigue test which is required several weeks, calculating the fatigue strength by simulation analysis is useful. In this study, fatigue strength simulation analysis in natural porous structure was figured out and the size effect which influences the strength of the material was investigated.

Keywords : Rice Hull, Fatigue strength, Strength simulation, Hardness, Pore distribution