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标题: Effects of Pressure Maintenance and Strain Maintenance during Compression on Subsequent Dimensional Stability and Density after Relaxation of Blocks of Chopped Corn Straw

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来源出版物: BIORESOURCES **卷:** 15 **期:** 2 **页:** 3717-3736 **DOI:** 10.15376/biores.15.2.3717-3736 **出版年:** MAY 2020

Web of Science 核心合集中的 "被引频次": 0

被引频次合计: 0

使用次数 (最近 180 天): 8

使用次数 (2013 年至今): 8

引用的参考文献数: 52

摘要: Chopped corn straw is a viscoelastic material that can rebound after compression. Pressure maintenance and strain maintenance are two key processes that enhance the dimensional stability of post-compression straw blocks. To study the effects of stabilization processes on the dimensions of post-compression straw blocks, the authors comparatively explored the relationships of strain and stress with time during constant speed compression (CC), constant-speed compression followed by strain maintenance (CCS), constant-speed compression followed by pressure maintenance (CCP), and constant-speed compression, pressure maintenance followed by strain maintenance (CCPS), and uncovered the reasons for these relationships. The Burgers constitutive model fit well to the data during the pressure maintenance stage ($R^2>0.990$), and the effects of pressure maintenance on strain and dimensional stability of post-compression straw blocks were investigated. The Wiechert model B ($R^2>0.990$) was the constitutive model that best represented the strain maintenance stage. Additionally, the effects of strain maintenance during CCS and CCPS on relaxation rate and dimensional stability of post compression straw were compared. The relaxation density of post compression straw blocks was compared among different stabilization processes. The relaxation density of post-compression straw blocks was the largest after CCPS, followed by CCS and CCP.

入藏号: WOS:000540457600116

语言: English

文献类型: Article

作者关键词: Chopped corn straw; Pressure maintenance; Strain maintenance; Dimensional stability coefficient; Relaxation density

KeyWords Plus: WHEAT-STRAW; DENSIFICATION PARAMETERS; STRESS-RELAXATION; BIOMASS; BEHAVIOR; DURABILITY; COMPACTION; PELLET; CREEP

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出版商: NORTH CAROLINA STATE UNIV DEPT WOOD & PAPER SCI

出版商地址: CAMPUS BOX 8005, RALEIGH, NC 27695-8005 USA

Web of Science 类别: Materials Science, Paper & Wood

研究方向: Materials Science

IDS 号: LY3VV

ISSN: 1930-2126

29 字符的来源出版物名称缩写: BIORESOURCES

ISO 来源出版物缩写: BioResources

来源出版物页码计数: 20

基金资助致谢:

基金资助机构	授权号
National Natural Science Foundation of China	51705191
National Key Research and Development Program of China	2018YFD0701102
Science and Nature Foundation of Jilin Province	20180101090JC

The authors gratefully acknowledge the financial support from the National Natural Science Foundation of China (Grant No.51705191), the National Key Research and Development Program of China (Grant No.2018YFD0701102), and the Science and Nature Foundation of Jilin Province (Grant No.20180101090JC).

开放获取: DOAJ Gold

输出日期: 2020-10-11