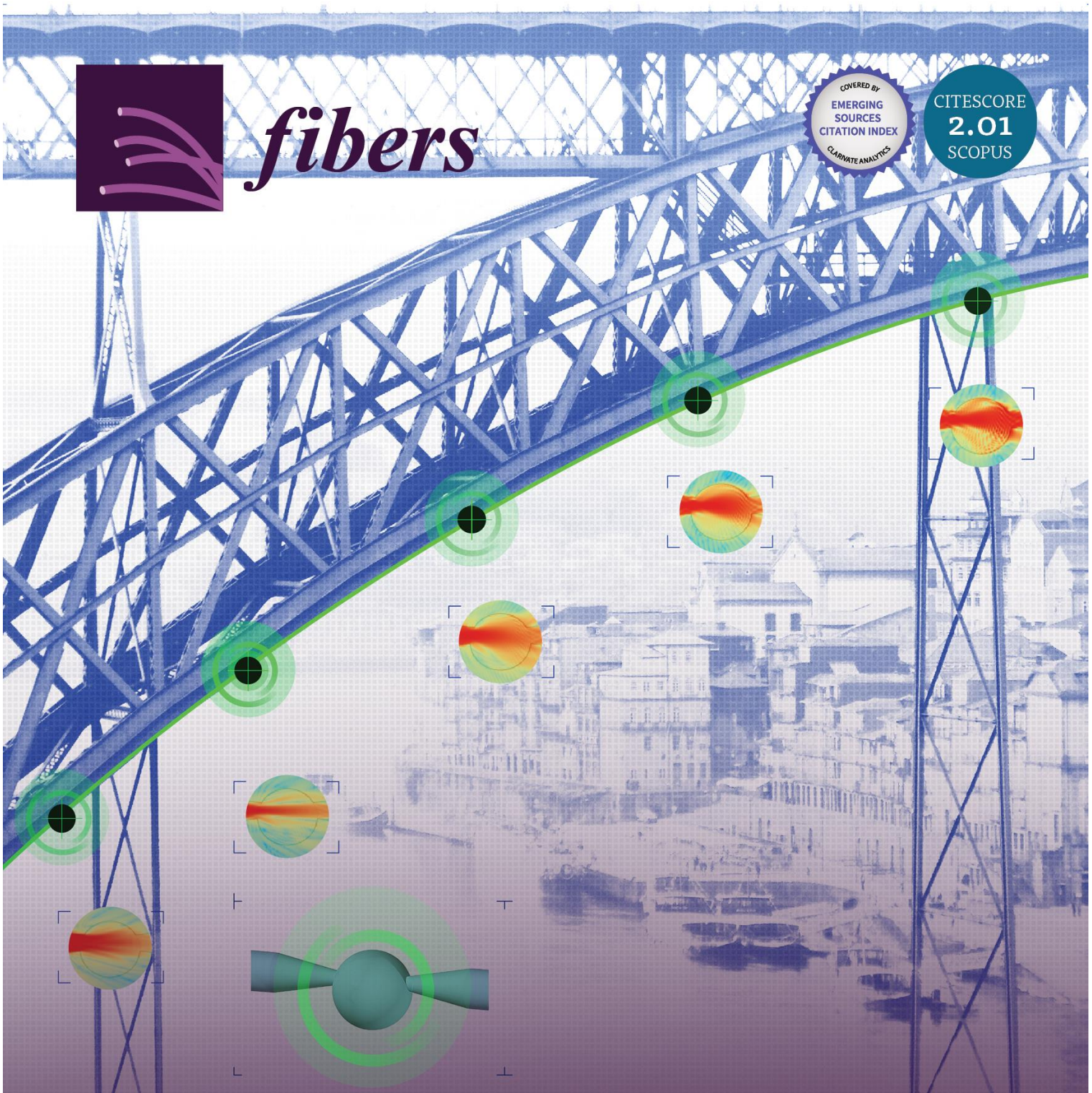

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SURAT KETERANGAN

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Penulis utama	: Prof. Dr. Ir. Erni Setyowati, MT
NIP	: 196704041998022001
Penulis pendamping	: Prof. Dr. Ing. Ir. Gaogoek Hardiman; Dr. Ir. Purwanto, MT., M.Eng
Judul manuskrip	: Tailoring Acoustic Performances of Resin Reinforced Biomass Fiber-Based Panel with Single and Multiple Tailed Cavity Inclusions for Interior Work
Nama Jurnal, Penerbit	: Fibers, MDPI
Volume (Issue)	: Vol. 7, Issue 10 (Oktober 2019)
Tahun terbit	: 2019
DOI	: https://doi.org/10.3390/fib7100085

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Yang Membuat Pernyataan

Prof. Ir. M. Agung Wibowo., M.M.,M.Sc.,Ph.D
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NIP/NIDN	: 196704041998022001/0004046704
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Pendidikan	: S-3, tahun 2011
Pangkat, golongan ruang, tmt	: Pembina, IV/a, 1 Oktober 2019
Jabatan/angka kredit/tmt	: Lektor Kepala/709,20/1 April 2017
Unit kerja	: Universitas Diponegoro

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Tailoring acoustic performances of resin reinforced biomass fiber-based panel with single and multiple tailed cavity inclusions for interior work

Setyowati, Erni[a] ; Hardiman, Gagoek[a] ; Purwanto[b]

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[a] Architecture Department, Engineering Faculty, Diponegoro University, Semarang, 50275, Indonesia

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Abstract

The aim of this research is to observe the acoustic performance of absorber-based biomass fiber-reinforced polyester resins that were experimentally associated with the design of tailed cavity resonator inclusion, i.e., the cavities are partly in the form of a narrow slit. The model of electro-acoustic resonators and several treatments were developed and became the bases for understanding the changes of acoustic reactance in the new structure. Variations in the inclusion cavity and the addition of a narrow slit were tested experimentally using an impedance tube technique based on ASTM E1050-98 and ASTM E2611-09. The improvements of acoustic performance were conducted by single and multiple cavity tailed inclusions with the addition of a Dacron fibrous layer and back cavity. The experimental results showed that a sample of 15 mm single tailed cavity kenaf fiber had higher sound absorption and wider broadband frequencies than did the hemp fiber, with a peak on 0.31-0.32 between 1.00-2.00 kHz. Meanwhile on multiple tailed cavities, the 30 mm hemp fiber had higher and wider broadband frequencies than did the kenaf, with peaks on 0.45-0.63 at frequencies between 1.75-2.10 kHz. It can be concluded that the tailed cavity inclusions could improve performance. Compared to the coco-husk with resonators in previous studies, the tailed cavity was a little bit lower, but the tailed cavities hemps and kenafs samples showed good sound absorption performance with lower band frequencies capabilities. © 2019 by the authors.

Author keywords

Acoustic improvement; Hemp and kenaf fiber; Tailed cavity inclusion

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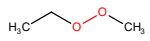

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Tunable parallel barriers using Helmholtz resonator

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doi: 10.1016/j.jsv.2018.11.013

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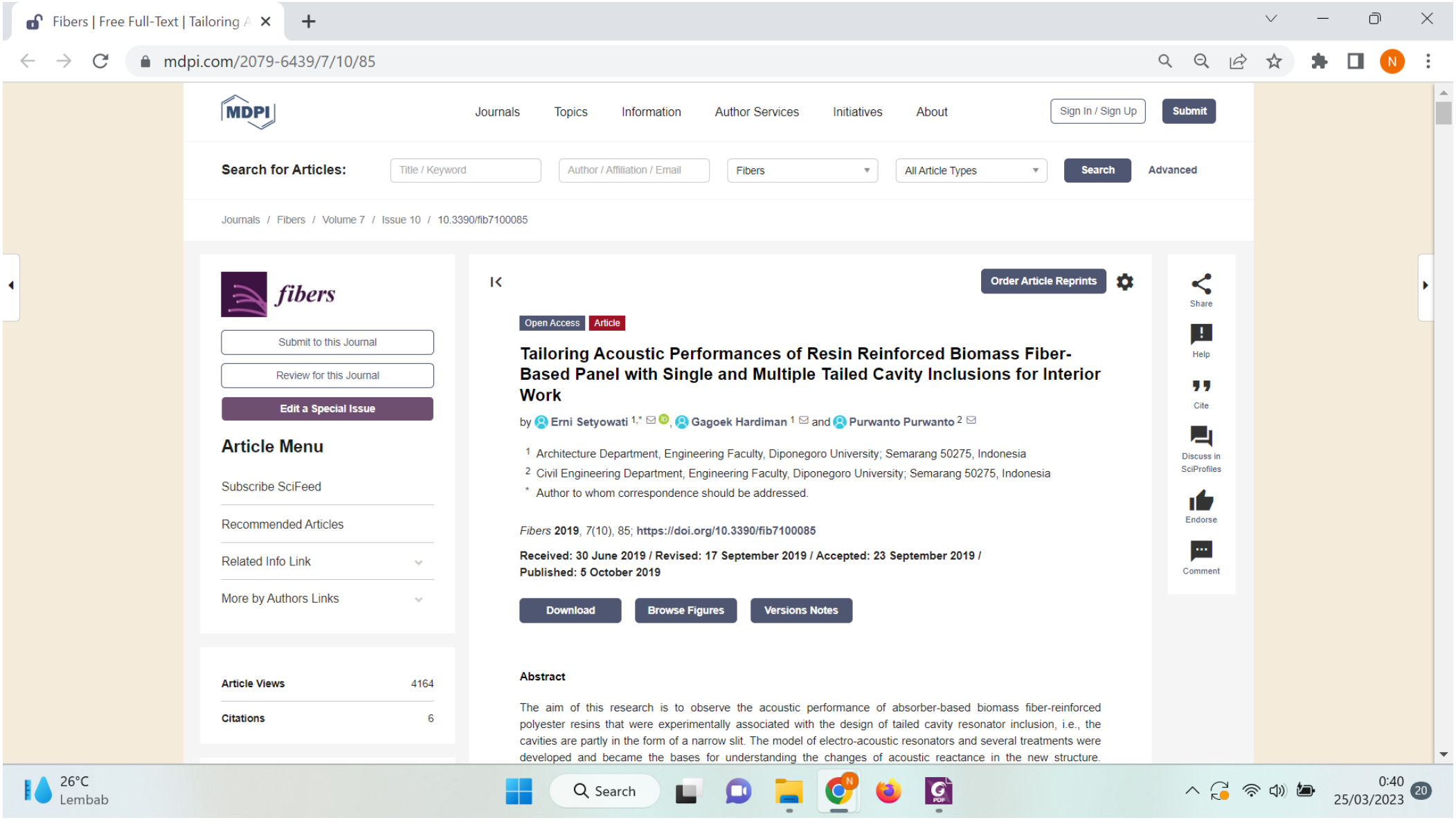

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Tailoring Acoustic Performances of Resin Reinforced Biomass Fiber-Based Panel with Single and Multiple Tailed Cavity Inclusions for Interior Work

by Erni Setyowati [1,*], Gagoek Hardiman [1] and Purwanto Purwanto [2]

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Abstract

The aim of this research is to observe the acoustic performance of absorber-based biomass fiber-reinforced polyester resins that were experimentally associated with the design of tailed cavity resonator inclusion, i.e., the cavities are partly in the form of a narrow slit. The model of electro-acoustic resonators and several treatments were developed and became the bases for understanding the changes of acoustic reactance in the new structure.

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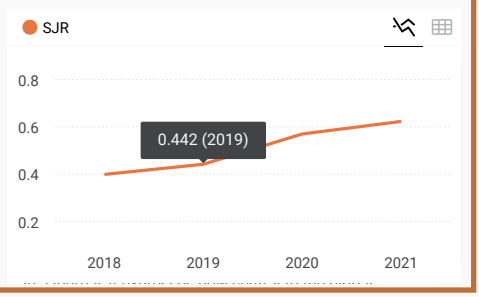

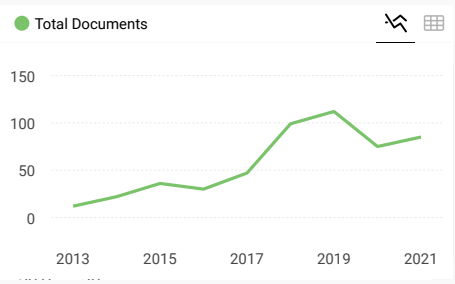

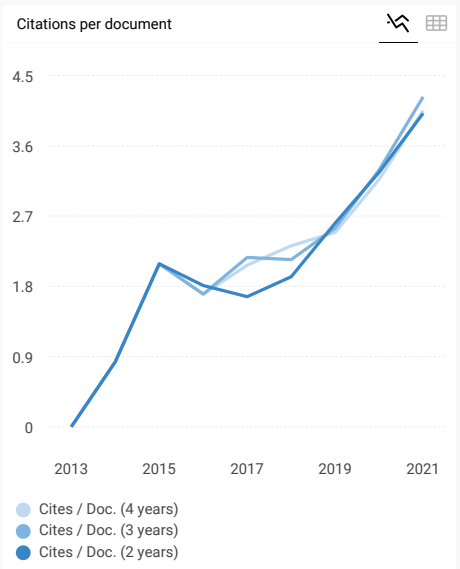

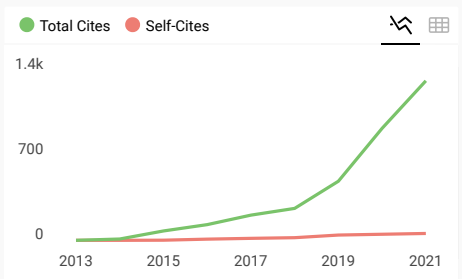

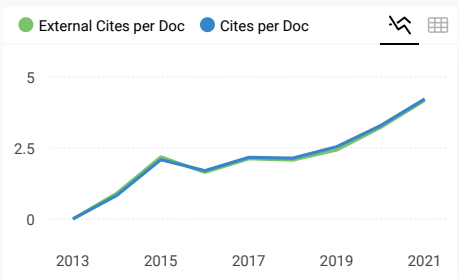

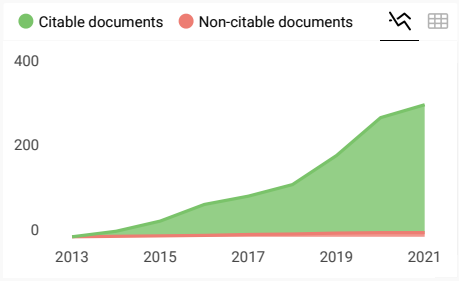

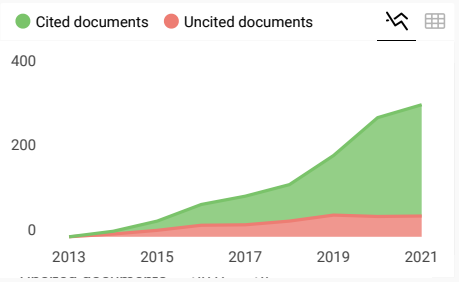

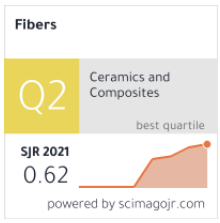

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Interests: laser fibers; applications for laser fibers; high power lasers

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TABLE OF CONTENT

Fibers, Volume 7, Issue 10 (October 2019) – 14 articles

Open AccessArticle

Flexural Behavior of Hybrid-Reinforced Concrete Exterior Beam-Column Joints under Static and Cyclic Loads

by **Ammar Yaser Ali** and **Ali Abdulameer Al-Rammahi**

Fibers **2019**, *7*(10), 94; **https://doi.org/10.3390/fib7100094** - 22 Oct 2019

Cited by 5 | Viewed by 5285

Abstract

This study presents an experimental investigation of the flexure behavior of exterior beam-column joints made from hybrid concrete (normal concrete (NC) and reactive powder concrete (RPC)) or hybrid reinforcement (steel and carbon fiber reinforced polymer (CFRP) bars internally or externally by near surface **[...] Read more.**

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Effects of Reinforcing Fiber Strength on Mechanical Properties of High-Strength Concrete

by **Hyun-Do Yun** , **Seong-Hoon Lim** and **Won-Chang Choi**

Fibers **2019**, *7*(10), 93; **https://doi.org/10.3390/fib7100093** - 21 Oct 2019

Cited by 7 | Viewed by 4719

Abstract

This paper investigates the effects of the tensile strength of steel fiber on the mechanical properties of steel fiber-reinforced high-strength concrete. Two levels of steel fiber tensile strength (1100 MPa and 1600 MPa) and two steel fiber contents (0.38% and 0.75%) were used **[...] Read more.**

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Resistance of Injection Molded Wood-Polypropylene Composites against Basidiomycetes According to EN 15534-1: New Insights on the Test Procedure, Structural Alterations, and Impact of Wood Source

by **Kim Christian Krause** , **Christian Brischke** , **Tim Koddenberg** , **Andreas Buschalsky** , **Holger Militz** and **Andreas Krause**

Fibers **2019**, *7*(10), 92; **https://doi.org/10.3390/fib7100092** - 21 Oct 2019

Cited by 2 | Viewed by 3908

Abstract

In this study, we investigated injection molded wood-polypropylene composites based on various wood sources and their decay resistance against white rot (*Trametes versicolor*) and brown rot (*Coniophora puteana*) in a laboratory test according to EN 15534-1:2014. The manufactured composites **[...] Read more.**

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Osage Orange, Honey Locust and Black Locust Seed Meal Adhesives Employed to Fabricate Composite Wood Panels

by **Brent Tisserat** and **Rogers Harry-O'kuru**

Fibers **2019**, *7*(10), 91; **https://doi.org/10.3390/fib7100091** - 14 Oct 2019

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Article

Effects of Reinforcing Fiber Strength on Mechanical Properties of High-Strength Concrete

Hyun-Do Yun [1], Seong-Hoon Lim [1] and Won-Chang Choi [2,*]

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Received: 30 August 2019; Accepted: 2 October 2019; Published: 21 October 2019

Abstract: This paper investigates the effects of the tensile strength of steel fiber on the mechanical properties of steel fiber-reinforced high-strength concrete. Two levels of steel fiber tensile strength (1100 MPa and 1600 MPa) and two steel fiber contents (0.38% and 0.75%) were used to test the compression, flexure, and direct shear performance of steel fiber-reinforced high-strength concrete specimens. The aspect ratio for the steel fiber was fixed at 80 and the design compressive strength of neat concrete was set at 70 MPa to match that of high-strength concrete. The performance of the steel fiber-reinforced concrete that contained high-strength steel fiber was superior to that which contained normal-strength steel fiber. In terms of flexural performance in particular, the tensile strength of steel fiber can better indicate performance than the steel fiber mixing ratio. In addition, a compression prediction model is proposed to evaluate compression toughness, and the model results are compared. The predictive model can anticipate the behavior after the maximum load.

Keywords: steel fiber-reinforced concrete; tensile strength; fiber content; compressive strength; flexure; direct shear

1. Introduction

Steel fiber-reinforced concrete (SFRC), which incorporates steel fiber into the concrete mixture, not only improves the material's shear strength and tensile strength, but also improves its impact resistance, fatigue life, and ductility, and controls crack growth via the crosslinking of the fibers [1]. Research into SFRC has been actively conducted since the 1970s, with studies investigating various mix ratios of steel fiber with respect to the steel fiber's aspect ratio and tensile strength [2,3]. Among the various parameters that influence the performance of SFRC, the mix ratio and aspect ratio of the steel fiber are the most prominent [4]. Köksall et al., 2012 studied the mechanical properties of SFRC with variables of concrete compressive strength and tensile strength of steel fiber. They concluded that variations of the mechanical properties of SFRC were insignificant when using normal concrete. Depending on the compressive concrete strength, the mechanical properties were highly affected in SFRC. In practice, when an amount of steel fibers are mixed in excess, the fibers reduce the mixture's workability during the pouring operation and diminish the positive effects of incorporating the fibers [5]. With advancements in manufacturing, various types and tensile strengths of steel fiber are available commercially, and high-strength steel fiber has been shown to improve the mechanical performance of SFRC [6].

This study was focused primarily on the effects of the tensile strength (rather than the aspect ratio) of steel fiber on the mechanical properties of SFRC. The tests performed were compression, flexure, and direct shear tests of SFRC specimens.

Cited by 2 | Viewed by 5248

Abstract

Seed meal of three trees common to the Midwest region of the USA (Honey locust, *Gleditsia triacanthos* L., family Fabaceae), Osage orange (*Maclura pomifera* (Raf.) Schneid., family Moraceae) and Black locust (*Robinia pseudoacacia* L., family Fabaceae) were tested for their adhesive [...] Read more.

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by **M. Chellapandian** , **Saumitra Jain** , **S. Suriya Prakash** and **Akanshu Sharma**

Fibers **2019**, *7*(10), 90; https://doi.org/10.3390/fib7100090 - 14 Oct 2019

Cited by 13 | Viewed by 4401

Abstract

The effectiveness of hybrid fibre-reinforced polymer (FRP) strengthening is evaluated for rapid repair of the pre-damaged plain concrete (PC) and reinforced concrete (RC) columns. The objective of this study is to understand the efficiency of hybrid technique for completely restoring the initial stiffness, [...] Read more.

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Estimation of the Effects of the Cross-Head Speed and Temperature on the Mechanical Strength of Kenaf Bast Fibers Using Weibull and Monte-Carlo Statistics

by **Richard Ntenga** , **Saïdjo SAÏDJO** , **Tibi Beda** and **Alexis Béakou**

Fibers **2019**, *7*(10), 89; https://doi.org/10.3390/fib7100089 - 11 Oct 2019

Cited by 6 | Viewed by 3898

Abstract

Methods used by different researchers to evaluate plant fibers' (PFs) mechanical performance, show great variance in results. In this work, 320 single kenaf fibers of gage lengths 10 and 20 mm were tensile-tested using four speed levels (0.05; 0.5; 1 and 5 mm·min [...] Read more.

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ANN-Based Shear Capacity of Steel Fiber-Reinforced Concrete Beams without Stirrups

by **Miguel Abambres** and **Eva O.L. Lantsoght**

Fibers **2019**, *7*(10), 88; https://doi.org/10.3390/fib7100088 - 11 Oct 2019

Cited by 21 | Viewed by 5256

Abstract

Comparing experimental results of the shear capacity of steel fiber-reinforced concrete (SFRC) beams without stirrups to the capacity predicted using current design equations and other available formulations shows that predicting the shear capacity of SFRC beams without mild steel shear reinforcement is still [...] Read more.

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Fiber Microsphere Coupled in a Taper for a Large Curvature Range

by **Paulo Robalinho** and **Orlando Frazão**

Fibers **2019**, *7*(10), 87; https://doi.org/10.3390/fib7100087 - 09 Oct 2019

Cited by 1 | Viewed by 3627

Abstract

This work consists of using an optical fiber microsphere as a sensor for a wide range of curvature radii. The microsphere was manufactured in a standard fiber with an electric arc. In order to maximize system efficiency, the microsphere was spliced in the [...] Read more.

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ANN-Based Shear Capacity of Steel Fiber-Reinforced Concrete Beams without Stirrups

Miguel Abambres [1,2] and **Eva O.L. Lantsoght** [3,4,*]

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Received: 30 August 2019; Accepted: 26 September 2019; Published: 11 October 2019

Abstract: Comparing experimental results of the shear capacity of steel fiber-reinforced concrete (SFRC) beams without stirrups to the capacity predicted using current design equations and other available formulations shows that predicting the shear capacity of SFRC beams without mild steel shear reinforcement is still difficult. The reason for this difficulty is the complex mechanics of the problem, where the steel fibers affect the different shear-carrying mechanisms. Since this problem is still not fully understood, we propose the use of artificial intelligence (AI) to derive an expression based on the available experimental data. We used a database of 430 datapoints obtained from the literature. The outcome is an artificial neural network-based expression to predict the shear capacity of SFRC beams without shear reinforcement. For this purpose, many thousands of artificial neural network (ANN) models were generated, based on 475 distinct combinations of 15 typical ANN features. The proposed "optimal" model results in maximum and mean relative errors of 0.0% for the 430 datapoints. The proposed model results in a better prediction (mean $V_{test}/V_{ANN} = 1.00$ with a coefficient of variation 1×10^{-15}) as compared to the existing code expressions and other available empirical expressions, with the model by Kwak et al. giving a mean value of $V_{test}/V_{pred} = 1.01$ and a coefficient of variation of 27%. Until mechanics-based models are available for predicting the shear capacity of SFRC beams without shear reinforcement, the proposed model thus offers an attractive solution for estimating the shear capacity of SFRC beams without shear reinforcement. With this approach, designers who may be reluctant to use SFRC because of the large uncertainties and poor predictions of experiments, may feel more confident using the material for structural design.

Keywords: artificial neural networks; beams; database; design formula; fiber-reinforced concrete; shear; steel fibers

1. Introduction

Because concrete is strong in compression but weak in tension, adding fibers to the material can be a solution for the limited strength in tension. In structural applications, fiber-reinforced concrete is combined with regular reinforcement steel. The type of fibers that are used, are most often steel fibers. These fibers help to distribute cracks and keep the crack widths small [1].

One failure mode where crack shape and width is essential, is shear failure. When steel fibers are included in the concrete mix, and the reinforced concrete element built with this concrete mix is tested in shear, then the addition of the steel fibers influences all mechanisms that contribute to the shear-carrying capacity of the member [2]. Since the mechanics of the problem are still not fully understood, it

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Sol–Gel Treatments to Flame Retard PA11/Flax Composites

by **Fabienne Samyn** , **Maxence Vandewalle** , **Séverine Bellayer** and **Sophie Duquesne**
Fibers **2019**, *7*(10), 86; **https://doi.org/10.3390/fib7100086** - 07 Oct 2019
Cited by 3 | Viewed by 3885
Abstract
This work investigates the efficiency of sol–gel treatments to flame retard flax fabric/PA11 composites. Different sol–gel treatments applied to the flax fabrics were prepared using TEOS in combination with phosphorus and/or nitrogen containing co-precursors (DEPTES, APTES) or additives (OP1230, OP1311). When the nitrogen **[...] Read more.**
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Fibers **2019**, *7*(10), 85; **https://doi.org/10.3390/fib7100085** - 05 Oct 2019
Cited by 6 | Viewed by 4160
Abstract
The aim of this research is to observe the acoustic performance of absorber-based biomass fiber-reinforced polyester resins that were experimentally associated with the design of tailed cavity resonator inclusion, i.e., the cavities are partly in the form of a narrow slit. The model **[...] Read more.**
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Improvement in Carbonization Efficiency of Cellulosic Fibres Using Silylated Acetylene and Alkoxysilanes

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Cited by 10 | Viewed by 5373
Abstract
Comparative studies of the structure and thermal behavior of cellulose and composite precursors with additives of silyl-substituted acetylene and alkoxysilanes were carried out. It is shown that the introduction of silicon-containing additives into the cellulose matrix influenced the thermal behavior of the composite **[...] Read more.**
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Influence of Spinning Temperature and Filler Content on the Properties of Melt-Spun Soy Flour/Polypropylene Fibers

by **Ozgun Guzdemir** and **Amod A. Ogale**
Fibers **2019**, *7*(10), 83; **https://doi.org/10.3390/fib7100083** - 25 Sep 2019
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Polypropylene (PP) fibers are heavily used in disposable nonwovens fabrics because of their desirable properties and low-cost, but they are not biodegradable. With the goal of reducing non-biodegradable plastic waste in the environment, the primary aim of this study was to produce fibers **[...] Read more.**
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Microstructure and Phase Composition of Yttria-Stabilized Zirconia Nanofibers Prepared by High-Temperature Calcination of Electrospun Zirconium Acetylacetonate/Yttrium Nitrate/Polyacrylonitrile Fibers

by **Vyacheslav V. Rodaev** , **Svetlana S. Razlivalova** , **Alexander I. Tyurin** , **Andrey O. Zhigachev** and **Yuri I. Golovin**
Fibers **2019**, *7*(10), 82; **https://doi.org/10.3390/fib7100082** - 25 Sep 2019
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Influence of Spinning Temperature and Filler Content on the Properties of Melt-Spun Soy Flour/Polypropylene Fibers

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Received: 3 July 2019; Accepted: 20 September 2019; Published: 25 September 2019

Abstract: Polypropylene (PP) fibers are heavily used in disposable nonwovens fabrics because of their desirable properties and low-cost, but they are not biodegradable. With the goal of reducing non-biodegradable plastic waste in the environment, the primary aim of this study was to produce fibers with reduced content of PP for disposable fabrics by incorporating soy flour, a bio-based renewable material. An optimum processing temperature of 190 °C was established, and thin fibers with a diameter under 60 μm were successfully melt-spun. Inclusion of compatibilized soy (SFM) at 30 wt% resulted in fibers with a tensile modulus of 674 ± 245 MPa and a yield strength of 18 ± 4 MPa. At 15 wt% SFM, fiber tensile modulus and yield strength were 914 ± 164 and 29 ± 3, respectively. Although lower than those of neat PP fibers (1224 ± 136 MPa and 37 ± 3 MPa), these SFM/PP fiber properties are suitable for nonwoven applications. Additionally, partial presence of soy particulates on fiber surface imparted enhanced water absorption and colorability properties to the fibers while imparting the fibers the feel of natural fibers.Although more difficult to produce, soy-PP fibers possessed similar properties as compared to those of than soy-PE fibers reported in earlier studies.

Keywords: polypropylene; soy flour; melt-spun fibers; hydrophilic; tensile properties

1. Introduction

In the last 60 years, world-wide plastics usage has increased from 1.5 million tons to 400 million tons [1] because plastics are low-cost materials that are suitable for a wide range of household applications due to their ease of processing and durability. A segment of these plastic products consists of nonwovens that are produced from polymeric fibers. In the USA, 51 million tons of nonwovens were produced in 2018 [2]. This large volume can be attributed to the very low cost of production of nonwoven facbrics relative to their woven counterparts. Plastics improve the quality of life by contributing comfort, convenience, and safety. The major advantage of plastics and the resulting disposables products is their affordability. Consequently, these inexpensive products have become ubiquitous. Unfortunately, the ease of disposability has also led to significant environmental pollution. It is tough to give up the utilization and production of these polyolefin polymers due to their excellent performance/cost ratio, but their massive annual production coupled with improper disposal has become a major societal problem.

The world has started to become more aware of sustainability issues and starting to follow the rule of "3Rs", i.e., "reuse, reduce use, and recycle". Plastic reusing and recycling are personal choices. Reusable plastics are mostly durable products, available in the market, which can be used over and over again. However, 'reuse' strategy (i.e., first "R") is not applicable to sanitary items and food packaging due to the cleaning difficulties. The second "R", recycling, can be done only when suitable facilities are

For the first time, dense nanofibers of yttria-stabilized tetragonal zirconia with diameter of ca. 140 nm were prepared by calcination of electrospun zirconium acetylacetonate/yttrium nitrate/polyacrylonitrile fibers at 1100–1300 °C. Ceramic filaments were characterized by scanning electron microscopy, X-ray diffractometry, and nitrogen adsorption. With **[...] Read more.**

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Improve in CO_2 and CH_4 Adsorption Capacity on Carbon Microfibers Synthesized by Electrospinning of PAN

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Fibers **2019**, *7*(10), 81; **https://doi.org/10.3390/fib7100081** - 21 Sep 2019

Cited by 14 | Viewed by 4140

Abstract

Carbon microfibers (CMF) has been used as an adsorbent material for CO_2 and CH_4 capture. The gas adsorption capacity depends on the chemical and morphological structure of CMF. The CMF physicochemical properties change according to the applied stabilization and carbonization temperatures. **[...] Read more.**

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