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ROMAN KIERA

Design and Life Assessment Issues
Springer
Today research on creep and shrinkage of concrete is diversified to such a degree that specialists working in different areas sometimes find it difficult to understand one-another. Materials scientists are mainly interested in processes on a microstructural level but they do not necessarily understand the relevance of time dependent deformation in structural design. On the other hand engineers who apply simplified model laws in non-elastic structural analysis are not always in

the position to judge the limitations implied in their approach. It is generally realized that further development can be stimulated by a more effective exchange of results and ideas among the different groups involved. In an attempt to bridge this obvious gap in September 1980 there was a Conference organized at Swiss Federal Institute of Technology in Lausanne. The papers presented at this meeting covered the wide range starting with microstructural aspects and mechanisms and including constitutive modelling and structural creep analysis. These contributions together with summaries of two panel discussions are being published in this volume. All serious of the meeting have been introduced by invited lectures. These papers will be published in a special volume "Creep and Moisture Effects in Concrete". This special volume is rather to be a general survey of the different areas covered while the present conference proceedings provide a unique selection of research papers. Nowadays time-dependent deformation of concrete can be taken into consideration realistically by computerized structural analysis.

Creep in Ceramics CRC Press

Although dynamical mechanical analysis or spectroscopy has left the domain of the rheologist and has become a prevalent tool in the analytical laboratory, it is still common to hear,

"What is DMA, and what will it tell me?" or "I think I could use a DMA, but I cannot justify its cost." Previously, the novice in the field had to sort through texts on thermal analysis, rheology, and materials science just to find basic information — until now.

Time-independent Limit of a Creep-recovery Constitutive Equation

Trans Tech Publications Ltd

This volume presents a collection of contributions on materials modeling, which were written to celebrate the 65th birthday of Prof. Nobutada Ohno. The book follows Prof. Ohno's scientific topics, starting with creep damage problems and ending with homogenization methods.

Creep Creep and Creep-recovery of Plain Concrete Under High Compressive StressesLong Creep-Recovery Behavior Of Bamboo-Based ProductsCreep-recovery is a deformation response for a typical viscoelastic materials. For the structural design, it is important to understand recovery behavior for the materials, by applying a constant stress for a period of time (i.e., creep) followed by removing the stress, and examining the subsequent relaxation response of the material (i.e., recovery) over a specifi duration. This paper describes the bending creep behavior of two types of bamboo-based products, bamboo-laminated veneer lumber (BLVL), and glued-laminated bamboo (GLB, also called Bamboo Glulam) at diffrent stress levels for half a year and

recovery for the same time. The conclusions showed that: (1)The stress level was more sensitive on creep property for BLVL than GLB. The relative creeps were ranged from 0.19 (30% stress level) to 0.49 (70% stress level) for BLVL, and from 0.41 (30% stress level) to 0.56 (70% stress level) for GLB. (2) The creep resistance of GLB was less than that of BLVL from stress level of 30u201350%. The relative creep of GLB was obtained as 0.41, 2.2 times than that of BLVL at stress level of 30%, while 2.7 times at stress level of 50%. (3) For both BLVL and GLB, the instantaneous recovery ratio (elastic recovery to elastic creep) was reduced with the stress level increased, while residual ratio (residual deformation corresponded to the total creep deflctions) was increased. (4) Burgers model fis the creep data very well for both BLVL and GLB with $R2 > 0.94$. The viscous parameter of BLVL was more close to the residual deflction obtained from experiment data than that of GLB, indicating that the recovery model fit better for BLVL than that of GLB.TENSILE CREEP AND CREEP-RECOVERY BEHAVIOR OF FIBER-REINFORCED CERAMIC MATRIX COMPOSITES.deformation and the post-creep monotonic tensile behavior.Nonlinear Creep and Creep Recovery of Die-cast Aluminum AlloysRheo-optical Behavior of Polyacrylonitrile: Creep and Creep RecoveryThe rheo-optical behavior of

PAN homopolymer film has been investigated by means of creep and creep recovery experiments with simultaneous measurements of birefringence changes. A progressive change in shape of the creep curve in a log-log plot of compliance vs time is seen: from very flat and gradual to more S-shaped both with increasing temperature, and with increasing stress at the higher temperatures. This S-shaped curve can be identified with the cold-drawing phenomenon, even though no neck formation was seen. Creep recovery is more complete at lower temperatures and after lower final strains in the creep experiment. Most of the recovery is instantaneous; only a very small amount of further time-dependent recovery is observed. At higher temperatures and higher strains, creep seems to involve permanent changes in the solid-state structure; these produce a permanent set which is not recoverable even on heating to higher temperatures. The creep and creep recovery therefore cannot be properly described in terms of the laws of simple viscoelasticity. The rheo-optical behavior of this polymer is clearly more complex than that of PVC, which has been investigated previously. Some speculations regarding the solid-state structure of PAN are presented, based primarily on the birefringence results. (Author).Creep and RecoveryA Seminar on Creep and Recovery of

Metals Held During the Thirty-eighth National Metal Congress and Exposition, Cleveland, October 6 to 12, 1956Creep and Fracture in High Temperature ComponentsDesign and Life Assessment Issues Rheology of Semisolid Foods comprehensively covers the rheological behaviors and rheological testing of semisolid foods. Individual chapters focus on semisolid food structure, rheological and sensory behaviors, testing of various semisolid food behaviors, and factors that impact those behaviors. Special concentration is given to the relationships among semisolid food structures and mechanical properties and textures. The second section of this work presents a series of case studies on acid milk gels and yogurt which provide a practical illustration of the concepts presented in the preceding chapters, allowing readers to gain both conceptual knowledge of semisolid food rheology and an understanding of how that knowledge can be applied to a food system of choice. Individual components, processing parameters, and storage conditions can dramatically impact food functional properties and textures. Changing any of these factors can cause significant microstructural alterations resulting in undesirable changes in product stability, functionality and texture. The lack of knowledge of how these factors impact the final food properties makes development of new food products a

process of empirical trial rather than intentional design. A fundamental understanding food structure, function and texture relationships is critical for targeted design of food products. This text is a valuable reference for researchers looking to gain an understanding of how rheology works in semisolid food design and processing.

Creep and Creep Recovery of 304 Stainless Steel at Low Stresses and Effects of Aging BoD – Books on Demand

Volume is indexed by Thomson Reuters CPCI-S (WoS). This collection reflects the current worldwide state of knowledge concerning the latest scientific concepts and technological developments in the characterization, testing, mechanics, modelling, manufacturing and applications of various classes of composite materials and structures. It is also intended to promote the sharing of ideas and emerging technologies, as well as to foster R & D collaboration among academia, research institutions and the relevant industries.

The Creep Recovery of a 0.17 Per Cent Carbon Steel Courier Corporation

The effect of strain recovery is taken into consideration in establishing a constitutive equation for metals at elevated temperatures. Internal state variables and Rice's flow potential are used in the representation. Growth law for the state variables is discussed and interpreted to be a more general form of the

kinematic hardening condition. Yield condition is obtained from the flow law. Accordingly, the flow rule is established with the effect of the recovery mechanism, as a slightly general version of the time-independent theory with the kinematic hardening rule. In the discussion of the time-independent limit, the duration of time required for the inelastic strain to reach its saturated value is defined.

Effects of Creep Recovery Periods on Creep Failure Times of Nylon Filaments

Springer Science & Business Media

The rheo-optical behavior of PAN homopolymer film has been investigated by means of creep and creep recovery experiments with simultaneous measurements of birefringence changes. A progressive change in shape of the creep curve in a log-log plot of compliance vs time is seen: from very flat and gradual to more S-shaped both with increasing temperature, and with increasing stress at the higher temperatures. This S-shaped curve can be identified with the cold-drawing phenomenon, even though no neck formation was seen. Creep recovery is more complete at lower temperatures and after lower final strains in the creep experiment. Most of the recovery is instantaneous; only a very small amount of further time-dependent recovery is observed. At higher temperatures and higher strains, creep seems to involve permanent changes in the solid-state structure; these produce a

permanent set which is not recoverable even on heating to higher temperatures. The creep and creep recovery therefore cannot be properly described in terms of the laws of simple viscoelasticity. The rheo-optical behavior of this polymer is clearly more complex than that of PVC, which has been investigated previously. Some speculations regarding the solid-state structure of PAN are presented, based primarily on the birefringence results. (Author).

Creep and Fracture in High Temperature Components Springer

Issues for Sept. 1951- include the Bulletin.

Prediction of Creep Recovery of Concrete from Creep in Tension and in Compression Springer Nature

Provides information from around the world on creep in multiple high-temperature metals, alloys, and advanced materials.

Creep and Creep-recovery of Plain Concrete Under High Compressive Stresses CRC Press

This book contains 12 chapters with original and innovative research studies in the issues related to the broadly defined creep effect, which concerns not only the area of construction materials but also natural phenomena. The emphasis on the discussion of a new trend of experimental creep testing, which binds the classic creep methods to seek the correlation of parameters obtained in tests, deserves particular attention. This book aims

to provide the readers, including, but not limited to, students and doctoral students and also the research personnel and engineers involved in the operation of equipment and structural components as well as specialists in high-temperature creep-resisting materials, with a comprehensive review of new trends in the field of creep-exposed materials and their research methodology. The chapters of this book were developed by respected and well-known researchers from different countries.

From Creep Damage Mechanics to Homogenization Methods

DEStech Publications, Inc

It is thought that creep recovery may be one of the main causes of acceleration of crack growth rates under variable loads. To explore this possibility, the effects of creep recovery and hardening on the near-tip fields are examined in this paper. Robinson's constitutive relation, which is based on the Bailey-Orowan model, is used to take these effects into account. In this model, the strain rate is proportional to the nth power of an effective stress, which is the difference between applied stress and internal stress. The rate of the internal stress is given by the difference between a hardening term and a recovery term, which are proportional to the strain rate divided by the ?th power of the internal stress and the (n - ?)th power of the internal stress, respectively.

Creep Recovery of

Commercially Pure Copper

Creep-recovery is a deformation response for a typical viscoelastic materials. For the structural design, it is important to understand recovery behavior for the materials, by applying a constant stress for a period of time (i.e., creep) followed by removing the stress, and examining the subsequent relaxation response of the material (i.e., recovery) over a specifi duration. This paper describes the bending creep behavior of two types of bamboo-based products, bamboo-laminated veneer lumber (BLVL), and glued-laminated bamboo (GLB, also called Bamboo Glulam) at diffrent stress levels for half a year and recovery for the same time. The conclusions showed that: (1)The stress level was more sensitive on creep property for BLVL than GLB. The relative creeps were ranged from 0.19 (30% stress level) to 0.49 (70% stress level) for BLVL, and from 0.41 (30% stress level) to 0.56 (70% stress level) for GLB. (2) The creep resistance of GLB was less than that of BLVL from stress level of 30u201350%. The relative creep of GLB was obtained as 0.41, 2.2 times than that of BLVL at stress level of 30%, while 2.7 times at stress level of 50%. (3) For both BLVL and GLB, the instantaneous recovery ratio (elastic recovery to elastic creep) was reduced with the stress level increased, while residual ratio (residual deformation corresponded to the total creep

deflctions) was increased. (4) Burgers model fis the creep data very well for both BLVL and GLB with R2 > 0.94. The viscous parameter of BLVL was more close to the residual deflction obtained from experiment data than that of GLB, indicating that the recovery model fit better for BLVL than that of GLB.

Rheo-optical Behavior of Polyacrylonitrile: Creep and Creep Recovery

deformation and the post-creep monotonic tensile behavior.

Yoga Biomechanics

CREEP, SHRINKAGE AND DURABILITY MECHANICS OF CONCRETE AND CONCRETE STRUCTURES contains the keynote lectures, technical reports and contributed papers presented at the Eighth International Conference on Creep, Shrinkage and Durability of Concrete and Concrete Structures (CONCREEP8, Ise-shima, Japan, 30 September - 2 October 2008). The topics covered

Creep and Recovery

The effect of strain recovery is taken into consideration in ORNL efforts to establish unified constitutive equations for time-dependent plastic deformation for metals at elevated temperatures. Representation by internal state variables and Rice's flow potential are under consideration. Here the growth law for the internal state variables is discussed and interpreted in terms of a generalized form of the kinematic hardening condition of Prager. The yield condition is obtained from the flow potential representation of the inelastic strain rate. A

consistency condition is derived from the yield condition and leads to a flow rule which assumes a slightly general form as compared with that of the classical plasticity due to the effect of strain recovery and the time-dependent property of the yield condition. Based on this representation, the time-independent limit is discussed. From a vanishing effect of recovery and a rate-independent limit for the yield condition at low temperature, this flow rule reduces to the well-known form of time-independent plasticity with a kinematic hardening condition. The duration of time (the characteristic time) required for the inelastic strain to reach its saturated value is defined for the inelastic loading condition. It provides the measure of a minimum duration of time which is required for a valid approximation made by the time-independent plasticity model.

A Practical Introduction

The Superpave specifications and equipment, introduced in 1993, represented a major advancement with respect to offering a better understanding of the behavior and characteristics of asphalt binders based on their rheological properties. However, the Superpave high-temperature test protocol has been shown to be inadequate for characterizing the high-temperature behavior (rutting resistance) of asphalt binders, particularly polymer modified ones. Recently, a specification based on the

Multiple Stress Creep Recovery (MSCR) test has been proposed to address the shortcomings of the Superpave high-temperature binder specifications. This study aims to investigate the merits of implementing the MSCR test and specification as a replacement for the conventional high-temperature testing in the Performance Graded (PG) system. A statistical analysis was conducted on a dataset from Indiana Department of Transportation (INDOT) to see how MSCR and PG procedures differ in grading different binders used in the state. In addition, an experimental study was conducted using seventeen different modified and unmodified binders. In addition to binder tests, seven of the binders were selected to conduct asphalt mixture tests such as dynamic modulus and flow number. The results confirm that the MSCR test is a suitable replacement for the current PG high temperature test since it provides a better tool to rank modified asphalt binders as well as unmodified ones. That is, creep compliance from the MSCR test more fundamentally represents binder behavior at high temperatures compared to the PG rutting parameter. In addition, the very simplified approach, known as grade-bumping, used in the current PG system to account for high traffic levels and low speed limits can be eliminated when using the MSCR test. The MSCR test also

provides a better coefficient of correlation (at both stress levels) with flow number test results than the PG rutting parameter, again indicating that it more accurately reflects binder performance at high temperatures.

Time-independent Limit of a Creep-recovery Constitutive Equation

Creep and Creep-recovery of Plain Concrete Under High Compressive StressesLong Creep-Recovery Behavior Of Bamboo-Based Products

Creep-recovery Constitutive Equation and Its Time-independent Limit

DIVPioneering presentation of basic theory, experimental methods and results, solution of boundary value problems. Six appendices. Updated bibliography. /div

Creep, Shrinkage and Durability Mechanics of Concrete and Concrete Structures, Two Volume Set

This book focuses on Creep in Ceramics. The book consists of two parts. In part A general knowledge of creep in ceramics is considered, while part B specifies creep in technologically important ceramics, namely creep in oxide ceramics, carnides and nitrides. While covering all relevant information regarding raw materials and characterization of creep in ceramics, the book also summarizes most recent innovations and developments in this field as a result of extensive literature search.

Nonlinear Creep and

Creep Recovery of Die- cast Aluminum Alloys