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Review

Dental Surface Conditioning Techniques to Increase the Micromechanical Retention to Fiberglass Posts: A Literature Review

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Abstract: Glass fiber posts (GFP) have an elastic modulus that shares structural characteristics with dentin. Ineffective removal of the smear layer (SL) in the root canal after post space preparation reduces resin tag formation, compromising an efficient hybrid layer formation leading to a subsequent debonding. In this sense, this review article focuses on the published literature related to dentin conditioning for GFP placement with the use of acidic solutions such as EDTA, citric and maleic acid or prefabricated conditioning solutions such as MEAD and QMix, both with/without activation by sonic or laser devices, analyzed by scanning electron microscopy (SEM) and/or push-out bond strength (PODBS) test. The collected information suggested that the conditioning agent that showed better results for dentin conditioning increasing the bond strength of the GFP to the root canal is 17% EDTA without activation.

Keywords: dentistry; dental materials; glass fiber post; irrigant; smear layer; dentin conditioning; push-out bond strength

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1. Introduction

Post and crown are dental rehabilitation options for dental organs extensively damaged [1]. Posts could be metallic [2], ceramic [3] or fiber reinforced composite [4]. The glass fiber posts (GFPs) are the most frequently used posts nowadays as they have elastic moduli that share similar to dentin [5,6]. In the clinic, the overall survival rate of the GFPs is 92.8% [7]. Nonetheless, GFPs present an annual failure rate after 5 years of 1.7%, mainly in consequences of root fractures and post-debonding [8]. Post-debonding occurs typically by adhesive failure between dentin-cement (25 and 80%), adhesive failure between post-cement (5 and 15%), cohesive failure with cement (10%), and mixed failure (15 and 75%) [9,10].

The smear layer (SL) is a disorganized, amorphous, and irregular structure formed by organic and inorganic components [11]. To eliminate and reach a successful penetration [12]

Surface Coating A Literature Review

J. Brander,I. Thorn

Surface Coating A Literature Review:

Surface Coating Ken Beazley,1992 Metal Furniture Surface Coating Standards ,1982 **Handbook of Research on Tribology in Coatings and Surface Treatment** Pakseresht, Amirhossein,Sharifahmadian, Omid,2022-03-25 Advances are continuously being made in applying the coatings and surface treatments by different techniques to reduce the damages from tribology Engineers need more detailed information to compare the capability of each coating process in wear resistant and lubrication applications It is also important to focus on the concepts of tribology in various applications such as the manufacturing process bio implants machine elements and corrosive environments The need for a comprehensive resource addressing these findings in order to improve wear resistance is unavoidable The Handbook of Research on Tribology in Coatings and Surface Treatment evaluates the latest advances the fabrication of wear resistant and lubricant coatings by different techniques and investigates wear resistant coatings and surface treatments in various applications such as the automobile industry Covering a wide range of topics such as lubricant coatings and wearable electronic devices it is ideal for engineers industry professionals researchers academicians scholars practitioners instructors and students

Polymer-Based Nanoscale Materials for Surface Coatings Sabu Thomas,Jesiya Susan George,2023-05-10 Polymer Based Nanoscale Materials for Surface Coatings presents the latest advances and emerging technologies in polymer based nanomaterials for coatings focusing on novel materials characterization techniques and cutting edge applications Sections present the fundamentals of surface preparation and nanocoatings linking materials and properties explaining the correlation between morphology surface phenomena and surface protection mechanism and covering theory modeling and simulation Other presented topics cover characterization methods with an emphasis on the latest developments in techniques and approaches Aging and lifecycle assessment of coated surfaces and coatings are also discussed Final sections explore advanced applications across a range of fields including intelligent coatings for biomedical implants self healing coatings syper hydrophobicity electroluminescence sustainable edible coatings marine antifouling corrosion resistance and photocatalytic coatings Explains the fundamentals of coatings and surface protection mechanisms materials and properties and modeling and simulation Presents detailed information on the latest characterization techniques to prepare nanoscale polymer coatings with enhanced properties Explores a broad range of state of the art applications and considers aging and lifecycle assessments of coatings Advanced Surface Coating Techniques for Modern Industrial Applications Roy, Supriyo,Bose, Goutam Kumar,2020-09-18 In engineering there are often situations in which the material of the main component is unable to sustain long life or protect itself from adverse operating environments Moreover in some cases different material properties such as anti friction and wear anti corrosive thermal resistive super hydrophobic etc are required as per the operating conditions If those bulk components are made of such materials and possess those properties the cost will be very high In such cases a practical solution is surface coating which serves as a protective barrier to the bulk

material from the adverse environment In the last decade with enormous effort researchers and scientists have developed suitable materials to overcome those unfavorable operating conditions and they have used advanced deposition techniques to enhance the adhesion and surface texturing of the coatings Advanced Surface Coating Techniques for Modern Industrial Applications is a highly sought reference source that compiles the recent research trends in these new and emerging surface coating materials deposition techniques properties of coated materials and their applications in various engineering and industrial fields The book particularly focuses on 1 coating materials including anti corrosive materials and nanomaterials 2 coating methods including thermal spray and electroless disposition and 3 applications such as surface engineering and thin film application The book is ideal for engineers scientists researchers academicians and students working in fields like material science mechanical engineering tribology chemical and corrosion science bio medical engineering biomaterials and aerospace engineering *Surface Phenomena and Additives in Water-Based Coatings and Printing Technology* Mahendra K. Sharma,2013-11-11 Water based technology has undergone revolutionary changes during the past two decades Interest in the properties and uses of water based coatings paints and inks has continued to grow since the establishment of the Clean Air Act of 1970 The present book is devoted to recent developments and trends in water based coating and ink technology This volume is divided in three broad catagories 1 Additives and Water based Coating Ink Systems 2 Surface Modifications and Wettability and 3 Ink Coating Formulations and Their characterization The role of various additives to improve the performance and properties of water based coatings with special reference to surface phenomena such as wettability adhesion surface energies dispersion stability particle size and size distribution are presented in these sections This volume documents the proceedings of the International symposium on Surface Phenomena and Additives in Water Based Coatings and Printing Technology sponsored by the 21st Annual Meeting of the Fine Particle Society FPS This meeting was held in San Diego california AUgust 21 25 1990 The symposium upon which this volume is based was organized in four sessions emphasizing several basic and applied aspects of water based coatings and printing technology Major topics discussed include advances in water based technology water based flexo and gravure inks hydrophobically modified cellulosic thickeners organosilicones uv curable silicone release coatings surface characterization of Ti02 pigments polymer substrates flexographic plates and coating films pigment wetting and dispersing agents hydrotrope effect in emulsion polymers film thickness control particle size measurements rheological properties and statistically designed mixtures for ink formulations

Surface Coatings for Protection Against Wear B G Mellor,2006-05-30 As wear is a surface or near surface phenomenon it has long been realised that the wear resistance of a component can be improved by providing a surface of different composition from the bulk material Although this book concentrates on surface coatings the distinction between surface coatings and the process of modifying the surface by changing its composition is not always clear so some useful surface modification techniques are also considered Surface coatings for protection against wear consists of twelve chapters written

by different authors experts in their field After a brief introductory chapter wear phenomena and the properties required from a coating are addressed Chapter three covers coating characterisation and property evaluation relevant to wear resistance with an emphasis on mechanical testing of coatings The next chapter provides an introduction to the various methods available to deposit wear resistant coatings The following six chapters describe in detail wear resistant coatings produced by various deposition routes Emphasis is placed on the microstructure property relationship in these coatings Chapter eleven addresses coatings and hardfacings produced from welding processes specifically modern developments such as friction surfacing and pulsed electrode surfacing techniques The final chapter is dedicated to future trends in both coating materials and coating processes Surface coatings for protection against wear is essential for anyone involved in selecting coatings and processes and will be an invaluable reference resource for all engineers and students concerned with the latest developments in coatings technology Essential for anyone involved in selecting coatings and processes engineers and students Written by an international team of experts in the field **Surface Coatings—2** A. D. Wilson,2012-12-06 The science and technology of surface coatings continues to advance Among the key areas are polymer chemistry as new binders are developed to meet increasingly stringent environmental demands testing and evaluation as the need to understand the factors affecting coatings performance becomes ever more intense and studies of that enduring problem corrosion of metal substrates from which coatings of ever improving effectiveness are emerging We have in this present volume of the series continued to cover aspects of these numerous developments There are chapters on waterborne paint a subject of increasing environmental importance by J W Nicholson and by H J Streitberger and R P Osterloh on a new and sophisticated test method acoustic emission R D Rawlings and on anticorrosion coatings both organic W Funke and inorganic M C Andrade and A Macias Finally that topic of immense practical importance to paint technology pigmentation is covered in a chapter by the late T Entwistle All the authors have brought considerable experience in their chosen field of coatings technology to the preparation of their chapters all of which are timely reviews of developing topics We are grateful to each author for helping in the preparation of this volume and for putting their experience at the disposal of the wide audience for whom this book is intended **Bioresorbable Materials and Bioactive Surface Coatings** Anoushka Khanna,Navneet Sharma,Bhupendra Singh Butola,Harpal Singh,2025-09-12 Bioresorbable Materials and Bioactive Surface Coatings Biomedical Implants and Tissue Regeneration provides a detailed review of biomaterials specially designed for use in biomedical implants tissue repair and regeneration A wide range of resorbable materials are covered including polymers bioceramics metallic alloys and dissolvable electronics as well as their properties degradation kinetics and potential clinical uses The book also explores bioactive surface modifications highlighting their importance in enhancing the functionality of bioresorbable materials Various coatings and surface modifications are covered such as bioactive ceramic coatings biofunctional polymer coatings and surface modifications for enhanced osseointegration cardiovascular applications and neural interfaces Additionally

regulatory guidelines for bioresorbable medical devices ethical considerations and environmental implications are analyzed Details the fabrication techniques properties applications and challenges of each material and implant type Covers a range of applications including orthopedics neural engineering drug delivery and cardiovascular implants Reviews the qualities and benefits of various bioresorbable and bioactive materials such as polymers alloys ceramics and composites Metal Coil Surface Coating Industry Emissions ,1982 **Recent Advances in Mechanical Engineering** Gaurav Manik,Susheel Kalia,Om Prakash Verma,Tarun K. Sharma,2022-09-08 This book presents the select proceedings of 2nd International Congress on Advances in Mechanical and Systems Engineering CAMSE 2021 It focuses on the recent advances in mechanical and systems engineering and their growing demands for increase in several design and development activities The contents in this book cover a blend of mechanical engineering computer aided engineering control engineering and systems engineering to design and manufacture useful products Various additional topics covered include mechanics machines materials science thermo fluids and control with state of the art computational methods to analyse innovate design implement and operate complex systems which are economic reliable efficient and sustainable Given the contents this book will be useful for researchers and professionals working in the field of mechanical engineering and allied fields

Horticultural Reviews, Volume 26 Jules Janick,2002-02-28 Horticultural Reviews ist eine Fortsetzungsreihe zu Forschungsartikeln ber kommerzielle Nutzpflanzen im Bereich Gartenbau wie z B Obst Gem se N sse und Zierpflanzen mit kommerzieller Bedeutung Band 26 gibt einen berblick ber diese spezielle Thematik Eine Vielzahl von Artikeln aus einschl gigen Fachzeitschriften wurde hier zusammengetragen miteinander verglichen und einander gegen bergestellt Dar ber hinaus gibt es eine F lle von Literaturverweisen die einen einfachen zeit und geldsparenden Zugriff auf die aktuellste Information bieten Dabei wird der spezialisierte Forscher ebenso angesprochen wie die gro e Gemeinschaft der Gartenbauexperten **Industrial Finishing and Surface Coatings** ,1973 **Surface Application of Paper Chemicals** J. Brander,I. Thorn,2012-12-06 With the exception of a slight hiccup during the height of the recent environmental movement during the early 1990s when for a year or two consumers were prepared to pay a price premium for lower quality recycled paper than for the virgin product the inexorable improvement in the quality demanded of paper products continues This demand for quality covers not only the aesthetics ofthe product but also its performance Moreover it is becoming increasingly the case that papers designed for a particular use must as it were incidentally also perform well in alternative applications An example is that of office and printing papers which are expected to perform as well in copier machines as in all the various forms of impact and non impact printers But even greater demands are made in other product areas where board designed for dry foods can also be expected to protect moist and fatty materials and be made of 100% recycled fibre The need to isolate foodstuffs from some of the contaminants that can affect recycled board is a serious challenge Thus papermakers are constantly striving to meet a broadening spectrum of demands on their products often while accepting

declining quality of raw materials The product design philosophy that has arisen in response to this is increasingly to isolate the bulk of a paper from its uses to engineer the needed performance characteristics into the paper surfaces while more or less ignoring what happens inside Smart Protective Coatings for Corrosion Control Lingwei Ma,Dawei Zhang,2024-03-27 Smart Protective Coatings for Corrosion Control Overview of the latest research in advanced coatings for anticorrosion and the development of optimized surfaces with high anticorrosion ability Smart Protective Coatings for Corrosion Control introduces the newest research developments in self healing coatings self reporting coatings and superhydrophobic coatings reviewing corrosion processes and strategies smart coatings for corrosion protection techniques for synthesizing and applying smart coatings different kinds of self healing and self reporting coatings activated by different environmental stimuli and current and future trends of protective coatings for automotive aerospace marine nuclear oil gas and military applications This book also discusses new ideas in the field such as the combination of self healing and self reporting properties new techniques to study localized microscale electrochemical corrosion behavior as well as atmospheric corrosion monitor technique to study the real time protection behavior of coatings in different environments The processes of coating degradation and metal corrosion are discussed in detail so that non experts can gain a basic understanding of the corrosion protection techniques Written by two highly qualified academics with significant research experience in the field Smart Protective Coatings for Corrosion Control includes information on Coating preparation filler preparation surface characterization macroscopic and microscopic electrochemical properties and self healing performance of self healing coating systems under different environmental stimuli Photothermal conversion species such as graphene oxide titanium nitride and Fe3O4 Different types of corrosion indicators such as phenolphthalein sulfosalicylic acid modified carbon dots and phenanthroline High mobility polymer networks that endow a shape memory effect and allow coatings to recover their original shape and barrier properties Solutions to three corrosion conditions room temperature immersion alternating wet dry and outdoor atmospheric exposure conditions Presenting the latest research in the field Smart Protective Coatings for Corrosion Control is a practical and highly valuable reference on the subject for scientists researchers and students in diverse programs of study Advances in Manufacturing Engineering Seyed Sattar Emamian,Mokhtar Awang,Farazila Yusof,2020-08-31 This book presents selected papers from the 5th International Conference on Mechanical Manufacturing and Plant Engineering ICMMPE 2019 held in Kuala Lumpur Malaysia It highlights the latest advances in the area brings together researchers and professionals in the field and provides a valuable platform for exchanging ideas and fostering collaboration Joining technologies could be change to manufacturing technologies Addressing real world problems concerning joining technologies that are at the heart of various manufacturing sectors the respective papers present the outcomes of the latest experimental and numerical work on problems in soldering arc welding and solid state joining technologies technologies technologies technologies technologies technologies technologies technologies technologies

technologies technologies *Roads and Airports Pavement Surface Characteristics* Maurizio Crispino,Emanuele Toraldo,2023-06-05 Roads and Airports Pavement Surface Characteristics contains the papers presented at the 9th International Symposium on Pavement Surface Characteristics SURF 2022 Milan Italy 12 14 September 2022 The symposium was jointly organized by the Italian company that manages Italy s National Roads ANAS Ferrovie dello Stato Italiane Group the World Road Association PIARC and Politecnico di Milano The contributions aim to improve the quality of pavement surface characteristics while accomplishing efficiency safety sustainability and addressing new generation mobility needs The book covers topics from emerging research to engineering practice and is divided in the following sections Advanced and performing construction methods and equipment Next generation mobility Data monitoring and performance assessment Surface features and performances Maintenance and preservation treatments Pavement management Economic and political strategies Safety and risk issues Minimizing road impacts Sustainability and performances issues about materials and design Pavements surfaces and urban heat islands Weather conditions impact Airport pavements Roads and Airports Pavement Surface Characteristics is of interest to academics engineers and professionals in the fields of pavement engineering transport infrastructure and related disciplines Advances in Micro and Nano Manufacturing and Surface Engineering M. S. Shunmugam,M. Kanthababu,2019-11-30 This volume presents research papers on micro and nano manufacturing and surface engineering which were presented during the 7th International and 28th All India Manufacturing Technology Design and Research conference 2018 AIMTDR 2018 The papers discuss the latest advances in miniature manufacturing the machining of miniature components and features as well as improvement of surface properties This volume will be of interest to academicians researchers and practicing engineers alike *Recent Trends in Material Processing, Characterization and Applications* Anil Kumar Singla,Amandeep Singh Shahi,Sanjeev Katoch,2025-08-28 This book presents select proceedings of the Advanced and Emerging Materials for Technological Applications AEMTA 2024 and covers topics in engineering material their processing properties and applications The topics covered include modeling and simulation of mechanical systems mechanical design additive manufacturing advance manufacturing processes material processing surface engineering and performance of engineering structure The book is a valuable reference for researchers and professionals interested in mechanical engineering materials design and advanced manufacturing process Metal, Metal Oxides and Metal Sulphides for Biomedical Applications Saravanan Rajendran,Mu. Naushad,D. Durgalakshmi,Eric Lichtfouse,2021-01-25 This book presents recent advances in inorganic nanomaterials for healthcare with focus on the synthesis medical applications and toxicity of metals metal oxides and metal sulfides Major applications include diagnosis bioimaging biosensing healing and therapy in cancer diabetes cardiovascular diseases obesity metabolic syndrome dentistry and antimicrobials

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