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Biography

Dr Egemen Avcu is an Assistant Professor at the Department of Machine and Metal Technologies, Ford Otosan İhsaniye Automotive Vocational School, Kocaeli University, Turkey. He has currently ongoing international research collaborations with Universities in the UK, Germany, and Turkey. He has been teaching courses on materials science and mechanical engineering at course coordinator and lecturer levels at the School of Materials, The University of Manchester (since 2018), at Department of Mechanical Eng., and Department of Mechatronic Eng., Kocaeli University (since 2013).

Egemen Avcu's research background falls mainly into the field of understanding the microstructure-mechanical and tribological behaviour relationship of materials, and the development and processing of advanced materials and coatings, particularly composites. His research area covers; i) mechanical, tribological, and surface characterisation of aerospace materials, ii) processing of advanced composite materials and coatings, and iii) design and development of testing and processing systems.

Education Information

- I. Doctorate, Kocaeli University, Fen Bilimleri Enstitüsü, Makine Mühendisliği Anabilim Dalı, Turkey 2011 - 2013
- II. Postgraduate, Kocaeli University, Fen Bilimleri Enstitüsü, Makine Mühendisliği Anabilim Dalı, Turkey 2009 - 2011
- III. Undergraduate Double Major, Kocaeli University, Mühendislik Fakültesi, Makine Mühendisliği Bölümü, Turkey 2003 - 2010
- IV. Undergraduate, Kocaeli University, Mühendislik Fakültesi, Metalurji Ve Malzeme Mühendisliği Bölümü, Turkey 2003 - 2007

Dissertations

- I. Doctorate, TİTANYUM ALAŞIMLARININ PARTİKÜL EROZYONU İLE PÜRÜZLENDİRİLMESİ VE AŞINDIRILMASI İŞLEMLERİNİN OPTİMİZASYONU , Kocaeli Üniversitesi, Fen Bilimleri Enstitüsü, Makine Mühendisliği Anabilim Dalı, 2013
- II. Postgraduate, Farklı büyüklüklere sahip aşındırıcı partikül karışımlarının ti6al4v alaşımının erozif aşınma davranışına etkileri, Kocaeli Üniversitesi, Fen Bilimleri Enstitüsü, Makine Mühendisliği Anabilim Dalı, 2011

Research Areas

Academic Titles / Tasks

- I. Associate Professor, Kocaeli University, Ford Otosan İhsaniye Otomotiv Meslek Yüksekokulu, Makine ve Metal Teknolojileri, 2021 - Continues
- II. Assistant Professor, Kocaeli University, Ford Otosan İhsaniye Otomotiv Meslek Yüksekokulu, Makine Ve Metal Teknolojileri Bölümü, 2018 - 2021
- III. Assistant Professor, Kocaeli University, Ford Otosan İhsaniye Otomotiv Meslek Yüksekokulu, Makine Ve Metal Teknolojileri Bölümü, 2013 - 2018
- IV. Assistant Professor, Friedrich-Alexander-Universitaet Erlangen-Nürnberg, Technische Fakultat, Institute For Biomaterials, 2016 - 2016
- V. Research Assistant, Kocaeli University, Fen Bilimleri Enstitüsü, Makine Mühendisliği Anabilim Dalı, 2010 - 2013

Academic and Administrative Experience

- I. Kocaeli Üniversitesi, Ford Otosan İhsaniye Otomotiv Meslek Yüksekokulu, 2014 - Continues
- II. Kocaeli Üniversitesi, Ford Otosan İhsaniye Otomotiv Meslek Yüksekokulu, 2013 - 2016
- III. Kocaeli Üniversitesi, Ford Otosan İhsaniye Otomotiv Meslek Yüksekokulu, 2013 - 2016

Courses

- I. YÜKSEK LİSANS TEZ, Associate Degree, 2016 - 2017
- II. Malzemelerin Mekanik Yüzey İşlemleri, Postgraduate, 2016 - 2017
- III. Malzemelerin Mekanik Yüzey İşlemleri, Doctorate, 2016 - 2017
- IV. MALZEME BİLGİSİ, Associate Degree, 2016 - 2017
- V. YÜZEY BİLGİSİ, Associate Degree, 2016 - 2017
- VI. TEMEL İMALAT YÖNTEMLERİ, Associate Degree, 2016 - 2017

Advising Theses

- I. AVCU E., Metalik malzemelerin bilyalı dövme uygulaması sonrası tribolojik davranışının deneysel olarak incelenmesi, Postgraduate, H.ARDA(Student), 2015

Published journal articles indexed by SCI, SSCI, and AHCI

- I. **High temperature oxidation and its effect on the mechanical behavior of SiCf/BN/SiBCN composites**
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JOURNAL OF THE EUROPEAN CERAMIC SOCIETY, vol.45, no.1, 2025 (SCI-Expanded)
- II. **Cavitation erosion behaviour of MAB-CU4 alloy: influences of cavitation number, attack angle, time, and stand-off distance**
Tini S. C., ZEREN A., YILDIRAN AVCU Y., Abakay E., Guney M., AVCU E.
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- III. **Electrophoretically deposited Asphaltum punjabianum (Shilajit) coatings on**

polyvinylalcohol/carboxymethylcellulose hydrogels

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- IV. **Oxidation and mechanical properties of SiC fibers after high temperature exposure in air and steam**
Li Z., Zhang X., Zhang Q., AVCU E., Withers P. J., Xiao P.
JOURNAL OF THE EUROPEAN CERAMIC SOCIETY, vol.44, no.12, pp.6864-6874, 2024 (SCI-Expanded)
- V. **The effects of diode and Er:YAG laser applications on the surface topography of titanium grade 4 and titanium zirconium discs with sand-blasted and acid-etched (SLA) surfaces**
Öztürk A., TOSUN E., MERAL S. E., Baştan F. E., Üstel F., Kan B., AVCU E.
Journal of Stomatology, Oral and Maxillofacial Surgery, vol.125, no.3, 2024 (SCI-Expanded)
- VI. **Oxidized alginate-gelatin (ADA-GEL)/silk fibroin/Cu-Ag doped mesoporous bioactive glass nanoparticle-based hydrogels for potential wound care treatments**
Akhtar M., Nazneen A., Awais M., Hussain R., Khan A., Irfan M., AVCU E., Ur Rehman M. A., Boccaccini A. R.
Biomedical Materials (Bristol), vol.19, no.3, 2024 (SCI-Expanded)
- VII. **Experimental and numerical analysis of drilled- and molded-hole glass fiber reinforced polymer matrix (GFRP) composites**
Cengiz A., Öztürk M. F., Sabah A., Avcu E.
POLYMER COMPOSITES, vol.1, no.1, pp.1-9, 2024 (SCI-Expanded)
- VIII. **Flexural and low velocity impact behaviour of hybrid metal wire mesh/carbon-fibre reinforced epoxy laminates**
Cengiz A., Yıldırım İ. M., Avcu E.
Composites Communications, vol.46, 2024 (SCI-Expanded)
- IX. **Advances in improving tribological performance of titanium alloys and titanium matrix composites for biomedical applications: a critical review**
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- X. **Corrosion Behavior of Shot-Peened Ti6Al4V Alloy Produced via Pressure-Assisted Sintering**
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- XI. **Enhancing the tribological performance of PLA-based biocomposites reinforced with graphene oxide**
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- XII. **Corrosion, surface, and tribological behavior of electrophoretically deposited polyether ether ketone coatings on 316L stainless steel for orthopedic applications**
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- XIII. **Abrasion resistance of a Nb3Sn magnetron-sputtered coating on copper substrates for radio frequency superconducting cavities**
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- XIV. **Void Nucleation and Growth from Heterophases and the Exploitation of New Toughening Mechanisms in Metals**
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- XV. **Electrophoretic Deposition, Microstructure, and Selected Properties of Poly(lactic-co-glycolic) Acid-Based Antibacterial Coatings on Mg Substrate**
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ACS OMEGA, vol.8, no.20, pp.18074-18089, 2023 (SCI-Expanded)
- XVI. **Mapping plastic deformation mechanisms in AZ31 magnesium alloy at the nanoscale**
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- XVII. **Electrophoretic deposition, microstructure and selected properties of zein/cloves coatings on 316L stainless steel**
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- XVIII. **Surface and Tribological Properties of Powder Metallurgical Cp-Ti Titanium Alloy Modified by Shot Peening**
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- XIX. **An Air Quality Modeling and Disability-Adjusted Life Years (DALY) Risk Assessment Case Study: Comparing Statistical and Machine Learning Approaches for PM2.5 Forecasting**
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- XX. **The effect of reduced graphene oxide content on the microstructural and mechanical properties of copper metal matrix composites**
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- XXI. **Biodegradable Polymer Matrix Composites Containing Graphene- Related Materials for Antibacterial Applications: A Critical Review**
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- XXII. **Analytical Methods for Physicochemical Characterization and Toxicity Assessment of Atmospheric Particulate Matter: A Review**
Agibayeva A., Guney M., Karaca F., Kumisbek A., Kim J. R., AVCU E.
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- XXIII. **Effects of the residential built environment on remote work productivity and satisfaction during COVID-19 lockdowns: An analysis of workers' perceptions**
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- XXIV. **Wear resistance of an additively manufactured high-carbon martensitic stainless steel**
Iakovakis E., AVCU E., Roy M. J., Gee M., Matthews A.
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- XXV. **Dry sliding wear behaviour of additive manufactured CrC-rich WC-Co cemented carbides**
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WEAR, vol.486, 2021 (SCI-Expanded)
- XXVI. **Modification of surface and subsurface properties of aa1050 alloy by shot peening**
Avcu Y., Gönül B., Yetik O., Sönmez F., CENGİZ A., Guney M., AVCU E.
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- XXVII. **TAILORING SURFACE MORPHOLOGY AND TOPOGRAPHY OF SHOT-PEENED Ti6Al4V VIA GRIT BLASTING**
Yıldıran Avcu Y., Yetik O., Guney M., Sınmazçelik T., Avcu E.
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- XXVIII. **Surface, Subsurface and Tribological Properties of Ti6Al4V Alloy Shot Peened under Different Parameters**
Yıldıran A., Yetik O., Guney M., Iakovakis E., Sınmazçelik T., Avcu E.
MATERIALS, vol.13, no.19, 2020 (SCI-Expanded)
- XXIX. **Electrophoretic deposition of chitosan-based composite coatings for biomedical applications: A review**
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- XXX. **3D Imaging of Indentation Damage in Bone**
Lowe T., Avcu E., Bousser E., Sellers W., Withers P. J.
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- XXXI. **Tailoring the surface characteristics of electrophoretically deposited chitosan-based bioactive glass composite coatings on titanium implants via grit blasting**
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PROGRESS IN ORGANIC COATINGS, vol.123, pp.362-373, 2018 (SCI-Expanded)
- XXXII. **Electrophoretic co-deposition of PEEK-hydroxyapatite composite coatings for biomedical applications**
Bastan F. E., Rehman M. A. U., Avcu Y., Avcu E., Ustel F., Boccaccin A. R.
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- XXXIII. **Dry Sliding Wear Behaviour of Shot Peened Ti6Al4V Alloys at Different Peening Times**
Avcu Y., Yetik O., Kocoglu H., Avcu E., SINMAZÇELİK T.
ACTA PHYSICA POLONICA A, vol.134, no.1, pp.349-353, 2018 (SCI-Expanded)
- XXXIV. **Fracture strengths of endocrown restorations fabricated with different preparation depths and CAD/CAM materials**
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DENTAL MATERIALS JOURNAL, vol.37, pp.256-265, 2018 (SCI-Expanded)
- XXXV. **The influences of ECAP on the dry sliding wear behaviour of AA7075 aluminium alloy**
Avcu E.
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- XXXVI. **Evaluation of dentin defect formation during retreatment with hand and rotary instruments: A micro-CT study**
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- XXXVII. **Micro-computerized tomography analysis of cement voids and pull-out strength of glass fiber posts luted with self-adhesive and glass-ionomer cements in the root canal**
Sarıdağ S., Helvacioğlu-Yigit D., Oezcan M., Avcu E., Kiziltas G.
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- XXXVIII. **Optimization of Surface Properties of Shot Peened Ti6Al4V Alloy**
Yildiran Y., Avcu E., Sımmazçelik T.
ACTA PHYSICA POLONICA A, vol.127, no.4, pp.984-986, 2015 (SCI-Expanded)
- XXXIX. **Investigation of the Effects of Erosion Test Parameters on the Particle Impingement Velocity by Using CFD Analysis**
ÖNEN B., Yildiran Y., AVCU E., ÇINAR A.
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- XL. **Possible Use of Volcanic Ash as a Filler in Polyphenylene Sulfide Composites: Thermal, Mechanical, and Erosive Wear Properties**
AVCU E., ÇOBAN O., BORA M. Ö., FİDAN S., SINMAZÇELİK T., ERSOY O.
POLYMER COMPOSITES, vol.35, no.9, pp.1826-1833, 2014 (SCI-Expanded)
- XLI. **Mechanical and Thermal Properties of Pumice Powder Filled PPS Composites**
ŞAHİN A. E., YILDIRAN Y., AVCU E., FİDAN S., SINMAZÇELİK T.
ACTA PHYSICA POLONICA A, vol.125, no.2, pp.518-520, 2014 (SCI-Expanded)
- XLII. **Influences of Particle Impingement Angle and Velocity on Surface Roughness, Erosion Rate, and 3D Surface Morphology of Solid Particle Eroded Ti6Al4V Alloy**
AVCU E., YILDIRAN Y., ŞAHİN A. E., FİDAN S., SINMAZÇELİK T.
ACTA PHYSICA POLONICA A, vol.125, no.2, pp.541-543, 2014 (SCI-Expanded)
- XLIII. **Effect of particle impact angle, Erodent particle size and acceleration pressure on the solid particle erosion behavior of 3003 Aluminum alloy**
Yildiran Y., AVCU E., ŞAHİN A. E., FİDAN S., YETİŞTİREN H., SINMAZÇELİK T.
Acta Physica Polonica A, vol.125, no.2, pp.523-525, 2014 (SCI-Expanded)

- XLIV. **Solid particle erosion behaviour of Ti6Al4V alloy**
AVCU E., FİDAN S., YILDIRAN Y., SINMAZÇELİK T.
Tribology - Materials, Surfaces and Interfaces, vol.7, no.4, pp.201-210, 2013 (SCI-Expanded)
- XLV. **The Effect of TiO₂ Filler Content on the Mechanical, Thermal, and Tribological Properties of TiO₂/PPS Composites**
BORA M. Ö., ÇOBAN O., AVCU E., FİDAN S., SINMAZÇELİK T.
POLYMER COMPOSITES, vol.34, no.10, pp.1591-1599, 2013 (SCI-Expanded)
- XLVI. **Effect of heat treatment on erosive wear behaviour of Ti6Al4V alloy**
FİDAN S., AVCU E., Karakulak E., YAMANOĞLU R., ZEREN M., SINMAZÇELİK T.
MATERIALS SCIENCE AND TECHNOLOGY, vol.29, no.9, pp.1088-1094, 2013 (SCI-Expanded)
- XLVII. **Solid Particle Erosive Wear Behavior of Glass Mat Reinforced PPS Composites: Influence of Erodent Particle Size, Pressure, Particle Impingement Angle, and Velocity**
AVCU E., FİDAN S., BORA M. Ö., ÇOBAN O., TAŞKIRAN I., SINMAZÇELİK T.
ADVANCES IN POLYMER TECHNOLOGY, vol.32, 2013 (SCI-Expanded)
- XLVIII. **A Study on the Derivation of Parametric Cutting Force Equations in Drilling of GFRP Composites**
OKUTAN E., KARABAY S., SINMAZÇELİK T., AVCU E.
STROJNISKI VESTNIK-JOURNAL OF MECHANICAL ENGINEERING, vol.59, no.2, pp.97-105, 2013 (SCI-Expanded)
- XLIX. **THE COMPARISON OF SOLID PARTICLE EROSION BEHAVIORS OF AA-1070 AND AA-6101 ALLOYS USED IN POWER TRANSMISSION LINES IN TURKEY**
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- L. **Internal damage investigation of the impacted glass/glass plus aramid fiber reinforced composites by micro-computerized tomography**
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- LI. **The Influence of Annealing on the Crystallization and Tribological Behavior of MWNT/PEEK Nanocomposites**
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- LII. **A review: Fibre metal laminates, background, bonding types and applied test methods**
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Articles Published in Other Journals

- I. **Understanding Public Perception of Air Quality in the Urban Environment of Central Asia: An Empirical Assessment Using Structural Equation Modelling**
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Environment and Urbanization ASIA, vol.15, no.1, pp.39-58, 2024 (ESCI)
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Aerosol Science and Engineering, vol.7, no.4, pp.502-516, 2023 (ESCI)
- III. **3D Printing Assisted Fabrication of Copper-Silver Mesoporous Bioactive Glass Nanoparticles Reinforced Sodium Alginate/Poly(vinyl alcohol) Based Composite Scaffolds: Designed for Skin Tissue Engineering**
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- IV. **High-velocity air fuel coatings for steel for erosion-resistant applications**
YILDIRAN AVCU Y., Guney M., AVCU E.
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- V. **Effect of micro blasting process parameters on 3D surface topography and surface properties of zirconia (Y-TZP) ceramics**
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- VI. **The Effects of Grit Size and Blasting Pressure on the Surface Properties of Grit Blasted Ti6Al4V Alloy**
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- VIII. **Bilyalı Dövme Parametrelerinin AA7075 Alüminyum Alaşımının Yüzey Altı Özelliklerine Etkileri**
AVCU E.
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- IX. **Surface Properties of AA7075 Aluminium Alloy Shot Peened under Different Peening Parameters**
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- X. **Microstructure and Mechanical Properties of High Velocity Oxygen Fuel HVOF Sprayed Nickel Powder Coating on Welding Regions of Aluminum Alloy AA5754 and DP600 Welded Steel Plates with the Friction Stir Spot Welding Process**
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- XI. **Microstructure and Mechanical Properties of High Velocity Oxygen Fuel (HVOF) Sprayed Nickel Powder Coating on Welding Regions of Aluminum Alloy AA5754 and DP600 Welded Steel Plates with the Friction Stir Spot Welding Process - Yüksek Hızlı Oksijen Yakıtlı Alev Toz Püskürtme Yöntemiyle Nikel Kaplanmış AA5754 Alüminyum Alaşımı ve DP600 Galvanizli Çeliğin Sürtünme Karıştırma Nokta Kaynağı ile Birleştirilmesinde Mikroyapı ve Mekanik Özelliklerin İncelenmesi**
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- II. AVCU E., Project Supported by Higher Education Institutions, KURU SÜRTÜNME AŞINMA TEST SİSTEMİ TASARIMI VE İMALATI, 2017 - 2018
- III. AVCU E., Project Supported by Higher Education Institutions, BİLYALI DÖVME İLE YÜZEYLERİ İŞLENMİŞ AA7075 ALÜMİNYUM ALAŞIMININ ADHESİF AŞINMA DAVRANIŞLARININ İNCELENMESİ, 2016 - 2017
- IV. AVCU E., Project Supported by Higher Education Institutions, MONOLİTİK VE KONVANSİYONEL ZİRKONYA ALT YAPILARIN KUMLAMA SONRASI YÜZEY MORFOLOJİLERİNİN İNCELENMESİ, 2015 - 2016

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- VI. TUBİTAK Project, Farklı büyüklüklere sahip aşındırıcı partikül karışımlarının sünek yarı sünek ve gevrek malzemelerin katı partikül erozyonu davranışlarına etkileri, 2010 - 2012

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Coaching Duties

Refereeing Duties

Non Academic Experience

- I. 110M064 nolu BİLİMSEL VE TEKNOLOJİK ARAŞTIRMA PROJELERİNİ DESTEKLEME PROGRAMI (1001) PROJESİ
- II. TÜBİTAK-MAM Malzeme Enstitüsü
- III. D.S.C. Otomotiv Koltuk Sistemleri A.Ş.
- IV. D.S.C. Otomotiv Koltuk Sistemleri A.Ş.