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Conference Program

Paper Title	Presenter	Session Name	Date	Time	Place
An Empirical Comparison of Claude, Llama, and Gemini for Aspect-Level Sentiment	Pınar Ersoy	AI and LLM	November 20, Thursday	11:00-11:10	Center Hall
LLM-Based Contract–Invoice Compliance and Anomaly Analysis on Turkish Financial Documents	Burak Yıldızak	AI and LLM	November 20, Thursday	11:10-11:20	Center Hall
Dynamic Multi-Criteria Analysis of Travel Safety Risks with Large Language Models	Doğan Özcan	AI and LLM	November 20, Thursday	11:20-11:30	Center Hall
Doğal Dil ile Hibrit Veri Etkileşimi: Çoklu Ajan Tabanlı Yapay Zeka Destekli Analiz ve Görselleştirme Platformu	Abdulkadir Karabacak	AI and LLM	November 20, Thursday	11:30-11:40	Center Hall
Finansal Hareketlerin Analizi için Doğal Dil İşleme Tabanlı Katmanlı Mutabakat Sistemi	Dilara Hazırlar	AI and LLM	November 20, Thursday	11:40-11:50	Center Hall
Open Source LLM ile Tableau Entegreli Veri Analiz Asistanı	Buşra Sabak	AI and LLM	November 20, Thursday	11:50-12:00	Center Hall
An AI-Based Question–Answering System for Corporate Documents: VK ArtiFin	Zeynep Destan	AI and LLM	November 20, Thursday	12:00-12:10	Center Hall
Dijital Dönüşümün Satış Gücü: AgenticAI Destekli Çok Kaynaklı Veri	Kerem Yılmaz	AI and LLM	November 20, Thursday	12:10-12:20	Center Hall

Entegrasyonu ve Proaktif Satış Fırsatı Yönetimi					
Designing for Explainability and Data Sovereignty: A Design Principles Approach for LLM-Augmented FinTech Analytics	Dr. Begüm Al	AI and LLM	November 20, Thursday	12:20-12:30	Center Hall
A Modular Semantic Kernel Agent for Automated Code Review and Refactoring Feedback	Semih Yazıcı	AI and LLM	November 20, Thursday	12:30-12:40	Center Hall

Paper Title	Presenter	Session Name	Date	Time	Place
Strategic Design for Sustainability: Education and Research Examples	Elif Küçüksayraç	Green Energy and Sustanability	November 20, Thursday	11:40-11:50	Saloon 2
Kahramanmaraş Kağıt Fabrikası'nda Isı Geri Kazanımı, Mikrobiyolojik Kirlilikle Mücadele ve Su Tasarrufu Olanaklarının Araştırılması	Sibel Bilgiç Kara	Green Energy and Sustanability	November 20, Thursday	11:50-12:00	Saloon 2
Development of Ash-Based Paving Stones Through the Utilization of Industrial Ash Generated During Urban Waste Disposal Processes	Gülin Kızılay	Green Energy and Sustanability	November 20, Thursday	12:00-12:10	Saloon 2
Trisiloksan ve Polihidroksikarboksilik Asitlerin (PHCA) Pamuk (Gossypium hirsutum L.) Yetiştiriciliğinde Su Ayak İzini Azaltmadaki Etkileri	Veli İlhan	Green Energy and Sustanability	November 20, Thursday	12:10-12:20	Saloon 2
Sürdürülebilir Soğuk Zincir Lojistiği için Paradigma Değiştiren Eko-Tasarım:	Hüner Aydın	Green Energy and Sustanability	November 20, Thursday	12:20-12:30	Saloon 2

Metalize Baskı Teknolojisiyle Geliştirilen, Karbon Ayak İzi Düşük, Geri Dönüşüme Hazır Termal Örtü					

Paper Title	Presenter	Session Name	Date	Time	Place
Tarımda Dijital Denge	**Ahmet Mermer**	**Design and Material Engineering**	**November 20, Thursday**	**11:00-11:10**	**Saloon 1**
Araç İçi Hava Kalitesinin İyileştirilmesinde Biyo-Katkılı ABS Kompozitlerin Kullanımı	**Songül Kılınç**	**Design and Material Engineering**	**November 20, Thursday**	**11:10-11:20**	**Saloon 1**
Investigation of Mechanical Properties of Hemp Hurd/PP Composites for the Application of Water Irrigation Pipes	**Beyza Gizem Duman**	**Design and Material Engineering**	**November 20, Thursday**	**11:20-11:30**	**Saloon 1**
Polioksimetilen (POM) Esaslı Yataklarda Yağ Kanalı Sayısının Rotil Ömrü Üzerindeki Etkisinin İncelenmesi	**Birol Oğluoğlu**	**Design and Material Engineering**	**November 20, Thursday**	**11:30-11:40**	**Saloon 1**
Synthesis and Characterization of Stereoselective Ozonides for Sustainable Textile Wet Processes	**Orhan Işık**	**Design and Material Engineering**	**November 20, Thursday**	**11:40-11:50**	**Saloon 1**
Evaluation of ROPS and FOPS Tests for Structural Integrity of Forklifts	**Hüseyin Samet Kartal**	**Design and Material Engineering**	**November 20, Thursday**	**11:50-12:00**	**Saloon 1**
IEC 60317-46 Standardına Göre Yuvarlak Emaye Bakır Tellerde, Aromatik Polyimide Esaslı İzolasyonun Araştırılması	**Hamide Termek**	**Design and Material Engineering**	**November 20, Thursday**	**12:00-12:10**	**Saloon 1**

ve Üretiminin Optimizasyonu					
Effect of Amorphous Silica–Forming Additive on Porosity and Mechanical Strength in Autoclaved Aerated Concrete Thermal Insulation Board	Yunus Ion Grecu	Design and Material Engineering	November 20, Thursday	12:10-12:20	Saloon 1
W-Mo-Si-B Sisteminin SHS yöntemiyle Üretimi ve Karakterizasyonu	Merve Cavlak	Design and Material Engineering	November 20, Thursday	12:20-12:30	Saloon 1
Pressure-Controlled Runner Optimization and Filling Balance Analysis in Multi-Cavity Injection Molds	Muhammet Furkan Çalık	Design and Material Engineering	November 20, Thursday	12:30-12:40	Saloon 1
A Compact Non-Intrusive Measurement System for Critical Dimensions and Calibration Chart Generation of Underground Fuel Tanks	İlker Değirmencioğlu	Design and Material Engineering	November 20, Thursday	12:40-12:50	Saloon 1
Rotil-Rotbaşı Parçalarındaki Eksenel Boşluğun Nanokompozit Yataklar Kullanılarak İyileştirilmesi	Mustafa Ata Afyon	Design and Material Engineering	November 20, Thursday	12:50-13:00	Saloon 1

Paper Title	Presenter	Session Name	Date	Time	Place
Determination of Transformation Efficiency of Some Tomato Genotypes Using Agrobacterium-Mediated Transformation Method	Merve Yiğit	Food Technologies and Engineering	November 20, Thursday	13:30-13:40	Center Hall
Ev Tipi Ankastre Fırın da Kat Kat Pişirme Teknolojisi Tabanlı Enerji Verimli ve Zaman Tasarruflu Çok	İrem Bıyıklı	Food Technologies and Engineering	November 20, Thursday	13:40-13:50	Center Hall

Katmanlı Gıda Kurutma Uygulaması					
Lactiplantibacillus plantarum SH5 Kültürü ile Zenginleştirilmiş Mikrofiliz Unlarından Geliştirilen Fonksiyonel Noodle Formülasyonlarının Besinsel ve Biyoaktif Özelliklerinin İncelenmesi	Cihat Güner	Food Technologies and Engineering	November 20, Thursday	13:50-14:00	Center Hall
Nohut Ununun Besinsel Kompozisyonunun ve Ekstrüzyon Teknolojisinde Potansiyel Kullanımının Değerlendirilmesi	Gizem Şevval Tomar	Food Technologies and Engineering	November 20, Thursday	14:00-14:10	Center Hall
Doğal Maden Sulu Clean-Label Noodle Serisi: Yerli Kaynaklarla Sürdürülebilir Üretim ve Kaynak Verimliliği	Yusuf Çakmakçı	Food Technologies and Engineering	November 20, Thursday	14:10-14:20	Center Hall
The Effect of Starch and Hydrocolloids on the Stability of Emulsion Based Sauces	Çiğdem Karakaya	Food Technologies and Engineering	November 20, Thursday	14:20-14:30	Center Hall
Sinerjik Etkileri ile Bağışıklık Destekleyici Biyoaktif Bileşikler İçeren Çiğneme Tableti:Ülker Everwell Force	Büşra Örnek	Food Technologies and Engineering	November 20, Thursday	14:30-14:40	Center Hall
Yer Fıstığının Besin Bileşiminin Değerlendirilmesi	Sena Erol	Food Technologies and Engineering	November 20, Thursday	14:40-14:50	Center Hall
Development of a Symbiotic Snacks Bar Product	Merve Al	Food Technologies and Engineering	November 20, Thursday	14:50-15:00	Center Hall

Paper Title	Presenter	Session Name	Date	Time	Place

A Modular and Foldable Detector Design: An Industrial Design Approach for Spatial Efficiency and User-Centered Ergonomics	Okşan Eylül Danışman Aktay	Design	November 20, Thursday	14:00-14:30	Saloon 2
MUTFAK MOBİLYALARINDA ULTRAVİOLE TEKNOLOJİSİNİN HAMMADDELERE ENTEGRASYONU	Mehmet Oğuzhan Okuşluk	Design	November 20, Thursday	14:30-14:40	Saloon 2
Isı Yalıtımlı Cam Üretiminde Argon Gazı Dolum Prosesi ve Uygulaması	Mustafa Gökay İspirgil	Design	November 20, Thursday	14:40-14:50	Saloon 2
Experience Design through Hydrodynamic Flow Control and Geometric Innovations: ECLIPSE Water Slide	Kübra Tuna	Design	November 20, Thursday	14:50-15:00	Saloon 2
Development of a New Door System with High Thermal Resistance and Improved Sealing Performance for Refrigerated Display Cabinets	Fatma Nur Erdoğmuş	Design	November 20, Thursday	15:10-15:20	Saloon 2

Paper Title	Presenter	Session Name	Date	Time	Place
CarrGo® Sorter: Parcel Sorting System with Autonomous Multi-Robots	Ali Han Polat	Computer Science and AI	November 20, Thursday	14:00-14:10	Saloon 1
Analog Video (CVBS/AHD) Görüntünün Sayısala Dönüştürülüp Internet Ağında İletimi	Talip Ege Seçkin İlbars	Computer Science and AI	November 20, Thursday	14:10-14:20	Saloon 1

Shopperline: Gerçek Zamanlı Görüntü İşleme ile Akıllı Mağaza Analitiği Platformu	Nadir Kocakır	Computer Science and AI	November 20, Thursday	14:20-14:30	Saloon 1
A New Approach Based on Ensemble Clustering for the Fabric Color Batching Problem	Esra Tabaş Asiltürk	Computer Science and AI	November 20, Thursday	14:30-14:40	Saloon 1
The Development of a Platform as a Service for Game Key Distribution	Deniz Tahmaz	Computer Science and AI	November 20, Thursday	14:40-14:50	Saloon 1
Real-Time Vision AI for Assembly Lines: A Position Paper on Defect Detection and Throughput Gains	Safa Taner Cetin	Computer Science and AI	November 20, Thursday	14:50-15:00	Saloon 1
Design and Implementation of a Real-Time Biometric-Based Smart Monitor System	Utku Barış Yağci	Computer Science and AI	November 20, Thursday	15:00-15:10	Saloon 1
Merkezi ve güvenli bir uzaktan içerik yönetim sistemi ile derin öğrenme tabanlı müşteri analizi modüllerinin geliştirilmesi	Abdülsamet Topal (Techmax Technology Yazılım San Tic Aş) Zeynep Şevval Şener (Techmax Technology Yazılım San Tic Aş) Seda Gunes Ozturk	Computer Science and AI	November 20, Thursday	15:10-15:20	Saloon 1
Visual Discovery in Retail: Operationalizing AI-Powered Visual Search at Boyner	Mert Alacan	Computer Science and AI	November 20, Thursday	15:20-15:30	Saloon 1

Paper Title	Presenter	Session Name	Date	Time	Place

A Data-Driven Framework for API Manufacturers, Patents and Occupational Safety in Pharmaceutical Development	Diren Dilan Dernek	AI and Machine Learning	November 20, Thursday	15:20-15:30	Center Hall
The Role of ice.berg Idea Management System in Transforming Corporate Innovation Culture	Eda Çikoğlu	AI and Machine Learning	November 20, Thursday	15:30-15:40	Center Hall
Classifying Operator Experience from Electric Screwdriving Signals: A BiLSTM-Based Study with External Validation	Kader Nikbay Oylum	AI and Machine Learning	November 20, Thursday	15:40-15:50	Center Hall
Designing an AI-Powered Product Entry Assistant for E-Commerce Marketplaces: A Position Paper	Merve Elif Çelik	AI and Machine Learning	November 20, Thursday	15:50-16:00	Center Hall
Secure Use of Artifical Intelligence with Artifical Intelligence Based Control	Fatıh Mehmed Bılgın, Alı Aydın, Tugberk Zurnacı, Engın Bılıcı	AI and Machine Learning	November 20, Thursday	16:00-16:10	Center Hall
Ev Tekstili Sektöründe Stok Optimizasyonuna Yönelik Alokasyon Modeli	Merve Yılmaz	AI and Machine Learning	November 20, Thursday	16:10-16:20	Center Hall
A Temporal-Weighted Hybrid Recommender for B2B Vehicle Auctions Using Word2Vec Embeddings	Uğur Barış Öztürk	AI and Machine Learning	November 20, Thursday	16:20-16:30	Center Hall
Credit Scoring with Machine Learning Supported by E-Commerce Data	Sinan Uzun	AI and Machine Learning	November 20, Thursday	16:30-16:40	Center Hall
A Multimodal Deep Learning Framework for Predicting Machine Anomalies Using IoT-	Alper Saylam	AI and Machine Learning	November 20, Thursday	16:40-16:50	Center Hall

Enabled Vibration and Sound Data					
Sovereign, Efficient, and Reliable CPU Configuration: A Data-Driven Recommendation Module for E-Commerce	Alper Kemal Keçeci	AI and Machine Learning	November 20, Thursday	16:50-17:00	Center Hall
Leveraging Machine Learning for Real-Time Fraud Detection in Transaction Systems	Utku Barış Yağci	AI and Machine Learning	November 20, Thursday	17:00-17:10	Center Hall
Anomaly Detection System for Distributed Job Processing within Microservice Architectures	Ramazan Pekin	AI and Machine Learning	November 20, Thursday	17:10-17:20	Center Hall

Paper Title	Presenter	Session Name	Date	Time	Place
Development of a Secure Structural Component to Mitigate Environmental Contamination at Ports During the Transfer of Granular Materials in Global Maritime Logistics: Ecological Port Loading Bunker	Özge Güler	Mechanical engineering	November 20, Thursday	15:50-16:00	Saloon 1
Structural Behavior Analysis of Rail-Mounted Portal Cranes Equipped with a 360° Rotatable Spreader Mechanism Using the Finite Element Method	Samet Dönerkaya	Mechanical engineering	November 20, Thursday	16:00-16:10	Saloon 1
Improving Cold Forging of 304HC Stainless Steel through Induction Preheating: A Comparative Industrial Study	Muhammed Kaan Kılınç	Mechanical engineering	November 20, Thursday	16:10-16:20	Saloon 1

Analytical Prediction and Experimental Validation of Bolt Self-Loosening under Vibration	Can İçmez	Mechanical engineering	November 20, Thursday	16:20-16:30	Saloon 1
Finite Element Analysis of Stress Pin Application in a Lobular Cold Forging Die	Tolga Aydın	Mechanical engineering	November 20, Thursday	16:30-16:40	Saloon 1
Alüminyum Gövdeli Gemi Şaft Sızdırmazlık Elemanının Geliştirilmesi	Hasan Ertuğrul	Mechanical engineering	November 20, Thursday	16:40-16:50	Saloon 1
Tire Cavity Noise Reduction by Using Helmholtz-Based Sandwich Resonator	Berk Özgür	Mechanical engineering	November 20, Thursday	16:50-17:00	Saloon 1
Rot Mili Kapama Aparatının Tork Değerleri Üzerine İncelenmesi	Ali Yazgan-Yaser Akpınar	Mechanical engineering	November 20, Thursday	17:00-17:10	Saloon 1
hBN Katkısının Farklı POM Tabanlı Kompozitlerde (100NC ve 100KM) Çekme ve Aşınma Özelliklerinin İncelenmesi	Ali Yazgan	Mechanical engineering	November 20, Thursday	17:10-17:20	Saloon 1

Paper Title	Presenter	Session Name	Date	Time	Place
Artificial Intelligence–Based Route Optimization in Logistics: A Sustainable Approach	Cihan Özmen	Artificial Intelligence	November 21, Friday	10:10-10:20	Center Hall
Satın Alma İlişkisiyle Kurulan Müşteri–Araç Bipartit Grafı GraphSAGE Tabanlı Kenar Tahmini ve Gömme Odaklı Müşteri Segmentasyonu	Abdullah Sezdi	Artificial Intelligence	November 21, Friday	10:20-10:30	Center Hall

A Smart Shopping Cart: Shopper®	Onur Melikoğlu	Artificial Intelligence	November 21, Friday	10:30-10:40	Center Hall
Machine Learning-Based Vehicle Renewal Prediction: A Hybrid Approach for Customer Retention in Premium Automotive Markets	Selçuk Bayracı	Artificial Intelligence	November 21, Friday	10:40-10:50	Center Hall
Probability-Calibrated Ensemble Methods for Automotive CRM Lead Scoring	Bilal Sedef	Artificial Intelligence	November 21, Friday	10:50-11:00	Center Hall
AI-Powered Customer Review Management: Designing a Next-Generation NLP Platform for E-Commerce	Merve Elif Çelik	Artificial Intelligence	November 21, Friday	11:00-11:10	Center Hall
Design and Development of a Customer Data Platform for Loyalty Programs: Data Deduplication and Personalized Marketing Infrastructure	Erhan Efe	Artificial Intelligence	November 21, Friday	11:10-11:20	Center Hall
Operasyon Maliyetine Duyarlı Vektör Arama: Üretim Koşullarında ANNS Seçimi için Pratik Bir Çerçeve	Melek Turan	Artificial Intelligence	November 21, Friday	11:20-11:30	Center Hall
Airline Crew Hotel Assignment: An Optimization Framework for Fairness and Efficiency	Seyit Ulutaş	Artificial Intelligence	November 21, Friday	11:30-11:40	Center Hall
EARS-XTSK: Privacy-Preserving Global Explainability in Cross-Silo Federated Two-Tower Recommendation Systems via Server-Side TSK Fuzzy Rule Distribution	Deniz Altay Avcı	Artificial Intelligence	November 21, Friday	11:40-11:50	Center Hall

A Decision Support Framework for Customer Loyalty Program Managers: Reward Mix Optimization	Ayşe Salı	Artificial Intelligence	November 21, Friday	11:50-12:00	Center Hall
A Web-Based Credit Card Payment Architecture for Dealer Portals: Android POS Integration, Microservice Design, and Behavioural Segmentation for Data-Driven Dealer Management	Adnan Erdoğan	Artificial Intelligence	November 21, Friday	12:00-12:10	Center Hall
Operational Excellence in Customer Service via AI-Powered Call Analysis	Erem Karalar	Artificial Intelligence	November 21, Friday	12:10-12:20	Center Hall
AI-Powered Multi-Agent Fashion Assistant for Personalized Retail Recommendations	Seza Dursun	Artificial Intelligence	November 21, Friday	12:20-12:30	Center Hall

Paper Title	Presenter	Session Name	Date	Time	Place
Development of Yarn Detection Sensor for Circular Patterned Yarn Dyeing Machine	Neslihan Okyay	Textile Engineering and Industry 4.0	November 21, Friday	10:30-10:40	Saloon 1
Optimization of Sleep Comfort in Mattresses Using Temperature-Positive Sensitive New Foam Technology	Zekiye Erdoğan Karakoç	Textile Engineering and Industry 4.0	November 21, Friday	10:40-10:50	Saloon 1
An Integrated Deep Learning Framework for Automated Quality Control and Process Optimization in Slasher Indigo Dyeing	Mohammad Muttaqi	Textile Engineering and Industry 4.0	November 21, Friday	10:50-11:00	Saloon 1
Investigation of the Comfort and Quality Properties of Knitted	Yusuf Koç	Textile Engineering and Industry 4.0	November 21, Friday	11:00-11:10	Saloon 1

Garments Produced with Raised Yarn					
Development of a Process to Prevent Back Contamination Caused by Cationization After Cationic Digital Reactive Printing on Cotton Knitted Fabrics	Sena Efsun Alpaslan	Textile Engineering and Industry 4.0	November 21, Friday	11:10-11:20	Saloon 1
Ozon Yıkama İle Batik Efekt Eldesi Prosesi Geliştirilmesi	Bilge İnce Kara	Textile Engineering and Industry 4.0	November 21, Friday	11:20-11:30	Saloon 1
Çevre Dostu Denim Efektlendirme İçin Köpük ve Islak Ozon Teknolojilerinin Birlikte Kullanımı	Merve Gideroğlu	Textile Engineering and Industry 4.0	November 21, Friday	11:30-11:40	Saloon 1
The Bleaching of Woven Fabrics Using the Foam Application Technique	Aylin Kuşen	Textile Engineering and Industry 4.0	November 21, Friday	11:40-11:50	Saloon 1
Optimization of Pultrusion Process Parameters for Carbon Fiber/Epoxy Composites	Ömür Alkan	Textile Engineering and Industry 4.0	November 21, Friday	11:50-12:00	Saloon 1
Sürdürülebilir Üretim Hedefi Doğrultusunda Pamuk Liflerinin Yeni Nesil Poliakrilonitril Lifleriyle Olan Karışımlarının Reaktif Boya İle Tek Banyolu Boyanması	Seda Keskin Atak	Textile Engineering and Industry 4.0	November 21, Friday	12:00-12:10	Saloon 1
The Green Step Upper: A Novel Sustainable Bonding Method Replacing Solvent-Based Adhesives in Footwear Upper Assembly	Baris Bekıroglu	Textile Engineering and Industry 4.0	November 21, Friday	12:10-12:20	Saloon 1
An Innovative Approach to Technical Textiles: Assessing the Performance	Merve Yaralı Kınlı	Textile Engineering and Industry 4.0	November 21, Friday	12:20-12:30	Saloon 1

of Olefin-Based Outdoor Fabrics					

Paper Title	Presenter	Session Name	Date	Time	Place
Improving the Accuracy of Location Data in UWB-Based RTLS Using Deep Learning Methods	Ramazan Kavak	Electrical Electronics Engineering	November 21, Friday	10:30-10:40	Saloon 2
Artificial Intelligence-Assisted Control of Light Pipe & LED Luminaire Hybrid Tunnel Lighting System	Levent Doğan	Electrical Electronics Engineering	November 21, Friday	10:40-10:50	Saloon 2
UWB-Based High-Precision Real-Time Positioning and Multi-Dimensional Visualization	Onur Yılmaz	Electrical Electronics Engineering	November 21, Friday	10:50-11:00	Saloon 2
Çok Protokollü SCADA Mimarileri için Test Yöntemi Önerisi	Mücahit Karaman	Electrical Electronics Engineering	November 21, Friday	11:00-11:10	Saloon 2
OG Şebekenin 5G ile İzlenilmesi ve Kontrolü	Büşra Töre	Electrical Electronics Engineering	November 21, Friday	11:10-11:20	Saloon 2
Yapay Zekâ Destekli Bulut Tabanlı e-SIEM: Dağıtım Sektöründe Yerli ve Özgün Bir Güvenlik Bilgileri ve Olay Yönetimi Yazılımı	Çağrı Kandıralı	Electrical Electronics Engineering	November 21, Friday	11:20-11:30	Saloon 2
Deri Etkisinin İletken Geometrisine Bağlı Değişiminin Analizi: Busbar ve Kablo Geometrilerinin Karşılaştırması	Ahmet Can Yalçın	Electrical Electronics Engineering	November 21, Friday	11:30-11:40	Saloon 2

Orta Gerilim Sistemlerinde İletken Geometrisinin Elektrik Alan Yoğunluğu ve Yalıtım Dayanımı Üzerine Etkisinin İncelenmesi	**Ahmet Can Yalçın**	**Electrical Electronics Engineering**	**November 21, Friday**	**11:40-11:50**	**Saloon 2**
Busbar Enerji Dağıtım Sistemlerinin Termal Davranışının Çoklu-Fizik Tabanlı Deneysel ve Sayısal Değerlendirilmesi	**Ahmet Can Yalçın**	**Electrical Electronics Engineering**	**November 21, Friday**	**11:50-12:00**	**Saloon 2**
Industrial Validation of a Safe and Sustainable by Design (SSbD) Antimicrobial Primer for High-Touch Plastic Surfaces	**Panasonic**	**Electrical Electronics Engineering**	**November 21, Friday**	**12:00-12:10**	**Saloon 2**
Switch Components Using Glass Fiber-Reinforced Polyamide 6: A Comparative Study With Polycarbonate	**Panasonic**	**Electrical Electronics Engineering**	**November 21, Friday**	**12:10-12:20**	**Saloon 2**

Alüminyum Gövdeli Gemi Şaft Sızdırmazlık Elemanının Geliştirilmesi

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Özet

Günümüzde şaft geçişlerinde kullanılan sızdırmazlık elemanları, gemi ve endüstriyel makinelerde güvenlik ve verimlilik açısından kritik öneme sahiptir. Mevcut uygulamalar, genellikle elastomer contalar, metal muhafazalar veya yağlama destekli sistemler üzerine kuruludur. Ancak bu yapılar, montaj sırasında hizalama hatalarına karşı hassas olup birleşim noktalarında sızıntı riski barındırmakta, uzun süreli kullanımda korozyon ve aşınma sorunları ile karşılaşmaktadır. Ayrıca kauçuk veya yaylı mekanizmalara dayalı çözümler, yüksek basınç, titreşim ve sıcaklık altında deformasyona uğrayarak sızdırmazlık performansını kaybederken, yağlama gerektiren sistemler bakım maliyetlerini artırmakta ve çevresel riskler oluşturmaktadır. Bu yetersizlikler, daha dayanıklı, montajı kolay, bakım gereksinimi düşük ve korozyona dirençli yenilikçi tasarımlara olan ihtiyacı ortaya koymaktadır.

Bu çalışmada, özellikle endüstriyel makine ve denizcilik uygulamalarında güvenli montaj sağlamak amacıyla kullanabilecek puzzle tipi bir sızdırmazlık elemanı tasarım, geliştirilmesi ve üretilmesi amaçlanmıştır. Bu tasarımın en önemli avantajı, denizcilik uygulamalarında sıklıkla karşılaşılan sızdırma, montaj zorlukları ve korozyon problemlerine etkili çözümler sunmasıdır. Üç parçalı puzzle tipi geçmeli tasarım, tamamlayıcı (dişi-erkek) bağlantı noktaları sayesinde parçaların montaj sırasında otomatik olarak hizalanmasını sağlayarak, işçilik kaynaklı hataları minimize eder ve montaj süresini kısaltmaktadır. Geçmeli bağlantı yapısı sayesinde birleşim noktalarındaki temas yüzeyi artırılarak sızdırmazlık performansı maksimum seviyeye çıkarılmaktadır. Dış yüzeyde bulunan kanal, O-ring, conta veya sıkıştırma teli gibi ek elemanların yerleştirilmesine olanak tanıyarak yüksek basınç ve titreşim altında dahi güvenli bir bağlantı

sağlamaktadır. Kullanılan karbon grafit ve korozyona dayanıklı alüminyum alaşımı, deniz ortamındaki aşındırıcı etkiler karşısında uzun ömür ve bakım kolaylığı sunmaktadır. Ayrıca yapının hafif olması, montaj ve taşıma süreçlerini kolaylaştırırken, sistemin genel maliyetini de düşürmektedir. Tüm bu özellikler, güvenlik, dayanıklılık ve operasyonel verimlilik açısından mevcut sistemlere kıyasla önemli üstünlükler sağlamaktadır.

Anahtar Kelimeler: Sızdırmazlık elemanları, Puzzle tip Şaft sızdırmazlık elemanı, Korozyon direnci, Denizcilik uygulamaları, Karbon-grafit entegrasyonu

Development of an Aluminum Body Ship Shaft Sealing Element

Abstract

Sealing elements used in shaft passages today are of critical importance for ensuring safety and efficiency in marine and industrial machinery applications. Current implementations are generally based on elastomeric gaskets, metal housing, or lubrication-assisted systems. However, these structures are sensitive to misalignment during assembly, prone to leakage at joint interfaces, and susceptible to corrosion and wear over long-term use. Moreover, solutions based on rubber or spring mechanisms lose their sealing performance under high pressure, vibration, and temperature, while lubrication-dependent systems increase maintenance costs and pose environmental risks. These limitations highlight the need for innovative designs that are more durable, easy to assemble, low-maintenance, and resistant to corrosion.

In this study, a puzzle-type sealing element was designed, developed, and manufactured to ensure reliable assembly, particularly for industrial machinery and marine applications. The main advantage of this design is its ability to effectively address common issues in marine environments such as leakage, assembly difficulties, and corrosion. The three-piece interlocking puzzle-type structure enables automatic alignment of parts during installation through complementary (male-female) connection points, thereby minimizing assembly errors and reducing installation time. The interlocking connection design increases the contact surface area at the joints, maximizing sealing performance.

Additionally, an external groove allows the integration of auxiliary components such as O-rings, gaskets, or compression wires, ensuring a secure connection even under high pressure and vibration conditions. The use of carbon graphite and corrosion-resistant aluminum alloy provides long service life and ease of maintenance against the aggressive marine environment. Furthermore, the lightweight structure facilitates assembly and transportation processes while reducing the overall system cost. All these features offer significant advantages over existing systems in terms of safety, durability, and operational efficiency.

Keywords: Sealing elements, Puzzle type shaft sealing element, Corrosion resistance, Marine applications, Carbon-graphite integration