

# Faculty of Engineering Department of Mechanical Engineering

### 8<sup>th</sup> INTERNATIONAL SCIENTIFIC CONFERENCE ON ADVANCES IN MECHANICAL ENGINEERING (ISCAME 2022)

10-11 November, 2022 Debrecen, Hungary

### **CONFERENCE PROGRAMME**

organized by

Department of Mechanical Engineering
Faculty of Engineering, University of Debrecen

and

Working Commission in Mechanical Engineering
Specialized Committee in Engineering
Regional Committee in Debrecen, Hungarian Academy of Sciences



10-11 November 2022, Debrecen, Hungary

Chair of ISCAME 2022

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György THALMAIER, Technical University of Cluj-Napoca, Romania

Zsolt TIBA, University of Debrecen, Hungary

László TÓTH, University of Debrecen, Hungary

Matej VESENJAK, University of Maribor, Slovenia

Zoltán WELTSCH, John von Neumann University, Hungary

László ZSIDAI, Hungarian University of Agricultural and Life Sciences, Hungary

Technical Assistance of ISCAME 2022

Szandra SITKU, University of Debrecen, Hungary

Lilla CSONKÁNÉ DÓRÓ, University of Debrecen, Hungary



10-11 November 2022, Debrecen, Hungary

#### WELCOME MESSAGE

On behalf of the ISCAME Scientific and Organizing Committee I am pleased to welcome you to Debrecen for the 8<sup>th</sup> International Scientific Conference on Advances in Mechanical Engineering organized by the Department of Mechanical Engineering, Faculty of Engineering of the University of Debrecen.

The main goal of ISCAME is to yearly bring together engineers working on research, development and practical application in the field of mechanical engineering. Furthermore, the purpose of this Conference is to provide opportunities for scientists and engineers to meet and to discuss current research, new concepts and ideas and establish possibilities for future collaborations in all aspects of mechanical engineering.

I am pleased to inform you that 96 experts from higher education have registered for this year's conference from altogether 7 countries. In the framework of ISCAME 61 presentations will be given and 14 posters will be exhibited.

We invite you to be an active participant in this Conference and to contribute to any topic of your scientific interest. We hope that the 8<sup>th</sup> International Scientific Conference on Advances in Mechanical Engineering will have an important impact on the research in all topics included in its program.

It is also an honour for us to have a privilege to invite you to the 8<sup>th</sup> Mechanical Engineering Industrial Exhibition and Job Fair. The Department of Mechanical Engineering of the University of Debrecen will host – parallel to ISCAME – the event, called "Mechanical Engineering Industrial Exhibition and Job Fair" where 24 companies will exhibit. The list of our exhibiting partners can be found at the end of the program booklet. This professional program will surely benefit the visitors who want to get up-to-date knowledge with the latest technology.

We want to express our appreciation to all members of the committees involved in the preparation of this Conference and to all the staff who are managing the different aspects of the Conference and to all the contributing authors and participants who will create the real Conference. We hope that all of you feel awarded for your participation and contribution.

Yours Sincerely,

Tamás Mankovits Chair of ISCAME, Head of Department Department of Mechanical Engineering Faculty of Engineering, University of Debrecen



10-11 November 2022, Debrecen, Hungary

#### TECHNICAL PROGRAMME

(8th ISCAME and 8th Mechanical Engineering Exhibition and Job Fair)

#### Thursday, 10th of November 2022 (2-4 Ótemető, Debrecen)

- 09:00 15:00 Mechanical Engineering Exhibiton and Job Fair (Aula of the Faculty of Engineering)
- 13:00 16:00 **ISCAME registration** (Aula of the Faculty of Engineering)
- 13:00 18:45 **ISCAME poster exhibition** (1st floor, Gallery of the Faculty of Engineering)
- 15:00 16:00 ISCAME opening and plenary lectures (4th floor, Lecture Hall 413)
- 16:15 18:45 **ISCAME sessions**

INDUSTRIAL PROCESSES
APPLIED AND THEORETICAL MECHANICS
MATERIALS SCIENCE AND TECHNOLOGY I.

19:00 – 22:00 ISCAME banquet (Restaurant Reskontó, 34 Péterfia, Debrecen) –entrance only with invitation card

#### Friday, 11th of November 2022 (2-4 Ótemető, Debrecen)

- 08:30 13:00 **ISCAME registration** (Aula of the Faculty of Engineering)
- 09:00 14:00 **ISCAME poster exhibition** (1st floor, Gallery of the Faculty of Engineering)
- 09:30 11:45 **ISCAME sessions**

DESIGN, MANUFACTURING, MAINTENANCE POLYMER ENGINEERING MATERIALS SCIENCE AND TECHNOLOGY II.

- 11:00 12:00 **ISCAME poster session** (1st floor, Gallery of the Faculty of Engineering)
- 11:30 13:30 lunch (Restaurant, Faculty of Engineering)
- 12:30 12:45 **ISCAME group photo** (meeting at the inner court)
- **13:00 15:15 ISCAME sessions**

FLUID MECHANICS MATERIALS SCIENCE AND TECHNOLOGY III.



10-11 November 2022, Debrecen, Hungary

#### **DETAILED PROGRAMME OF ISCAME 2022**

#### Thursday, 10th of November 2022 (2-4 Ótemető, Debrecen)

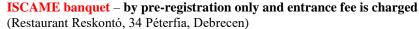
13:00 – 16:00 13:00 – 18:45	ISCAME registration (Aula of the Faculty of Engineering) ISCAME poster exhibition (1st floor, Gallery of the Faculty of Engineering)		
15:00 – 16:00			
15:00 – 15:05	(Lecture Hall 413, 4 <sup>th</sup> floor) <b>Tamás MANKOVITS</b> , University of Debrecen, Hungary <i>Welcoming words</i>		
15:05 – 15:20	Piroska AILER, University of Debrecen, Hungary Automotive research projects at the University of Debrecen		
15:20 - 15:35	László TÓTH, University of Debrecen, Hungary The role of natural sciences and engineering in society		
15:35 – 15:50	<b>Zoltán WELTSCH</b> , John von Neumann University, Hungary  The effect of high energy density surface treatments on automotive bonding technologies		
15:50 - 16:00	Tamás MANKOVITS, University of Debrecen, Hungary Research projects and infrastructure at the Department of Mechanical Engineering		
16:15 – 17:45	Session INDUSTRIAL PROCESSES (Emerson Pneumatic Laboratory, ground floor, room E.0.21.)		
Chairman: Secretary:	Lajos GULYÁS, University of Debrecen, Hungary István DOMOKOS, University of Debrecen, Hungary		
16:15 – 16:30			
	<u>László TÓTH</u> What is the profit center in organizations that operate large asset systems?		
16:30 – 16:45	What is the profit center in organizations that operate large asset systems?  Ömer Faruk KARAMAN, László HÉGELY, Péter LÁNG		
16:30 – 16:45 16:45 – 17:00	What is the profit center in organizations that operate large asset systems?  Ömer Faruk KARAMAN, László HÉGELY, Péter LÁNG  Optimisation of methanol recovery by surrogate models: Influence of prices  Dániel HORVÁTH, Tibor POÓS		
	What is the profit center in organizations that operate large asset systems?  Ömer Faruk KARAMAN, László HÉGELY, Péter LÁNG  Optimisation of methanol recovery by surrogate models: Influence of prices  Dániel HORVÁTH, Tibor POÓS  Dimensional analysis of mixing power requirement in agitated drum  Evelin VARJU, Tibor POÓS		
16:45 – 17:00	What is the profit center in organizations that operate large asset systems?  Ömer Faruk KARAMAN, László HÉGELY, Péter LÁNG  Optimisation of methanol recovery by surrogate models: Influence of prices <u>Dániel HORVÁTH</u> , Tibor POÓS  Dimensional analysis of mixing power requirement in agitated drum		



Faculty of Engineering, University of Debrecen



19:00 – 22:00	ISCAME banquet – by pre-registration only and entrance fee is charged		
17:45 – 18:00	Balázs ÁDÁM Investigation of non-isothermal crystallization kinetics of melamine-based flame retardant PLA		
17:30 - 17:45	György THALMAIER, Ioan VIDA-SIMITI, Niculina SECHEL Creating porous metal parts by Fused Deposition Modeling and Sintering		
17:15 – 17:30	György LEDNICZKY Metal injection molding		
17:00 – 17:15	Eliza ANGELI, László KOLTAI, Rozália SZENTGYÖRGYVÖLGYI Influence of cardboard surface sizing on solvent retention		
	Investigation of the adhesion properties of pottings		
16:45 – 17:00	Wettability measurement possibilities on adhesives Ferenc TAJTI, Miklós BERCZELI		
16:30 – 16:45	Tube-to-Tube joining by forming <u>Miklós BERCZELI</u> , Ferenc TAJTI, Gergely JUHÁSZ, Péter KOVÁCS, Zsolt KÖNYVES,  Andrea CAPÁR, István KUTI, Zoltán WELTSCH		
16:15 – 16:30	Szabolcs JÓNÁS, Péter Zoltán KOVÁCS		
Chairman: Secretary:	György THALMAIER, Technical University of Cluj-Napoca, Romania András GÁBORA, University of Debrecen, Hungary		
16:15 – 18:00	Session MATERIALS SCIENCE AND TECHNOLOGY I.  (Metallograpfic Laboratory, 1 <sup>st</sup> floor, room E.120.)		
	A solution for creating a submodel of an electric motor in a vehicle dynamics model by using Matlab Simulink		
18:30 - 18:45	Design and analysis of patient specific femoral stem using lattice structures <u>Dániel NEMES</u> , Sándor HAJDU		
18:15 - 18:30	Rashwan ALKENTAR, Tamás MANKOVITS		
18:00 - 18:15	<u>Dávid HURI</u> , Tamás MANKOVITS  Artificial intelligence for simulation-based engineering optimization		
17:45 - 18:00	Mortda MOHAMMED, György KOVÁCS, Szabolcs SZÁVAI Using artificial neural network in the design of the composite sandwich panel		
	Prediction of FLD using Gurson Model for simple flat spacemen		
17:30 - 17:45	Numerical modelling and simulation of sheet metal forming process  Tatiane DOMOKOS		
17:15 - 17:30	Hypergraph-based modeling of kinematic structures  Marwen HABBACHI, Attila BAKSA		
17:00 – 17:15	<u>Csaba HAJDU</u> , Ádám CSAPÓ		
16:45 – 17:00	Humam Kareem AL-JANABI, Endre KOVÁCS  New stable explicit methods for heat conduction, convection and radiation		
16:30 – 16:45	István ECSEDI, Attila BAKSA, Ákos József LENGYEL, Dávid GÖNCZI  On the torsional rigidity of orthotropic beams with rectangular cross section		
16:15 – 16:30	<u>István ECSEDI</u> , Attila BAKSA, Ákos József LENGYEL, Dávid GÖNCZI  An analytical solution for the two-layered composite beam-column with interlayer slip and constant axial load		
Secretary:	Rashwan ALKENTAR, University of Debrecen, Hungary		
Chairman:	(Technical Mechanics Laboratory, 1 <sup>st</sup> floor, room U.1.08.) <b>Sándor HAJDU</b> , University of Debrecen, Hungary		
16:15 – 18:45	Session APPLIED AND THEORETICAL MECHANICS		





Lake Békás and Water Tower, Debrecen



10-11 November 2022, Debrecen, Hungary

Friday, 11<sup>th</sup> of November 2022 (2-4 Ótemető, Debrecen)

08:30 - 13:00 09:00 - 14:00				
09:30 – 11:45				
Chairman: Secretary:	(Plastic and Rubber Testing Laboratory, 3 <sup>rd</sup> floor, room E.320.) <b>Levente CZÉGÉ</b> , University of Debrecen, Hungary <b>Dániel NEMES</b> , University of Debrecen, Hungary			
09:30 - 09:45	Gergely HUNYADI, Dénes FODOR  Key questions on the combination of modular system design with driverless car based on internal combustion drivetrain			
09:45 - 10:00	János Péter ERDÉLYI  Relation of power and capacity of HPDC machine			
10:00 - 10:15	<u>L'uboslav STRAKA</u> , Patrik KUCHTA			
10:15 – 10:30	Efficiency of machining curved surfaces through electrical discharge technology <u><b>Ľuboslav STRAKA, Patrik KUCHTA</b></u>			
10.13 – 10.30	Machining of carbide metals by electrical discharge technology			
10:30 - 10:45	Atosi ROY, Sándor BODZÁS Geometric analysis of spline shafts by surface roughness tester and 3D scanner			
10:45 - 11:00	Todor MITKOV, Tihomir DOVRAMADJIEV			
11:00 – 11:15	Investigation of the luxury yachts condition and their maintenance Péter TRAMPUS			
	Industry 4.0 and non-destructive evaluation in symbiosis			
11:15 – 11:30	O Attila ARADI, Attila Károly VARGA  Deep learning based classification of sounds recorded by hydrophone in a tank for leak detection and			
11:30 – 11:45	monitoring of pump condition  Attila Károly VARGA			
11.30	Expert investigation of the installation and maintenance of a communication cable cut with and agricultural machine			
09:30 – 10:45	Session POLYMER ENGINEERING (SMARTMAT Material Technology Laboratory, 4 <sup>th</sup> floor, room E.414.)			
Chairman:	István BUDAI, University of Debrecen, Hungary			
Secretary:	Máté FILE, University of Debrecen, Hungary			
09:30 - 09:45	Zoltán TAKÁCS, Imre <u>KÁLLAI</u> Application of additive manufacturing technology for the production of injection molding tools in order to reduce the cycle time			
09:45 - 10:00	Péter HALMAI, Imre KÁLLAI, <u>Péter VOLASCSEK</u>			
10:00 - 10:15	Material development of an aircraft interior panel  Imre KÁLLAI, Zoltán MAJOR, Ferenc KUN			
10:15 – 10:30	The future of thermoplastic polymer matrix composites in the aircraft industry  Máté FILE, Zoltán MAJOR, Gábor BALOGH, Tamás MANKOVITS, Dávid HURI			
10:30 – 10:45	Multiscale modelling of a unidirectional composite material  István BUDAI, András SZOBOSZLAI  Development of cellular martix drog formula			



10-11 November 2022, Debrecen, Hungary

09:45 – 11:30	Session MATERIALS SCIENCE AND TECHNOLOGY II.
	(Metallograpfic Laboratory, 1st floor, room E.120.)
Chairman:	Sándor PÁLINKÁS, University of Debrecen, Hungary
Secretary:	Gábor BALOGH, University of Debrecen, Hungary
09:45 - 10:00	<u>Dániel MOLNÁR</u>
	Casting simulation developments
10:00 - 10:15	Béla KONDÁS, Valéria MERTINGER
	Effect of conventional and non-conventional annealing on DC01 steels
10:15 – 10:30	Branko SKORIC, Pal TEREK, Lazar KOVACEVIC, Vladimir TEREK, Zoran BOBIC
10:13 – 10:30	Dragan KUKURUZOVIC
	Influence of ion implantation on tool steel
10:30 - 10:45	<u>Dávid HALÁPI</u> , László VARGA
	Ultrasonic powder atomisation for additive manufacturing
10.45 11.00	Márk WINDISCH, Anna MALOVECZKY, Miklós VERES, István RIGÓ, Péter FÜRJES
10:45 - 11:00	Zoltán DANKHÁZI, Ádám VIDA
	Application of laser surface treatment in surface-enhanced Raman spectroscopy
11:00 - 11:15	Rabea Hussein Mohammed QASEM
	Effect of surface-modified nanoparticles on oil recovery efficiency and the mechanism underlies this effect
11:15 – 11:30	Jemal Ebrahim DESSIE, Zsolt LUKÁCS
	A numerical study on springback prediction with systematic process improvement
11:00 - 12:00	poster session (1st floor, Gallery of the Faculty of Engineering)
11:30 - 13:30	lunch (Restaurant, Faculty of Engineering)

#### 12:30 – 12:45 **ISCAME group photo** (meeting at the inner court)



A group of ISCAME Participants in 2018



13:00 – 14:45	Session FLUID MECHANICS
~. ·	(Technical Mechanics Laboratory, 1st floor, room U.1.08.)
Chairman:	Ferenc SZODRAI, University of Debrecen, Hungary
Secretary:	Sándor ANDRÁSKÓ, University of Debrecen, Hungary
13:00 – 13:15	Kálmán KLAPCSIK
	Bubble position control by phase-controllable ultrasonic standing wave
13:15 – 13:30	Ferenc SZODRAI
	Assessment of pulsating flow
13:30 – 13:45	Issa OMLE, Ali Habeeb ASKAR
	Investigating the effect of surface roughness type on the convection and radiation heat transfer
	inside the enclosure
13:45 – 14:00	Mohsen KHALILI NAJAFABADI, Krisztián HRICZÓ, Gabriella VADÁSZNÉ BOGNÁR
	Heat transfer characteristics of water-CuO nanofluid dlow inside 2D pipe
14:00 – 14:15	ZAINAB ALI, GABRIELLA VADÁSZNÉ BOGNÁR
	CFD study of the effect of surface roughness on the ship resistance
14:15 – 14:30	Mustafa HASAN, Krisztián HRICZÓ
	Prediction of energy efficiency of a solar air collector using artificial neural network technique
14:30 - 14:45	Levente TUGYI, Zoltán SIMÉNFALVI, Gábor L. SZEPESI
	Propane gas diffusion for propane-propylene separation columns with different outflow directions
13:00 – 15:15	Session MATERIALS SCIENCE AND TECHNOLOGY III.
	(Robert Bosch Engineering Education and Development Laboratory, ground floor, room E.0.22)
Chairman:	László TÓTH, University of Debrecen, Hungary
Secretary:	Dávid HURI, University of Debrecen, Hungary
13:00 – 13:15	Ahmad Yasser DAKHEL, János LUKÁCS
13.00 – 13.13	Full-scale tests of pipeline girth welds under complex cyclic internal pressure and static bending
	loading conditions
13:15 – 13:30	Gábor GYARMATI, Zoltán KÉRI, Dániel MOLNÁR
13.13 – 13.30	Analysis of the quality of incoming aluminum alloy ingots
13:30 – 13:45	László KOROKNAI, László KUZSELLA, Gábor PÓR
15.50 – 15.45	The importance of perpendicularity during the scanning ultrasound examination
13:45 – 14:00	Martin L. KÖLÜS, Richárd BORBÉLY, Dániel SZŐKE, Gábor BÉRES
13.43 – 14.00	Effect of the flow curve determination on the thinning of drawn parts
14:00 – 14:15	Anas JAWABREH, Máté SEPSI, Péter BARKÓCZY
14.00 – 14.13	Effects of elevated temperature on the mechanical behavior of ACSR type conductors
14:15 - 14:30	Bassel ALSALAMAH
14.13 - 14.30	The effect of temperature on the hot compression test of AlSi7 aluminium alloy
14:30 - 14:45	Nóra BÍRÓ, Dániel MOLNÁR, György FEGYVERNEKI
14:30 - 14:43	Thermal analysis - Theory and application
14.45 15.00	
14:45 - 15:00	Sándor Endre KOVÁCS, László VARGA
15.00 15.15	Mechanical testing of 3D printed stainless steel specimens
15:00 - 15:15	Hanna ZAKIYYA, Tamás KÉKESI
	The effect of Ni impurities on the electrodeposition of Zn from chloride media



City Centre, Debrecen



10-11 November 2022, Debrecen, Hungary

**ISCAME posters** (1st floor, Gallery of the Faculty of Engineering)

#### **Mahmood ALHAFADHI**

Numerical simulation and experimental comparison of refrigeration and air conditioning scroll compressors: Review

#### Tamás ANTAL, János NAGY

Changes in physical and mechanical properties of dried sweet potatoes during storage

#### Montassar AYARI, Zsolt DOBÓ, Attila GARAMI

Investigation of neat PET, PETG, ABS, PBT and their mixtures by thermogravimetry

#### Sándor BODZÁS

Geometric design of form tools for turning technologies

#### István DOMOKOS, Sándor PÁLINKÁS, Lajos FAZEKAS, András MOLNÁR

Application of laser remelting technology in case of cultivator tine

#### Ramóna LADÁNYI, Sándor BODZÁS

Design unique clamping device for the development of pressing technology

#### **Daniel LATES, Alfianu CALIN**

Analysis of structural strengths for the cableway group

#### Viktor NAGY, Gábor KOVÁCS

Experimental analysis of bus driver behavior and cognitive load

#### Annamária POLYÁKNÉ KOVÁCS, Kinga TAMÁSI

Examination of hydrolysis-resistant polyketone and its application possibilities in the industry

#### Muhammad QAMAR, Ghulam ABBAS, Muhammad AFZAAL, Abdul GHUFFAR

Gold nanorods for doxorubicin delivery: Numerical analysis of electric field enhancement, optical properties and drug delivery

#### Kristóf SZABÓ

Application of topological methods in the development of vehicle components

#### Kristóf SZABÓ

Component development using topological methods

#### Kinga TAMÁSI, Annamária POLYÁKNÉ KOVÁCS, Viktor BORDÁS, Andrea SIMON

Cellular ceramic and polymeric materials for defence and military applications- A review

#### Annamária CS. TÓTH, Edina PREKLET, Zoltán BÖRCSÖK, Brigitta HORVÁTH, Katalin HALÁSZ

Characterization of a biodegradable edible film obtained from psyllium husk flour



Main building of the University of Debrecen



10-11 November 2022, Debrecen, Hungary

#### INFORMATION TO CHAIRMEN, TO PRESENTERS AND TO VISITORS

Chairmen, Presenters and on-line registered Visitors are invited for lunch and coffee, but it is connected to registration at the registration desk at the Aula in the building of the Faculty of Engineering on the Conference days.

#### To Presenters:

- The official language of ISCAME is English;
- Show up to the session 10 minutes before the session begins;
- Each oral presentation will take 15 minutes including discussion;
- The files required for the presentation (PowerPoint or PDF) must be uploaded and tested in the computer placed in the room before the respective presentation session.

#### To Poster Presenters:

- The official language of ISCAME is English;
- The Poster Exhibition will be opened on Thursday 10 November, 13:00 and can be visited until 11 November, 14:00. It means from Thursday 13:00 onwards posters can be put on display (Location: Faculty of Engineering, 1st floor, Gallery).
- Poster sessions are scheduled on 11 November, from 11:00-12:00. At this time anyone interested should be received in front of the posters;
- Posters will be displayed on vertical boards with maximum dimensions of 1000mm (width) x 2000mm (height), the recommended poster size is standard A0 with page orientation portrait.

#### To Chairmen:

- During the presentations enforce time limits strictly so that no author monopolizes someone else's time;
- One presentations are complete the remainder of the time can be used for informal discussion with the audience and session participants. It is your job to field questions from the audience.

#### In any case please contact:

#### **ISCAME Secretary**

Szandra SITKU, administrator Phone: +3652415155/77860 Mobile: +36704098909

E-mail: iscame@eng.unideb.hu

Department of Mechanical Engineering Faculty of Engineering, University of Debrecen 2-4 Ótemető, Debrecen, H-4028, Hungary

Website: www.mecheng.unideb.hu



Not	es:



Note	es:	



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10-11 November 2022, Debrecen, Hungary

#### LIST OF THE EXHIBITING COMPANIES

8<sup>th</sup> Mechanical Engineering Industrial Exhibition, Debrecen

AD Plastik Tisza Kft.	www.adplasztik.hr/hu	Tiszaújváros
		İ
Coloplast Hungary Kft.	www.coloplast.hu	Nyírbátor
ContiTech Magyarország Kft.	www.continental.com	Nyíregyháza
Diehl Aviation Hungary Kft.	www.diehl.com/aviation-hungary	Debrecen
Emerson Automation FCP Kft.	www.pneumatika.hu/	Eger
FAG Magyarország Ipari Kft.	www.schaeffler.hu	Debrecen
FreeDee Nyomdai Szolgáltató Művek Kft.	www.freedee.hu/	Budapest
HAJDU Hajdúsági Ipari Zrt.	www.hajdurt.hu	Téglás
HOYA Szemüveglencse Gyártó Magyarország Zrt.	ww.hoya.com	Mátészalka
KITE Zrt.	www.kite.hu	Nádudvar
Krones Hungary Kft.	www.krones.com/hu-hu	Debrecen
Magyar Suzuki Zrt.	www.suzuki.hu	Esztergom
Manz Hungary Gépgyártó Kft.	ww.manz.com	Debrecen
Michelin Hungária Abroncsgyártó Kft.	www.michelin.hu	Nyíregyháza
Oerlikon Eldim (HU) Kft.	www.oerlikon.com	Debrecen
Robert Bosch Automotive Steering Kft.	https://www.bosch.hu	Maklár
S&T Consulting Hungary Kft.	www.snt.hu	Budapest
Sensirion Hungary Kft.	www.sensirion.com	Debrecen
SMR Automotive Mirror Technology Hungary Bt.	www.smr-automotive.com/	Túrkeve
Sólyomsoft Kft.	www.solyomsoft.hu	Budapest
SPM Budapest Kft.	www.spminstrument.com	Budapest
Tecnica Ungheria Kft.	www.tecnicagroup.com	Nagykálló
thyssenkrupp Components Technology Hungary Kft.	www.thyssenkrupp.hu	Debrecen
Unilever Magyarország Kft.	ww.unilever.hu	Nyírbátor
ZF Hungária Kft.	www.zf.com/hu	Eger