

International Conference

FT 2021

Fluid Power 2021



Conference Programme

IZUM INSTITUTE

SLOVENIA - MARIBOR, 16. - 17. SEPTEMBER 2021

International conference Fluidna Tehnika / Fluid Power 2021

Ladies and Gentlemen!

In these challenging times it is a great pleasure and honour for us that we can invite you to the **international Fluid Power 2021 conference**, which will be held in **Maribor, at IZUM Convention Centre, on the 16th and 17th September**. The conference is a two-day event which is, by its content, intended for all those professionally involved with hydraulic or pneumatic power devices. It is specially designed for those wishing to be informed about the 'state of the art', and about new findings within the field of hydraulics and pneumatics.

The gathering of internationally recognised experts at these conferences in Maribor has been a **tradition since 1995** and is organised by the **Faculty of Mechanical Engineering at the University of Maribor**, here in Slovenia. These conferences are organized every second year and cover those principal technical events within the field of fluid power technologies in Slovenia, and this region of Europe.

The main purpose of the conference **Fluid Power 2021** is to introduce the latest achievements and results of research and development work, to offer insights into daily practice, as well as present new products and services over a wide- range of applications. The focus will be on new development trends: components within system development based on classical and IT approaches, and novelties within the field of hydraulic fluids, as well as the condition monitoring of fluids, components, and systems, modern concepts of system control regarding fluid power, and innovative examples of fluid power usage in the industrial applications.

According to the actual pandemic situation, the conference will be held live, considering the restrictions and recommendations at the time.

Organizing committee



Conference programme:

Thursday, 16th September 2021 – Great Hall

- 08:00 *Arrival and Registration*
- 09:00 *Opening ceremony*
- 09:30 **OPENING SESSION - Invited lectures**
- 11:00 *Coffee break*
- 11:30 **Session I**
- 12:00 – 14:00 *Main break - Lunch*
- 14:00 **Session II**
- 16:00 *Coffee break*
- 16:30 **Round table – discussion**
- 08:00 – 18:00 **Poster session, Exhibition**
- 18:00 **Social evening – Embraced by Fluid Power**

Friday, 17th September 2021 – Great Hall

- 08:00 *Registration, information*
- 09:00 **Session III**
- 10:00 *Coffee break*
- 10:30 **Session IV**
- 12:30 *Coffee break*
- 13:00 **Session V**
- 14:00 **Fluid Power Golden diploma award
Summary, Conclusion**
- 08:00 – 15:00 **Poster session, Exhibition**

all papers will be presented and printed in English language



Opening Session – Invited Lectures

Thursday, 16. 9. 2021 | 9:30 – 11:00 | Great Hall

Trends in Hydraulics

K. Schmitz

IFAS – Institute for Fluid Power Drives and Systems, Aachen, Germany

Trends in pneumatics – digitalization

H. Hufnagl

FESTO SE & Co. KG, Product Line Controlled Pneumatic, Esslingen, Germany



Session I:
Fluid Power Components – Development and Trends
Thursday, 16. 9. 2021 | 11:30 – 12:00 | Great Hall

Research on the water hydraulic pressure relief valve

F. Majdič

University of Ljubljana, Faculty of Mechanical Engineering, Ljubljana, Slovenia

Development of metallic 3d-printed water hydraulic proportional directional control valve

J. Bartolj¹⁾, A. Čelik²⁾, F. Majdič¹⁾

¹⁾ University of Ljubljana, Faculty of Mechanical Engineering, Ljubljana, Slovenia

²⁾ Poclain Hydraulics d.o.o., Žiri, Slovenia

Some special specifics of dimensioning of a hydraulic cylinder as an executive device of an electrohydraulic actuator system

D. Nauparac, N. Višnjić

PPT-Engineering, Belgrade, Serbia

Calculation and analysis hydraulic system for paint mixing machine

A. Osmanović, E. Trakić, E. Omeragić

University of Tuzla, Faculty of Mechanical Engineering, Tuzla, Bosnia and Herzegovina

Development of Direct Driven Servo Hydraulic Actuator

T. Jurak, V. Tič

University of Maribor, Faculty of Mechanical Engineering, Maribor, Slovenia



Session II:
Computer-aided design of fluid power components
Thursday, 16. 9. 2021 | 14:00 – 16:00 | Great Hall

Challenges in modelling and simulation of hydraulic servo valves

J. Edler ¹⁾, S. Goljat ²⁾

¹⁾Graz University of Technology, Graz, Austria

²⁾University of Maribor, Faculty of Mechanical Engineering, Maribor, Slovenia

Influence of differently viscous hydraulic fluid on the flow behaviour inside hydraulic tank

I. Biluš, L. Lešnik, L. Kevorkijan, D. Lovrec

University of Maribor, Faculty of Mechanical Engineering, Maribor, Slovenia

Flow conditions inside small hydraulic tank at excessive flow rates

D. Lovrec, I. Biluš

University of Maribor, Faculty of Mechanical Engineering, Maribor, Slovenia

Results of identification and optimization of the parameters of axial piston pump

R. Petrović ¹⁾, N. Todić ²⁾, S. Savić ²⁾, M. Andjelković ¹⁾

¹⁾University "Union-Nikola Tesla" of Belgrade, Faculty of Information Technology and Engineering, Beograd, Serbia ²⁾University of Kragujevac, Faculty of Engineering, Kragujevac, Serbia

Challenges of numerical modelling and simulation of flow inside the hydraulic tank

L. Kevorkijan, I. Biluš

University of Maribor, Faculty of Mechanical Engineering, Maribor, Slovenia

Identification of root cause based on simulation approach

A. Čelik, M. Rupnik, M. Žust

Poclain Hydraulics d.o.o., Žiri, Slovenia

Round Table – Discussion

Thursday, 16.9.2021 | 17:00 | Great Hall

Role and Importance of IT Technologies in Fluid Power – Visiting VEGA



Session III:
Control and Monitoring Concepts

Friday, 17. 9. 2021 | 09:00 – 10:00 | Great Hall

**Research of the influence of the operating Parameters of a mobile lift
on the oscillatory processes occurring during the work operation**

*I. Kyrychenko, O. Reznikov, D. Klets, A. Kholodov P. Yehorov, O. Olieinikova
Kharkov National Automobile and Highway University, Kharkiv, Ukraine*

**Design and control of mechatronic systems with pneumatic and
hydraulic drive**

*Ž. Šitum, J. Benić, K. Pejić, M. M. Bača, R. Radić, D. Semren
University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture,
Zagreb, Croatia*

Force control on Direct Driven Servo Hydraulic Actuator

*M. Janežič, A. Petrovič, V. Tič
University of Maribor, Faculty of Mechanical Engineering, Maribor, Slovenia*



Session IV:
Hydraulic fluids

Friday, 17. 9. 2021 | 10:30 – 12:30 | Great Hall

Ionic Liquids – the path to the first industrial application

D. Lovrec

University of Maribor, Faculty of Mechanical Engineering, Maribor, Slovenia

Electrically tuneable viscosity of Ionic Liquids

V. Tič

University of Maribor, Faculty of Mechanical Engineering, Maribor, Slovenia

Premium quality hydraulic oils

M. Kambič

OLMA Ljubljana, Slovenia

Advanced approach to the maintenance of hydraulic and turbine oils

J. Tomažin

Dimas Pro, Ljubljana, Slovenia

**Development of portable filtration unit with self-diagnostics
for industrial use**

N. Novak, R. Jelovčan, F. Majdič

University of Ljubljana, Faculty of Mechanical Engineering, Ljubljana, Slovenia

Elimination of leaks in the hydraulic block of the MAC Master press

D. Grgič ¹⁾, M. Bogadi ²⁾, M. Lesjak ³⁾, E. Antolič ⁴⁾

¹⁾ Nevija d.o.o. Maribor, Slovenia, ²⁾ BOGADI Tesnila d.o.o., Maribor, Slovenia,

³⁾ BGS storitve, d.o.o., Maribor, Slovenia, ⁴⁾ ENGAN Inženiring, Maribor, Slovenia



Session V:
Smart applications

Friday, 17. 9. 2021 | 13:00 – 14:00 | Great Hall

Challenges and pitfalls of time constrained hydraulic projects

T. Tašner¹⁾, K. Les²⁾

¹⁾ HAWE Hidravlični sistemi d.o.o., Štore, Slovenia

²⁾ HAWE Hidravlika d.o.o., 3220 Štore, Slovenia

The concept of automatic generation of hydraulic press cycle

D. Jankovič, R. Novak, M. Šimic, N. Herakovič

University of Ljubljana, Faculty of Mechanical Engineering, Ljubljana, Slovenia

Innovative solution of hybrid hydraulic firewood splitting machine

D. Biškup, M. Čipek, D. Pavkovič, J. Benić, Ž. Šitum

University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia

**IoT based WEB application concept for monitoring and control
of fluid power systems**

J. Benić, A. Vico, L. Vučetić, Ž. Šitum

University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia

Fluid Power Golden diploma award

Friday, 17.9.2021 | 14:00 | Great Hall

Summary, Conclusion



General sponsor:

FESTO

Social evening sponsor:

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VENTIL
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<http://www.fs.uni-lj.si/ventil/>
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The logo for IRT 3000, featuring the text "IRT" in a stylized, red, outlined font, with "3000" in a smaller font to the right, and the text "INOVACIJE • RAZVOJ • TEHNOLOGIJE" and "WWW.IRT3000.COM" below it.

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Social Evening: Embraced by Fluid Power

Social evening, organized at the end of the first day of the conference, is a great opportunity to relax at the end of the day, and to chat with others in a relaxed atmosphere, make new contacts and acquaintances, or exchanged some point of views.

This year's social evening will be held at the Maribor Castle built between 1478 and 1481. The castle houses the Provincial Museum with several collections. We will also visit a part of the museum's permanent collection under the expert guidance of the museum's curator. After visiting the museum, we will continue our gathering with at the castle lodge with a beautiful view of the surrounding area.



The sponsor of social evening is **HAWE Hidravlika d.o.o., Slovenia.**

Location:

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