

Introduction

My name is Dr Péter Károly Juhász, I am currently working as a chief structural engineer at JKP STATIC Ltd. For the last 15 years I have been involved in the design, optimization and research of concrete structures.

During my work in structural design, I first learned the **ANSYS** finite element program, where I was introduced to 3-dimensional finite element modelling. Later I started to work with the finite element program **ATENA**, which was specifically developed for the design/research of concrete structures.

I worked as an assistant professor in the [Department of Mechanics, Materials and Structures](#) of the Budapest University of Technology, and as the head of the [Czako Adolf Laboratory](#). I also did my [PhD thesis](#) there, which dealt with the investigation of synthetic macro fibres reinforcing concrete. One of the theses of my PhD work was a new material model parameter suitable for simple but relatively accurate modelling of fibre reinforced concrete (Modified Fracture Energy Method). This material model is also published in the [ITAttech guideline: ITAttech Guidance for precast fibre reinforced concrete segments](#). The material model parameter later was integrated into ATENA software. For this development we have participated in a EUROSTAR funding program with [Dr. Jan Cervenka](#). The project name was [FibreLab](#).

After founding my own laboratory ([JKP Concrete Laboratory](#)) I left the university, so I could spend more time on research. In addition to synthetic fibre reinforcements, FRP reinforcements became my focus of interest, during which we started our [SynSol](#) (Synthetic Solution) project, which aimed to investigate non-corrosive concrete reinforcement materials. The results of our first research is reported in our [conference paper](#) presented at the CCC Congress in Hainburg, 2015.

Non-corrosive materials are an important pillar of sustainability, but I am also investigating the low carbon footprint. Significant results can be achieved through the selection and application of new materials and optimised design. In this direction, our latest [conference paper](#) has been published, in which we show the combined results of synthetic macrofibres and advanced finite element design on carbon footprint through a concrete example.

Due to my experience as a laboratory manager (both in the university and in my own laboratory), I am skilled in research design, testing of concrete materials and structures, specimen preparation and testing, and analysis of results, and I am also familiar with the main international standards. I have obtained ISO 17025 accredited status for my own laboratory, so I have also gained proficiency in quality management. With a high level of knowledge of finite element software (ANSYS and ATENA), I am also proficient in finite element systems, so I have the skills to perform full optimisation of structures: from materials development to advanced modelling. During my university teaching, I have organised several conferences, inviting renowned speakers. My publications have appeared at conferences and in recognised journals. During my teaching, several of my students have won academic competitions ([1](#), [2](#), [3](#)). I have been invited for external consulting assignments (vice tutor) by [Tongji University](#), Shanghai, during which I consulted graduate students on the topic of fibre reinforced concrete. I am the member of the working group of *fib*: [WG 2.4.2 Modelling of Fibre Reinforced Concrete Structures](#).

Publications of my significant optimization work can be downloaded from the company website. One of these was the full synthetic macrofiber reinforced tramway in Szeged (Hungary), which was among the first in Europe (**Opportunities for synthetic fibre reinforcement in concrete tramlines** - doi.org/10.35789/fib.BULL.0095.Ch17). Similar successes were achieved with the optimization of the [grandstand elements of the Debrecen stadium](#). An optimization study was also carried out for the [Shanghai metro TBM tunnel](#), where I proposed a major replacement of reinforcing steel. I was always the responsible designer in my work, but most of the work was done in collaboration with my colleagues, working as a team.

I have always tried to optimise the structure and I publish the results of my work. For me, my most significant publication was published in the [journal of ASTM](#), which introduce a new method for determining the design material parameter of FRC materials.

I believe that the engineers of the future have the solution to global warming in their hands. Since a significant part of the earth's CO2 emissions is from the production of cements, the development of concrete materials and structures can make a significant difference and reduce global warming.

Dr Péter Károly Juhász

Budapest, 4th February 2023

Curriculum Vitae

Personal data

Name: Dr Péter Károly Juhász
Address: Budapest, Reitter Ferenc utca 100. Hungary
Date of birth: 11th February 1980
Nationality: Hungarian
Telephone: +36 70 330-9149
Company: JKP STATIC Ltd., chief structural engineer, concrete technologist
Email: office@jkp.hu
LinkedIn: www.linkedin.com/in/karoly-peter-juhasz-4362a526
Webpage: www.jkpstatic.com
ResearchGate: www.researchgate.net/profile/Karoly-Juhasz

Education

2019 Budapest University of Technology and Economics (BME)
Pál Csonka Doctoral School
Architectural Engineering PhD

2012 – 2014 Budapest University of Technology and Economics (BME)
Department of Construction Materials and Technologies
Postgraduate Diploma from Concrete Technology

2000 Budapest University of Technology and Economics (BME)
Scientific Students' Associations
Calculating the neutral axis of concrete sections under biaxial bending
First place, Rector's Special Award

1998 – 2005 Budapest University of Technology and Economics (BME)
Faculty of Architecture, structural design specialization

Language skills

2020 English C1
2015 Spanish B1
1997 English B2

Work experience

2019 – 2020 Budapest University of Technology and Economics (BME)
Department of Mechanics, Materials and Structures, assistant professor
Czakó Adolf Laboratory, head of laboratory

2013 – JKP STATIC Ltd.

2010 – 2019 Budapest University of Technology and Economics (BME)
Department of Mechanics, Materials and Structures, assistant lecturer
Czakó Adolf Laboratory, head of laboratory

2007 – 2009

MCT Consult GmbH., Switzerland, structural engineer

Professional interest

Design, optimization, laboratory testing and research of concrete, reinforced concrete and fibre-reinforced concrete (FRC) materials and structures, research on fibre-reinforced polymer reinforcement (FRP), concrete technology.

Publications

www.researchgate.net/profile/Karoly-Juhasz

www.jkpstatic.com/publications

Organised conferences

Celebration of Hungarian Science - Reinforced concrete in architecture: the material of the future (A Magyar Tudomány Ünnepe – Szálerősítésű betonok az építészetben: a jövő anyaga)
Péter Károly Juhász (BME), Ferenc Frank (KERA)

Budapest University of Technology and Economics (BME), Department of Mechanics, Materials and Structures

7. November 2014.

New materials and design methods in the concrete industry (Új anyagok és méretezési módszerek a betoniparban)

Péter Károly Juhász (BME), Garry Martin (EPC), János Herbák and Lapshinov Andrey (Armastek), Jan Cervenka (Cervenka Consulting)

Budapest University of Technology and Economics (BME), Department of Mechanics, Materials and Structures

27. September 2013.

Professional activities

2016 – Member of *fib* WG 2.4.2
Modelling of Fibre Reinforced Concrete Structures

2016 – Member of *fib*

2015 – 2019 FibreLAB: Virtual Lab for Fibre Reinforced Concrete Design by Simulation Prototyping
Eurostars Funding Program with Dr. Jan Cervenka (Cervenka Consulting)
www.fibrelab.eu

2013 – 2014 Vice tutor
Tongji University, Shanghai, China
Cathy PENG: Finite element modelling of Shanghai Metro tunnel using synthetic fibre reinforced concrete