

Rejtő Sándor Faculty of Light Industry**Institute of Leather, Textil and Garment Technology****Address: Bécsi út 96/B, H-1034 Budapest, Hungary****Tel.: +36-1-453-2859****Fax: +36-1-453-2860****E-mail: koczor.zoltan@rkk.bmf.hu****Website: <http://www.rkk.bmf.hu/>****Head of Institute: PhD Zoltán Koczor****1 Introduction**

The three departments of our institution have trained engineers for the textile, garment, and leather industry from 1972, the beginnings of academy education onwards. The aim of the training was that they be capable of applying their up-to-date and extensive professional knowledge in industrial areas. All areas were characterised by commitment to the profession and an excellent relationship with the industry. Education started with independent, well-equipped laboratories and training workshops.

From January 2000 training for the light industry continued within the confines of BMF, on the Faculty of Light Industry.

The Institute of Leather, Textil and Garment Technology was founded in 2000 by the unification of the three departments of leather, textile and garment technology. In 2004 it was joined by the Specialised Group for Quality Management.

Our institute does high level educational and research work in four areas of specialisation. As a result both on theoretical and practical side a large amount of up-to-date knowledge has accumulated in clothing, leather and quality management fields.

Our institute has close contact with the industry in all above trades. Independent and well-equipped laboratories and training workshops help the process of education. Some of these labs represent very good technical level while others need continuous renewal.

Some forty of our colleagues take part, in addition to the training of nearly 1100 engineers of light industry, in technical manager's and engineering tutor's training, on full time, corresponding and distant learning bases.

Nowadays the textile and clothing industry has been undergoing sweeping changes and this was taken into consideration through the relevant modification of specialisations, and important reforms in BSc training. The successful realisation of these efforts is a great challenge for us.

2 Educational Profile

Due to the restructuring of the labour market, the former training concentrating on one special industry area was replaced with skill-centered training. Within the frame work of the BSc training the institute controles the teaching of four specialisations: *Product design (centering on aesthetic design)*, *Fashion products and technology (here emphasis is laid on the organisation of production and service processes)*, *Composite and construction (development and evaluation of function and structure)*, as well as *Industrial system development (where training is focused on the system approach towards the entire business process)*. The development of practical skills is facilitated by modules linked to the special industry areas. The tutors of our institute are responsible for the elaboration of several major subjects of the Bsc curriculum, such as *Knowledge of material structure in light industry*, *Theory of technology*, *Process organisation*, *Integrated control systems*, *Theory of design* and *Engineering communication*.



In the training at the **Product design specialisation** great emphasis is laid on technological and construction knowledge, questions of producibility, quality, economy and market competitiveness, as well as on user and environment friendly development.

At the **Composite and construction specialisation** methods for the design of up-to-date materials and products are taught. Graduates from this specialisation are able to consciously influence the characteristics of products made from fibres and polimers and to optimalise these characteristics.



At the **Fashion products and technology specialisation** the characteristics of material processing, as well as process planning, organisation, and controlling techniques are taught. In the centre of tuition is the production-oriented analysis and control of production lines, the development of the efficacy of production processes and modern test technologies.

At the **Industrial system development specialisation** engineers are trained who are capable of the comprehension of entire production



and service processes and of their system oriented organisation. The training includes the appraisal of customer needs and their technical interpretation as well as the system oriented execution of planning and engineering processes.

We lay great stress on the practical application of technical, analytical, intervention, risk analysis and correlation methods and techniques and on

the knowledge of corporate management information systems and different management systems.

Resources: It is a tradition with the institute to have a good relationship with the small and medium-sized Hungarian enterprises in the field of textile, garment, and leather industry, and with the professional organisations of the different branches. The development of instrument and measurement systems is covered almost entirely by the training contributions and by the OKÉV competition.

The practical training is facilitated by a CAD laboratory including a computer park with up-to-date software for the planning of textile, garment, and leather products.

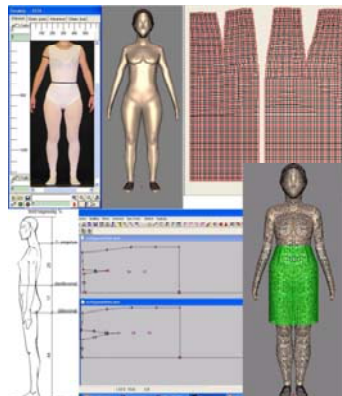
3 Research and Scientific Activity

The field of research in our institute embraces an extraordinary wide spectrum of topics. Our activities are particularly successful in the field of applied sciences. Our scientific work is mostly done in the field of material structure, construction, technology, organisation and control belonging to the cooperating branches of industry.

Between 1972 and 1990 the institute undertook several industrial commissions and applied research, technological and product development activities on a great scale. The main area of this research was: industrial assignments on technological and product development for stretching-machines with regulators and on textile, (spinning, weaving and knitting), garment, and leather industry machines.

In recent years the institute has published leading results in Hungarian relations on up-to-date materials and technologies and quality management systems. A part of the major research topics is published in various national trade papers, books and in conferences organised in Hungary and abroad. The institute has recently concentrated on taking part in competitions more successfully, through the coordination of research topics integrated on joint areas. Some of the research projects are carried out are shown below:

Project	Type of project
Three dimensional garment design: developing of a 3D computer aided design program	OMFB competition
Solving clothing tasks using „seeing robots“	GVOP competition
Analysing of draping properties of clothing textiles	OTKA
Complementation of clothing products with intelligent textiles sensing the characteristics of the state of the body	commission work
Developing of intelligent textiles, surface tests of galvanized textiles (with gold, silver and copper)	Innovation fund
Test of textiles made of high density oxidated fibres	commission work
Development activities concerning a quality management system (ISO/TS 16949:2002) for the automotive industry	Innovation fund (NOLATO)
Developing of a central environmental system, the efficient conditioning and evaluation adopted to the organism	Innovation fund (PLES ZRt.)
Evaluation of the European benchmarking projekt (BEN TEX) on the field of clothing industry	commision for expert work
Developing of methods for decreasing of measurements uncertainty	Innovation fund (TEMIC)
Quality management tools for training activities in small businesses	Leonardo da Vinci project
Vocational Education of teachers and professors to teach the consumer knowledge within school system	Leonardo da Vinci project
Optimalisation of the process of product design	In house research
Working out of the constructional grounds for intelligent textiles, garments and footwear, developement of certain products	Innovation fund
Modelling of the properties of leather and artificial leather, development of computer aided identification method	Commission work
Development of protection features of various protective cloths and suitable test methods (electrosmog, UV, antibacterial effect)	Innovation fund

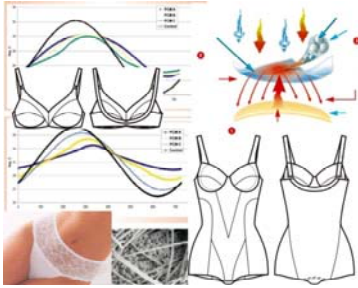


Our most significant research works in the field of **garment industry**: development of a 3D computer planning programme by the commission of OMFB. With the help of the programme the virtual fitting of a dress of whatever material and on different builds is possible, and the dress itself can be completed without the presence of the procurer, e.g. with the help of data sent via e-mail.

We took part in a GVOP competition entitled *The solution of garment industry tasks with the help of seeing robots*. The aim of the project

was the development of a robot that can see three dimensionally, to ensure

- measurement for the garment industry, production quality control,
- other special purposes, e.g. health measurements.



By the commission of FELINA Hungaria Kft. we started the development of concrete intelligent products in conformity with the company profile that can be fitted into the garment products to perceive and regulate the characteristics of the state of the body.

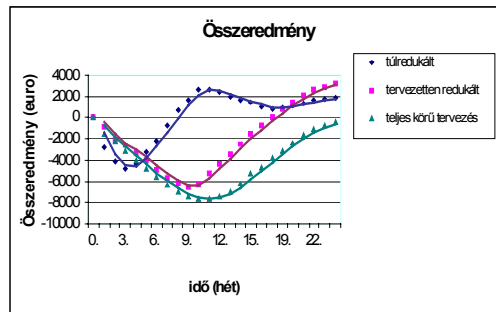
Development of ironing technique

Another field of technology

development bringing practical benefits, a novel method of ironing men's jackets and women's blazers, was suggested by Berwin Ruhagyár Rt. The results of the project, the analysis of ironing procedures in the light of laboratory tests were utilised by Berwin Ruhagyár Rt. for their products.



Optimisation of product planning processes

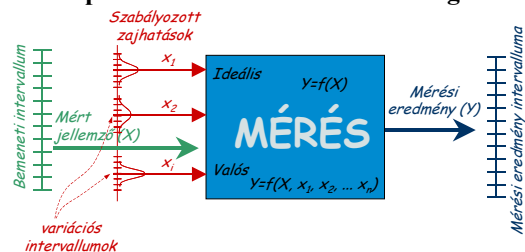


These days the life cycle of products is becoming shorter and the importance of product development is playing an increasingly important and critical role in company success. Expectations are in constant change; between the expectations of different

customer segments significant differences can be found. Price, cycle times and physical characteristics of a certain product in the competition necessitate conflicting planning and design methods. This creates the need for compromises and the tailoring of solutions on specific customer groups.

We developed a method for the optimisation of the product planning process that enables the organisation to execute the product planning requested by the customer effectively, in the shortest possible time, and with the lowest possible cost.

Development of methods for decreasing measurement uncertainty



The industry shows great interest in the new results of the continuous measurement development. This defines partly the thematic method of the identification of measurement uncertainty and partly the methodology of its

practical execution. The results are developed and employed in the country's biggest quality management conference and at several global concerns.

Research in the field of the integration of different management systems and their problems with application techniques

The institute consciously develops the theoretical and practical methods for the harmonisation of different management systems, the joint operation of systems based on MSZ EN ISO 9001:2001, the environment-centered MSZ EN ISO 14001:2005, the information security, the food industry, the hygienic and the controlling-based systems. The institute achieved nationwide authority by widely researching and publishing statistic and problem solving methods for increasing the efficacy of the application.

The institute's innovation field to determine the near future: the research package entitled 'Intelligent Garments and Textiles'

The topic is the development of intelligent garments that are capable of the causal and symptomatic diagnosis of personal health hazard factors and of affecting them with small intensity.

The aim of the research and development work is the development of a system integrated into the garment that is equipped with regulation potential and capable of information collection. Knowledge of intelligent materials, special physical and product design, information technology and garment comfort is necessary for the project.

The research aims at developing comfortable, actually produced garments (clothing and shoes) that facilitate health preservation and active lifestyle. With the utilisation of adequate materials and regulation based on them the perservation of the supporting tissue, the reduction of fatigue, the improvement of the blood circulation, and the influencing of the blood pressure with *active* compression effects is possible. The intelligent materials to be developed and the garments made from them are moreover able to increase the heat, the air humidity and pressure of the wearer's body.

The systematic application of personal solutions that are helpful against risk factors means a new possibility also in public health relations. The most important

potential is the medical possibility provided by a great amount of data and statistics available for a long time at a low cost that would substitute or complement the present diagnostic system.

The direct regulation will be executed as risk-free solution with small intensity and heat, moisture, and pressure release in the shoes, on the limbs, and on the torso.

More significant publications by the members of the Institution, published as books or parts of books

Author, Title	Publication
Dr. Zoltán Koczor et al: <i>Quality Assurance in the Light Industry</i> General higher education lecture notes	<i>PHARE TDQM 1997.</i>
Dr. Zoltán Koczor et al (editor and co-author): <i>Introduction to the Quality Assurance</i> (Practical Aspects of Quality Assurance)	<i>Műszaki Könyvkiadó, Budapest 1999. 2000.</i>
Dr. Zoltán Koczor et al: <i>Improvement of Quality Management Systems</i>	<i>TÜV Rheinland Akadémia, Budapest 2001.2004. 2005.</i>
<i>Quality Assurance</i> (Parts of the book in the 'folder book')	
Benchmarking, The poka-yoke principle, Economic Aspects of Quality Assurance,	<i>Verlag Dashöfer 1998.</i>
Application of Qualitative Control Cards, The Corporate Quality Indicator System. Regulation with the Corporate Quality Indicator System	<i>1999.</i>
<i>Controlling in Practice</i> (Parts of the book in the 'folder book')	
Basic Questions of Logistics, Recent Investigations in Logistics Controlling	<i>Verlag Dashöfer 2001.</i>
Innovation Investment Strategy on a Corporate Level with the Consideration of Return, Maintenance Controlling	<i>2002.</i>
<i>Controlling in Practice</i> (Parts of the book in the 'folder book')	
	<i>Verlag Dashöfer 2002. 2004. 2005.</i>
<i>Quality Improvement</i> (Parts of the book in the 'folder book')	
Quality Aspects of Customer Satisfaction	<i>Raabe Kiadó 2001</i>
Indicators of Regulation Efficacy in the Light of Quality Management Controlling	<i>Raabe Kiadó 2002</i>

4 International Relations

The institute has a wide range of international relations, which on the one hand refer to scientific cooperation and on the other one to the mobility among students and tutors.

Institute of Leather, Textil and Garment Technology



Our institute regularly organises international conferences, well known in Europe, to show the educational and scientific results of the light industry, for example: IN-TECH-ED (Innovation-Technic-Education).



Within the frame of the Erasmus program our institute has connections with the following institutes:

Technical University of Gent, Technische Universität Dresden, Technische Universität Wien, Universidade do Minho, Tampere University of Technology, Hogeschool Gent, Fachhochschule Kaiserslautern, Fachhochschule für Technik und Wirtschaft

Reutlingen, Fachhochschule Niederrhein – Mönchengladbach, Fachhochschule für Technik und Wirtschaft Berlin, Westsächsische Hochschule Zwickau, The University of Northampton, LIUC-Universita Carlo Cattaneo Castellanza, Jyväskylä University of Applied Sciences.

In the professional and research work of our institute we have partners like Technical Universities of Athens, Maribor, Ljubjana, Dresden, Wien, Zagreb and Iasi.