«Coopetition» – A Joint Approach to Innovation

PFI can justifiably claim to have the footwear and leather industry firmly embedded in its DNA: The institute was, after all, founded for and by this very sector. The advantages of what is now known as «coopetition» (a contraction of «cooperation» and «competition») were already obvious 60 years ago. And that is why PFI was called into being in 1956 by a group of very different companies involved in the footwear industry. As a non-profit institute, it was assigned the tasks of materials testing and development. These are absolutely crucial tasks which would be beyond the financial or structural means of individual companies.

Owing to its history and organisational structure as a non-profit registered association, thanks to its broad-based and diverse network, thanks to its involvement in expert bodies and its deep-rootedness in the world of research, and above all thanks to its many years of experience in the areas of testing, research, and certification, PFI has been taking the pulse of the footwear and leather industry on a daily basis for the past 60 years. Footwear and leather form part of PFI's DNA, even though we have long been active in other areas ranging from biotechnology to renewable energy.

From its very inception, PFI has provided a range of valuable services to the footwear and leather industry. That happened, for example, in the case of thousands of pairs of white court shoes whose uppers were disfigured by yellowish stains. How did this come about, what caused the stains? Who was liable for the damage? The sole supplier, the adhesive supplier, the leather supplier, or the shoe manufacturer? PFI not only tests materials for their suitability, but can provide processing tips, act as an arbitration body, and can draw conclusions from problematic situations from which all parties can learn. That is how PFI embarked on its first research projects of immediate practical relevance in the early days of its existence.

The term «coopetition» is nowadays used to describe a situation in which competing companies cooperate in specific areas while remaining fiercely competitive in others. Benefits include savings in expenditure for research and development or joint utilisation of sales resources. Exploitation of such synergies is becoming ever more important. There is a steadily increasing readiness of companies to share resources and expertise in the development of joint solutions – to the benefit of all participating market players.

From: Driving Impact: Wertschöpfung in der Welt von morgen, Sven T. Marlinghaus and Christian A. Rast, 2013 published by mi-Wirtschaftsbuch, Münchner Verlagsgruppe GmbH

Networking in the Service of the Footwear and Leather Industry

The list of organisations to which PFI belongs as a member is long because to be networked in all matters relating to footwear and leather is one of institute's the primary concerns:

- German Federation of Industrial Research Associations (AiF)
- § 64 Working Group on "Articles of Daily Use" at the Federal Office of Consumer Protection and Food Safety (BVL)
- CADS, Technical Secretariat
- Dechema
- German Association for Water, Wastewater and Waste
- German Association of Independent Test Laboratories (VUP)
- German Institute for Standardisation (DIN)
- Dialog Textilbekleidung (DTB)
- Dynamikum
- Biogas Association
- Friends of Pirmasens University of Applied Sciences

- Association of German Chemists (GDCh) Working Group on Articles of Daily Use
- HDS/L
- International Shoe Competence Center
- OEKO-TEX® Association
- International Union of Leather Technologists and Chemists Societies (IULTCS)
- International Union of Shoe Industry Technicians (UITIC)
- Association for Chemistry and Technology in Tanning (VGCT)
- Zuse Association

Forschungsnetzwerk Mittelstand

The wealth of information coming together at PFI through its membership in the above organisations and associations constitutes a valuable body of knowledge for members and clients of PFI and enhances their chances of success in the face of international competition.

PFI as Innovation Incubator

PFI's wide range of network contacts with the outside world is not its only strength. As a non-profit association, PFI was intended to serve as a communication hub for the footwear and leather industry. This is also evident from the fact that the board of PFI is made up of industry experts (see the article "PFI: A 60-Year Success Story" in the April 2016 issue of the PFI Newsletter); moreover, PFI has working groups for relevant areas of activity, such as the Experience Exchange Working Group, the CADS Working Groups, or the Technology Working Group. Constant close contact with companies from the leather and footwear sector via a testing service provider-client relationships means that a lively exchange of ideas and development projects takes place on a daily basis at PFI.

As a rule, SMEs will not have sufficient means to implement innovative projects on their own. Even larger companies will rarely have their own innovation departments (with the exception of large sport article manufacturers). Thus, wherever there is a lack of appropriate capacity: We have what it takes. Our engineering lab makes large-scale experimental set-ups feasible for a wide range of industries. And our department for mechanical engineering, software development, and control engineering develops and builds special and testing machines to your specifications.

PFI is an ideal partner for research projects – and brings a wealth of research experience to the table. We advise interested companies concerning current sources of support and handle all the formalities. As a member of the German Federation of Industrial Research Associations (AiF) and the Zuse Associa-

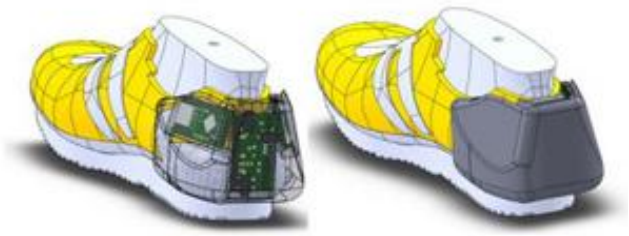
tion, we constantly participate in transnational projects. PFI is a place where innovative ideas are discussed, nurtured to maturity, and put into practice with the right partners.

The mere writing of research proposals is an onerous task requiring experience. It is then real boon to be able to access to PFI as competent expert with a huge wealth of knowledge and experience amassed during 60 years of research.

Research Projects

Projects concluded during the last 12 years are listed on the PFI website. Innumerable other projects can be found in our archives.

- Recycling Methods for Consumer Goods Made of Biopolymers
- Sensor Controlled Running
- Sole Design Guidelines for Optimum Slip and Rupture Resistance
- Self-fastening Shoe – Mobility Despite Physical Limitations
- Optimisation of Penetration-resistant Inserts in Safety Shoes
- Optimisation of Toe Caps in Safety Shoes against Run-over Accidents
- Simulation of the Thermal Behaviour of Footwear
- Development of Design Guidelines for Street Shoes Considering Foot Dynamics
- Improved Demands and Optimisation of Material Parameter for Use in Orthopaedic Shoemaking
- Development of Plastic Membranes for Controlled Release of Antimicrobials
- Study and Development of True-to-contour Adhesive Application Techniques in the Footwear Industry
- Development of Inline Process Control for Cementing of Shoe Materials with Dispersion Adhesives
- Development and Application of Innovative Simulations for Conducting Physical and Chemical Tests on Shoes and Shoe Materials for Quality Improvement of Newly Developed Shoes
- To Stick or to Stitch
- Effective Shoe Ventilation
- Studies to Determine the Relations between Soluble Total Chromium as well as Hide Constituents and Chromium(VI) Formation in Leather and Leather Goods
- Alternative Roughing Methods
- Where Does the Shoe Pinch?
- Development of a Measuring Procedure for Production Inspection of Internal Dimensions of Shoes with the Aid of Computer Tomography
- Can New Gradation Improve the Supply Width of Shoes?
- Can the Fit of Shoes Be Influenced by the Materials Used?
- Technical Measures for Reduction of Solvent Use in the Manufacture of Heavy Duty Footwear
- Virtual Reality and the Shoe
- Measurement of Sweat Odour
- Production of Lasts by Laminated Object Modelling
- High-value Utilisation of Xylan-containing Biomass for the Example of Spent Brewer's Grain



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- Footwear Flexibility – PFI Flexibility Measuring Device
- Virtual Presentation of Shoe Models
- Dynamic Design of Shoe Bottoms
- Elektronics in Shoes
- Reduction of Solvent Emissions in the Manufacture of Mountaineering Boots by Waste Air Treatment and Use of Dispersion Adhesives
- Feel Good Climate in Occupational Footwear
- Acceleration of Testing the Long-term Use Properties of Shoes and Shoe Components
- Development of a Cost-favourable Last Measuring and Inspection Device
- Computer-implemented Parametric Foot Model for Consistent Description of Foot Geometry in Shoe Manufacturing and Sales
- Protection against Excess Strain in the Heel Region of Orthopaedic Shoes for Osteoporosis Patients
- Inkjet Technology for Application of Individual Effects andMarkings on Shoes
- Implementation of the EU Solvent Directive in the Footwear Industry
- Anthropometric Foot-Last-Shoe Relationship
- Influence of Heel Lift on the Foot

From 2003 the PFI project portfolio has expanded to include biotechnology, with research conducted mainly at EU level:

- BYPROVAL
- TrickleZyme
- SaliChem
- On-Site-Enzymes
- HP4Drying
- BioKorrMin
- Bio EOL
- Lactic acid
- WindGas
- W2PHeat
- Methanotrophs
- Biogas Enzymes
- Material and Energetic Utilisation of Straw

Our ongoing research activities offer the best proof that PFI senses the pulse of the industry. The research projects are all carried out with active participation of interested companies in a committee accompanying the project. This approach ensures that the results can also be transformed into marketable products.