

Dr. Jochen Köhler

Matrisk GmbH, August 2009

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Personal Information

Name **Jochen Köhler**

Address, Office
Matrisk GmbH
Am Börtli 17
P.O. Box 469
CH-8049 Zurich

Telephone, Office +41-44-633 40 78

E-mail kohler@matrisk.com

Homepage <http://www.matrisk.com>

Nationality German

Date of birth 10.09.1972

Gender male

Work Experience

Occupation or position held **Lecturer**
Period from January 2008

Occupation or position held **Research Associate – Chair: Risk and Safety**
Period from January 2006

Occupation or position held **Research Assistant – Chair: Risk and Safety**
Period from February 2001 to December 2005

Name and address of employer Institute of Structural Engineering (IBK) at ETH Zurich, Zurich, Switzerland
Type of business or sector University

Main activities and responsibilities Research, lecturing, supervising and consulting

Occupation or position held **Consulting Engineer, Director**
Period from December 2008

Occupation or position held **Consulting Engineer, Associated Expert**
Period from October 2007 to November 2008

Name and address of employer Matrisk GmbH, Zurich, Switzerland
Type of business or sector Consulting

Main activities and responsibilities Risk and Reliability Assessment for Civil Engineering

Occupation or position held **Student Assistant**
Period from October 1996 to November 1997

Name and address of employer Chair: Timber Engineering, Karlsruhe Technical University, Germany
Type of business or sector University

Main activities and responsibilities Teaching Assistance, Laboratory Assistance

Education

Period	November 2001 – December 2005
Title of qualification awarded	PhD
Name and type of organization providing education and training	Chair: Risk and Safety, Institute of Structural Engineering (IBK) at Swiss Federal Institute of Technology (ETH), Zurich, Switzerland
Principal subjects/occupational skills covered	Structural Engineering, Timber Engineering, Probability Theory, Decision Theory
Period	October 1993 – October 2000
Title of qualification awarded	Diploma (corresponding to Master Degree)
Name and type of organization providing education and training	Department of Civil Engineering, Geo- and Environmental Sciences, Karlsruhe Technical University
Principal subjects/occupational skills covered	Civil Engineering / Structural Engineering

Educational Stopovers

Period	from January 2005 to March 2005
Activity	Academic Guest, Studies on the probabilistic modelling of the load bearing capacity of timber connections
University	University of Eindhoven, The Netherlands
Reference	Prof. Dr. André Jorissen
Scholarship	European Cooperation in the field of Scientific and Technical research, COST, Action E24
Period	from March 2002 to May 2002
Activity	Academic Guest, Studies on the creep rupture effect of timber structural elements
University	Division of Structural Engineering, Lund University, Sweden
Reference	Prof. Dr. Sven Thelandersson
Scholarship	European Cooperation in the field of Scientific and Technical research, COST, Action E24
Period	from February 1998 to October 1998
Activity	Research project on wood fracture mechanics; assistant, ground surveys
University	Facultad Regional Concepción del Uruguay, Argentina
Reference	Prof. Dr. Juan Carlos Piter
Period	from October 1997 to February 1998
Activity	Courses in Spanish and soil mechanics, non-profit activities, mountaineering
University	Universidad Politécnica Quito, Ecuador
Reference	Prof. Dr. Jorge Valverde

Personal skills and competences

Language skills	German	English	Spanish
Reading skills	Mother tongue	Good-Excellent	Good
Writing skills	Mother tongue	Good-Excellent	Basic
Verbal skills	Mother tongue	Good-Excellent	Good

Research Projects

Title	Prediction and Assessment of the Life-cycle Performance of Timber Structures
Position	Project Leader
Status	running since 2007
Client	State Secretariat for Education and Research, Switzerland
Partners	Swiss Federal Laboratories for Materials Testing and Research (EMPA), Bern University of Applied Science
Synopsis	The aim and main objective of this research project is to provide the basic framework and knowledge required for the efficient and sustainable use of timber as a structural and building material. This is achieved by building on four main research activities: the identification and modelling of relevant load and environmental exposure scenarios, the improvement of knowledge concerning the behaviour of timber structural elements, the development of a generic framework for the assessment of the life-cycle vulnerability and robustness of timber structures, and the improvement of methods for the evaluation of the strength and stiffness behaviour of existing timber structures.
Title	Development of an Efficient Scheme for Timber Machine Stress Grading
Position	Project Co-Leader
Status	running since 2006
Client	State Secretariat for Education and Research, Switzerland
Partners	Swiss Federal Laboratories for Materials Testing and Research (EMPA)
Synopsis	Despite the high potential of modern machine grading systems to assess the timber strength, machine grading is rarely utilized in practice; timber at the market is still predominantly visually graded. The aim and main objective of this research project is to provide all involved parties an efficient scheme for machine timber grading. The work will deliver a theoretical framework for the probabilistic modelling of graded timber material properties. A best practice procedure for timber grading will be developed considering all the needs and technical requirements identified throughout this project.
Title	COST Action E 55: Modelling of the Performance of Timber Structures
Position	Chairman of the management committee
Status	running since 2006
Client	Research Framework Program, European Cooperation in the field of Scientific and Technical Research (COST)
Partners	Researchers from 18 European Countries
Synopsis	COST (European COoperation in the field of Scientific and Technical Research) is an intergovernmental framework for the coordination of nationally-funded research at a European level, based on a flexible institutional structure. The main objective of COST Action E55 is to provide the basic framework and knowledge required for the efficient and sustainable use of timber as a structural and building material. This Action is a consortium of European experts in the fields of timber engineering and structural reliability. The duration of the action is scheduled from December 2006 - December 2010. Further information is available at the actions web page: [http://www.cost-e55.ethz.ch].
Title	Development of a Method for Fire Risk Assessment in Residential and Industrial Buildings
Position	Associate
Status	running since 2008
Client	Vereinigung Kantonalen Feuerversicherung (Swiss Association of Cantonal Fire Insurances)
Partners	Chair: Steel, Timber and Composite Structures, Swiss Federal Institute of Technology.
Synopsis	The project is aiming at the development of a generic fire risk assessment methodology for residential and industrial buildings. The methodology should allow a consistent and differentiated account for uncertainties due to both, natural randomness of the considered phenomena and lack of knowledge. Furthermore, the model framework to be developed should facilitate the assessment of the efficiency of fire risk reducing measures.

Research Projects (cont.)

Title Post-Tsunami Project
Position Associate
Status running since 2005
Client Internal Project, Swiss Federal Institute of Technology
Partners Institute for Environmental Decisions and Geological Institute, Swiss Federal Institute of Technology; Asian Institute of Technology (AIT), Asian Disaster Preparedness Centre (ADPC)
Synopsis Following the devastating consequences of the Banda Earthquake related tsunami in the Indian Ocean on December 26, 2004, focus has been directed towards the high vulnerability and low robustness of the affected societies in regard to natural hazards. The ETH post tsunami initiative is an ETH initiated project lead by the group of risk and safety in civil engineering at the Institute of Structural Engineering with the purpose of enhancing the management of risks due to natural hazards in the region of South-east Asia (SEA). The project is being conducted in close collaboration with the Asian Institute of Technology (AIT) and the Asian Disaster Preparedness Centre (ADPC), both located in Thailand, but also includes several participants from other countries in the region. A special focus in the project is to provide generically applicable methodologies and tools for the efficient use of limited resources in the quest of management of natural hazards. Key elements in the project concern the interrelation between sustainable land use, hazard exposure, vulnerability of societal infrastructure and societal robustness. The focus of the project is directed towards two different exposure conditions, namely hazard conditions relevant for coastal regions and conditions relevant for inland regions. The first mentioned regions are typically exposed to more rapidly evolving events of natural hazards such as tsunamis and floods whereas the inland regions may be more exposed to e.g. climatic changes and short sighted land use.

Title **Reliability of the Swiss Road Network**
Position Associate
Status accomplished (running 2006-2008 / 18 month)
Client Swiss Federal Roads Authority FEDRO
Partners Ernst Basler & Partner, Engineering Consulting
Synopsis This research project is part of the Swiss Federal Roads Authority (ASTRA) framework project 'The Reliability of the Road Traffic System and its Structures'. The general objective of this framework research program is the development of a decision support methodology which enables the efficient and sustainable allocation of new investments into the road network to the overall benefit of the Swiss society. The aim of this sub-project 'Reliability of a Road network' is to develop a method for the assessment of direct and indirect consequences of different adverse events on the road network. The envisaged method should be based on recent scientific developments in the field of risk based decision making. At the same time the method should be applicable and communicable. In the first part of the project the relevant components of the road network are identified and described. Kernel of the project is the development of a network model for the description and assessment of risks and the availability of transport capacity, and for the evaluation of the efficiency of safety measures. The project has been initiated in June 2006 and did run for 18 month.

Title **Development of a methodology for a standardized risk-assessment in the area of highway networks**
Position Associate
Status accomplished (running 2006-2008 / 18 month)
Client Swiss Federal Roads Authority FEDRO.
Partners Ernst Basler & Partner, Engineering Consulting, Risk&Safety Consulting
Synopsis The aim of this research project is to develop a decision framework and a methodology to identify the appropriate and efficient use of limited resources in the society especially in regard to the achievement of an acceptable level of safety for the highway network in Switzerland. In different application areas many different methodologies and approaches of risk assessment and risk management have been developed. The reason for this development can be seen in the very specific situations in the different application areas. Thus, the assessed risks are not comparable amongst these different application areas. To compare and judge risks in the different application areas, the development of a standardized methodology for the risk assessment is of utmost importance. Such a methodology has to be applicable to all decision situations and to all application areas in the highway network and have to facilitate the consistent assessment of risks and the establishment of acceptance criteria. A rational and comprehensible basis to judge risk reduction measures in the different application areas will be developed.

Research Projects (cont.)

Title	CodeCal – a Software Tool for Reliability Based Code Calibration
Position	Developer
Status	accomplished (running 2002-2003 / 4 month)
Client	Joint Committee on Structural Safety (JCSS) / Internal Project
Partners	-
Synopsis	Modern structural design codes such as the EUROCODES provide a simple, economic and safe way for the design of civil engineering structures. CodeCal is an Excel based program for the Reliability Based Code Calibration of structural design codes, which are based on the Load and Resistance Factor Design (LRFD) format. The calibration of the partial safety factors can be performed, following the approach recommended by the Joint Committee on Structural Safety (JCSS). The program can be downloaded as freeware on the WWW. [http://www.jcss.ethz.ch/Codecal/Codecal.html]
Title	Assessment of fire characteristics of industrial buildings
Position	Project Leader
Status	accomplished (running 2005-2006 / 6 month)
Client	Vereinigung Kantonaler Feuerversicherung (Swiss Association of Cantonal Fire Insurances)
Partners	Chair: Steel, Timber and Composite Structures, Swiss Federal Institute of Technology
Synopsis	Several methodologies for the fire risk assessment exist. The method as described in the Swiss SIA Documentation 81 represents the current Swiss state of the art fire risk evaluation method for cases where fire risk in buildings is of explicit interest. The basis for this method was developed in the 1960's and many of the tabulated industry specific fire relevant characteristics are out dated. The aim of this joint research project of the Swiss Association of Cantonal Fire Insurances and the Swiss Federal Institute of Technology was to gain updated knowledge from a substantial survey of fire relevant characteristics of 95 industrial facilities in Switzerland.
Title	Basis for the Design of Timber Structures
Position	Associate, (PhD Student)
Status	accomplished (running 2001-2005)
Client	State Secretariat for Education and Research, Switzerland
Partners	Chair: Steel, Timber and Composite Structures, Swiss Federal Institute of Technology
Synopsis	The basis for the design of timber structures has by far and large not achieved the same level of rationality as the basis for the design of steel and concrete structures. The basis for the design of steel and concrete structures takes basis in the developments achieved in the field of structural reliability methods over the last two decades. The newly developed EUROCODES and several national codes have utilized these methods when calibrating the partial safety factors and load combination factors. It would be fully consistent to use these methods also when considering the design of timber structures. As a consequence of this the European community COST E24 action entitled 'Reliability of Timber Structures' was initiated, an action that was running for 5 years and which was finalized in 2005. The efforts of the project have resulted in a proposal for the Probabilistic Model Code for the Design of Timber Structures which in the present version contains the following articles: models for the material properties of solid timber and for timber materials; models for size effects, load-type effects and moisture effects; models for timber connections; a model for quality control in timber structures. The JCSS Probabilistic Model Code for the Design of Timber Structures is strictly based on the proposal developed during this project and was recently published.

Activities for the Benefit of the Academic Society and Industry

Participation in European
Research Networks

COST European Cooperation in the field of Scientific and Technical Research
E24: Reliability of timber structures, member Switzerland, 2001-2005
E53: Quality control for wood and wood products, MC member Switzerland, since 2005
E55: Modelling of the performance of timber structures, Chairman, since 2006
C26: Urban Constructions under Catastrophic Events, member Switzerland, since 2007

European Science Foundation: Research project application reviews since 2008

WoodWisdom – Gradewood: Associated expert

Review Boards of Scientific
Journals

Wood science and Technology, review board since 2008
Engineering Structures, review board since 2008
Structural Control and Health Monitoring, review board since 2007

Academic Committees for
International Conferences and
Workshops

Member of the organising committee **CIB W18**, 42th Meeting, International Council for Research and Innovation in Building and Construction, Working Commission W18 – Timber Structures, EMPA Dübendorf, Switzerland, 25. – 28. August 2009.
Scientific Committee at the **ICSA 2010** the 1st International Conference on Structures & Architecture, University of Minho in Guimarães, Portugal, 21 – 23 July 2010.
Co-Organiser Mini-Symposium at the **ICSA 2010** the 1st International Conference on Structures & Architecture, University of Minho in Guimarães, Portugal, 21 – 23 July 2010.
Technical Advisory Panel at **ICASP 11** the 11th International Conference on Applications of Statistics & Probability, Swiss Federal Institute of Technology, Zurich, July 2011.

Participation in National and
International Code Committees

Comité Européen de Normalisation **CEN TC 124** Timber Structures, Working Group member since 2008

Teaching and Advisor Activities

Recent Advisor Activities

Activity	Year	Level
Co-Advisor to PhD projects, ETH Zurich	Since 2006	PhD
Co-Advisor to PhD projects at Facultad Regional Concepcion, Argentina	Since 2007	PhD
Advisor and Co-Advisor to Master and Bachelor projects, ETH Zurich	Since 2001	Master / Bachelor, Civil-, Environmental- and Geomatic Engineering and Planning

External Referee for PhD Projects

Institute / University	Obligation / Date	Name PhD candidate / Title
Division of Structural Engineering, Lund University	Opponent / 3.04.2009	Martin Häglund Moisture induced stress perpendicular to the grain in timber structures

Recent Teaching Activities at ETH Zurich, Switzerland

Name	Year	Level
Risk and Safety in Civil Engineering	Spring 09	Certificate of Advanced Studies on risk and safety for technical systems for practising engineers
Statistics and Probability Theory (lectures and exercises)	Spring 08	Bachelor Studies in Civil-, Environmental- and Survey Engineering and Planning, 2 nd Semester
Reliability of Structures	Spring 06	Certificate of Advanced Studies on risk and safety for technical systems for practising engineers

Publications

Monographs

- Faber M.H., Köhler J., Schubert M., Sabiote E., Fermaud C. and Scheiwiler A. (2009). Forschungspaket AGB1, Sicherheit des Verkehrssystems Strasse und dessen Kunstbauten, *Methodik zur vergleichenden Risikobeurteilung*, Forschungsauftrag AGB 2005/102 auf Antrag der Arbeitsgruppe Brückenforschung, Bundesamt für Strassen (ASTRA), Bericht Nr. 618, VSS Zürich, Switzerland.
- Fermaud C., Willi C., Köhler J., Schubert M. and Faber M.H. (2009). Forschungspaket AGB1, Sicherheit des Verkehrssystems Strasse und dessen Kunstbauten, *Ermittlung des Netzrisikos*, Forschungsauftrag AGB 2005/103 auf Antrag der Arbeitsgruppe Brückenforschung, Bundesamt für Strassen (ASTRA), Bericht Nr. 619, VSS Zürich, Switzerland.

Journal Papers refereed

- Köhler J. (2008). *Die Modellierung der Tragfähigkeit von Holzkonstruktionen*. SAH Bulletin, Heft 1, 16. Jahrgang, Schweizerische Arbeitsgemeinschaft für Holzforschung SAH, Juni 2008, pp. 26-28.
- Köhler J., Sørensen J.D. and Faber M.H. (2006). *Probabilistic modelling of timber structures*. Journal of Structural Safety, Volume 29 (4), pp. 255-267.
- Köhler J., Klein J. and Fontana M. (2006). *Die Erhebung von Brandlasten in 95 Industrie- und Gewerbebauten*. Bauphysik, (6) 2006, pp. 360-367.
- Faber M.H., Köhler J. and Sørensen, J.D. (2004). *Probabilistic modeling of graded timber material properties*. Journal of Structural Safety, Volume 26 (3), pp. 295-309, July 2004.

Conference Papers refereed

- Köhler J., Frangi A. and Steiger R. (2008). *On the role of stiffness properties for ultimate limit state design*. Proc. 41th Meeting, International Council for Research and Innovation in Building and Construction, Working Commission W18 – Timber Structures, CIB-W18, Paper No. 41-1-1, St. Andrews, Canada, August 2008.
- Sandomeer M.K., Köhler J. and Faber M.H. (2008). *Quality control of machine graded structural timber by means of probabilistic output control procedures*. Proc. 41th Meeting, International Council for Research and Innovation in Building and Construction, Working Commission W18 – Timber Structures, CIB-W18, Paper No. 41-5-1, St. Andrews, Canada, August 2008.
- Steiger R. and Köhler J. (2008). *Development of new Swiss standards for the assessment existing load bearing structures*. Proc. 41th Meeting, International Council for Research and Innovation in Building and Construction, Working Commission W18 – Timber Structures, CIB-W18, Paper No. 41-102-2, St. Andrews, Canada, August 2008.
- Köhler J. and Sørensen, J.D. (2007). *Recent developments in the area of probabilistic design of timber structures*. Proc. 10th international Conference on Applications of Statistics and Probability in Civil Engineering, ICASP 10, Tokyo, Japan, August 2007.
- Sandomeer M. K., Köhler J. and Linsenmann P. (2007). *The efficient control of grading machine settings*. Proc. 40th Meeting, International Council for Research and Innovation in Building and Construction, Working Commission W18 – Timber Structures, CIB-W18, Paper No. 40-5-2, Bled, Slovenia, August 2007.
- Köhler J., Klein J. and Fontana M. (2006). *Brandlasten in Industrie- und Gewerbebauten*. Baulicher und Technischer Brandschutz. VDI-Berichte, Nr. 1909. VDI-Verlag, Düsseldorf 2006.
- Köhler J. and Steiger R. (2006). *A discussion on the control of grading machine settings – current approach, potential and outlook*. Proc. 39th Meeting, International Council for Research and Innovation in Building and Construction, Working Commission W18 – Timber Structures, CIB-W18, Paper No. 39-5-1, Florence, Italy, August 2006.
- Leijten A., Köhler J. and Jorissen A. (2006). *Timber density restrictions for timber connection tests according to ISO8970/EN28970*. Proc. 39th Meeting, International Council for Research and Innovation in Building and Construction, Working Commission W18 – Timber Structures, CIB-W18, Paper No. 39-7-1, Florence, Italy, August 2006.

Conference Papers refereed
(cont.)

- Köhler J. and Faber M.H. (2006). *The JCSS Probabilistic Model Code for Timber – examples and discussion*. Proc. 9th World Conference of Timber Engineering WCTE, Portland, Oregon, USA, August 2006.
- Köhler J., Leijten A. and Jorissen A. (2006). *Uncertainties related to the strength modeling of dowel type fastener connections*. Proc. 9th World Conference of Timber Engineering WCTE, Portland, Oregon, USA, August 2006.
- Köhler J. (2005). *A probabilistic framework for the reliability assessment of connections with dowel type fasteners*. Proc. 38th Meeting, International Council for Research and Innovation in Building and Construction, Working Commission W18 – Timber Structures, CIB-W18, Paper No. 38-7-2, Karlsruhe, Germany, August 2005.
- Steiger R. and Köhler J. (2005). *Analysis of censored data – examples in timber engineering research*. Proc. 38th Meeting, International Council for Research and Innovation in Building and Construction, Working Commission W18 – Timber Structures, CIB-W18, Paper No. 38-17-1, Karlsruhe, Germany, August 2005.
- Köhler J., Sørensen J.D. and Faber M.H. (2005). *Probabilistic modeling of timber structures*. Proc. International Conference on Probabilistic Models in Timber Engineering, Arcachon, France, September 2005.
- Leijten A., Köhler J. and Jorissen A. (2005). *Probabilistic evaluation of embedment data for timber connections with dowel type fasteners*. Proc. International Conference on Probabilistic Models in Timber Engineering, Arcachon, France, September 2005.
- Köhler J. and Faber M.H. (2004). *Proposal for a probabilistic model code for design of timber structures*. Proc. 37th Meeting, International Council for Research and Innovation in Building and Construction, Working Commission W18 – Timber Structures, CIB-W18, Paper No. 37-104-1, Edinburgh, UK, August 2004.
- Leijten A., Köhler J. and Jorissen A. (2004). *Review of data for timber connections with dowel-type fasteners*. Proc. 37th Meeting, International Council for Research and Innovation in Building and Construction, Working Commission W18 – Timber Structures, CIB-W18, Paper No. 37-7-13, Edinburgh, UK, August 2004.
- Köhler J. and Faber M.H. (2003). *A probabilistic approach to cost optimal timber grading*. Proc. 36th Meeting, International Council for Research and Innovation in Building and Construction, Working Commission W18 – Timber Structures, CIB-W18, Paper No. 36-5-2, Colorado, USA, August 2003.
- Köhler J. and Faber M.H. (2003). *A probabilistic creep and fatigue model for timber materials*. Proc. 9th International Conference on Applications of Statistics and Probability in Civil Engineering ICASP9, Volume 2, pp. 1141-1148, San Francisco, USA, July 2003.
- Köhler J. and Svensson S. (2002). *Probabilistic modeling of duration of load effects in timber structures*. Proc. 35th Meeting, International Council for Research and Innovation in Building and Construction, Working Commission W18 – Timber Structures, CIB-W18, Paper No. 35-17-1, Kyoto, Japan, August 2002.
- Köhler J. (2002). *Probabilistic modeling of duration of load effects in timber structures using a fracture mechanics model*. Proc. 4th International Ph.D. Symposium in Civil Engineering, fib, Munich, September 2002.

Other Publications

- Sandomeer M.K., Köhler J. and Faber M.H. (2008). *Adaptive adjustment of grading machine settings*. Proceedings, COST E53 Conference "End User's Needs for Wood Material and Products", Delft, The Netherlands, October 29-30, 2008.
- Köhler J. and Sandomeer M.K. (2007). *Modeling the properties of strength graded timber material*. Proceedings of the 1st Conference, COST Action E53 "Quality Control for Wood and Wood Products". Warsaw, Poland. October, 15-17th. pp. 69-74.
- Sandomeer M.K. and Köhler J. (2007). *Approach for an efficient control of grading machine settings*. Proceedings of the 1st Conference, COST Action E53 "Quality Control for Wood and Wood Products". Warsaw, Poland. October, 15-17th. pp. 115-120.