



DATE

Ellange / Luxembourg

21st – 22nd January 2019, 9 a.m. – 5 p.m.



ORGANISATION

Participation fee

1296 € plus VAT.

The participation fee includes the seminar documents, drinks, refreshments, lunch and a certificate of participation.

Rebate system

If you make two or more registrations at the same time, you will receive a **10% discount** on the seminar price from the second booking.

Maximum number of participants

In order to achieve an optimal learning outcome and to ensure the exchange between the speaker and the seminar participants as well as the participants among each other, the **maximum number of participants for this seminar is 12 people.**



CONTACT

GRADEL SÀRL

6, Z.A.E. Triangle Vert
L-5691 Ellange

Tel.: +352 / 390044-1
Fax: +352 / 398857

gradel@gradel.lu
<http://www.gradel.lu>



LIGHTWEIGHT INNOVATION

in fiber composite technology
from the idea to the finished component



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Lightweight design innovation in fiber composite technology. The innovative process xFK-in-3D is a very simple, **highly flexible**, almost arbitrarily configurable, **cost-effective** and **sustainable** fiber composite technology. xFK-in-3D describes a precise as well as a measurable and assessable technological contribution to the integrative lightweight design of the future. If the (glass, coal, basalt and many other natural) fibers of composite materials (xFK) are aligned and produced in three dimensions (xFK-in-3D) according to the desired component functions and load collectives, spatial ultra-light structural components of high intelligence are created.

xFK-in-3D is a technology that serves environmental and climate protection, resource conservation and sustainability. Thus, the process provides clear answers to key social, ethical and sociopolitical issues - all in terms of sustainability.



GOALS

The participants learn:

- to know the xFK-in-3D process as a new process technology and how it can be applied,
- the difference between conventional and new design methodology in terms of efficient ultra-lightweight design,
- the complete CAE-CAD-CAM value chain based on a design methodology at roving fiber string level,
- to know the benefits of hybrid and fiber composite parts in xFK-in-3D and
- how to design, develop and implement a technical feasibility study for xFK-in-3D components



AGENDA

1. A new way to ultra-lightweight design

Against the background of current discussions on climate protection, CO₂ and NO_x emissions etc., lightweight design is becoming increasingly important. The process technology xFK-in-3D offers a new understanding and a new approach of ultra-light design. The first seminar day therefore begins with an introduction of the basic concept and the value chain of xFK-in-3D and documents the innovation potential of xFK-in-3D with representative feasibility studies. Conventional design methods based on the laminate theory are unsuitable for this new interpretation of ultra-lightweight design and need to be re-thought. The first seminar day promotes a sufficient understanding with a presentation and comparison of traditional and new methods.

2. Modeling at roving fiber string level within the CAE-CAD-CAM value chain

On the second day of the seminar, the innovative xFK-in-3D design process will be presented in detail. During virtual sizing three phases are distinguished: i) complexity reduction to a rough model through topology optimization, ii) development of a beam model as fine model at component level, and iii) the derivation of a fine model with resolved roving fiber strings. A reliable error prediction of failure states as well as the physical description of the xFK-in-3D structures requires the incorporation of the heterogeneity on roving fiber string level. In the seminar, the essential aspects are gradually illustrated: the appropriate material selection, the identification of simulation parameters on the basis of laboratory experiments, the modeling, the final optimization of the xFK-in-3D structure and the CAE-CAD-CAM information transfer in the value chain.



SPEAKERS

Dr.-Ing. Claus Georg Bayreuther

is head of lightweight technology consulting at AMC. His responsibility includes both technology and innovation consulting. During his professional career, he has been in various management positions, primarily in the area of calculations and simulations for well-known companies in the automotive, aerospace and mechanical engineering industry. He has many years of interdisciplinary knowledge in lightweight design, which he passes on in seminars and lectures.



Dr.-Ing. Ulrich Hindenlang

is founder, shareholder and managing director of LASSO Ingenieurgesellschaft mbH. He developed a highly innovative finite element analysis method for xFK-in-3D that enables the calculation, simulation and sizing of xFK-in-3D parts on single roving level. Together with AMC, he developed and specified his methodology. Dr.-Ing. Hindenlang is one of the leading experts for FEM analysis and lightweight design in the German-speaking world.

