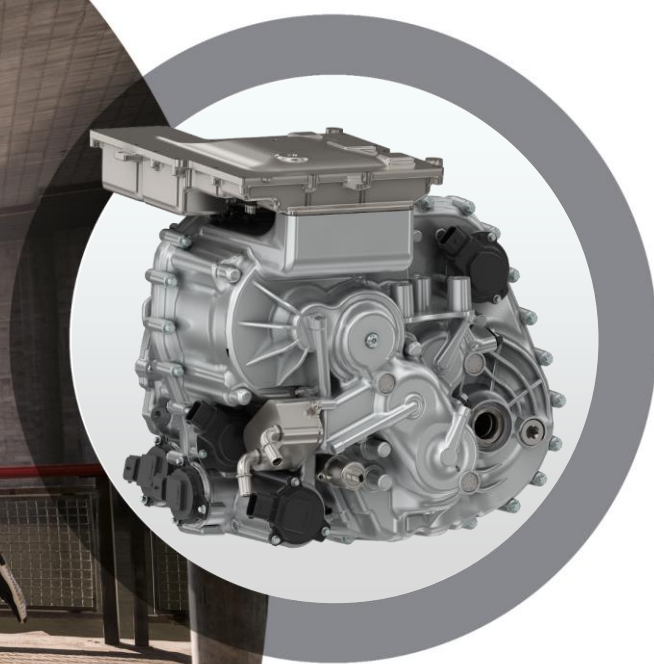
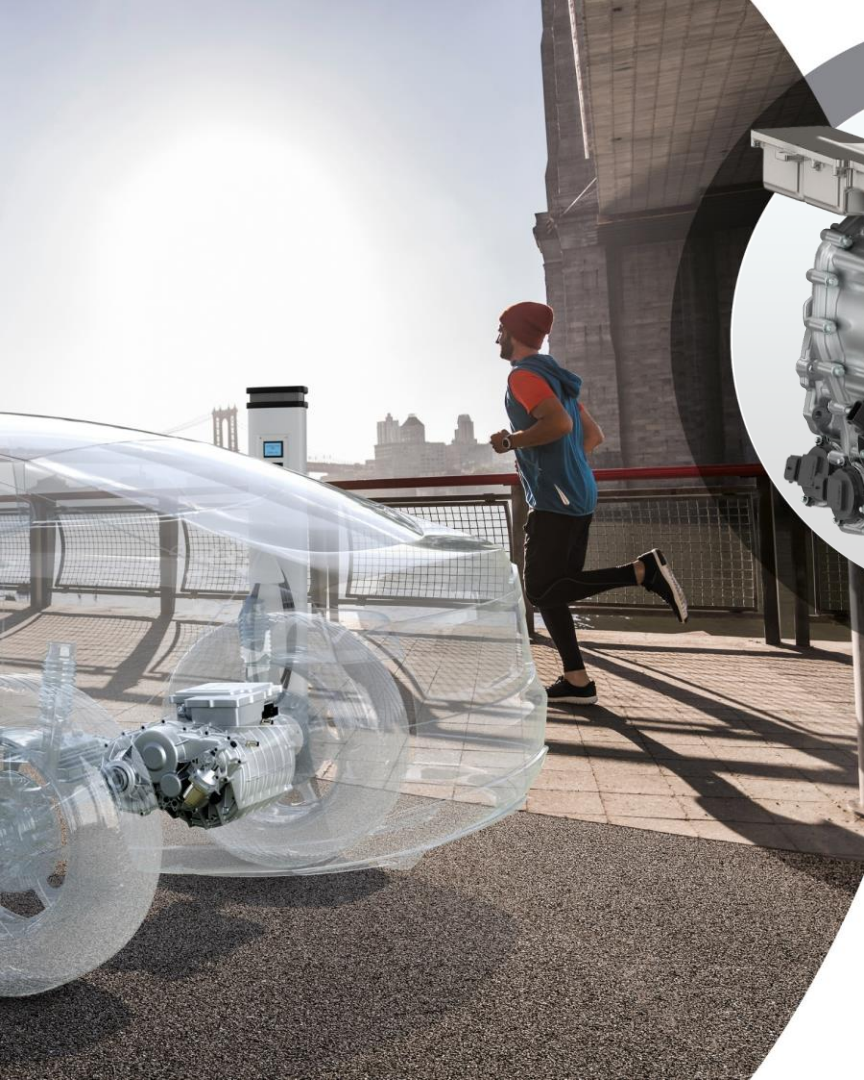




Welcome Address International ECS Simulation Conference 2021

Helmut Dannbauer
Senior Manager Simulation & Testing
May 19-20



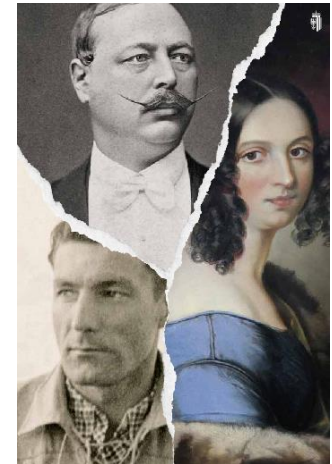
Welcome to the 1st International Online Conference 2021!

25+ Years of Excellence in Durability & Dynamics

Plans for first **ECS Simulation Conference**



- Move from Steyr to Linz “Steel World”
- Generous meeting rooms & exhibition space
- Voestalpine company tour
- Cultural option to Steyr town with district exhibition



“Work /
Wealth /
Power”

crumble because of...





**SYSTEM DYNAMICS &
STRUCTURAL DURABILITY**

THERMAL MANAGEMENT
KULI

SYSTEM DYNAMICS & STRUCTURAL DURABILITY

FEMFAT

13th International FEMFAT User Meeting (1997)

DYNAMIC

6th International Conference

*“Dynamic Simulation in Vehicle Engineering”
(2010)*

MAMBA

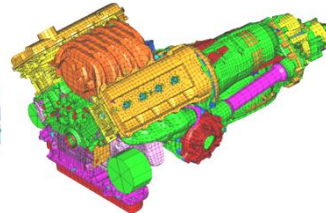
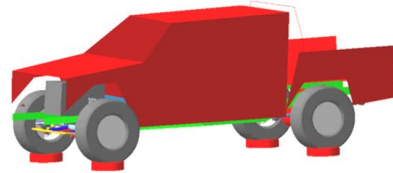
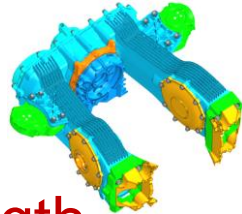
MNOISE

FEMFAT LAB

1st International User Meeting (2013 local 4)

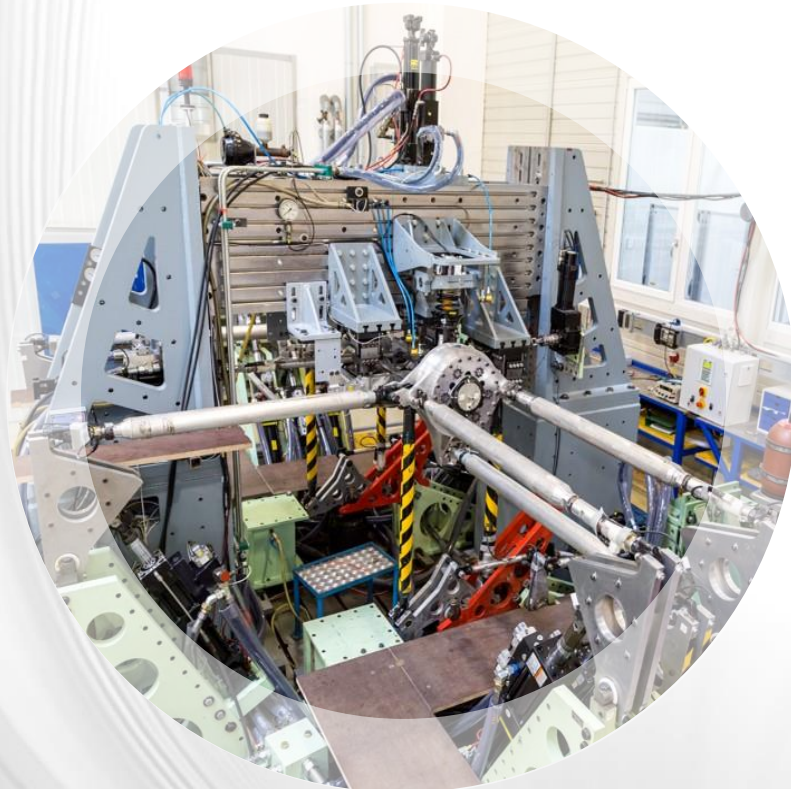
Durability / Strength

Stiffness
Static strength
Durability
Crash



Dynamics / Acoustics

Drivability
Ride comfort
Acoustics
Load generation



Equipment and Infrastructure

- 250 Servo-hydraulic actuators
- Forces between 10 kN – 500 kN
- Frequency up to 100 Hz
- 40 actuators controlled simultaneously
- 9 Foundations (up to 500 tons)
- Max. weight of specimen 50 tons
- Flexible modular test rig systems

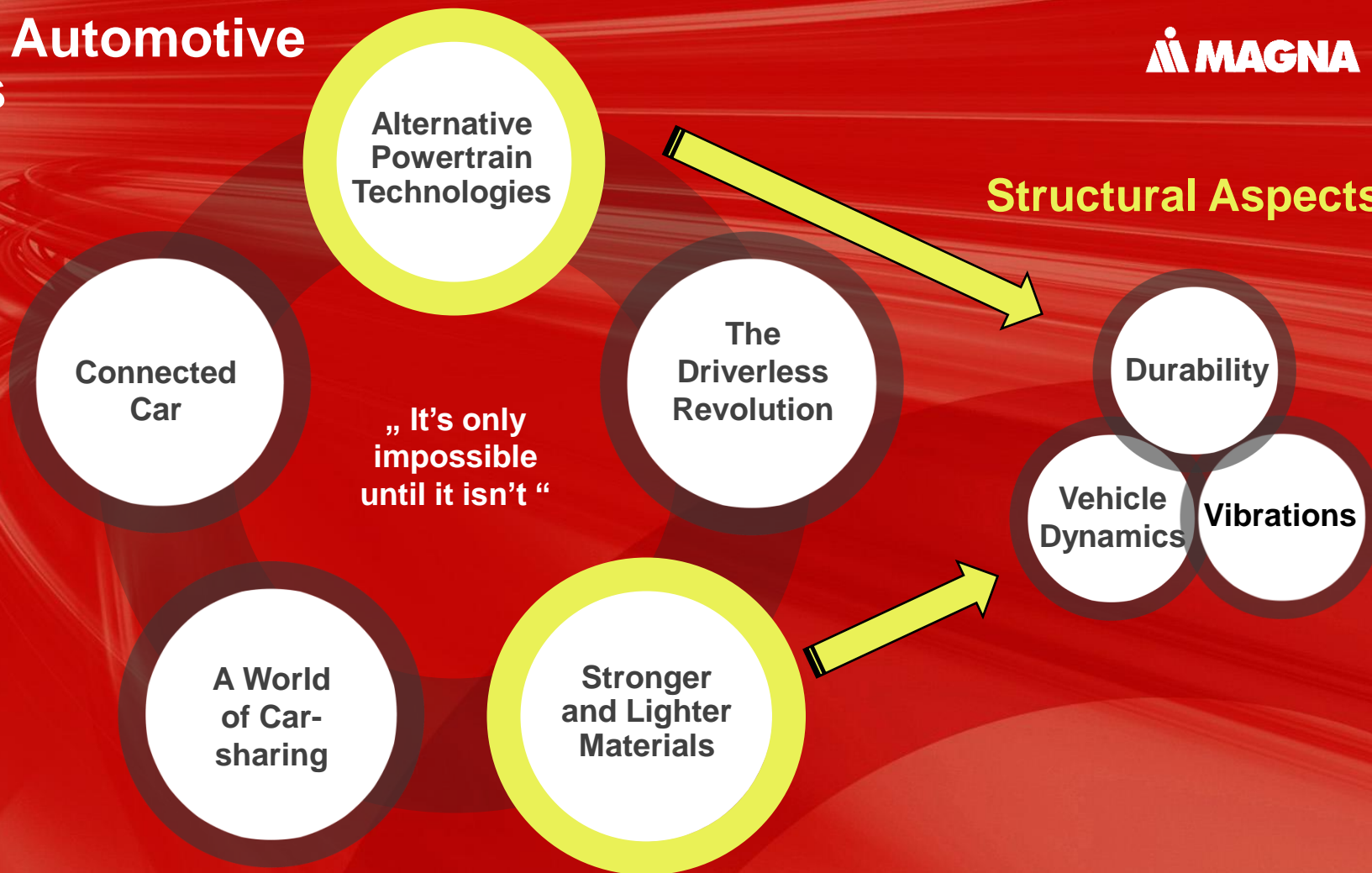
Main Testing Topics

- Body fatigue
- Axle and suspension
- Exhaust system
- Frame and subframe
- Steering system
- Front end
- Material and joint testing
- Measurement data logging and processing

Fatigue Testing Workflow

- Testing concept
- Design of test rig
- Test rig setup
- Creation of test program
- Test rig iteration
- Fatigue testing

Global Automotive Trends



FEMFAT

**SYSTEM DYNAMICS &
STRUCTURAL DURABILITY**



Hot topics

- Modal approaches in fatigue assessment ↔ higher excitation frequencies
- Random response fatigue analysis considering mean stresses, local plasticity and anisotropic material behavior ↔ speed, testing standards
- Durability assessment of joints with vibration loading and contact ↔ accuracy
- Processing and definition of power spectral densities ↔ e-mobility

DYNAMIC

**SYSTEM DYNAMICS &
STRUCTURAL DURABILITY**



Hot topics

- Full vehicle dynamics ↔ **e-mobility**
- Road load data generation ↔ **everlasting topic**
- Modeling techniques for damping and non-linearities ↔ **accuracy**
- New challenges of electro-mobility ↔ **noise, vibrations, durability**

FEMFAT LAB

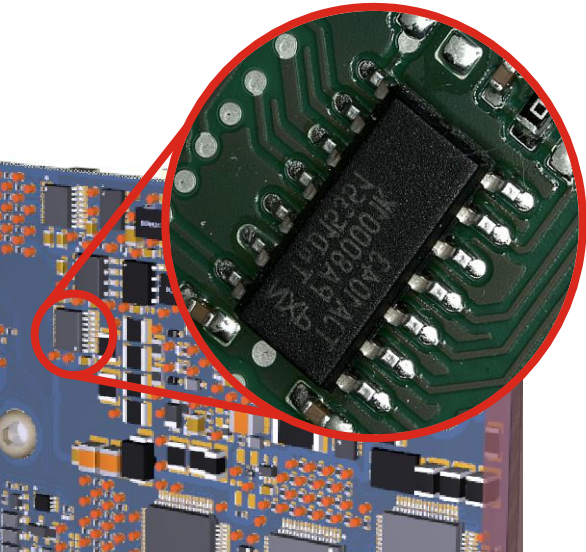
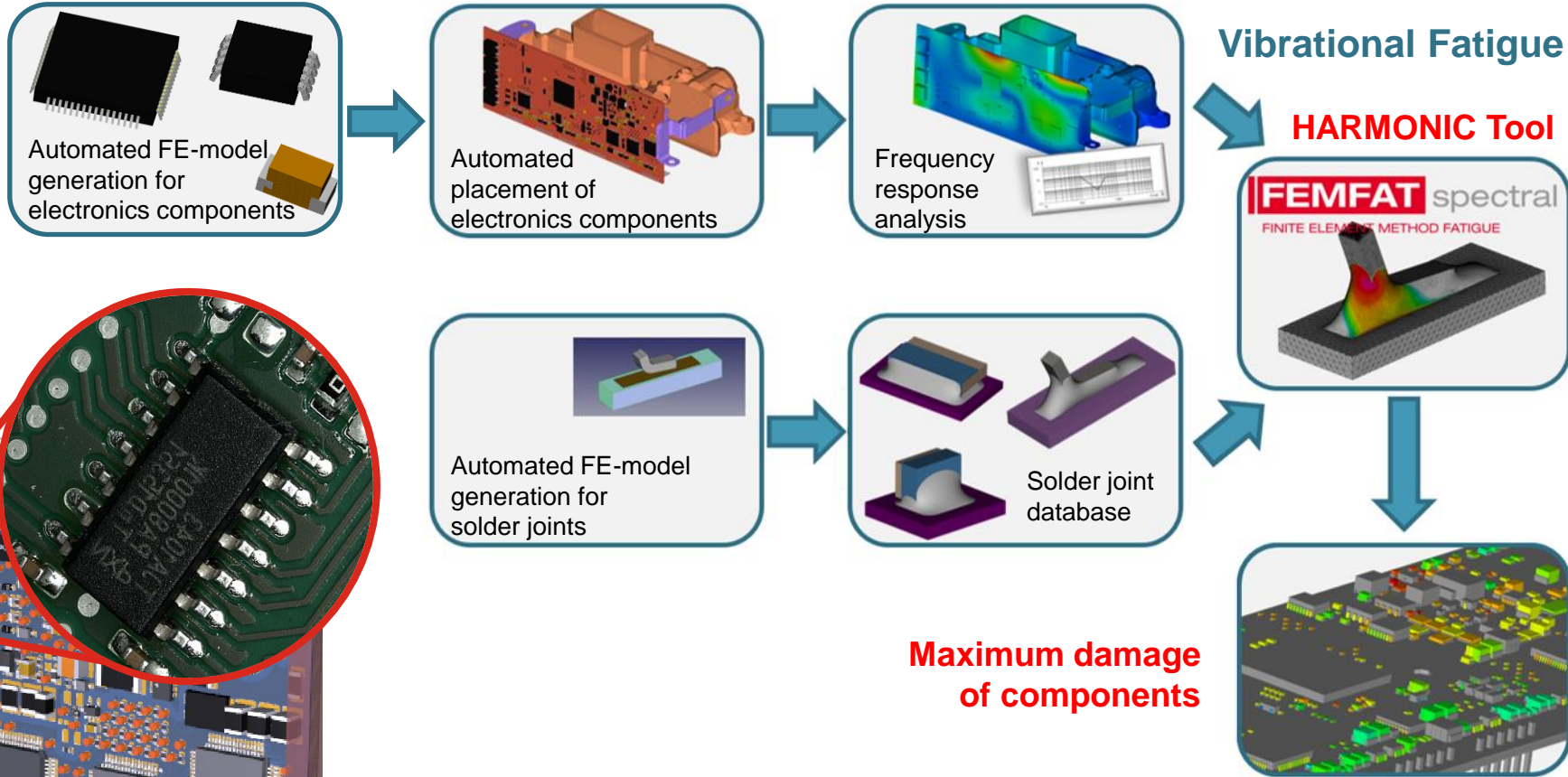
**SYSTEM DYNAMICS &
STRUCTURAL DURABILITY**



Hot topics

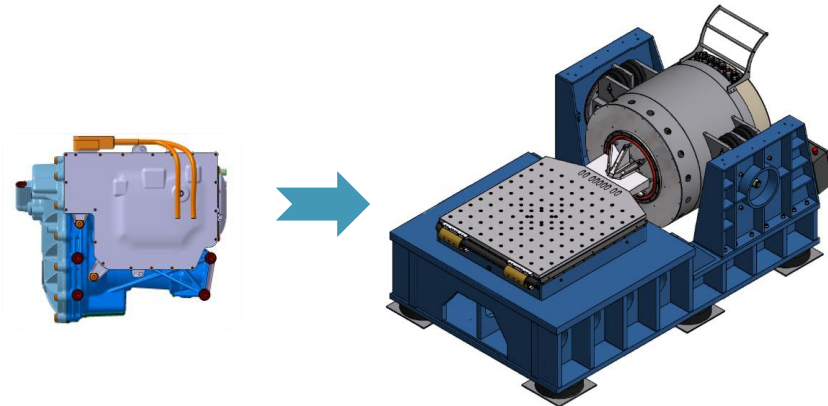
- Generation of load data for simulation models based on measured responses
↔ **combined analysis / testing approach**
- Optimized test programs and test time reduction ↔ **economics & accuracy**
- MBS models verification and optimization ↔ **results quality**
- Calculation of 3D road surfaces without test track scanning ↔ **availability**

Printed Circuit Board Simulation Process



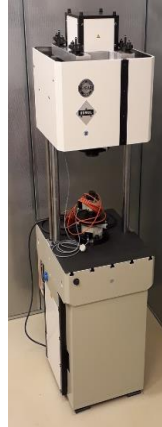
Electrodynamic Shaker Table & Climate Chamber

Force sine/noise/shock	125000/115000/375000 N
Frequency range	5 - 2500 Hz
Main resonance	> 2100 Hz
Max. displacement sine/noise/shock	63,5/63,5/76,2 mm
Max. velocity sine/noise/shock	2,0/2,0/4,0 m/s
Max. acceleration sine/noise/shock	100/90/300 g



Operating from 7/2021

Servo Hydraulic and Resonance Test Benches



3 MTS axial test benches

3 MTS bending test benches

RUMUL 150 kN from 45-260 Hz

Elevated temperatures up to 1000 deg. C

Climatized room

Argon fire extinguisher

In operation since 12/2020

- Honor academic work about fatigue
- Chance for young engineers / researchers
- Strengthen our relationship to research
- Not limited to analysis or FEMFAT related
- Jury from ECS & industry & academic

Please encourage students
and postgraduates to participate!

Prize money € 5000



The poster features the MAGNA logo at the top left. The background is red. In the center, there is a circular graphic with a mesh and a stress distribution map. To the right of this graphic is a smaller circular graphic with a list of bullet points. Below these graphics, the text 'Academic Fatigue Research Award' is written in large white letters. At the bottom, there is a paragraph of text and a list of bullet points.

MAGNA

Academic Fatigue Research Award

The Engineering Center Steyr as part of Magna Int. located in St. Valentin/Austria develops the worldwide successful fatigue software FEMFAT. In 2021 we will grant the Academic Fatigue Research Award during the international FEMFAT User Meeting, being a part of ECS SIMULATION Conference, for the second time. This award honors scientific papers focused on fatigue, durability and strength applications as well as further developments in theory.

- Submission of abstracts until Dec. 31st 2020 ONLINE at femfat.magna.com.
- Presentation of your paper to an international audience at the FEMFAT User Meeting in Linz/Austria.
- This award is endowed by € 5.000,- for the best contribution.

femfat.magna.com

Thank you for making it happen!

Presenters

ECS Marketing
Team

Local
Representatives

ECS Sales &
Support Team

Exhibitors

Chairmen

25+ Years of Excellence in Durability & Dynamics



DRIVING **EXCELLENCE.**
INSPIRING **INNOVATION.**