

INSTRON AWARD

Prize awarded to

Stefan Weiland

for his work at the Fraunhofer-Institut für Betriebfestigkeit und Systemzuverlässigkeit LBF, Darmstadt/Germany, on a

“Loading Standard for Structural Durability Design and Optimization of Trailer Couplings Considering Bike Carrier Service Loads at Passenger Cars”

Trailer couplings are safety components. Tests on trailer couplings with realistic load assumptions are essential for the design as well as for durability proof. Up to now, the European regulation 94/20/EC considering uni-axial loading with constant amplitude is mandatory for experimental trailer couplings durability proof. In addition to the regulation 94/20/EC the loading standard CARLOS TC (CAR LOading Standard for Trailer Couplings) has been derived with regard to service loadings of passenger car-trailer combinations. However, neither the regulation 94/20/EC nor CARLOS TC consider service loadings caused by transportation of bike carriers.

Basing on this fact, Stefan Weiland derived a loading standard called CARLOS TC BC (Bike Carriers) with focus on trailer couplings during bike carrier service. He considered the results of a users opinion poll in combination with service load measurements at trailer couplings on proving grounds and public roads. He took the scatter bands caused by the track mixture, the way of driving and the loading conditions into account to define the scaleable standardized load sequence. Furthermore, Stefan Weiland recommended an appropriate test set-up for durability proof. Additionally, he performed comparisons with available loading standards and derived numerically optimized hook designs.

The mentioned work was performed by Stefan Weiland in a project supported by an international consortium of car manufacturers, suppliers, technical control boards and research institutes. Currently the industry is applying already the developed loading standard which could be established as a European technical regulation in the next years.

Instron[®] awards Stefan Weiland for his excellent PhD-Thesis on deriving the scaleable and usage oriented loading standard CARLOS TC BC considering bike carrier service loads to enable safe and lightweight design of trailer couplings.

Instron Structural Testing Systems

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