WINNER

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Category: **Rail** Country: **Austria**

WINNER

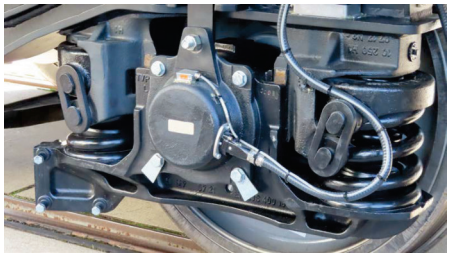
Nicole Dörr is an expert in tribology and condition monitoring. Her activities straddle academia and industry. She has longstanding expertise in assessment, benchmarking, and optimization of lubricants and lubricated components in a wide range of applications. Since 2002 she has been involved in a multitude of national and EU funded research projects. Most notable are 7 projects delivered as part of two long running series under the Shift2Rail joint undertaking, IN2TRACK 1-3 (2016-19, 2018-20 & 2021-23) and FR8RAIL I-IV (2016-19, 2018-22, 2019-22 & 2020-23). IN2TRACK is focused on enhancing permanent way infrastructure by reducing lifecycle costs and improving the reliability and punctuality of tomorrow's railway. The FR8RAIL series of projects aim to increase the sustainability and attractiveness European rail freight.

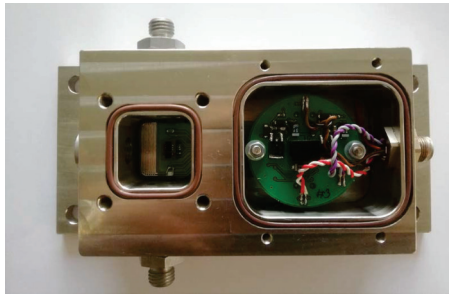
One challenge within the FR8RAIL series is to develop suitable and robust sensor systems and a set of algorithms as a basis for condition-based maintenance of lubricated components (transformer, axle box bearing, diesel engine) in locomotives and wagons. This required developing and then field testing these customized sensor systems from scratch as no appropriate sensor systems previously existed for the selected applications. Dr Dörr's in-depth expertise in tribology and machinery damage patterns was crucial to realizing the customized sensors and establishing the algorithms that can reliably inform on the health status of lubricants and lubricated components, i.e., correlating lubricant properties with sensor signals.

Field demonstration of the sensor systems so far confirms functionality and robustness under real operating conditions. There is the potential for a significant extension of lubricant change intervals with resulting maintenance cost reduction, resource savings and safety benefits. The customized sensor systems are mostly assembled from commercial individual sensors; hence, acquisition costs are in line with stringent cost requirements of operators. A major advantage of the developed sensor systems is that they can be retrofitted to existing locomotives or wagons. The sensor development environment can be also applied to other railway applications and machinery with similar stress profiles, were robustness of sensor and algorithm is indispensable for example mining vehicles and wind turbines.

Key research themes

Tribology; Condition-based and predictive maintenance strategies





Nicole Dörr, Scientific Head of AC2T research GmbH and holder of a venia docendi in tribology at TU Wien, has longstanding expertise in assessment, benchmarking, and optimization of lubricants and lubricated components in a wide range of applications. She is involved in the FR8RAIL and IN2TRACK project series of the Shift2Rail Joint Undertaking and contributes to new maintenance strategies of rail vehicles and infrastructure.