

ELYFOG



Application within FFI Circularity





LARS OXELMARK

SENIOR ENGINEERING ADVISOR – TIGHTENING TECHNIQUE

GLOBAL INDUSTRIAL DEVELOPMENT



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Long-Term reliable electrical contacts in EVs – application phase and beyond

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Project information

Project leader: RISE

Duration: 2023 – 2026

Total budget: 11,98 MSEK



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Partners

Scania, Volvo, Husqvarna, Northvolt, Provexa, Mickropower, Bulten,
Atlas Copco, Stanley, Harting,



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Project background

Long-term reliable electrical contacts in EVs - application phase and beyond

The role of electrical connections in electric vehicles is generally underestimated compared to batteries or electric motors.

Very little information is available in the literature and conferences and workshops rarely, if ever, include anything concerning electrical contacts and wiring systems

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Practical contribution, Industry relevance

The project is aimed at electrically powered vehicles of various types: cars, trucks, buses, riding mowers and forklifts.

The project results are also applicable to other electrical products such as ships, boats, power electronics, and handheld machines.



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Theoretical contributions, Academic relevance

Within this project and given the cross-disciplinary character of the topic and the project consortium, current knowledge is applied to new system requirements (EV instead of ICE vehicles)

And new knowledge is created by applying known test methodologies and development of new test methodologies that can account for self-reinforcing degradation effects by combining loads simultaneously instead of sequential testing.

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Deliverables (connected to the assembly cluster aim & vision)

The project will apply a holistic approach to optimize joint configuration, durability, sustainability, costs, and re-usability and recyclability.

The results will be available as web-based guidelines.

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Project goals

Main goal is to minimize energy losses in electrical connections due to degradation of the joints by thermal, environmental, and mechanical loads, for both with primary and recycled material streams.

In other words, creating the conditions for long-term stable electrical connections in electric vehicles over the whole application phase and where possible even beyond.

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Project purpose

The focus will be mainly on bolted connections for grounding and busbar applications to keep the level of complexity manageable, but the created knowledge is expected to be applicable also to other connection methods and may be used in further follow-up projects

Effects

Long-term reliable electrical contacts in EVs - application phase and beyond



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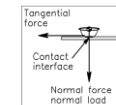
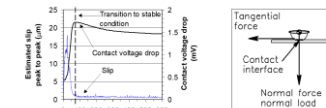
Status so far

- 4 meetings
- 1 workshop
- 5 work package
- Define test
 - Methods
 - Material
 - Fasteners
 - Tightening strategies



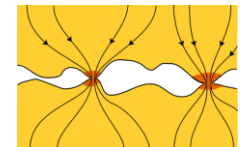
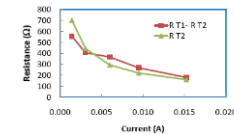
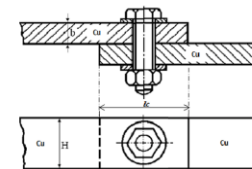
Designation: B539 – 20

Standard Test Methods for
Measuring Resistance of Electrical Connections (Static
Contacts)¹



$$R_T^1 - R_T^2 = 2 \cdot R_{SR}^C - R_{SS}^C - R_{RR}^C$$

$$R_T^2 = 3 \cdot R_S^B + 2 \cdot R_R^B + 2 \cdot R_{SR}^C + R_{SS}^C + R_{RR}^C$$

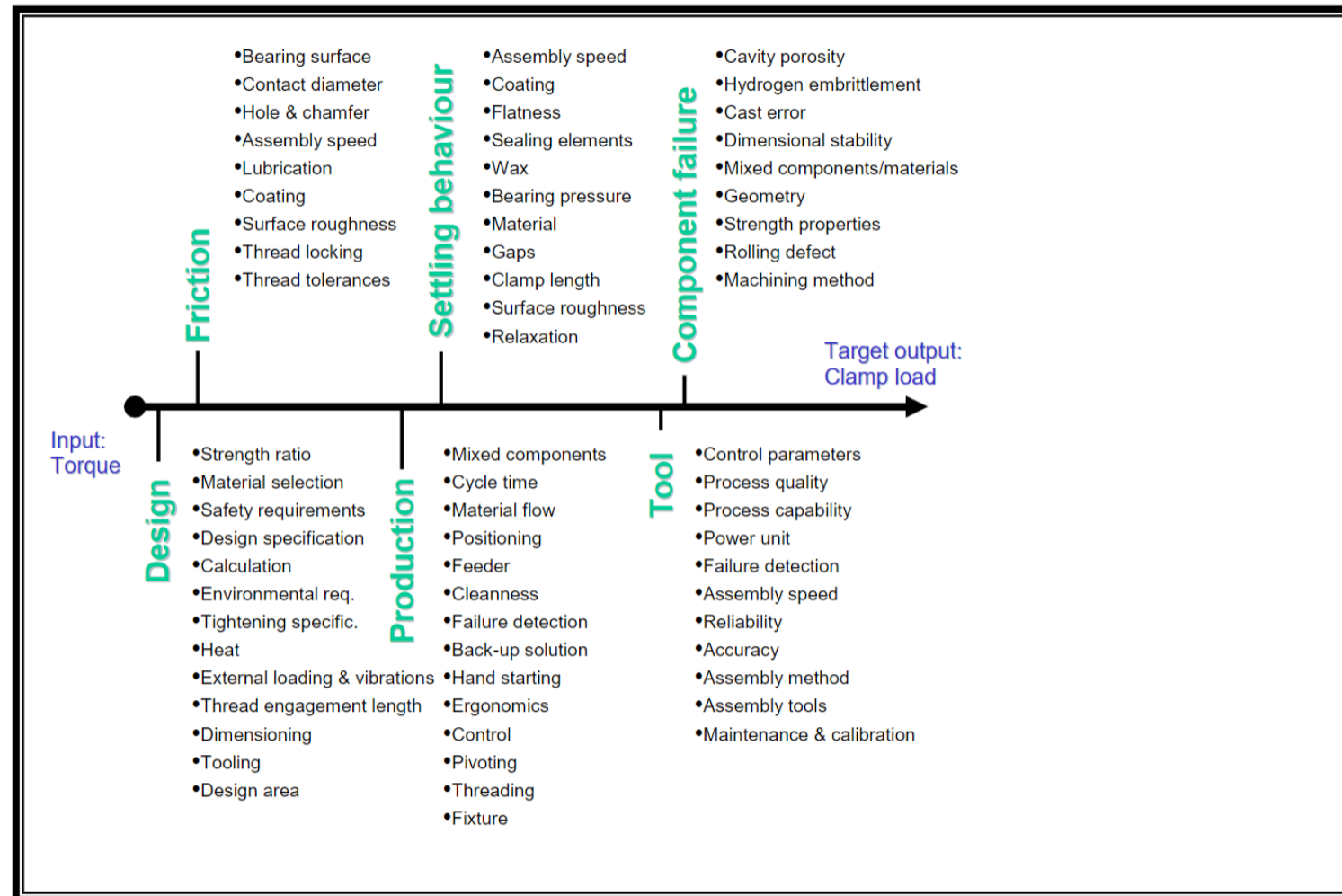


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Why do we need this project?



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That's all folks!

TAKE CHARGE
100% ELECTRIC