

Welding numerical simulation including fatigue prediction of welded construction in ground transportation, steel constructions and energy industrial section – high and low fatigue, thermal fatigue and hot tearing

The main general aim of the project is increase competitiveness of participating companies. The aims of project are following:

1. Validation and optimisation of numerical solution of the fatigue of welded constructions in area of ground transportation, steel constructions – low and high fatigue.
2. Validation and optimisation of numerical solution of the fatigue of welded constructions in energy industrial sector – low and thermal fatigue
3. Description of influence of individual technology parameters on fatigue.
4. Optimisation of the welding technology of taken welded construction to maximal decrease material degradation and residual stresses.
5. Description of thermal fatigue.
6. Preparation of methodology of thermal fatigue solution.
7. Measurement of material input data for numerical simulation of welding process.
8. Measurement of material input data for numerical simulation of fatigue- basic materials and weld joints.
9. Measurements of material input data and experimental tests for numerical solution of hot tearing.
10. Preparation of numerical solution methodology for hot tearing of austenitic and Ni based alloy materials.
11. Application of all methodologies on industrial cases.
12. Marketing activities:
 - a) Preparation of marketing materials describing complete numerical solution of fatigue process and hot tearing.
 - b) Making web-seminars to demonstrate complete numerical solution of fatigue process and hot tearing.
 - c) Preparation manuals with demonstration examples.
 - d) Participation on conferences, seminars, workshops.

Code	FV10709
State providing funder	Ministry of Industry and Trade of The CR https://www.mpo.cz/en/
Programme	FV – TRIO (2016-2022)
Total eligible costs	9 331 000 CZK
Total project subsidy	6 852 000 CZK
Subsidy FME TUL	3 180 000 CZK
TUL project number	17772
Contractor	MECAS ESI s.r.o. https://www.esi-group.com/
Project participant	TUL, Faculty of Mechanical Engineering
Principal investigator TUL	doc. Ing. Jaromír Moravec, Ph.D.
Department	Department of Engineering Technology http://www.fs.tul.cz/en/technology/welding/research-and-innovations/
Period	2016-2018

<https://www.rvvi.cz/cep?s=jednoduche-vyhledavani&ss=detail&n=0&h=FV10709>

Costs (year) TUL	2016	2017	2018	Total
Non-investment (CZK)	720 000	1 240 000	1 220 000	3 180 000
Investment (CZK)	0	0	0	0

Total (CZK) TUL		720 000	1 240 000	1 220 000	3 180 000
Project results					
2018	Proven technology	RIV/46747885:24210/18:00006061			
2018	Proven technology	RIV/46747885:24210/18:00006062			
2018	Prototype	RIV/46747885:24210/18:00006063			